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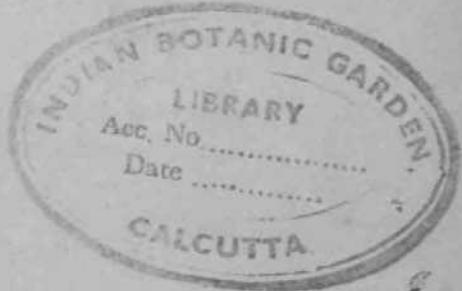
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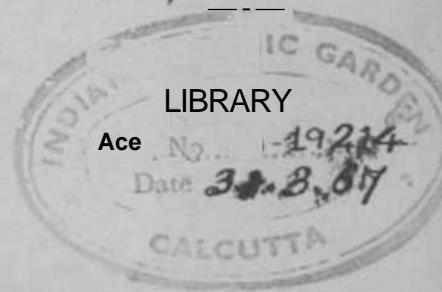
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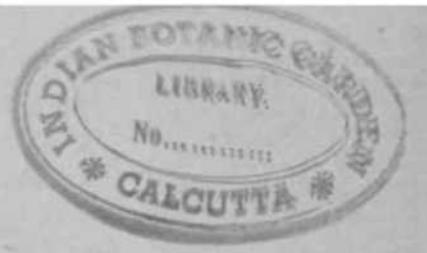
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The sign f after abstract numbers signifies that the abstract consists of a title only.

INTERNATIONAL ABSTRACTS OF BIOLOGICAL SCIENCES

NOTES TO INDEX. VOLUME 31

Entries are grouped under keywords (i.e. names or concepts under which information is most likely to be sought). Keywords are printed in heavy type and referred to as "bold headings" in cross-references. Generally choice of keyword is based on titles only but, where titles do not adequately represent the scope of the work, further selections are made from the body of the abstract.

The index is mainly alphabetic but under headings dealing with complex subjects a general section (alphabetically arranged) is followed by bold type subsections which may have the main keyword repeated, e.g. :—

Muscle
general entries
Muscle apparatus & techniques
Muscle contraction
general entries
skeletal
smooth
Muscles, specific [where named muscles are listed].

CROSS-REFERENCES are as full as possible but are not given where the choice of heading is reasonably evident. Thus, names of individual bones, muscles, nerves etc. are listed under **Bones**, **Muscles**, **Nerves**, and not **Tibia**, **Soleus**, **Sciatic**. All enzyme studies are grouped under **Enzymes**: here sections dealing with concepts of general biochemical and physiological interest (e.g. **Enzyme biosynthesis**) are followed by a section listing specific enzymes, their classification and nomenclature being based on the "Report of the Commission on Enzymes of the International Union of Biochemistry" (e.g. aldolase will be found under **Enzymes, specific, lyases**).

CHEMICAL SUBSTANCES. *Organic compounds* are indexed either under the principal substituted group (e.g. 2-amino-6-mercaptopurine under **Purine analogues**) or alphabetically under the name of the first substituent group (e.g. **Sulphamethoxypyridazine**). Some prefixes have been alphabetically ignored in accordance with the conventions laid down by The Chemical Society, 1959, e.g. *cis*-, *trans*-, *o-t* *m-t* mono-, di-, DL-. *Drugs* are indexed under their G.M.C. approved names and cross-referred from chemical and alternative names. Group headings based on chemical composition or physiological action are used extensively (e.g. **Antibiotics**, **Barbiturates**, **Cholinergic agents**, **Tranquillisers**). *Inorganic compounds* are indexed under group headings (e.g. **Electrolytes**) and under individual elements/ions (e.g. **Carbon**, **Fluoride**, **Sodium**).

DISTURBANCES IN FUNCTION (both experimental and pathological) are grouped in special sections under organs and systems concerned (e.g. **Liver disorders**).

ORGANISMS have been indexed in two ways:—

(1) in the general Subject Index under the names of the major groups of organisms. Here there are references to the general biology of the group and also to specific organisms where these are mentioned by their common names in the abstracts, e.g. monkeys will be found under **Mammals**. The chief group headings used are :—

- | | |
|------------------------------|--|
| (a) for Micro-organisms .. . | Bacteria , Bacteriophages , Micro-organisms , Protozoa ,
Viruses , Yeasts . |
| (b) for Plants | Algae , Lichens , Fungi , Bryophytes , Pteridophytes ,
Gymnosperms . Angiosperms are covered by various
Plant headings which also contain references to the
biology of other green plants. |
| (c) for Animals | The phyletic names, or in the case of Arthropods and
Vertebrates, the class names. |

Occasionally it is necessary to use wider headings, e.g. **Aquatic organisms**; **Invertebrates**. Other headings relating to living organisms include **Species comparisons** and **Laboratory animals**.

(2) in the Taxonomic Index which follows the general subject index. Here organisms are indexed under their Latin names. This index is in three parts, Bacteria, Plants, and Animals. It is preceded by a systematic key to the included genera and also by further explanatory notes.

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TAXONOMIC INDEX

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The index is in three parts, **Bacteria**, **Plants** and **Animals**, preceded by a key to generic names. In the index itself, *gen** are in bold type and species in italics. Occasionally names of taxa higher than genera are used.

>U In the main subject index are references to the larger systematic groups, e.g. **Algae** ; **Birds**. These contain information on general biology and references to organisms under their common names, e.g. **Mammals, specific, sheep**. There is also a section on **Taxonomy** covering general studies and taxonomic methods.

KEY

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Algae			
Acetabularia			
Anacystis			
Bryopsis			
Chlamydomonas			
Chlorella			
Coccolithus			
Fucus			
Hemiselmis			

Lampratococcus
Laminaria
Macrocystis
Microcystis
Nitella
Nostoc
Oedogonium
Oscillatoria
Pseudeendactylum
Ranunculus

Stenodermus
Stenoptera
Smyra
Synchococcus

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Aspergillus
Allomyces
Auxomycetes
Arthrobotrys
Aspergillales

Ascomycetes
Basidiomycetes

luteola
luteola
luteola

Fungi—continued.

Calvatia
Candida
Cephalosporium
Ceratostysis
Cercospora
Cocciaioides
Colletotrichum
Colybia
Comophora
Coprinus
Cordyceps
Cryptococcus
Cunninghamella
Curvularia
Dacrymyces
Dictyostelium
Eremothecium
Erysiphe
Fusarium
Gibberella
Gloeosporium
Helminthosporium
Hemileia
Hericium
Histoplasma
Hypomyces
Kirschsteinella
Lactarius
Lampteromyces
Merulius
Microsporum
Mycosphaerae Ua
Myrothecium
Nectria
Neobulgaria
Neurospora
Olipidiopsis
Olipidium
Ophiostoma
Panus
Penicillium
Pestalotia
Phlebia
Phycomyctes
Physarum
Phytophthora
Pilobolus
Polyporus

Fungi—continued.

Protomycetes
PsaUiota
Puccinia
Pyronema
Pythium
Rhizina
Rhizophorus
Rhodotoma
Saccharomyces
Saprolegniaceae
Schizophyllum
Schizosaccharomyces
Sclerotiniaceae
STEREUM
Thraustochytrium
Torulopsis
Trametes
Trichoderma
Trichophyton
Ustilago
Verticillium
Bryophyta
Bryum
Ceratodon
FUNARIA
Lunularia
Marchantia
Riccia
Riella
Sphagnum
Pteridophyta
Equisetum
Marsilea
Phymatodes
Pteridium
Gymnosperms
Abies
Agathis
Cycas
Ginkgo
Picea
Pinus
Pseudotsuga
Sciadopitys

Monocotyledons

Aegilops
Agapanthus
Agave
Allium
Amaryllis
Areca
Avena
Babiana
Bothriochloa
Brachiaria
Bulbinella
Capillipedium
Carex
Cocos
Dactylis
Dioscorea
Echinochloa
Elodea
Galanthus
Gasteria
Haemanthus
Hordeum
Hydrocharis
Ixia
Lemna
Lilium
Liriopae
Lolium
Lycoris
Molinia
Moraea
Musa
Oncidium
Oryza
Phalaris
Reineckia
Schoenus
Secale
Setaria
Sorghum
Sparaxis
Tigridia
Tradescantia
Trillium
Tripsacum
Triticum
Tritonia
Typha

Monocotyledonfl —continued.	Dicotyledons —continued	Cnidaria —continued.	Annelida —continued.
Wolffia	Mimosa	Hydra	Myxicola
Zea	Mundulea	Spirocodon	Nereis
Dicotyledon!	Myrica	Platyhelminthes	Pelodrilus
Abutilon	Nelumbium	Bdelloura	Perinereis
Acacia	Nicotiana	Cura	Philaemon
Acer	Oenothera	Diphyllothorium	Tubifex
Achillea	Oxalis	Dugesia	
Aconitum	Oxytropis	Echinococcus	Diplopoda
Aegle	Panax	Fasciola	Apheloria
Anethum	Persea	Gastrocotyle	
Anthemideae	Petasites	Hydatigena	Odonata
Antiaris	Petroselinum	Lacistorhynchus	Aeschna
Antirrhinum	Petunia	Pseudoaxine	
Arabidopsis	Pharbitis	Pterobothrium	Dictyoptera
Arachis	Phaseolus	Schistosoma	Blaberus
Arbutus	Philotheca	Taenia	Blatta
Artocarpus	Physalis		Leucophaea
Astragalus	Pisum	Kemertina	Nauphoeta
Atriplex	Plantago	Lineus	Periplaneta
Bassia	Podophyllum		
Begonia	Populus	Aschelminthes	Phasmida
Beta	Proserpinaca	Ascaris	Carausius
Brassica	Prunus	Brugia	
Brunfelsia	Pyrus	Caenorhabditis	Orthoptera
Buxus	Quercus	Gongylonema	Acridoidea
Calluna	Raphanus	Haemonchus	Cannula
Calotropis	Rauwolfia	Loa	Gryllus
Calycanthus	Rhagodia	Nematodirus	Locusta
Capparidaceae	Ribes	Paramermis	Moraba
Capraria	Ricinus	Priapulus	Nomadacris
Chrysanthemum	Rivea	Strongyloides	Orchelimum
Cirsium	Rubus	Toxocara	Schistocerca
Citrus	Salvia	Trichinella	
Clarkia	Securinega	Turbatrix	Dermoptera
Coffea	Senecio		Forficula
Coleus	Seseli	Polyzoa	Phthiraptera
Collinsia	Silene	Bugula	Pediculus
Convolvulus	Sinapis		Phthirus
Corydalis	Siphonodon	Brachiopoda	Hemiptera
Crassulaceae	Skimmia	Crania	Adelphocoris
Crotalaria	Solanum		Agraptacorixa
Cruciferae	Spinacia	Mollifloa	Aphis
Cucurbita	Stanleya	Acmaea	Brevicoryne
Cuscuta	Streptocarpus	Aplysia	Cardiaspina
Cynara	Tecoma	Archachatina	Dysdercus
Dalbergia	Thymus	Argobuccinum	Endria
Daucus	Trifolium	Australorbis	Laccifer
Digitalis	Ulex	Barnea	Macrosiphum
Dionaea	Vaccinium	Buccinum	Megoura
Dipteryx	Valeriana	Cepaea	Murgantia
Drimys	Vicia	Charonia	Myzus
Eclipta	Vinca	Chlamys	Notonecta
Erica	Vitis	Conidae	Oncopeltus
Eriostemon	Wistaria	Cuspidaria	Oxycarenus
Eucalyptus	Xanthium	Diodora	Planococcus
Euphorbia	Xysmalobium	Doryteuthis	Platymerus
Eurya		Eledone	Pulvinaria
Evodia	Protozoa	Halictis	Rhinocoris
Fagopyrum	Amoeba	Helix	Rhodnius
Ficus	Astasia	Katherina	Sappaphis
Flindersia	Blepharisma	Loligo	Theroaphis
Galeopsis	Chlamydodon	Lymnaea	Triatoma
Garcinia	Chrysóchromulina	Martesia	
Glycine	Cricospaera	Mercenaria	Neoptera
Grevillea	Crithidia	Mopalia	Sialis
Gypsophilas	Eimeria	Mya	
Halfordia	Entamoeba	Mytilus	Cojeoptera
Helianthus	Entodinium	Octopus	Anthonomus
Humulus	Euglena	Oncocelania	Anthrenus
Hunteria	Gonyaulax	Ostrea	Coccinella
Hydrangea	Histogramonas	Planorbis	Corthylus
Hypericum	Laverania	Rangia	Epilachna
Impatiens	Leishmania	Sepia	Hypera
Ipomoea	Nosema	Sepioteuthis	Menochilus
Kalanchoe	Ochromonas	Spisula	Photuris
Kochia	Oxytricha	Tropicoribus	Tenebrio
Lathyrus	Paramecium	Venus	Trichobius
Lavendula	Pelomyxa	Sipunculoidea	Trogoderma
Linanthus	Plasmodium	Dendrostomum	
Linum	Prymnesium	Golfingia	Lepidoptera
Lithospermum	Spathidium		Antheraea
Lophocereus	Stentor	Echiuroidea	Automeris
Lunaria	Strigomonas	Urechis	Bombyx
Lupinus	Styfonychia		Carpocapsa
Lycopersicum	Tetrahymena	Annelida	Choristoneura
Lythrum	Toxoplasma	Eisenia	Chorizagrotis
Malus	Trichomonas	Enchytraeus	Corcyra
Matthiola	Trypanosoma	Helodrilus	Ephestia
Melampyrum		Hirudo	Galleria
Melastomataceae	Cnidaria	Lumbricus	Grapholita
Mentha	Cordylophora		

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<i>Hyalophora</i>	<i>Idotea</i>	<i>Fundulus</i>	<i>Carpodacus</i>
<i>Lamdbina</i>	<i>Leander</i>	<i>Gadus</i>	<i>Chlorospingus</i>
<i>Melanargia</i>	<i>Libinia</i>	<i>Gambusia</i>	<i>Columba</i>
<i>Ostria</i>	<i>Ligia</i>	<i>Gasterosteus</i>	<i>Corvus</i>
<i>Pandroma</i>	<i>Mysidium</i>	<i>Gobio</i>	<i>Delichon</i>
<i>Pieris</i>	<i>Næsa</i>	<i>Gymnarchus</i>	<i>Dolichonyx</i>
<i>Prodenia</i>	<i>Ocypode</i>	<i>Gymnotus</i>	<i>Ficedula</i>
<i>Rhyacionia</i>	<i>Orconectes</i>	<i>Labeo</i>	<i>GaUus</i>
<i>Saturniidae</i>	<i>Pacifastacus</i>	<i>Lebistes</i>	<i>Junco</i>
<i>Trichoplusia</i>	<i>Pagurus</i>	<i>Lophius</i>	<i>Lanius</i>
<i>Diptera</i>	<i>Palaemon</i>	<i>Microgadus</i>	<i>Lams</i>
<i>Aedes</i>	<i>Panulirus</i>	<i>Myoxocephalus</i>	Lipaugus
<i>Anopheles</i>	<i>Porcellio</i>	<i>Oncorhynchus</i>	<i>Malimbus</i>
<i>Baetis</i>	<i>Procambarus</i>	<i>Perca</i>	<i>Molothrus</i>
<i>Bellulucilia</i>	<i>Talitrus</i>	<i>Pleuronectes</i>	<i>Passer</i>
<i>Calliphora</i>	<i>Temora</i>	<i>Rastrelliger</i>	<i>Perissecephalus</i>
<i>Caliphoridae</i>	<i>Uca</i>	<i>Salmo</i>	<i>Philohela</i>
<i>Chæborous</i>		<i>Salvelinus</i>	<i>Phoeniconaias</i>
<i>Chironomus</i>		<i>Scorpaena</i>	<i>Ploceinae</i>
<i>Clytomya</i>		<i>Staetogenes</i>	<i>Procnias</i>
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<i>Cnemidopoda</i>		<i>Tinea</i>	Rissa
<i>Diptero</i>		<i>Trachinus</i>	<i>Rupicola</i>
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<i>Glossina</i>			<i>Tangavirius</i>
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<i>Hinea</i>			
<i>Lucilia</i>			
<i>Mansonia</i>			
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ABBREVIATIONS ETC. USED IN INDEX

The same abbreviations are used for the singular and plural forms of nouns.

A	Angstrom	C-R	crown-rump	FMN(H)	flavin mononucleotide (reduced)
Ab	antibody	o~, e+ cryst*	/crystalline \crystallised	freq.	frequency
abs.	absolute	crystn.	crystallisation	FSH	follicle-stimulating hormone
a.c.	alternating current	c/s	cycles per second	ft.	foot
a.c.d.	acid citrate dextrose	CS	conditioned stimulus	g	acceleration due to gravity
a.c.g.	acid citrate glucose	c.s.f.	cerebrospinal fluid	g.	gram
ACh	acetylcholine	CTP	cytidine triphosphate	GA	gibberellic acid
AChase	acetylcholinesterase	c.v.s.	cardiovascular system	GABA	Y- ^{aminob} utyric acid
ACTH	adrenocorticotrophic hormone	cyt.	cytochrome	GDP	guanosine diphosphate
ADH	antidiuretic hormone	cytol.	cytological, -ly	genet.	genetic, -s, -ally
ad lib.	ad libitum	2,4-D	(2,4-dichlorophenoxy)- acetic acid	GFR	glomerular filtration rate
admin.	administration, -ered	d.c.	direct current	GH	growth hormone
ADP	adenosine diphosphate	DEAE	diethylaminoethyl- (applied to cellulose)	g.i.	gastrointestinal
Ag	antigen	d.e.f.	number of decayed extracted or filled deciduous teeth	GLC	gas-liquid chromatography
aggl.	agglutinate, -d	deriv.	derivative	GMP	guanosine monophosphate (guanylic acid)
aggl.	agglutination	DFP	diisopropyl- phosphorofluoridate	GOT	glutamic-oxaloacetic transaminase
alk.	alkaline	diam.	diameter	GPT	glutamic-pyruvic transaminase
Amp.	ampere	dil.	dilute	GSH	reduced glutathione
AMP	adenosine monophosphate (adenylic acid)	diln.	dilution	GSSG	oxidised glutathione
anhyd.	anhydrous	DMB A	9,10-dimethyl 1,1,2- benzanthracene	GTP	guanosine triphosphate
a.n.s.	autonomic nervous system	DMF	number of decayed missing or filled permanent teeth	g.u.	genitourinary
ant.	anterior	DNA	deoxyribonucleic acid	haematol.	haematological, -ly
approx.	approximate, -ly	DNase	deoxyribonuclease	Hb	haemoglobin
aq.	aqueous	DNP	2,4-dinitrophenol	HCG	human chorionic gonadotrophin
atm.	atmospher-e, -ic	DOC(A)	11-deoxycorticosterone (acetate)	5-HIAA	5-hydroxyindolylacetic acid
ATP	adenosine triphosphate	dopa	3,4-dihydroxyphenyl- alanine	histol.	histological, -ly
ATPase	adenosine triphosphatase	DPN[H]	see NAD[H]	hr.	hour
a.v.	arterio-venous	i)	viscosity	5HT	5-hydroxytryptamine (serotonin)
A-V	auriculo-ventricular	E	extinction	5HTP	5-hydroxytryptophan
b.c.g.	ballistocardiogram	EaC'x,,	erythrocyte stroma-h ambceptor-r- C or components thereof	i.a.	intra-arterial, -ly
BCG	Bacille Calmette-Gue'r'in	e.c.g.	electrocardiogram	IAA	3-indolylacetic acid
biochem.	biochemical, ly	ED _{B0}	median effective (or exciting) dose	ICSH	interstitial cell stimulating hormone
biol.	biological, -ly	EDTA	ethylenediaminetetra- acetic acid	i.d.	intra-dermal, -ly
B.M.R.	basal-metabolic rate	e.e.g.	electroencephalogram	IDP	inosine diphosphate
b.p.	blood pressure	E.M.	electron microscope, -y	i.m.	intra-muscular, -ly
BSA	bovine serum albumin	embryol.	embryological, -ly	immunol.	immunological, -ly
BSP	sulphobromophthalein sodium	e.m.f.	electromotive force	IMP	inosine monophosphate (inosinic acid)
c	curie	e.m.g.	electromyogram	in.	inch
C	complement	EPR	electron paramagnetic resonance	inf.	inferior
cal.	calorie	equiv.	equivalent	INH	isonicotinic acid hydrazide (isoniazid)
calc.	calculate, -ed	E.R.	endoplasmic reticulum	inhib.	inhibit, -ed
calcn.	calculation	e.r.g.	electroretinogram	inhibn.	inhibition
CDP	cytidine diphosphate	e.s.r.	erythrocyte	inj.	inject, -ed
CF	complement fixation	ESR	sedimentation rate	injn.	injection
Chase	cholinesterase	e-V	electron spin resonance	inoc.	inoculate, -ed
chem.	chemical, -ly	expt.	electron volt	inocn.	inoculation
chr.	chromosome, -al	FAD	experiment, -al, -ly	inorg.	inorganic
chromatog.	chromatography, -ic	FFA	flavin-adenine dinucleotide	insol.	insoluble
CM-	carboxymethyl-	floccn.	free fatty acids	i.p.	intra-peritoneal, -ly
cm ⇡ ⇢	centimetre (squared) (cubed)	flocculation		i.r.	infra-red
CMP	cytidine monophosphate (cytidylic acid)			ITP	inosine triphosphate
c.n.s.	central nervous system			I.U.	international unit
CoA	co-enzyme A			i.v.	intravenous, -ly
coeff.	coefficient			k	kilo-
cone.	concentrate, -ed				
concen.	concentration				
cond. refl.	conditioned reflex				
const.	constant				
cpd.	compound				

Km	Michaelis constant	PBI	protein-bound iodine	serol.	serological, -ly
17-KS	17-ketosteroid	PCA	passive cutaneous anaphylaxis	sig.	significant, -ly, -ce
l	litre	p.d.	potential difference	simult.	simultaneous, -ly
X	wavelength	PD ₅₀	median protective or paralysing dose	sol.	soluble
lab.	laboratory	pharmacol.	pharmacological, -ly	soln.	solution
lat.	lateral	physiol.	physiological, -ly	sp.	specific, -ally
LD	median lethal dose	PMS	pregnant mare's serum	sp. spp.	species (singular, plural)
L.E ^M	lupus erythematosus	poll.	pollinate, -ed	sp.gr.	specific gravity
LH	luteinising hormone	polymorph.	polymorphonuclear leucocyte	sRNA	soluble (transfer) RNA
LSD	lysergic acid diethylamide	popln.	population	spont.	spontaneous, -ly
m	milli-	pos.	positive	stim.	stimulate, -ed
m. ² >< ²	metre (squared) (cubed)	post.	posterior	stimn.	stimulation
M	molar solution (also mega-)	PPD	purified protein derivative	S.T.P.	standard temp, and pressure
MAO	monoamine oxidase	p.p.m.	parts per million	sup.	superior
m ^g .	millimicrogram	ppt.	precipitate, -ed	temp.	temperature
(t	micro- or micron	PPtg.	precipitating	TCA	trichloroacetic acid
max.	maximum	pptn.	precipitation	TDP	thymidine diphosphate
min.	minimum, minute	prelim.	preliminary	tert.	tertiary (chemical)
MLD	minimum lethal dose	prep.	preparation, prepared	TLC	thin layer chromatography
mol.	molecul-e, -ar	prop.	property	Tm	maximum tubular
morphol.	morphological, -ly	prox.	proximal		reabsorption rate
m.p.	melting point	psychol.	psychological, -ly		thymidine monophosphate
MSH	melanocyte stimulating hormone	PVP	polyvinylpyrrolidone		tobacco mosaic virus
n	refractive index	qual.	qualitative, -ly		scio NADP[H J
N	normal solution	quant.	quantitative, -ly		thyroid-stimulating hormone
NAA	a-naphthalenacetic acid	r	Röntgen unit	TTP	thymidine triphosphate
NAD[HJ	nicotinamide adenine dinucleotide [reduced]	P	density	U	units
NADP[H _a]	nicotinamide adenine dinucleotide phosphate [reduced]	rad	radiation unit (100 ergs per g.)	UDP	uridine diphosphate
NDV	Newcastle disease virus	r.b.c.	red blood corpuscle	UMP	uridine monophosphate (uridylic acid)
^{ne} g.	negative	RE	reticulo-endothelial	US	unconditioned stimulus
neurol.	neurological, -ly	ref.	reference	UTP	uridine triphosphate
-NMR	nuclear magnetic resonance	rep.	Rontgen equiv. physical	u.v.	ultra-violet
no.	number	Rf	relative flow rate	V	volt
N.T.P.	normal temperature and pressure	R.H.	relative humidity	vac.	vacuum
O.D.	optical density	RNA	ribonucleic acid	vaccn.	vaccination
17-OHCS	17-hydroxycorticosteroid	RNase	ribonuclease	vit.	vitamin
org.	organic	RNP	ribonucleoprotein	vol.	volume
%	per cent, percentage	r.p.m.	revolutions per minute	v/v	volume for volume
PAB	parts per thousand	R.Q.	respiratory quotient	W	watt
H H	/>-aminobenzoic acid	S	sedimentation coefficient	w.b.c.	white blood corpuscles
[^] AS	/>-aminohippuric acid	sat.	saturated	wt.	weight
^A -A-Schiff	^A -aminoalicyclic acid	satn.	saturation	w/v	weight for volume
Pathol.	periodic acid-Schiff	s.c.	subcutaneous, -ly	yr.	year, years
	pathological, -ly	S.D.	standard deviation		
		sec.	second (time only)		
		sec.	secondary (chemical)		

Positive inorganic ions are written as, e.g., Ca^{2+} , Mn^{2+} , and negative ions as, e.g., Cl^- , SO_4^{2-} .

In addition, elements, groups, and easily recognised substances are denoted in the text by symbols and formulae, but in the case of salts of complex acids the symbol for the cation only is permitted. This applies only to inorganic impounds, excluding water; in general, organic formulae are not abbreviated. Centigrade scale of temperature is turned in the absence of other indication. The symbol for 10 Angström Units is m/x (not /x/x), the symbol for 10^{-g} is jig. (not y).

The principal Pharmacopoeias are denoted by B.P., U.S.P., and D.A.B., followed in each case by their identifying Numeral.

Where many different amino acids are named, they may be abbreviated according to the I.U.P.A.C. rules e.g. Gly-Ala-Lys- for peptides of known sequence ; Gly, Ala, Lys, for peptides of unknown sequence or mixtures).

For polynucleotides the prefix poly- followed by the standard abbreviation for the base(s) may be used (e.g. poly-U).

ERRATA

VOLUME 31, No. 1, 1963.

No.

- 106 for " Heppert " read " Hoppert " (author).
 443 for " ATPase " read " ATP " (line 1).
 605 for " o-methyl " read " O-methyl " (title and line 2).
 eiO for " Listema: " read " Listeria " (title).
 611 for " lipid " read " lipoic " (title).
 648 for " d -amino-levulinic " read " <>-aminolevulinic acid " (last line).
 999 for " 10¹⁰M pyruvate " read " 10->M tyramine " (line 4).
 1112 for " Macaca virus " read " Macaca irus " (title).
 1132 for " Cryptococcosis " read " Cryptococciosis " (title).
 1227 for " e-amino-N-caproic " read " e-amino-w-caproic " (title).
 1649 delete repeated sentence " In 7 of them " (line 12).
 1712 for " dates " read " dogs " (line 3).
 1771 for " 25.5° & 25.5° " read " 27.5° and 25.5° " (line 4).
 2163 for " Oxford Univ., U.S.A " read " Oxford Univ., England " (address).
 2364 for " Lithanus parrage " read " Linanthus parryae " (line 2).
 2447 for " blumeni " read " blumei " (line 2).
 2496 for " stomatal " read " stromatal " (title).
 2562 for " ⁴⁰Co " read " "Co " (line 2).
-

No. 2.

- 2640 for " rat " read " bat " (title).
 2791 for " diphosphate " read " diphosphatase " (title).
 2877 for " o-methyl " and " o-trimethyl " read " O-methyl, -trimethyl ¹⁵ (lines 3, 4, 5).
 2899 for " Bugarus " read " Bungarus " (line 1).
 3120,3121 reverse abstracts to fit titles & authors.
 3132 for " fine " read " five " (line 1).
 3322 for " of ATP " read " by ATP ¹⁵ (line 1).
 3627 for "charges " read " changes " (title).
 3900 for " ³⁵C " read " ³⁶S " (line 2).
 3952 for " Fusobacterium " read ¹⁵ Fusarium " (line 2).
 4608 for " significant changes " read " no significant changes " (line 7).
 4714 for " Tritium " read " Trillium " (line 1).
 4756 for " parenteral " read " parental " (title).
 4761 for " or " read " of " (title).
 4912 for " hypognea " r^aaf " hypogaea " (title),
 4943 /of " no " read " of " (line 8).
 4985 /or " Mormyoid " read " Mormyrid " (title).
 4994 /or " Dahbominus " read " Dahlbominus " (title).
 5038 /or " ATP ¹⁵ read " ATPase " (title 22).
-

No. 3.

- 5057 for " Dorytenthis " r^aⁱ " Doryteuthis " (line 3).
 5217 for " glutamic " read " glutamine ¹⁵ (title).
 5223 /or " Aspergillumaramin " read " Aspergillumarasmin " (title).
 5464 for " Cheironomus " read " Chironomus " (lines 4', 10).
 5476 /or " sempiflorens " read " semperflorens " (line 2).
 5487 for " sarcomas " r^aai " sarcosomes " (title IV),
 5747 as 5476 (line 1).
 5789 for " d " fwi " p " (line 1).
 5818 /or " F+ " read " F" " (line 6).
 5884 /or " Ag " r^aof " Ab " (line 6).
 6367 for " Prediculus " read " Pediculus " (title).
 6504 for " hypotension " read " hypertension " (title).
 6515-6 for " hypotensive " read " hypertensive " (line 1).
 6667 for " steroid " read ¹⁵ catecholamine " (line 6).
 6882 for " p-ebony " read " p-alanine " (title).
 7013 for " Arconectes ¹⁵ read " Orconectes " (title).

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Volume 31

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• Denotes an Author's abstract edited primarily by the journal of origin:

ANATOMY

HISTOLOGY AND HISTOCHEMISTRY

1. SYNAPSE ARISING AT CENTRAL NODE OF FRANIER. AND NOTE ON FIXATION OF C.N.S. D.Bodian and N.Taylor: *Science*, 1963, 139, 330-332 (Dept. Anat., Johns Hopkins Univ. Sch. Med., Baltimore, Md., U.S.A.) E.M. investigations of normal and polio-virus-infected motor columns of the spinal cord of monkeys has been made after fixation through intra-arterial perfusion of formaldehyde followed by post-fixation with QSO4. The discovery of a synaptic bouton arising directly from a node of Ranvier in the motor horn and a node covered by expansions of 2 outer lamellae of the myelin sheath, suggests a degree of variation of central node structure and development not usually attributed to nodes of Ranvier. CM.Lewis

- 2* HISTOCHEMICAL IDENTIFICATION OF PHOSPHOGLYCERIDES IN MYELIN. F.Gallyas: *J. Neurochem.*, 1963, 10, 125-126 (Dept. Neurol. ftychol., Univ. Pécs Med. Sch., Hungary) The method described utilizes the conversion by phosphoglycerides of alk. NH₂OH to hydroxamic acid and this used to reduce AgN₃ to Ag. With formal-fixed c.n.s. tissue, washing J_h hot or cold acetone reduced stainability and ether or uroform/methanol washing abolished it. Pictures of man myelin sheath in medulla oblongata are presented. R.Woodman
- * CYTOMORPHOLOGICAL STUDY OF CHOLINESTERASE IN SYMPATHETIC GANGLIA OF THE CAT. B-Fiedriesson and F.Sjöqvist: *Aeta morph. neerl.-scand.*, 1962, 5, 140-166 (pept. Histol., Karolinska Inst., Stockholm, Sweden) Distribution of cholinesterases A normal pre- and paravertebral ganglia, and die effect by "Post-ganglionic denervation has been studied Holmstedt's modification of the thiocoline method on Phx ^{cr}yostat and freeze-dried material examined by ^{e*}contrast and light microscopy. Existence of 3 types

of ganglion cell based on differences in AChase activity was confirmed. Preganglionic denervation resulted in loss of AChase from presynaptic terminals; post-ganglionic denervation caused a considerable decrease of AChase in Type I and n cells. Distribution of butyryl-Chase was unaffected by these operations. Consecutive prep, stained for Nissl substance and AChase did not show obvious morphol. differences between ganglion cells exhibiting marked variations in AChase activity. Relationship between cellular AChase and peripheral function of the neuron is discussed. J.W.S.Harris

4. MORPHOLOGY AND ENZYMIC ACTIVITY OF RAT CEREBRAL CAPILLARIES. J.W.Landers, J.L.Chason, J.E.Gonzalez and W.J.Palutke: *Lab. Invest.*, 1962, 11, 1253-1259 (Pathol. Dept., Wayne State Univ. Med. Coll., Detroit, Mich., U.S.A.) The morphol., histochem. (oxidative and hydrolytic enzymes) and phagocytic ability of rat cerebral capillaries was compared with capillaries of other organs. Endothelium is enzymically active. The morphol., enzymic activity and lack of phagocytosis of Rouget cells suggests that they are modified muscle cells. A.M.Mackay

5. EXPERIMENTAL AND CYTOLOGICAL STUDIES OF PINEAL CELLS STAINING WITH ACID HEMATEIN IN THE RAT (*RATTUS NORVEGICUS*). W.B.Quay: *Acta morph. neerl.-scand.*, 1962, 5, 87-100 (Dept. Zool., Univ. California, Berkeley, Calif., U.S.A.) In an extensive series of expt. to study the response of acid hematein-pos. (type II) cells to a variety of pharmacol. agents and physiol. conditions, only massive injn. of noradrenaline and amphetamine significantly modified the no. of these cells/pineal section. Four subtypes of type II cells are described, based on morphol. differences and staining with acid hematein after various fixatives and extractions. These subtypes, although distinct, appear to bridge in cytol. characteristics the fibrous astrocytes and type I parenchymal cells. J.W.S.Harris

6. PITUITARY OF FOWL: A CORRECTION AND ADDITION. F.J.Payne: *Anat. Rec.*, 1961, 140, 321-327

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(Dept. Zool., Indiana Univ., Bloomington, Ind., U.S.A.) The large bodies which accumulate in the gonadotrophs of ageing and castrate fowl, accompanied by degeneration of cells, are formed by an increase in size and fusion of the secretory vesicles and not from mitochondria. Evidence is presented to support the theory that a cell which functions as a gonadotroph may synthesise more than one kind of secretory substance.

F.Beck

7. THE PREHYPOPHYSE OF THE PEKEN MALE DUCK THROUGH AN ANNUAL CYCLE. A.Tixier-Vidal, M. Herlant and J.Benoit: Arch. Biol. Liège, 1962, 73, 317-368. Six different types of cell have been identified in the ant. hypophysis of the ♂ Pekin duck. Cells which possess glycoprotidic granulations which stain histochem. the same as β and γ gonadotrophic cells and 6 thyrotrophic cells of mammals, reptiles, batrachians and fish, were identified, a acidophilic and either ϵ or T cells were present, together with a sixth type of cell, termed K, which appears to be peculiar to birds. The α and γ cells are located in the caudal subdivision of the prohypophysis while the β , δ , ϵ and η cells are found in the cephalic subdivision. The θ cells are equally distributed between the 2 regions. These cell types were followed during the course of a yr. This confirmed the gonadotrophic role of the β and γ cells, and the thyrotrophic significance of the θ cells.

(French) R.J.Walker

8. ANATOMY OF SECRETION OF FOLLICULAR CELLS OF THYROID GLAND. II. EFFECT OF ACUTE THYROTROPHIC HORMONE STIMULATION ON SECRETORY APPARATUS. S.L.Wissig: J. cell. Biol., 1963, 16, 93-117 (Dept. Anat., Yale Univ., New Haven, Conn., U.S.A.) Thyroid tissue dissected from Sprague-

Dawley rats 1-24 hr. after s.c. injn. of 0.5 u.s.p. units of thyrotrophic hormone was fixed in OSMO4 and studied in the E.M. and phase contrast microscope. The follicular cells elaborate colloid at an increased rate in the first few hr. after injn. but the accelerated secretory response subsides by 12-24 hr. and the follicles subdivide into smaller units. The no. of Golgi vesicles increases during secretion and small colloidal droplets appear to form from these. The follicular cells appear to utilise apical pseudopodia to release the contents of the mature droplets into the follicular lumen.

P.Barlow

9. THE EOSINOPHILIC CELLS OF THE PARATHYROID (OXYPHIL CELLS), SALIVARY (ONCOCYTES), AND THYROID (HURTHLE CELLS) GLANDS. LIGHT AND E.M. OBSERVATIONS. S.I.Roth, E.Olen, L.S.Hansen: Lab. Invest., 1962, 11, 933-941 (Armed Forces Inst. Pathol., Washington, D.C., U.S.A.) light and E.M. studies of formalin-fixed tissues have confirmed that oxyphil cells of parathyroid, salivary and thyroid glands have cytoplasm largely filled with mitochondria. The relation of structure to cellular activity is discussed.

A*M.Mackay

10. THE SECRETORY CYCLE OF THE PANCREATIC ISLET α -CELL. AN E.M. STUDY OF NORMAL AND SYNTHALIN-TREATED RABBITS. B.L.Munger: Lab. Invest., 1962, 11, 885-901 (Armed Forces Inst. Pathol., Washington, D.C., U.S.A.) The E.M. of normal α -cells of pancreatic islets of rabbits and the processes of degranulation and cytoplasmic vacuolation following synthalin administration are described. The α -granules, arising in the Golgi body disintegrate and secretory particles pass through cell membrane and endothelial cell.

Vacuolation is present in cells with at least a few (X-) granules. A.M.Mackay

11. AGE CHANGES OF THE THYMUS IN TWO HIGH-LEUKAEMIC STRAINS OF MICE, SL AND AKR, AND IN THEIR F₁ HYBRIDS. K.Nakakuki and Y.Nishizuka: Nature, Lond., 1963, 197, 1217-1218 (Dept. Pathol., Mie Prefectural Univ., Sch. Med., Tsu, Mei-Ken, Japan) A comparative study is made of the development of the thymus in SK and AKR mice and their F₁ hybrids, differences being correlated with the age of sexual maturity. A marked sex difference was noted, the developing significantly heavier thy muses. A difference in histol. of the thymus was noted between the strains.

G.M.Lewis

12. STUDIES ON DNA IN W.B.C. AND RELATED CELLS OF MAMMALS. I. ON MICROSPECTROPHOTOMETRIC ERRORS AND STATISTICAL MODELS. II. ON THE FEULGEN REACTION AND TWO-WAVELENGTH MICROSPECTROPHOTOMETRY. A.M.Garcia: Z. Zellforsch. Histochem., 1962, 3, 170-177, 178-194 (Dept. Zool., Columbia Univ., New York, U.S.A.)

I. A statistical model for the simult. analysis of several of the variables involved in cytophotometric determinations of the Feulgen-DNA content of w.b.c. is described. II. An account of the two-wavelength method used & microspectrophotometry of the nuclear reaction is given, together with a description of some complementary techniques (measurement of area, selection of wavelengths and overall performance of the apparatus used).

E.E.Hobbiger

13. LYMPHOPOEISIS OF ORAL MUCOSA. P.D.Toto and H.Kwan: J. dent. Res., 1962, 41, 1414-1423 (Loyola Univ. Sch. Dent., Chicago, Ill., U.S.A.) Thirteen formalin-fixed specimens which demonstrated lymphoid tissue were stained to show comparisons with normal lymphoid tissue. Loose connective tissue can organise lymphatic follicles locally to produce lymphocytes.

A.D.Dixon

14. A COMPARATIVE HISTOCHEMICAL EVALUATION OF VARIOUS DEHYDROGENASES IN THE ORAL SQUAMOUS EPITHELIUM. M.Mori, T.Mizushima and K.Koizumi: Z. Zellforsch. Histochem., 1962, 3, 111-121 (Dept. Oral Surg., Osaka Univ. Dental Sch., Kitaku, Osaka, Japan) The histochem. localisation of succinic, lactic, malic, a-glycerophosphate, glutamic, glucose 6-phosphate and TPN-isocitric dehydrogenase activities in the human oral mucosa, the buccal epithelium of rats and guinea-pigs, and the mucosa of the palate of cats and dogs was investigated.

E.E.Hobbiger

15. E.M. OBSERVATIONS ON HARDENING IN HUMAN HAIR FOLLICLE. F.Happéy and A.G.Johnson: J. ultrastructure Res., 1962, 7, 316-327 (Textile Ind. Dept. Inst. Technol., Bradford, England) The boundary between the outer and inner root Sheath of a human hair follicle is more irregular than was originally supposed. The Flitgelzellen of Huxley's layer contain trichohyalin granules. The β -keratose fraction from oxidised hair originates from both inter- and intracellular areas. Fibilar material in the keratinising hair cuticle is demonstrated.

H.B.Waynfirth

16. INFLUENCE OF THYROIDECTOMY ON SEBACEOUS SECRETION OF THE WKTAR RAT. G.Moulin, M.Millard, M.Croisille and G.Lapicorey: C.R. Soc. Biol., Paris, 1962, 156, 1418-1420 (Lab. d'Histol., Fac. Méd. Lyon, France) The epicutaneous lipid film secreted by the sebaceous glands was slightly modified in thyro-

ANATOMY

ectomised rats compared with normal animals. There was an increase in the amount of secretion in expt. animals, although the fatty acid composition as shown by chromatography was the same in both. Histol. examination showed a slight increase in vol. of the sebaceous glands and an increase in the sudanophilic material of the corneal layers of the epidermis in thyroidectomised rats.

(French) M.A. Price

17. FINE STRUCTURE OF NORMAL AND NEOPLASTIC MELANOCYTES IN SYRIAN HAMSTER, WITH PARTICULAR REFERENCE TO CARCINOGENIC-INDUCED MELANOTIC TUMOURS. H.Rappaport, T.Nakai and H.Swift: *J. cell. Biol.*, 1963, 16, 171-186 (Div. Oncol., Chicago Med. Sch., 111, U.S.A.) Normal melanogenesis is compared with that occurring during tumour formation induced in Syrian golden and white hamsters by a single application of 800 fig. of 7-12 dimethylbenz(a)-anthracene. Dermal, epidermal and hair follicle melanocytes were studied using OSO4 fixed, Epon embedded tissue. Details of the E.M. obtained are given but the origin of the melanin granules remains obscure in both the neoplastic and non-neoplastic tissue. P.Barrow

¹ 18. HAEMATOXYLIN-PHLOXINE-ALCIAN BLUE-ORANGE G DIFFERENTIAL STAINING OF PREKERATIN, KERATIN AND MUCIN. E.T.Dane and D.L.Herman: *Stain Technol.*, 1963, 38, 97-101 (Dept. Pathol., Los Angeles County Hosp., Los Angeles, Calif., U.S.A.) A modification of Kreyberg's stain which simult. demonstrates prekeratin, keratin and mucin in histol. sections described. Phloxine B and Orange G stain prekeratin and keratin orange to red orange, while Alcian Blue stains all mucopolysaccharides turquoise blue. MJ.Bell

¹⁹ 19. HISTOLOGICAL PHENOMENA ASSOCIATED WITH COLLAGEN TRANSFORMATION AND BREAKDOWN PROCESSES. A. Van Den Hooff: *Acta morph. neerl.-scand.*, 1962, 5, 101-116 (Histol. Lab., Univ., Amsterdam, Netherlands) Transformation and reabsorption of collagen in the pubic symphyses of pregnant mice are characterised by a marked increase in metachromasia and Alcian Blue staining and a simult. loss of PA-¹-Uff positivity and stainability with Van Gieson's picrosin. Fibres with these staining characteristics remain intact during relaxation but are replaced by an amorphous material during involution. The findings are considered to result from a lowering of collagen stability due to binding of acidic mucopolysaccharides to basic groups and breakdown of hexose linkages between adjacent polypeptide chains. J.W.S.Harris

²⁰ 20. COMPARATIVE ANATOMICAL AND NEUROHISTOLOGICAL OBSERVATIONS ON TONGUE OF PANGOLIN (MANIS PENTADACTyla, LIMNEUS). K.Kubota, J. Kubota, T.Nakamura, N.Fukuda, S.Asakura, S.Nakasawa and M.Mesui: *Aliat. Rec.*, 1962, 144, 43-55 (Dept. Anat., Tokyo Med. and Dental Univ., Yushima, Tc*yo, Japan). F.Beck

²¹ 21. ENZYMIC MATURATION OF SKELETAL MUSCLE. C.T. & H. Univ. sheffield. England) Sections of V% from human, guinea-pig, rabbit, rat and hamster less than 24 hr. old were examined for their degree differentiation and the activity of phosphorylase, NAD isozyme, NAD-linked lactate dehydrogenase and ATP. Attempts are made to correlate the results with gestation and degree of general maturity at birth. G.M.Lewis

22. E.M. OF POST-MORTEM CHANGES IN PORCINE MUSCLE. R.G.Cassens, E.J.Briskey and W.G.Hoekstra: *Nature*, Lond., 1963, 196, 1119-1120 (Dept. Meat and Animal Sci., Univ. Wisconsin, Madison, Wis., U.S.A.) Samples of the longissimus dorsi were removed from pigs at death, at the onset of rigor mortis, and 24 hr. post-mortem, and examined in the E.M. At death, the muscles were in the contracted state, but within 15 min., the I band was clearly visible and ruptured mitochondria were scattered between the myofibrils. By 24 hr. post-mortem, a complete banding pattern was seen. G.M.Lewis

23. MUSCULAR DYSTROPHY [MD] IN FISHES, AMPHIBIANS AND REPTILES. A.Stolk: *Acta morph. neerl.-scand.*, 1962, 5, 117-139 (Histol. Dept., Free Univ., Amsterdam, Netherlands) MD has been observed in middle-aged or elderly specimens of both sexes in 71 spp. Distribution of acid and alk. phosphatases in normal and atrophic muscles is described, together with results of a histochem. study of the ability of connective tissue in normal and affected muscles to dephosphorylate various deriv. of AMP and other compounds of physiol. importance. The results are considered to support the concept that the primary cause of MD is an aberration of the neighbouring connective tissue. J.W.S.Harris

24. E.M. OF THE NORMAL RABBIT AORTA. F.Bierring and T.Kobayashi: *Acta path. microbiol. scand.*, 1963, 57, 154-168 (Med.-Anat. Inst., Univ. Copenhagen, Denmark) A subendothelial layer of appreciable width containing as its most conspicuous element numerous branching elastic fibres separates the endothelium from the tunica media. The morphol. evidence supports the concept that this layer arises through a degenerative transformation of the inner parts of the tunica media. The dense areas which occur regularly along the basal endothelial plasma membrane represent zones where endothelial cells are attached to elastic elements of the subendothelial layer. Delicate filaments emanating from the surface of elastic fibres are interpreted as elastic structural units. LFriedmann

25. THE FINE STRUCTURE OF RAT AORTA IN EXPERIMENTAL LATH YRBM. K.N.Ham: *Aust. J. exp. Biol. med. Sci.*, 1962, 40, 353-366 (Dept. Pathol., Univ. Melbourne, Australia) E.M. study of lathyrous aorta has confirmed and extended earlier reports of increased collagen content and intercellular substance in aortic walls. This substance appears to coat elastic laminae and to project between the cells. The anatomical relations of muscle cells and elastic fibres are disrupted and changes in collagen fibrils characteristic of lathyrism are commonly seen. Changes described in the muscle cells are interpreted as being consistent with a high level of secretory activity in the early stages, but later they more resemble a degenerative change. B.A.Stone

26. STAINING SECRETORY CAPILLARIES OF EXOCRINE GLANDS WITH TECHNIQUES FOR SPECIFIC PHOSPHATASES. A.F.Baradi and R.Quinton-Cox: *Stain Technol.*, 1963, 38, 121-125 (Dept. Anat., Emory Univ., Atlanta, Ga., U.S.A.) The Wachstein-Meisel ATPase technique offers a reliable and consistent method for staining secretory capillaries of exocrine glands in laboratory animals. It has been successfully applied to intracellular secretory capillaries in parotid glands, eccrine sweat glands and intracellular secretory capillaries in parietal cells of gastric glands in rabbit, rat and guinea-pig. Secretory capillaries did not stain with Wachstein-Meisel 5-nucleotidase technique. MJ.Bell

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27. INTRA- CELLULAR LOCALISATION OF ACID PHOSPHATASE AS STUDIED IN MAMMALIAN KIDNEYS. M.Wachstein, E.Meisel and J.Ortiz: Lab. Invest., 1962, 11, 1243-1252 (Pathol. Dept., St. Catherine's Hosp., Brooklyn, N.Y., U.S.A.) A modified Gomori technique at pH 6 was used to demonstrate acid phosphatase in mammalian kidneys. It is present in granular structures assumed to be lysosomes and diffusely throughout the cytoplasm. Phosphatase activity of the brush border was also demonstrated. A.M.Mackay
28. AUTO-ENZYMIC BASOPHILIA, SWELLING AND DIS- SOLUTION OF FAT DROPS IN FIXED LIVER. D.Sinapius: Z. Zellforsch. Histochem., 1962, 3, 150-169 (Pathol. Inst., Univ. GOTtingen, Germany) Formalin fixation only causes a partial inactivation of lipase in liver slices. The residual lipase activity is responsible for the basophilia of fat droplets in formalin-fixed liver sections; it also accounts for a gradual swelling of these droplets and their later disappearance. Complete lipase inactivation can be obtained either by using lipase inhibitors or fixation in formalin adjusted to pH 2*5. (German) E.E.Hobbiger
29. ELECTRON AND LIGHT MICROSCOPY OF CHOUINE DEFICIENCY IN MOUSE, WITH SPECIAL REFERENCE TOSIXHOURHEPATIC UPSIS. R.D.Meader: Anat. Rec., 1961, 141, 1-9 (Dept. Anat., Louisiana State Univ. Sch. Med., New Orleans, La., U.S.A.) E.M. revealed the presence of submicroscopic lipid in the centrolobular hepatic parenchyma of mice 3 hr. before its initial appearance was revealed by light microscopy. The initial centrolobular liposis which involved most of the lobular zones at the end of 6 hr. of choline deficiency, was observed in mice fed a choline-deficient diet containing lard as the lipid component. F.Beck
30. CELLS IN NIEMANN-PICK DISEASE AND OTHER LIPOIDOSES. Y.Tanaka, G.Brecher and D.S.Fredrickson: Nouv. Rev. franc. Hemat., 1963, 3, 5-16 (Dept. Hlth., Educn. and Welfare, Hematol. Serv., Bethesda, Md., U.S.A.) Bone-marrow cells from 3 cases of Niemann-Pick disease, 1 case of hyperlipaemia with diabetes, 2 cases of Tangier disease, and 1 case with storage of esterified cholesterol were studied. Phase contrast microscopy did not reveal any differences between the macrophages of these cases. All corresponded in appearance to the classical Niemann-Pick cell. Under the E.M., granules of 0*5-5 μ diam. were seen. Their opacity varied inversely with their size. Although the lipids stored in the various cases were different, there were no definite differences in the ultrastructure of the granules. Only the cerebrosides stored in Gaucher's disease produce structurally different granules. (French) V.Eisen
31. EFFECT OF OESTROGEN ON HISTOLOGY OF UTERINE EPITHELIUM OF MOUSE. III. CHANGES IN CONCENTRATION OF CYTOPLASMIC SOLIDS. O.Nilsson and K.A.Norberg: Exp. Cell Res., 1963, 29, 380-388 (Dept. Histol., Karolinska Inst., Stockholm, Sweden) The interferometric quotients, which were obtained from the values of the optical path differences between control and oestrogen-treated animals, showed a decrease in the concn. of solids in the oestrogen-treated animals. This is interpreted as a consequence of an uptake of water into the cells. E.M. demonstrated that both the apical and the basal cell surfaces of the oestrogen-treated animals were more irregular. K.Jones
32. HISTOCHEMICAL COMPARISON OF GLYCOGEN
- SYNTHESIS FROM GLUCOSE 1-PHOSPHATE (G-1-P) AND URIDINEDIPHOSPHOGLUCOSE (UDPG) IN UTERINE SECTIONS. W.J.Bo: Proc. Soc. exp. Biol., N.Y., 1962, 111, 186-189 (Dept. Anat., Bowman Gray Sch. Med., Winston-Salem, N.C., U.S.A.) Phosphorylase but not UDPG-glycogen transferase was demonstrated in the uterus of rat and rabbit seeming to indicate only 1 polysaccharide forming pathway. M.M.Shapland
33. E.M. OF RETE TESTIS OF RAT. T.S.Leeson: Anat. Rec., 1962, 144, 57-67 (Dept. Anat., Univ. Toronto, Ont., Canada) A description of the epithelium lining the rete testis is given. Specialisations of the cell surface seen under the E.M. are noted and their significance discussed. F.Beck
34. FIXATION AND STAINING. AFFINITY OF NUCLEO- PROTEIN COMPONENTS FOR LEAD HYDROXIDE AND URANYL ACETATE. V.Marinozzi and A.Gautier: J. ultrastructure Res., 1962, 7, 436-451 (Lausanne Univ. E.M. Centre, Switzerland) Uranyl acetate and lead hydroxide did not preferentially stain the chromatin material in fragments of pancreas after OSO₄ fixation. After fonnol fixation, uranyl acetate alone stained the chromatin. If fonnol and OSO₄ fixation were carried out concurrently both acetate and hydroxide stained the chromatin. Fonnol had the ability to inhibit the denaturation action of OSO₄ on the deoxyribonucleoproteins. (French) H.B.Waynfirth
35. STAINING OF BOUND (MASKED) LIP(O)IDS WITH SUDAN BLACK B. H.J.Schott: Z. Zellforsch. Histochem., 1962, 3, 138-149 (Anat. Inst. Univ. Marburg/Latin, Germany) Two methods are described which are based on the use of Sudan Black B and capable of staining free and bound lipids without producing artifacts*. e.g. by staining proteins and mucopolysaccharides. Hist⁰¹ and chromatographic studies showed that Sudan Black B contains several components with different colours. (German) E.E.Hobbiger
36. THE HISTOCHEMICAL DEMONSTRATION OF FREE . AND ESTERIFIED CHOLESTEROL; A QUANTITATIVE COMPARISON BETWEEN CHEMICAL AND HISTOCHEMICAL TESTS OF THE FEIGIN REACTION. R.Schnabel: Z. Zellforsch. Histochem., 1962, 3, 1¹⁷, 137 (List. Pathol., Neuropathol. Abt., Med. Akad., Magdeburg, Germany) The method for the histochemical differentiation of cholesterol and its esters as described w Feigin is liable to lead to an underestimation of free cholesterol. This is because Feigin did not state the concn of ethanol and ether required for differential solubilisation of free cholesterol and its esters after their pretreatment with digitonin. The solubility of the cholesterol-digits complex in ethanol-ether mixtures and its rate of oxidation (under conditions used for histochem. purposes) are reported. (German) E.E.Hobbiger
37. THE STABILITY OF HYDROLYTIC ENZYMES IN FRESHLY-FROZEN SECTIONS WHICH HAVE BEEN KEPT IN DRY AIR. E.Kem-Bontke: Z.Zellforsch. Histochem., 1962, 3, 107-110 (Univ. -Frauenklinik m KOln, Germany) Alk. and acid phosphatase and n_{sp} esterase were demonstrated histochem. in non-fixed air-dried freshly frozen sections (of mouse tissues) which had been kept for 2 yr. in boxes (used for microscope slides) at room temp, and in dust-free atmosphere. (German) E.E.Hobbiger.
38. THE METACHROMASIA OF THE ABSORPTION AN^A FLUORESCENCE OF ACRIDINE DYES; WITH A RE^A TO THE PAPER BY Ch. M.A. KUYPER: THE META

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CHROMASIA OF FLUORESCENCE OF ACRIDINE DYES'. CScheibe and V.Zanker: Z. Zellforsch. Histochem., 1962, 3, 122-126 (Inst. Physik. Chem., Technische Hochschule, Mtnchen, Germany) A critical review of the literature clearly shows that the aggregation of the dye mol. is responsible for the metachromatic behaviour of acridine dyes. This is contrary to the conclusion leached by Kuyper. (German) E.E.Hobbiger

39. I.R. SPECTROSCOPY STUDIES ON ISOLATED SO-CALLED CALCIUM DEPOSITS FROM HUMAN ORGANS. M.Gade and H.J.Einbrodt: Naturwissenschaften, 1963, 50, 21-22 (Bergbauforschung GmbH., Forschunginst. Steinkohlenbergbauvereins, Essen, Germany) The crystal structure types of deposits from joint, premature Placenta and pancreas were analysed. (German) A.J.Wansbrough

40. THE PERIODIC ACID-SCHIFF REACTION. K.Aterman and S.Norkin: Nature, Lond., 1963, 197, 1306 (Dept.Pathol., Woman's Med. Coll. Pennsylvania, Philadelphia, Pa., U.S.A.) A little-known paper Published in 1947 by Shabadash on the subject of the PA-Schiff reaction is discussed. G.M.Lewis

41. COMBINED SCHIFF PROCEDURES. H.Elftman: Stain Technol., 1963, 38, 127-130 (Dept. Anat., Coll. Physn. Surg., Columbia Univ., New York, N.Y., U.S.A.) Details of methods for combining the PA-Schiff staining with iron hematoxylin, direct silver and aldehyde fuchsin, and for combining the Feulgen nuclear staining reaction with Sudan Black are described. MJ.Bell

42. DEMONSTRATION OF PA-SCHIFF-POSITIVE MATERIAL IN E.M. WITH LEAD STAINING. W.T. Daems and J.-P.Persijn: Z. Zellforsch. Histochem., 1962, 3, 79-88 (Lab. E.M., Univ. Leiden, Netherlands) Pb(OH)₂ increases the contrast in QsO₄ sections, probably by reacting with neg. sites, i.e. 02, °f the bound Os. In addition it causes the appearance of coarse ppt. at sites where there is no contrast previously; this stain resembles the PA-Schiff stain and is probably due to a reaction of Pb with OH groups. E.E.Hobbiger

43. PURIFICATION OF THIONIN, AZURE A. AZURE B AND METHYLENE BLUE. CNerenberg and R.Fischer: Stain Technol., 1963, 38, 75-84 (Biochem. Branch, Dept. Psychiat., Ohio St. Univ., Columbus, Ohio, U.S.A.) A simple and reliable analytical method for detecting impurities in the dyes Thionin, Azure A, Azure B and Methylene Blue is given: org. impurities detected by paper chromatography, inorg. impurities by Paper chromatography after ashing. The authors purify their dyes by the conventional methods using ion-exchange resins and alumina columns before use in the differential staining of excited and depressed c.n.s. tissue. MJ.Bell

44. THE USE OF LIQUID EMULSIONS IN AUTORADIOGRAPHIC STUDIES INVOLVING ³H-LABELLED SUBSTANCES. W.Oehlert, P.Nettesheim and R.Machemer: Z.Zellforsch. Histochem., 1962, 3, 99-106 (Ludwig-Aschoff Haus, Pathol. Inst.. Univ. Freiburgi. Br., Germany) A method using liquid emulsions for autoradiographic studies of tissue sections obtained from animals inj. with [3H]thymidine is described in detail. The advantages and disadvantages of the method, which is illustrated by results obtained on sections of mouse tissues, discussed. (German) E.E.Hobbiger

45. THE USE OF STANDARD SLIDES IN SEMI-QUANTITATIVE RADIOAUTOGRAPHY WITH TRITIATED COMPOUNDS. R.Baserga and K.Nemeroff: Stain Technol., 1963, 38, 111-116 (Dept. Pathol., Northwestern Univ. Med. Sch., Chicago, Ill., U.S.A.) To ensure that different batches of radioautographs have been processed in an identical manner and if not to supply a correction factor so that comparisons can be made between different batches of radioautographs the authors use the following method: essentially identical smears are prepared from a pooled suspension of cells, in this case Ehrlich ascites tumour cells labelled with [³H]thymidine, and the limits of variability for % labelled cells and mean grain count/labelled cell calc. Thereafter, one or more of these standard smear slides are processed with any batch of radioautographs and used to detect variations in the radioautographic procedure. MJ.Bell

46. SQUASHING UNDER SCOTCH TAPE NO.665 FOR AUTORADIOGRAPHIC AND PERMANENT HISTOLOGICAL PREPARATIONS. R.Jona: Stain Technol., 1963, 38, 91-95 (Lab. cytogenétique Végétale, Univ. Catholique, Louvain, Belgium) When removing cover slips from squash prep, before coating with autoradiographic emulsion much material is often lost or disturbed. The substitution of No.665 Scotch double-coated adhesive tape, outer side of tape downwards, in place of the glass cover slip improves results. The cells, particularly if soaked in 45% acetic acid before squashing, do not adhere to the tape which can be removed after pressure without disturbing the material. MJ.Bell

47. PAPER CHROMATOGRAPHY AS APPLIED TO HISTOLOGICAL SECTIONS. J.Ackermann and M.Samecka-Keller: Z. Zellforsch. Histochem., 1962, 3, 89-96 (Dept. Histol., Med. Acad., Krakow, Poland) Sections of frog liver were subjected to paper chromatography in a manner analogous to that normally used for substances in soln. Amino acids, lipids, carbohydrates, steroids and carotenoids were identified on the chromatograms. The results of parallel histochem. studies are also reported. E.E.Hobbiger

48. NEW EMBEDDING TECHNIQUE FOR E.M., COMBINING A WATER-SOLUBLE EPCXY RESIN (DURCUPAN) WITH WATER-INSOLUBLE ARALDITE. W.Staubli: J.cell.Biol., 1963, 16, 197-201 (Res. Labs. Phannaceut. Dept., C.I.B.A. Ltd., Basle, Switzerland) Animal tissues may be embedded using neither alcohol nor acetone dehydrating agents. Ultra-thin sections may be obtained if araldite replaces Duicupan as the final embedding agent. The method was tested using 2% OSO₄-fixed liver, kidney and pancreatic tissue of rats. P.Barrow

TISSUE CULTURE

49. CHARACTERISATION OF HUMAN CELLS: VARIATION IN GROWTH RATE, VOLUME, MORPHOLOGY AND GROWTH EFFICIENCY IN MEDIA SUPPLEMENTED WITH HUMAN SERUM OR BOVINE FOETAL SERUM. P.E.Treadwell and J.D.Ross: Exp. Cell Res., 1963, 29, 356-379 (Dept. Microbiol., Univ. Minnesota, Minneapolis, Minn., U.S.A.) Cubelines of 3 cell strains in process of cultural establishment were compared by

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examination of colony morphology, cell yield, cell-vol. distribution, single-colony growth and cell chr. no. Influence of cultural conditions was reflected quant. rather than qual. by effects on cell prop., and growth of sub-lines in single-serum medium did not enhance capacity for growth in that medium selectively. The results are interpreted to show that cellular prop. could be affected variously by cultural conditions, and that multiple criteria are needed for differential characterisation.

K. Jones

50. A CHEMICALLY-DEFINED MEDIUM FOR GROWTH OF ANIMAL CELLS IN SUSPENSION. S.C.Nagle, jun., H.R.Tribble, jun., R.E.Andereon and N.D.Gary: Proc. Soc. exp. Biol., N.Y., 1963, 112, 340-344 (U.S. Army Biol. Labs., Fort Detrick, Frederick, Md., U.S.A.) A chem. defined medium including 13 amino acids, 2 antibiotics, glucose and sodium pyruvate as energy supplies and 10 vitamin supplements has been used to grow a variety of mammalian cells in tissue culture as suspensions at concn. up to 3×10^6 cells/ml.

D.N.Wheatley

51. IMPROVED NUTRIENT SOLUTION FOR DIPLOID CHINESE HAMSTER AND HUMAN CELL LINES. R.G. Ham: Exp. Cell Res., 1963, 29, 515-526 (Dept. Biophys., Florence R.Sabin Labs., Univ. Colorado Med. Center, Denver, Colo., U.S.A.) A new nutrient mixture (F 10) is described for the diploid Chinese hamster ovary cells, in which each component was added at the expt. determined optimum concn. The new medium contains more arginine than other mixtures, among other alterations. Expt. data are presented to show that this nutrient mixture is not only superior for the cell strain used in the initial study, but also for several others, including a diploid human line.

K.Jones

52. METABOLISM OF H.A1. TUMOUR CELLS. GLYCOLYSIS AND CRABTREE EFFECT. SENSITIVITY OF RESPIRATION TO OXYGEN TENSION. B.L.Sorensen: Acta path. microbiol. scand., 1963, 57, 129-144 (Dept. Path., Finsen Inst., Copenhagen, Denmark) Under endogenous conditions the respiration of H.A1. cells is max. when the gas phase contains 10-20% O₂ which is characteristic of tumour cells. At increasing O₂ tensions the respiration of the tumour cells is inhib. The 'Cartesian diver respirometer' is considered more efficient in demonstrating slight differences in the respiration of cells than the ordinary Warburg apparatus.

L.Friedmann

53. GROWTH OF HeLa CELLS IN HUMAN ADULT AND BOVINE FOETAL SERUM MEDIUM. P.E.Treadwell and J.D.Ross: Proc. Soc. exp. Biol., N.Y., 1962, 111, 197-201 (Dept. Microbiol., Univ. Minnesota, Minneapolis, Minn., U.S.A.) Unchanged medium containing both human adult and bovine foetal serum maintained exponential growth of HeLa cells for 5 days, from 48 hr. after inocn. Change in growth rate was associated with change in median cell vol. and viability.

M.M.Shapland

54. PRIMARY CULTURES OF MACROPHAGES FROM NORMAL HUMAN PERIPHERAL BLOOD. L.Berman and C.S.Stulberg: Lab. Invest., 1962, 11, 1322-1331 (Pathol. Dept., Wayne State Med. Coll., Detroit, Mich., U.S.A.) A method of culturing human blood macrophages is described. In 15-25 days macrophages, giant cells and small lymphocytes- are present despite the absence of significant mitoses. The macrophages are resistant to type I poliovirus. They degenerate, lymphocytes disappear and lymphoblastoid cells undergoing

mitoses appear when phytohaemagglutinin is added to the culture.

A.M.Mackay

55. CULTURE OF STRAIN L CELLS IN SUSPENSION: REPLACEMENT OF POLYMER BY TRACES OF TRYPSIN IN A DEFINED MEDIUM. R.Sinclair, R.A.Reid and P. Mitchell: Nature, Lond., 1963, 197, 982-984 (Chem. Biol. Unit, Dept. Zool., Univ. Edinburgh, Scotland)

Culture of strain L mouse cells in a simple defined medium containing FeSO⁺ and-a-ketoglutarate is facilitated by addition of 10-50 fig./l. trypsin to prevent adherence of the cells to each other and to surfaces, which causes damage during motion of the medium. A continuous culture system has been set up.

G.M.Lewis

56. CELL GUIDANCE BY ALTERATIONS IN MONO-MOLECULAR FILMS. M.D.Rosenzweig: Science, 1963, 139, 411-412 (Rockefeller Inst., New York, U.S.A.)

Monolayers of stearic and behenic acids were transferred to quartz slides, troughs of different depths cut, and additional monolayers superimposed. When cultured and fresh embryonic cells were grown on such substrata, cells became entrapped within troughs as small as 6 mji deep. The results demonstrate cellular responses to mol. changes in contact surfaces.

CM.Lewis

57. CELL CULTIVATION IN SYRINGE CHAMBERS. E.H. Stonehill and J.Fogh: Exp. Cell Res., 1963, 29, 483-489 (Sloan-Kettering Inst. Cancer Res., New York, N.Y., U.S.A.) A method is described whereby cells can be cultured as monolayers on the syringe wall or on the plunger top permitting investigation of a no. of parameters. This technique allowed, in a simple manner, variations in the vol. of gas and liquid, with const. or variable area available for cell attachment to a glass surface.

K. Jones

58. A REGULATED INCUBATOR CONTROLLING CO₂ CONCENTRATION, HUMIDITY AND TEMPERATURE FOR USE IN ANIMAL CELL CULTURE. R.G.Ham and T.T.Puck: Proc. Soc. exp. Biol., N.Y., 1962, 111, 67-71 (Dept. Biophys., Univ. Colorado Med. Center, Denver, Colo., U.S.A.)

M.M.Shapland

59. IN VITRO PROGRESSION OF A BDF₁ ASCITES TUMOUR. G.F.Rabotti, J.Geldner and W.Hoffner: Cancer Res., 1963, 23, 165-168 (Charlotte Drake Cardeza Fdn., Jefferson Med. Coll., Philadelphia, Pa., U.S.A.) A tumour occurring spontaneously in a BDF₁ mouse was used to establish a long term cell line. The original tumour and the line kept by transplantation into isologous mice both failed to grow in CBA, A/Jax or C3H mice. After many transplant generations in spinner culture, cell suspensions did induce tumours in these strains. Growth and histopathol. characteristics were identical in tumours produced by the original strain sp. tumour and the nonsp. adapted cell lines.

B.M.Stevens

60. SUBMICROSCOPIC CHARACTERISTICS OF FOUR STRAINS OF YOSHIDA ASCITES HEPATOMA OF RAT⁵. A COMPARATIVE STUDY. M. Hoshino: Cancer Res., 1963, 23, 209-216 (Dept. Pathol., Nagoya Univ. Sch. Med., Nagoya, Japan)

E.M. showed that endoplasmic reticulum, mitochondria, mode of cell contact and other characteristics were increasingly developed in the order AH 13, AH 130, AH 7974 and AH 602. The Golgi complex was more developed in the former pair than in the latter. Variations in fine structure and freq. of degenerative changes were much higher in AH 13 and AH 130 than

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in AH 7974 and AH 602. The existence of intercellular substance in AH 602, of cytoplasmic filaments in AH 130 and AH 13 and of glycogen areas in AH 13 is described. Average diam. of mitochondria and average no. of mitochondria/cell were estimated from thin sections.

B.M.Stevens

- 61. MICROCINEMATOGRAPHY OF SPLEEN TISSUE CULTURES.** R.Robineaux, J.Pinet and R.Kourilsky: *Nouv. Rev. franc. Hémat.*, 1963, 3, 797-811 (Centre de Rech. d'Immuno-Pathol. de l'Association Claude-Bernard, Hop. Saint-Antoine, Paris, France) Guinea-pig spleen tissue was cultured in Rose chambers underneath a Visking cellophane membrane through which the medium was introduced by dialysis.. The cultures were filmed with the aid of phase contrast microscopy. Centrifugal spreading of cells started within a few hr., phagocytosis within 3 days, and mitoses after 10 days. Lymphocytes, plasma cells, mononuclear and reticular cells continued to proliferate for more than 3 weeks whilst remaining differentiated. Eventually only macrophages were found. The formation and functions of plasma cell islets are discussed. (French) V.Eisen

- 62. BIOSYNTHESIS OF PHOSPHATIDES IN SEVERAL TISSUE-CULTURE CELL LINES.** RX.McCarl and H.O. Triebold: *Exp. Cell Res.*, 1963, 29, 475-482 (Dept. Agric. Biol. Chem., Pennsylvania St. Univ., University Park, Pa., U.S.A.) HeLa cells, bovine lymphosarcoma cells, monkey heart cells and chick embryo endothelium cells grown *in vitro* varied in their phosphatide relative activities. In HeLa cells, P was used preferentially for the synthesis of P compounds other than phosphatides. Other 3 cell lines had a common biosynthetic pathway for phosphatides, as shown by determinations of % of total phosphatide activity for individual phosphatides. K.Jones

- 63. STARCH GEL 'ZYMOGRAMS' OF CULTURED HUMAN CONNECTIVE TISSUE CELLS.** C.W.Castor and R.K.Prince: *Lab. Invest.*, 1963, 12, 38-45 (Dept. Int. Med., Univ. Michigan, Ann Arbor, Mich., U.S.A.) Lactic acid dehydrogenase, acid phosphatase and non-sp. esterase activity in extracts of fibroblast cultures from synovium, pericardium and periosteum were qual. compared by histochem. methods on vertical starch gel zone electrophoretic protein separations. Different cell lines may be characterised by different patterns. A.M.Mackay

- 64. CYTOCHEMICAL STUDIES OF HUMAN BONE MARROW FIBROBLAST-LIKE CELLS.** I. ALKALINE PHOSPHATASE P.Fames and B.E.Barker: *Exp. Cell Res.*, 1963, 29, 278-288 (Dept. Pathol., Rhode Island Hosp., Providence, R.I., U.S.A.) Alk. phosphatase as demonstrated in the vascular network of marrow stroma, maturing myeloid cells and fibroblast-like cells developing in culture. It is concluded that the fibroblast-like cells originate from marrow stroma and not from any haemic cells, in this culture system, the most likely parent cell being endothelial cells. K.Jones

- 65. FATE OF RAT BONE MARROW, SPLEEN AND PERIOSTEUM CULTIVATED IN VIVO IN DIFFUSION CHAMBER, WITH SPECIAL REFERENCE TO BONE FORMATION.** A.Rosin, H.Freiberg and G.Zajicek: *Exp. Cell Res.*, 1963, 29, 176-187 (Dept. Expt. Med. Cancer Res., Hebrew Univ., Hadassah Med. Sch., Jerusalem, Israel) The histogenesis of bone formation in cultures *in vivo* of bone marrow and of periosteum was investigated. Under conditions studied, bone forma-

tion occurred only in the presence of osteogenic cells. The data did not show, however, whether bone formation in the cultures took place by the growth of surviving osteogenic cells or by the humoral influence of necrotising bone splinters on the reticulum cells of the bone marrow. K.Jones

- 66. OPTIMAL CONDITIONS AND COMPARATIVE EFFECTIVENESS OF DIMETHYLSULPHOXIDE [DMSO] AND POLYVINYL PYRROLIDONE [PVP] IN PRESERVATION OF BONE MARROW.** M.Persidsky and V.Richards: *Nature*, Lond., 1963, 197, 1010-1012 (Surg. Res. Lab., Presbyterian Med. Centre, San Francisco, Calif., U.S.A.) Expt. on the optimum recovery of rat bone marrow cells after freezing in DMSO or PVP showed that although DMSO offers 50% survival compared with 30% in PVP, there is a much larger variability range in the protective action of DMSO. DMSO has a considerable toxicity for the cells and many precautions must be taken when it is used. PVP is simpler to handle and gives more predictable results. G.M.Lewis

- 67. HORMONAL AND PHYSIOLOGICAL BACKGROUND IN THE PRODUCTION OF B PARTICLES BY MOUSE MAMMARY EPITHELIUM IN ORGAN CULTURES.** E.Y.Lasfargues and D.G.Feldman: *Cancer Res.*, 1963, 23, 191-196 (Dept. Microbiol., Columbia Univ., New York, N.Y., U.S.A.) Two peaks of higher production of B particles were found in explants of RIII mammary gland. One, in explants taken in early pregnancy, was induced by an ovarian-hypophyseal combination and corresponded to an active alveolar differentiation and growth of the epithelium. The other, in lactation, originated by the combined effects of mammotrophin and cortisol. In either case B particle formation occurred in a phase of high protein synthesis and depended on the complete physiol integrity of the cell. Absence of hormonal stimn. or an improper combination inhib. B particle production. Duplicate cultures of agent-free C57 mammary tissue reacted moiphil. like the RIII cultures but no B particles were formed. B.M.Stevens

- 68. DEVELOPMENT OF A HYDROCORTISONE-RESISTANT SUB-LINE OF MOUSE LYMPHOMA IN VITRO.** L.Aronow and J.D.Gabourel: *Proc. Soc. exp. Biol.*, N.Y., 1962, 111, 348-349 (Dept. Pharm., Stanford Univ. Sch. Med., Palo Alto., Calif., U.S.A.) A steroid-resistant variant of ML-388 cells has been isolated by culture of the parent cell strain in the presence of 10-6 M hydrocortisone for several weeks. The cell line is also resistant to other potent anti-inflammatory steroids tested. M.M.Shapland

- 69. ACTION OF SOLUDECADRON (9a-FLUORO-16(X)-METHYL A-HYDROCORTISONE 21-SODIUM PHOSPHATE) ON CULTURES OF EMBRYONIC ORGANS OF CHICK.** J.V.Ruch, Y.Rumpler, J.Clavert and P.Buck: *C.R.Soc. Biol.*, Paris, 1962, 156, 1510-1512 (Inst. Embryol. Fac. Méd., Strasbourg, France) Embryonic tissues of chick were cultured on cock plasma and an embryonic extract. The liquid medium contained 0.1 mg. Soludcadron or plasma from cocks receiving 4-8 mg. Soludcadron 30-60 min. before the removal of blood. In all cases Soludcadron inhib. the growth of embryonic cardiac fibroblasts, but did not modify the growth of hepatic cells. (French) M.A. Price

- 70. MICRONUCLEI FORMATION IN TISSUE CULTURED CELLS TREATED WITH COLCHICINE.** E.F.Deig, T.J. Starr and K.K.Church: *Proc. Soc. exp. Biol.*, N.Y.,

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- 1962, 111, 248-250 (Lab. Comp. Biol., Kaiser Fdn. Res. Inst., Richmond, Calif., U.S.A.)
 M.M.Shapland
- 71. BIOLOGICAL CRYSTALS AND PARTICLES PRODUCED IN TISSUE CULTURE. I. INTRODUCTION.** G.G.Rose: Cancer Res., 1963, 23, 279-284 (Dept. BioL, Univ. Texas, M.D. Anderson Hosp., Houston, Tex., U.S.A.) A method for chick embryo tissue cultivation which gave rise to many and unusually large crystals and particles is described. Forms were helical, tubular, ribbon-like, hexagonal, rhomboidal and filamentous. Rhomboids and hexagonals often had surface areas several times the size of the broad and flat cultured cells. Helices were up to 300 μ long. Transformations of helical and related forms were observed. Conventional cytochem. techniques did not identify these forms but modified methods showed that helical and related forms gave a pos. reaction to pyronin staining which was inhibited by prior RNase digestion.
 B.M.Stevens

zone of the chick neural tube (presumptive spongioblasts) lack the ability to differentiate into neuroblasts or neurones. The differentiation of ependymal cells from presumptive ependymal spongioblasts depends upon a direct association with mantle layer tissue. If deprived of this, presumptive spongioblasts form typical choroidal epithelial cells which if associated with developing leptomeninges contribute to choroid plexus tissue.
 F.Beck

EMBRYOLOGY

- 72. SMALL INTESTINE DURING DEVELOPMENT.** II. INTRACELLULAR LOCATION OF INTESTINAL β -GALACTOSIDASE. R.G.Doell and N.Kretchmer: Biochim. biophys. Acta, 1963, 67, 516-519 (Dept. Pediat., Stanford Univ. Sch. Med., Palo Alto, Calif., U.S.A.) β -galactosidase and alk. phosphatase appeared to occupy similar sites.
 B.M.Stevens
- 73. ULTRASTRUCTURE OF CHICK EMBRYOS. I. ESTABLISHMENT OF INTERCELLULAR CONTACT IN THE NEURULA BETWEEN THE 17TH AND 40TH HOUR OF INCUBATION.** J.P.Zahnd and A.Porte: C.R. Soc. Biol., Paris, 1962, 156, 1506-1507 (Inst. Embryol., Fac. Méd., Strasbourg, France) E.M. examination of chick embryos revealed the presence of a fine basal membrane in embryos of 20 hr. incubation, situated on the lower face of the neural plate. After 40 hr. a basal membrane was seen in the region of the myotome and sclerotome. In 40 hr. embryos desmosomes were found in the region of the neural tube, in the ectoderm near the amniotic cavity and in the endoderm. In the advanced neurula, desmosomes were always to be found in the region of the embryonic cavities.
 (French) M.A. Price
- 74. CHANGES IN FORM AND RESPONSE OF NEURULA IN DEVELOPING OVUM OF WHITE LEGHORN.** S.O'hata, K.Ogura and S.Shinozuka: Jap. J. Physiol., 1963, 13, 14-23 (Dept. Physiol., Med. Coll., Tokyo, Japan) The relationship between stimuli and excitations of the primitive tissue was studied by recording the electric responses in fresh chick neurula. The newborn tissues like the primitive nervous and circulatory systems appeared one after another on a chick's neurula in the course of development, and the varieties of oscilloscopes accompanied with the transformation of animal life were all clearly observed at the end of the local elevation.
 K.Jones
- 75. TISSUE INTERACTION ASSOCIATED WITH DIFFERENTIATION OF PRESUMPTIVE SPONGIOPBLASTS OF CHICK NEURAL TUBE.** W.J.Birge: Anat. Rec., 1961, 140, 345-357 (Dept. Zool., Univ. Illinois, Urbana, Ill., U.S.A.) Epithelial cells of the germinative

MIGRATION PATTERNS OF PRECARDIAC MESODERM IN EARLY CHICK EMBRYO. RX.DeHaan: Exp. Cell Res., 1963, 29, 544-560 (Carnegie Inst. Washington, Dept. Embryol., Baltimore, Md., U.S.A.) The migration patterns and mechanisms of the clusters of precardiac mesoderm were studied in developing chick embryos by microcinematography. The mesoderm migrated both actively and passively, and at stages 6 to 7 all the preheart clusters appeared to be subjected to a distinct orienting influence, becoming arranged in a definite spatial pattern* It is suggested that the precardiac mesoderm may be influenced by the orientated lines of cell junctions, or by other linear structures at the exposed cell surfaces which become aligned by the alteration in cell shape. The correlation between direction and time of alignment of endoderm and migration of the mesoderm is believed to be suggestive of a causal relationship.
 K.Jones

77. HYPOXANTHINE DEHYDROGENASE [HD] IN THE DEVELOPING CHICK EMBRYONIC KIDNEY. S.Chaube: Proc. Soc. exp. Biol., N.Y., 1962, 111, 340-343 (Dept. Pharm., Yale Univ. Sch. Med., New Haven, Conn., U.S.A.) The period of most rapid increase of sp. activity of HD occurred at days 6 and 7 in the mesonephros and 13 to 15 in the metanephros, the latter reaching a plateau of HD by day 16.
 M.M.Shapland

78. EFFECTS OF MULTIPLE DOSES OF THYROXINE ON CHICK EMBRYOS. A.E.Adams: Anat. Rec., 1961, 141, 63-71 (Dept. Zool., Mt. Holyoke Coll., South Hadley, Mass., U.S.A.) Four series of eggs received varying doses of thyroxine into the yolk sac on different days of incubation. Autopsies were carried out between 16 and 20 days and body wt., third toe length and yolk sac wt. and retraction recorded. Thyroid glands were examined histol. Yolk sac retraction was greater in treated animals and the thyroid gland was retarded in growth and differentiation.
 F.Beck

79. ACTION OF 5HT ON THE THYROID OF EMBRYONIC CHICK. R.Maraud, R.Stoll and A.Sparfel: C.R.Soc. Biol., Paris, 1962, 156, 1375-1377 (Lab. Biol., Fac. Méd., Bordeaux, France) Administration of 0.1 mg. 5HT to chick embryos on the 3rd day of incubation resulted in an increase in the I fixation ability of the thyroid throughout incubation. Administration of 5HT to embryos on the 8th day of incubation resulted in inhibn. of I fixation from the 11th to 13th day and an increase in fixation in those embryos killed on the 16th and 17th day.
 (French) M.A.Price

80. COMMENTS ON THE PAPER BY C. MARIT AND J. MILAIRE: (A MODIFIED TECHNIQUE FOR THE DETECTION OF ACID AND ALKALINE PHOSPHOMONOESTERASES AND OF ADENOSINE-TRIPHOSPHATASE IN TISSUES OF EMBRYOS. Z. Zellforsch. Histochem., 1961, 2, 298-305. H.Voss: Z.Zellforsch. Histochem., 1962, 3, 97-98 (Anat. Inst., Friedrich Schiller Univ., Jena, Germany) The author points out that one illustration in the paper by Marit and Milaire shows that the cells ~~from~~ which the thyroid glands develop are very rich in acid ~~phos~~ phatase. This was not stated in the original paper.
 (German) E.E.Hobbiger

ANATOMY

- I. TRANSPLANTATION OF GONADAL PRIMORDIA IN 28- TO 38-SOMITE STAGE DUCK EMBRYOS.** I. van limborgh: *Acta morph. neerl.-scand.*, 1962, 5, 167-181 (Dept. Anat. and Embryol., State Univ., Utrecht, Netherlands) To investigate whether the tissues surrounding the gonadal primordia exert any influence on the assymetrical development of gonadal cortical tissue, right and left gonadal primordia were transplanted into the opposite somatopleure of hosts of equal age. Hetero-Jt. transplantation did not influence the prospective fate of the grafted cortical tissue, and normal development of follicles in the presence of a host gonad of the opposite sex did not confirm the hypothesis of early production of sex hormones.

J.W.S.Harris

- 83. POSSIBLE LUTEOTROPIC FUNCTION OF THE GRAVID UTERUS IN EUROPEAN BADGER MELES MELES** L. R.Canivenc, M.Bonnin-Laffargue and M.C. Relexans: *C.R. Soc. Biol. Paris*, 1962, 156, 1372-1375 (Lab. Histol., Fac. Méd., Bordeaux, France)

The corpora lutea of the ovary of badger involuted within a few days after the birth of the young. The cytoplasm was entirely occupied by osmophilic lipid material. In animals hysterectomised during gestation there was no degeneration of corpora lutea in ovary removed 8 or 12 days after operation. (French) M.A.Price

- 84. PROLIFERATION OF ELASTIC FIBRES AFTER X-IRRADIATION.** S.JelUnek: *Lancet*, 1962, ii, 1192-1193 (Dept. Electropathol., Univ., Vienna, Austria) Elastic fibres in the s.c. tissue of the ear of the rabbit disappear after irradiation but regenerate after 4 weeks.

G.H.Bell

- 85. RELATION OF MICROSCOPIC MINERALISATION TO INTRINSIC BONE STRENGTH.** G.J.Vose: *Anat. Rec.*, 1962, 144, 31-36 (Nelda Childers Stark Lab., Texas Women's Univ., Denton, Tex., U.S.A.) There was a high correlation between interstitial bone mineralisation and the ultimate yield loading of cortical bone. A lower correlation coeff. was found between the ultimate yield loading of rectangular cortical samples and the degree of osteoporosis as determined by a thinning of the cortical wall.

F.Beck

- 86. INFLUENCE OF TESTES ON SHAPING BONY PELVIS IN MICE.** E.S.Crelim and D.K.Blood: *Anat. Rec.*, 1961, 140, 375-379 (Dept. Anat., Yale Univ. Sch. Med., New Haven, Conn., U.S.A.) Brown-belt stock cT mice were castrated at intervals from 3 to 54 days of age and killed at 63 days in order to correlate features in the bony pelvis with the time of castration. The findings indicate that the presence of functioning testes is necessary during normal post-natal development from 12 to 30 days of age up to sexual maturity in order that the bony pelvis acquires all morphol. features characteristic of the adult.

F.Beck

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- 82. ORGANISATION AND FUNCTION OF THE TRIGEMINAL MESENCEPHALIC NUCLEUS.** CRJerge: *J. Neurophysiol.*, 1963, 26, 379-392 (Univ. Pennsylvania Sch. Med., Philadelphia, Pa., U.S.A.) Three types of units were observed in the mesencephalic trigeminal nucleus: (1) those innervating muscle spindles of the masseter, temporalis, and medial pterygoid muscles, (2) those innervating dental pressure receptors of a single tooth, and (3) those innervating dental pressure receptors of 2 or more adjacent teeth, and in some cases contiguous gingival areas. Muscle-spindle afferents from each of the muscles mentioned were observed throughout the rostrocaudal extent of the nucleus. The tooth pressure receptor units innervating several teeth were all located in the caudal half of the nucleus. Most of the units innervating single teeth were located within 2 mm. on either side of the Horsley-Clark zero coronal plane. All cells were activated solely from homolat. fields.

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87. ECHIMYINAE (ECHIMYIDAE, RODENTS) OF PLEISTOCENE OF LAGOA SANTA (BRAZIL): INTERPRETATION OF THEIR MOLARS. M.Friant: *Acta anat.*, Basel, 1962, 51, 95-111 (Sch. Anthropol., Paris, France) A study of the cheek teeth indicates that these animals were true rodents; the premolar, P4, had disappeared and the deciduous molar, M4, persisted throughout life. (French) N.B.Symons
88. MORPHOLOGICAL STUDY OF CROWN OF JAPANESE PERMANENT TEETH BY CONTOUR LINES. III. MOLAR TEETH. IV. OCCLUSAL SURFACE. S.Wakamatsu: *Shikwa Gakuho*, 1963, 63, 150-173 (Dept. Anat., Dent. Coll., Tokyo, Japan) The relative heights and positions of cusps and depths of pits were determined in 100 each of 3 and 4 cusp upper molars and 4 and 5 cusp lower molars. (Japanese, English summary) C.P.Wallis
89. INTERRELATIONS FROM SERIAL DATA FOR ERUPTION OF PERMANENT DENTITION. J.E.Sturdvant, U.B.Knott and H.V.Meredith: *Angle Orthodont.*, 1962, 32, 1-13 (W-510 East Hall, Iowa City, Iowa, U.S.A.) Casts were collected biannually until the age of 12 yr. in 57 individuals from the emergence of the first permanent tooth and then annually to the completion of the dentition, excluding third molars. Mean eruption ages for mandibular incisor and canine teeth were earlier than for their maxillary counterparts. Variability of eruption age is lowest for first molars and increases with lat. incisors to a max. for canines and second premolars; this variability also exists between similar teeth in the same arch. Mandibular canine eruption can be predicted fairly satisfactorily from the age of eruption of the mandibular central incisor. R.D.Howard
90. ONTOGENESIS OF HUMAN TEMPOROMANDIBULAR JOINT. I. DEVELOPMENT OF CONDYLES. L.J.Baume: *J. dent. Res.*, 1962, 41, 1327-1339 (Inst. Méd. Dent., Univ., Genève, Switzerland) Stages in condylar development are described in 12 human foetuses from 15-72 mm. C-R length. The fate of Meeker's cartilage and sites of secondary cartilage are discussed. A.D.Dixon
91. DEVELOPMENT OF PERIODONTAL ATTACHMENT IN RAT. J.R.Trott: *Acta anat.*, Basel, 1962, 51, 313-328 (Dept. Periodont., Fac. Dent., Univ. Manitoba, Winnipeg, Canada) Histol. sections of the molar teeth of rats from 7 weeks to 1 yr. were examined. No indication of an intermediate plexus or a cushioned hammock ligament was found in the developmental stages, nor was there any sign of circular gingival fibres in the later stages. N.B.Symons
92. MINERALISATION OF DENTINE AND ENAMEL IN THE ACCOUNT OF METABOLISM OF GENERATIVE TISSUES. M.Pourtois: *Arch. Biol.*, Liège, 1962, 73, 491-520 (Fac. Med., Univ., Brussels, Belgium) The reduction sites of the nitrobluetetrazolium were studied in mouse tooth germs together with the dephosphorylation sites of certain mononucleotides, e.g. ATP, CTP, ADP and AMP. Succinic dehydrogenase and phosphatase activities were absent in tooth germs in the earliest stages and appeared only at the end of the morpho-differentiation period, in the enamel organ and in the pulp, and in the peripheral pulp. From the period of elaboration of hard tissues, the activities were localised in the apical regions of the odontoblasts and ameloblasts. A second dephosphorylating enzyme was identified in the endothelia and perivascular cells; it only cleaves ATP and CTP and is inhib. by the salyrgane. It may have a trophic role. (French) R.J.Walker
93. TOOTH GERM OF MOUSE. II. PHASES OF CYTO-DIFFERENTIATION, ORGANIC AND MINERAL ELABORATION. M.Pourtois: *Arch. Biol.*, Liège, 1962, 73, 225-309 (Lab. Human Embryol., Fac. Med., Univ., Brussels, Belgium) The presence of RNA, glycogen, mucopolysaccharides, alk., acid and neutral phosphatases and ATP-dephosphorylating enzyme, were studied in the tooth germs of the mouse. Alk. and acid glycerophosphatases occur in the 5 or 6 superficial cellular layers of the pulp, while RNA elaboration occurs only in the most peripheral layer. The odontoblasts contain both glycerophosphates and RNA. The odontoblasts contribute to the formation of an ATP dephosphorylating enzyme which migrates to the dentine. The development of the ameloblasts is effected in 4 stages marked successively by the synthesis of RNA, acid phosphatase, ATP-dephosphorylating enzyme¹ and alk. phosphatase. (French) R.J.Walker
94. GROWTH CHANGES OF PALATE. L.Lebret: *J. dent. Res.*, 1962, 41, 1391-1404 (Forsyth Dent. Infirmary, Boston, Mass., U.S.A.) Symmetrograph measurement and tracings in 30 longitudinal series of dental casts showed that the alveolar processes increased in height and breadth continuously. It was not possible to define the role played by suture growth and remodelling in the more active growth at the apex of the palatal vault. A.D.Dixon
95. HISTOCHEMICAL STUDY OF AMELOBLASTS AND ENAMEL MATRIX IN RAT MOLARS. E.Scheinmann, M.M.Weinreb and M.Wolman: *J.dent. Res.*, 1962, 41, 1293-1303 (Dept. Anat., Sch. Med., Hebrew Univ., Jerusalem, Israel) Histochem. methods for the detection of polysaccharides and lipids were applied to molar teeth of rats aged 2-16 days. Neutral and acidic polysaccharides were found which may form a framework for the deposition of Ca salts. Intra- and extracellular lipids were detected which may serve as an energy source for the cell and in primary nucleation of Ca respectively. A.D.Dixon
96. OBSERVATION OF INTERNAL STRUCTURES OF TEETH BY ULTRASONOGRAPHY. G.Baum, I.Greenwood, S. Slawski and R.Smirnow: *Science*, 1963, 139, 495-496 (Bronx V.A. Hosp., New York, U.S.A.) Some internal structures can be seen in vital teeth using high-resolution intensity modulated ultrasonographic techniques at 15 megacycles per sec. A relationship between time, too²* vitality and ultrasonic viewing was observed. G.M.Lewis
97. SOUND STIMULATION AND ITS EFFECT ON DENTAL SENSATION THRESHOLD. S.Carlin, W.D.Ward, A. Gershon and R.Jngraaham: *Science*, 1962, 138, 1258-1259 (Human Factors Res. Div.¹ Sch. Dent., Univ. S. California, Los Angeles, Calif., U.S.A.) The sensitivity to electrical stimm. of the teeth did not alter upon presentation of loud white noise. 'Auditory analgesia' therefore probably depends on distraction and suggestion not on cross-sensory masking. G.M.Le^{wis}
98. DENTINE SENSITIVITY. M.Braunström: *Dtsch. Zahn-, Mund-u. Kieferheilk.*, 1963, 39, 7-14 (TandläkarkOgskolan, Stockholm, Sweden) Droplets were observed on exposed dentine immediately after extraction of the tooth. The drops increased in size when pressure was applied to the apical foramen. It is suggested that in hypersensitive dentine there is an excessive loss of tubule contents from the exposed surface. (German) CPW^{Hi}^s

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99. TRACER STUDY ON THE EFFECT OF DIETARY CALCIUM DEFICIENCY DURING PREGNANCY IN RATS.

J.W.Bowden and J.W.Osbome: *J. dent. Res.*, 1962, 41, 1349-1358 (Dept. Physiol., St. Univ. of Iowa, Iowa City, Iowa, U.S.A.) Two groups of rats were maintained during pregnancy on control and Ca-free diets respectively. Tracer doses of ^{45}Ca were given daily by stomach tube. Immediately after parturition litters and mothers were killed and relative uptake of ^{45}Ca in both was determined. Ash contents of litters and of the maternal femur were also determined. The Ca-stressed rats retained more ^{45}Ca than the controls, but with no apparent redistribution between maternal and litter bone. There was no difference between litter ash in the 2 groups but significantly lower maternal bone ash in the stressed animals.

A.G.Leaver

100. VOLUME AND CONTENT OF SODIUM, POTASSIUM AND CALCIUM IN RESTING AND STIMULATED HUMAN PAROTID SALIVA.

J.Eschler and H.Krug: *Dtsch. Zahn-, Mund-u. Kieferheilk.*, 1963, 39, 14-20 (Hugstetter Str. 55, Freiburg i Br., Germany)

Analyses were carried out on samples obtained from 10 subjects by bilat. cannulation. (German) C.P.Wallis

101. IN VIVO AND IN VITRO EFFECTS OF SALIVA ON ETCHED OR MECHANICALLY-MARKED ENAMEL AFTER CERTAIN PERIODS OF TIME.

H.Lenz and H.R. Mühlemann: *Helv. odont. Acta*, 1963, 7, 30-33 (Dent. Inst., Univ., Zurich, Switzerland)

Smooth darel surfaces were marked with a steel needle or etched with 0.3 N HCl, and then exposed to saliva in the mouth or under in vitro conditions. The surface roughness of etched enamel was smoothed by a pellicle of salivary origin. Hie marks were filled by calculus-like globular deposits resembling micro-organisms.

D.S.Barker

102. EVALUATION OF ANTICARIES AGENTS BY USE OF ARTIFICIAL MOUTH.

W.Pigman and E.Newbm: *I. dent. Res.*, 1962, 41, 1304-1311 (Dept. Biochem., Univ. Toronto, Canada) The rate of softening of sound human tooth surfaces in the artificial mouth apparatus was followed by microhardness tests. Treatment of the surfaces with NaF and SnF₂ soln. greatly reduced the rate of softening. Of 6 commercial dentifrices, those containing F were the most effective in reducing softening rate.

R.J.Andlaw

103. GLYCOLYSIS IN FILMS OF ORAL SAMPLES FROM PERSONS WITH DIFFERENT CARIES RATES.

R.S. Manly, F.R.Shiere, A.O'Brien and D.Harrington: *J. dent. Res.*, 1962, 41, 1461-1474 (Dept. Dent. Sci., Tufts Univ. Sch. Dent. Med., Boston, Mass., U.S.A.) Dental plaque and salivary sediment were obtained from children with high or low caries susceptibility, prepared in the form of thin films and placed in contact with glass electrodes. The pH of plaque was 0.8-1 unit lower than that of sediment. Glycolysis rates were followed on addition of glucose and sucrose soln. Addition of salivary emanant from caries-susceptible or resistant children did not affect glycolysis rates of sediment. None of the measures of glycolysis rates appeared to be correlated with dental caries susceptibility.

R.J.Andlaw

104. E.M. OF CARIOUS DENTAL ENAMEL.

Y.Awazawa: *J. Nihon Univ. Sch. Dent.*, 1962, 5, 99-124 (Dept. Rath., Nihon Univ. Sch. Dent., Tokyo, Japan)

Replicas of carious lesions from 8 permanent teeth were shadowed with Cr and examined. The earliest alteration

in the carious process is mineral loss associated with fine defects within the enamel rods. The orientation of enamel crystals becomes indistinct as carious defects increase.

A.D.Dixon

105. COMPARISON OF DENTAL CARIES ACTIVITY IN STRAINS OF LABORATORY RATS.

J.H.Shaw, D.Griffiths and D.H.Wellman: *J. dent. Res.*, 1962, 41, 1312-1321 (Harvard Sch. Dent. Med., Boston, Mass., U.S.A.)

The caries activities of 14 strains of laboratory rats were studied under controlled and highly cariogenic conditions. Three susceptible and 2 resistant strains were extensively studied and managed by selective breeding to develop high predictability with respect to phenotypic expression of expt. caries. A further 9 strains were surveyed with regard to their potentiality for use in expt. caries work. It was concluded that further selective breeding of these strains, 5 of which were susceptible and 4 resistant, might produce offspring of high dependability.

A.G.Leaver

106. EFFECTS ON CARIES OF CROSS-BREEDING CARIES-RESISTANT AND CARIES-SUSCEPTIBLE RATS.

S.Rosen, G.T.Coleman, A.CSawant, H.R.Hunt and C.A.Heppert: *J. dent. Res.*, 1962, 41, 1033-1036 (Michigan State Univ., East Lansing, Mich., U.S.A.)

The progeny of cross-breeding expt. using caries-susceptible \times crossed with resistant \times and vice-versa were examined for caries experience. There was no difference in the caries experience of the progeny of the reciprocal matings indicating that caries resistance is determined by genetic factors contributed by both parents.

A.G.Leaver

107. EFFECTS OF PARTICLE SIZE OF CORN AND SUGAR DIETS AND OF MASTICATION ON CARIES INCIDENCE IN OS BORNE-MENDEL RATS.

K.G.KOnig: *J. dent. Res.*, 1962, 41, 966-985 (Dent. Inst. Univ., Zürich, Switzerland)

The incidence, and especially the initiation, of carious lesions was studied in 108 rats fed 9 coarse and fine corn and sugar diets both under mastication and non-function. Diets containing 66% corn induced markedly less sulcal lesions than did those containing 66% sugar. Fine particle diets caused more lesions than coarse, this effect being less noticeable in the case of corn. On the corn diets there were more lesions under mastication than non-function, the reverse being the case with the sugar diets.

A.G.Leaver

108. CARBON DIOXIDE INDUCED ACIDOSIS IN PREGNANT RATS AND CARIES SUSCEPTIBILITY OF THEIR PROGENY.

C.T.G.King, A.Wilk and F.J.McClure: *Proc. Soc. exp. Biol.*, N.Y., 1962, 111, 486-489 (Nat. Inst. Dent. Res., N.I.H., Publ. Hlth. Serv., U.S. Dept. Hlth., Educn. and Welfare, Bethesda, Md., U.S.A.)

Respiratory acidosis in the rat induced by CO₂ exposure previous to the 10th day of gestation significantly increased the severity of dental caries in the progeny subsequently fed a cariogenic diet. Treatment had no significant effect when applied after 15th day of pregnancy.

M.M.Shapland

109. DEPRESSION OF ORAL MICROBIOTA BY ANTI BIOTICS AND ITS EFFECT ON CARIES INCIDENCE IN OSBORNE-MENDEL RATS.

K.G.KOnig, T.M.Marthalier and H.R. Mühlemann: *Helv. odont. Acta*, 1963, 7, 2-12 (Dent. Inst., Univ., Zürich, Switzerland)

Upon depression of the cariogenic microflora by administration of erythromycin at different ages during lactation, the incidence of lesions in short-period post-weaning caries tests in the young and 4 months later in the young of the following generation was studied as an indicator of re-infection and of die rapidity of re-establishment of the micro biota. In

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spite of the sensitivity to penicillin and erythromycin of die cariogenic micro-organisms, they were found to regain their full caries-inducing potency within a rather short time, especially when depressed animals were caged with non-depressed caries-active control rats.

D.S.Barker

110. SURVEY OF YEAST POPULATION IN SALIVA AND EVALUATION OF PROCEDURES FOR IDENTIFICATION OF CANDIDA ALBICANS. H.A.Bartels and H.Blechman: J. dent. Res., 1962, 41, 1386-1390 (Dept.

Microbiol., N.T. Univ., Coll. Dent., N.Y., U.S.A.) Incidence and no. of yeasts isolated from stim. and unstim. salivas via modified Littman's medium were not significantly different. 40% of saliva specimens contained yeasts or yeast-like organisms of which 75% were *Candida* spp.: 78% of these were *C. albicans*. Cream-of-rice and com-meal agar media were most suitable for chlamydospore production. Modified Pagano-Levin medium aided presumptive identification of *C. albicans* confirmable by slide aggltn. tests. T.H.Melville

111. ORAL NOCARDIA. G.D.Roth and A.N.Thurn: J. dent. Res., 1962, 41, 1279-1292 (Univ. Kansas City,

Sch. Dent., Kansas City, Mo., U.S.A.) Nocardias isolated from carious humap teeth were studied as to their morphol. and ptysiol. prop. Results are discussed in terms of their reproducibility and environment-dependence. Particular points noted are: variability of both colonial and cellular morphology; adaptive nature of catalase enzyme; and unreliability of standard tests for gelatinase activity and carbohydrate breakdown. The relationship of oral nocardias to various other oral bacteria is*considered. T.H.Melville

112. MICROBIOLOGICAL MINERALISATION: CALCIFIABLE CELL-FREE EXTRACT FROM CALCIFIABLE MICRO-ORGANISM. J.Enniger: J. dent. Res., 1962, 41, 1383-1385 (Ivorydale Tech. Center, Procter and Gamble Co., Cincinnati, Ohio, U.S.A.) Washed

cells of *Bacterionema matruchotii* were extracted with acetic acid and a cell-free extract was recovered by water dialysis. This extract suspended in a calcifying solution acquired Ca hydroxyapatite as shown by X-ray diffraction but this prop. was not present in an extract which had been freeze-dried. T.H.Melville

113. INORGANIC CONTENT AND HISTOLOGY OF EARLY DENTAL CALCULUS IN MAN. H.E.Schroeder: Helv. odont. Acta, 1963, 7, 17-30 (Dent. Inst., Univ., Zürich, Switzerland)

The formation rate and composition of early supragingival calculus forming on Mylar strips attached to lower incisor teeth of 11 subjects was studied and compared with plaque from other tooth surfaces. D.S. Barker

114. INFLUENCE OF FLUORIDE AND PHOSPHATE LOZENGES ON EARLY CALCULUS FORMATION. H.E. Schroeder, E.Muller and H.R.Muhlemann: Helv. odont. Acta, 1963, 7, 12-16 (Dent. Inst., Univ., Zurich, Switzerland)

The amount of calculus forming in 7 days on Mylar strips attached to the lower central incisor teeth of 8 students was compared during periods when the students sucked lozenges 6 times a day. The lozenges contained either 200 mg. Na phosphates, 0-442 mg. NaF, or both. An increase of 25% in dry wt. of calculus resulted from sucking the phosphate lozenges. The F" lozenges produced a 10% wt. increase. D.S.Barker

115. PRESENCE OF ANAESTHETIC IN DENTAL PULP IN LOCAL ANAESTHESIA. A.Rost: Stoma Heidel.,

1963, 16, 112-118 (Friedrichstrasse 28, Giessen, Germany) Hostacaine and hydroxyprocaine were present in the pulp of all of 40 teeth extracted 5-15 min. after injn. for infiltration or block anaesthesia. Procaine could not be detected. C.P.Wallis

116. THE EFFECT OF DIFFERENT^f VITAL PULP AND ROOT-FILLING PREPARATIONS ON TISSUE CULTURES.

H.Maizumi and E.Sauerwein: Dtsch. zahnärztl. Z., 1962, 17, 1628-1635 (Pharmacol. Inst., Univ., Bonn, Germany)

The results of testing 8 prep. intended for use on vital pulp tissue (including Calxyl and ZnO-eugenol), and 13 'root filling' medicaments (including chloropercha, •N2 normal^l, and iodoform paste) are reported in detail. The effects of each prep. on tissue cultures of embryo chick heart cells were studied. Calxyl or chloropercha, among others, interfered with cell growth far less than, for instance, ZnO and eugenol or iodoform paste or 'N2 normal'. The authors point out that non-irritation of cells is not the only prop. required of the substances tested.

(German, English summary) J.P.Waterhouse

117. AGE, GONAECTOMY, AND WOUND HEALING IN PALATAL MUCOSA OF RAT. E.O.Butcher and J.Klingsberg: Oral Surg., 1963, 16, 484-493 (Dept. Anat., Coll. Dent., New York Univ., N.Y., U.S.A.)

Wounds ranging in size from 1-2 mm., and involving either the superficial mucosa only, or the whole mucoperosteum, were made in the palates of 200 Long-Evans strain rats, aged from 22-830 days. The gonads of some of these animals had been removed up to 20 months prior to the expt. The superficial wounds healed rapidly, but in the deeper wounds, the epithelium covered the surface only after removal of necrotic tissue and growth of the underlying granulation tissue had occurred. Healing was faster in the younger animals, and ovariectomy, but not orchectomy, gave more rapid healing. D.S.Barker

118. LICHEN RUBER PLANUS OF THE ORAL MUCOUS MEMBRANE. D.Herrman: Dtsch. zahnärztl. Z., 1963, 18, 346-363 (Clin. for Dis. of Teeth, Mouth and Jaws, Free Univ., Berlin, Germany)

A detailed account of the clinical and histol. findings in 60 patient* who had oral lesions of lichen planus ('typical', atropW hypertrophic, bullous, erosive) without skin involvement is given. The group contained 44 women and 16 men: a sex ratio of 2*7. Slightly less than one half of the whole group were aged 50-59 yr., although men and women in all decades of life from 20 to 90 were seen. 93% of the group had lesions on the cheeks. Attempts to influence the course of non-erosive types of lichen plant* by local or systemic administration of steroids, vitamins* arsenic, etc. were unsuccessful.

(German, English summary) J.P.Waterhouse

119. RELATIONSHIP BETWEEN THIRD MOLAR AGENESIS AND REDUCTION IN TOOTH NUMBER. S.Gam and A.D.Lewis: Angle Orthodont., 1962, 32, 14-18 (Fels Res. Inst., Yellow Springs, Ohio, U.S.A.)

A sample consisting of 100 subjects of 14 yr. or older, having one or more third molars missing and a control group of 398 having all 4 third molars present was examined clinically, radiographically and by means of models. When 1 or more third molar teeth were missing, the incidence of other missing teeth increased 13-fold. Third molar agenesis was also associated with a reduction in &* no. of all the other teeth, first molars excluded, whereas the reduction in no. in the control group relate^ only to the second incisor and second premolar teeth. R.D.Howard

CARBOHYDRATES

120. STUDIES ON THE CARBOHYDRATE METABOLISM OF A GRAM NEGATIVE ANAEROBE (BACTERIODES SYMBIOSUS) USED IN THE CULTURE OF ENTA-MOEBA HISTOLYTICA. P.D.Bragg and R.E.Reeves: J. Bact., 1962, 83, 76-84 (Dept. Biochem., Louisiana State Univ. Sch. Med., New Orleans, La., U.S.A.)

Resting cells of B. symbiosus have been shown to utilise glucose and several other monosaccharides. The fermentation of the sugars is mediated by demonstrable kinases except in the case of mannitol. The main end-products of the metabolism of glucose are CO₂, H₂, ethanol and acetic, butyric, succinic and lactic acids. Changes in the thiol used in the growth media produce different enzyme complements in the cells. For example cells grown with cysteine are unable to metabolise glucosamine, whereas those grown with thiomaltate rapidly degrade this amino sugar. Enzyme assays and ¹⁴C-labelled glucose studies suggest that glucose is metabolised by resting cells mainly by the Embden-Meyerhof pathway.

C. Toothill

121. CARBOHYDRATE METABOLISM IN STRAIN L-929 MOUSE FIBROBLAST CELLS. M.K.Johnson and E.J. Johnson: Proc. Soc. exp. Biol., N.Y., 1962, 111, 149-152 (Dept. Microbiol., Univ. Mississippi Sch. Med., Jackson, Miss., U.S.A.)

The cells oxidised glucose, typical tricarboxylic acid substrates and pentose phosphate. Cell extracts contained enzymes of the Embden-Meyerhof pathway, the citric acid cycle and the glucose 6-PO₄ oxidative pathway although no trans-*etolase or transaldolase could be detected.

M.M.Shapland

122. SUBSTANCES OF THE CARBOHYDRATE METABOLISM OF ISOLATED PERFUSED RAT LIVER. H.Schimassek: Biochem. Z., 1963, 336, 460-467 (Physiol. Inst., Univ. Marburg/Lahn, Germany) An apparatus described in which a medium containing bovine r.b.c. & albumin, Tyrode soln. and Terramycin is perfused ¹⁴C-liver. The levels of lactate, pyruvate, Wycerol 1-phosphate, dihydroxyacetone phosphate and lactose 1,6-diphosphate were 50% higher than in vivo, ¹⁴lactate and glucose 6-phosphate had decreased by 40% (German) L.Cohn

123. OXIDATION AND FERMENTATION OF SUGARS BY YEAST PROTOPLASTS. J.W.Millbank: Exp. Cell Res., 1963, 29, 422-429 (Brewing Indust. Res. Fdn., Nuffield, Surrey, England) Glucose, fructose, sucrose and maltose were oxidised by protoplasts of 3 strains of brewing yeasts at rates equal to or greater than those of the corresponding intact cells, as measured using ¹⁴N as a basis for determining the parameters QCO₂ to Q₁₄ and protoplasts of \pm strain nor mally

{** to metabolise maltose, lost this ability after incubation for 2 hr. in media lacking this sugar. The distribution of invertase and its activity were studied in 1 strain.

K.Jones

124. RESPIRATORY ENZYMES OF CHLORELLA. H.-S. Gewitz and W.Volker: Hoppe-Seyleis Z. physiol. Chem., 1962, 330, 124-131 (Max-Planck-Inst. für Physiol., 1 Berlin-Dahlem, Germany) The iso-

¹⁴On of a new enzyme is described. It contains Fe, ⁵⁵Fe, ⁵⁷Cr, ⁵⁹Fe, ⁶³Fe, ⁶⁵Fe, ⁶⁷Fe, ⁶⁹Fe, ⁷¹Fe, ⁷³Fe, ⁷⁵Fe, ⁷⁷Fe, ⁷⁹Fe, ⁸¹Fe, ⁸³Fe, ⁸⁵Fe, ⁸⁷Fe, ⁸⁹Fe, ⁹¹Fe, ⁹³Fe, ⁹⁵Fe, ⁹⁷Fe, ⁹⁹Fe, ¹⁰¹Fe, ¹⁰³Fe, ¹⁰⁵Fe, ¹⁰⁷Fe, ¹⁰⁹Fe, ¹¹¹Fe, ¹¹³Fe, ¹¹⁵Fe, ¹¹⁷Fe, ¹¹⁹Fe, ¹²¹Fe, ¹²³Fe, ¹²⁵Fe, ¹²⁷Fe, ¹²⁹Fe, ¹³¹Fe, ¹³³Fe, ¹³⁵Fe, ¹³⁷Fe, ¹³⁹Fe, ¹⁴¹Fe, ¹⁴³Fe, ¹⁴⁵Fe, ¹⁴⁷Fe, ¹⁴⁹Fe, ¹⁵¹Fe, ¹⁵³Fe, ¹⁵⁵Fe, ¹⁵⁷Fe, ¹⁵⁹Fe, ¹⁶¹Fe, ¹⁶³Fe, ¹⁶⁵Fe, ¹⁶⁷Fe, ¹⁶⁹Fe, ¹⁷¹Fe, ¹⁷³Fe, ¹⁷⁵Fe, ¹⁷⁷Fe, ¹⁷⁹Fe, ¹⁸¹Fe, ¹⁸³Fe, ¹⁸⁵Fe, ¹⁸⁷Fe, ¹⁸⁹Fe, ¹⁹¹Fe, ¹⁹³Fe, ¹⁹⁵Fe, ¹⁹⁷Fe, ¹⁹⁹Fe, ²⁰¹Fe, ²⁰³Fe, ²⁰⁵Fe, ²⁰⁷Fe, ²⁰⁹Fe, ²¹¹Fe, ²¹³Fe, ²¹⁵Fe, ²¹⁷Fe, ²¹⁹Fe, ²²¹Fe, ²²³Fe, ²²⁵Fe, ²²⁷Fe, ²²⁹Fe, ²³¹Fe, ²³³Fe, ²³⁵Fe, ²³⁷Fe, ²³⁹Fe, ²⁴¹Fe, ²⁴³Fe, ²⁴⁵Fe, ²⁴⁷Fe, ²⁴⁹Fe, ²⁵¹Fe, ²⁵³Fe, ²⁵⁵Fe, ²⁵⁷Fe, ²⁵⁹Fe, ²⁶¹Fe, ²⁶³Fe, ²⁶⁵Fe, ²⁶⁷Fe, ²⁶⁹Fe, ²⁷¹Fe, ²⁷³Fe, ²⁷⁵Fe, ²⁷⁷Fe, ²⁷⁹Fe, ²⁸¹Fe, ²⁸³Fe, ²⁸⁵Fe, ²⁸⁷Fe, ²⁸⁹Fe, ²⁹¹Fe, ²⁹³Fe, ²⁹⁵Fe, ²⁹⁷Fe, ²⁹⁹Fe, ³⁰¹Fe, ³⁰³Fe, ³⁰⁵Fe, ³⁰⁷Fe, ³⁰⁹Fe, ³¹¹Fe, ³¹³Fe, ³¹⁵Fe, ³¹⁷Fe, ³¹⁹Fe, ³²¹Fe, ³²³Fe, ³²⁵Fe, ³²⁷Fe, ³²⁹Fe, ³³¹Fe, ³³³Fe, ³³⁵Fe, ³³⁷Fe, ³³⁹Fe, ³⁴¹Fe, 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C-1 and C-6 with more activity in the latter than in the former. This shows that L-glyceraldehyde presented to the liver and that formed from L-sorbose within the liver follow the same pathways. The distribution of 14C does not differentiate L-glyceraldehyde metabolism by way of the phosphate from that via dihydroxyacetone phosphate.

J.N.Ashley

131. SYNTHETIC CYTOLIPIN H AND OTHER LACTOSIDES. A.C.Schram, E.H.Byers and R.H.Wilson: Nature, Lond., 1963, 197, 1074-1076 (Biochem. Dept., Univ. Texas Southwestern Med. Sch., Dallas, Tex., U.S.A.) A ceramide lactoside has been synthesised from ceramide and a-acetobromolactose. The lactoside was identified as ceramide 3-lactoside. Data from i.r. analytical and immunol. techniques strongly suggest that ceramide 3-lactoside is very similar to, if not identical with, the hapten cytoltipin H. J.R.Sargent

132. STRUCTURE AND CHROMATOGRAPHIC PROPERTIES OF CARBOHYDRATES. II. LIQUID-LIQUID PARTITION MOBILITIES OF ALDONO-y-LACTONES. R.J.Ferrier: J. Chromatography, 1962, 9, 251-252 (Lawrence Rad. Lab., Univ. California, Berkeley, Calif., U.S.A.) Notes. P.D.Dawkins

133. PREPARATION OF SOME NEW DISACCHARIDES AND D-ALLOSE FROM 3-KETOGLYCOSIDES. M.J.Bernaerts, J.Fumelle and J.De Ley: Biochim. biophys. Acta, 1963, 69, 322-330 (Central Lab., Min. Economic Affairs, Brussels, Belgium) Conditions for reducing the 3-keto function much faster than the hemiacetal group with Raney Ni are described. The yield was 85-90%. Lactose and gulosylglucose were obtained from 3-keto lactose. Lactose was eliminated by oxidation with Aerobacter cloacae and gulosylglucose was purified and cryst. as the monohydrate. 3-Ketomaltose gave maltose and allosylglucose. 3-Ketomaltobionate gave better yields. Maltose was eliminated with a Paracolobactrum strain and allosylglucose was obtained as a chromatographically pure syrup. 3-Ketosucrose reduction gave sucrose and allosylfructose, the latter being purified by charcoal chromatography. D-allose was obtained by treating with a Paracolobactrum strain which oxidised glucose and fructose, unchanged D-allose was purified and cryst. B.M.Stevens

134. FUNCTION OF TREHALOSE IN BAKER * S YEAST (SACCHAROMYCES CEREVISIAE). A.Panek: Arch. Biochem., 1963, 100, 422-425 (Biochem. Dept., Nat. Sch. Chem., Rio de Janeiro, Brazil) Trehalose and glycogen were formed in nonproliferating cells in the proportion 5:1. During aerobic starvation trehalose was not utilised but during the initial 'lag' phase of a growth curve approx. 9VJo of the trehalose was rapidly mobilised and degraded, largely to CO₂. * B.M.Stevens

135. OCCURRENCE OF SUGAR PHOSPHATES IN COW'S MILK. N.C.Ganguli and K.K.Iva: Indian J. Chem., 1963, 1, 145-146 (Nat. Dairy Res. Inst., Karnal, Punjab, India) The presence of some sugar phosphates like fructose 6-phosphate, fructose 1,6-phosphate and pentose phosphates in milk has been demonstrated. Their isolation and identification have been established by both chem. and paper chromatographic methods. Apart from these sugars, glucose, galactose and lactose are also present in milk in their phosphorylated forms. I.A.B.S.

136. COLANIC ACID. W.F.Goebel: Proc. nat. Acad. Sci., Wash., 1963, 49, 464-471 (Rockefeller Inst., New York, U.S.A.) Colicinogenic bacillus E. coli

K235 L + O (in) produces a serol. active, nitrogen-free polysaccharide which is named colanic acid. The isolation and prop. of colanic acid are described. The compound is a capsular polysaccharide which confers upon tW bacillus its mucoid characteristics and also certain of its serol. prop.

J.R.Sargeni

137. INFRA-RED SPECTRAL CHARACTERISATION OF COLANIC ACID. H.Jaffe: Proc. nat. Acad. Sci., Wash., 1963, 49, 472-473 (Rockefeller Inst., New York, U.S.A.) A limiting and characteristic i.r. spectrum has been determined for the purified salt and acid forms of colanic acid. The spectra indicate the presence of an amino functional group which may be a constituent part of the polysaccharide structure but which is considered more likely to be due to a strongly absorbed basic contaminant.

J.R.Sargefl

138. THE IN VITRO INCORPORATION OF HEXOSAMIN* INTO RAT COLON MUCOIDS. A.Moretti and G.Wolfi G. Biochim., 1962, 11, 175-180 (Inst. di Chim. BioL Univ. Milan, Italy) It has been shown that rat colon is capable of synthesising hexosamine from glucose 6-P and glutamine, and that once formed it is incorporated into non-dialysable high polymers by enzymes present in colon homogenates. It is concluded that mucoid synthesis has taken place.

B.Pay*

139. DIFFERENTIAL DETERMINATION OF D-GLUCOSAMINE AND D-GALACTOSAMINE. Y.Imanaga: J. Biochem., Tokyo, 1963, 53, 80-83 (Dept. Chem. Fac. Sci., Nara Women's Univ., Nara, Japan).

B.M.Stevens

140. NON-ENZYMIC DEGRADATION OF D-GLUCOSAMINIC ACID. Y.Imanaga, F.Saito and Y.Kusuda: J. Biochem., Tokyo, 1963, 53, 84-85 (Dept. Chem. Fac. Sci., Nara Women's Univ., Nara, Japan) Pyridoxal and Cu mainly decomposed D-glucosaminic acid aldolatically at the C-2 to C-3 bond.

B.M.Stevens

141. EPIMERISATION OF N-ACETYL-D-GALACTOSAMINE TO N-ACETYL-D-TALOSAMINE. S.Fuji *nd H.Kushida: Biochim. biophys. Acta, 1963, 69, 572' 573 (Res. Lab., Kaken-yaku-kako Co. Ltd., Kyoto, Japan) The converted aminosugar was isolated ana characterised.

B.M.Steven*

142. CARBAZOLE METHOD FOR THE DIFFERENTIAL ANALYSIS OF GLUCURONATE, GLUCOSIDURONAT* AND HYALURONATE. H.Yuki and W.H.Fishman: Biochim. biophys. Acta, 1963, 69, 576-578 (Tufts. Univ. Sch. Med., Boston, Mass., U.S.A.) Anaiy*? was based on hypoiodite oxidation and the Dische ²_{fpi} reaction; hyaluronate was differentiated by its copi reaction with HgS from aq. soln.,

B.M.Stevens

143. RHODINOSE, A TRIDESOXYSYHEXOSE. H.BrocW¹¹* and T.Waehneldt: Naturwissenschaften, 1963, 50t, 43 (Org. Chem. Inst. Univ. GGttingen, Germany) Isolation from sol. hydrolysate of y-Rhodomycin IV *hu results of physicochem. analysis are described.

(German) A.J.Wansbrow¹¹

144. CATABOLISM OF GLUCOSE AND GLUCONATE § INTACT RATS. C.H.Wang, L.P.Snipper, O.Bilen ^{ax}, B.Hawthorne: Proc. Soc. exp. Biol., N.Y., 1962, 112, 93-97 (Dept. Chem., Oregon State Univ., Corvallis, Ore., U.S.A.) Glucose administered per os is catabolized mainly via the Embden-Meyerhof-Parnas P^{aff}_{JL}, but a small *jo is routed into the glucuronate and phosi*

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is

gluconate pathways. Gluconate is readily utilised via the Utter.

M.M.Shapland

145. OXIDATION OF GLUCOSE TO γ - AND 6-GLUCONOLACTONE BY MICROBIAL ENZYMES. R.Weinberg: *Biochim. biophys. Acta*, 1963, 67, 359-365 (Pioneering Lab. Microbiol. Chem., Northern Reg. Res. Lab., Peoria, 111., U.S.A.) Three particulate enzymes yielded glucose α - γ -lactone whereas 2 sol. enzymes produced glucono-6-lactone. B.M.Stevens

146. GLUCOSE SUPPLY BY THE LIVING HOST AND GLYCOLYSIS OF YOSHIDA ASCITES HEPATOMA IN VIVO. U.Del Monte and C.B.Rossi: *Cancer Res.* 1963, 23, 363-367 (Inst. Gen. Pathol., Univ. Messina, Italy) Glucose penetration into and lactate efflux from ascitic fluid was measured in rats in which the tumour had been replaced by cell free ascitic fluid. Glucose concn. were extremely low in ascitic fluid but lactate levels were higher than in blood. Blood lactate was also above normal in tumour bearing rats. Lactate efflux was of the same order of magnitude as glucose influx. When extra glucose was supplied both glucose utilization and lactate formation increased. B.M.Stevens

147. GLUCOSE AND ACETATE METABOLISM IN ALLIGATOR MISSISSIPPIENSIS. A.L.Black, M.G. Simesen and J.C.Bartley: *Comp. Biochem. Physiol.*, 1963, 8, 299-310 (Dept. Physiol. Sci., Univ. California, Davis, Calif., U.S.A.) Alligators, *Allmississippiensis*, were obtained and kept for a week without food so that expt. animals were in the post-absorptive condition*. The respiratory rates of the gators were studied after injn. of labelled acetate or ^{14}C ucose. The metabolism of acetate was faster than glucose. A range of ^{14}C -containing amino acids was plated. The nature of these was similar to those obtained in mammals inj. with $[14\text{C}]$ acetate or $[14\text{C}]$ glucose. M.S.Laverack

148. ATP DEPENDENT INCORPORATION OF $[14\text{C}]$ GLUCOSE INTO CHARONINSULPHURIC ACIDS BY A CELL FREE EXTRACT OF THE MUCOUS GLAND OF CHARONIA LAMPAS. K.Iida: *J. Biochem. Tokyo*, 1963, 53, 37-42 (Dept. Chem., Fac. Sci., Nagoya Univ., Nagoya, Japan) ATP and Mg were essential. ATP was converted to AMP during the reaction. UTP was required. Addition of SO_4^{2-} had no effect. More glucose was incorporated into the S-poor charoninsulphuric acid than into the S-rich charoninsulphuric acid. Almost all the incorporating activity of the extract was found in a 6000 r.p.m. supernatant. B.M. Stevens

149. GLUCURONIDE FORMATION AND TRANSPORT OF VARIOUS COMPOUNDS BY GUNN RAT INTESTINE IN VITRO. I.M.Arias, M.Furman, D.F.Tapley and J.E. Ross: *Nature, Lond.*, 1963, 197, 1109-1110 (Dept. Einstein Coll. Med., Yeshiva Univ., New York, N.Y., U.S.A.) Prep. from the mucosa of Gunn rats had a markedly reduced ability to form glucuronides of 2-amino-4-methylumbellifero. Transport of triiodothyroacetic acid and testosterone V_{d} in the sacs of the intestine in Gunn rats was less than 50% normal; transport of monoiodotyrosine was less than 50%. The biosynthesis of glucuronides in intestinal tissue appears to be similar to that in the liver. It is suggested that glucuronide formation plays a major part in active transfer of thyroxine analogues and certain steroids by the mucosal cell. G.M.Lewis

150. GLUCOSE METABOLISM OF EUGLENA GRACILIS VAR. BACILLARIS; GROWTH AND ENZYMIC STUDIES. R.E.Hurlbert and S.C.Rittenberg: *J. Protozool.*, 1963, 9, 170-182 (Dept. Bacteriol., Univ. Southern California, Los Angeles, Calif., U.S.A.) CO_2 , certain Krebs cycle acids and certain amino acids stimulate growth and glucose utilisation of a colourless strain of *E. gracilis* in a phthalate-buffered mineral salt medium. Glucose utilisation was initiated within a pH range of 3.0-5.0 which could be extended by the addition of glycine. Cells cultured at pH 4.5 could be adapted to growth at pH 7.0 when a small amount of citrate was present. It is suggested that the citrate acted as a chelator. The major enzymes of the Embden-Meyerhof-Parnas and pentose phosphate pathways were demonstrated in cell-free extracts. The pH optima of a no. of the enzymes was found to be between 7.5-8.6, though the cells from which the enzymes were obtained were grown in acid medium. There was evidence for the operation of a uridine linked pathway in the hexose metabolism.

R.J.Walker

151. [THE] OXIDATIVE ASSIMILATION AND DISTRIBUTION OF GLUCOSE IN *BACILLUS CEREUS*.

C.E.Clifton: *J. Bact.*, 1962, 83, 66-69 (Dept. Med. Microbiol., Stanford Univ. Sch. Med., Stanford, Calif., U.S.A.) Exogenous labelled $[14\text{C}]$ glucose is taken up rapidly by washed cells of *B. cereus* and apparently enters a metabolic pool sol. in cold & J_0 TCA. From this pool the label rapidly passes into other cellular fractions, primarily materials sol. and insol. in hot & J_0 TCA, which may constitute the endogenous reserves of the cells. There is a marked lag in the liberation of $^{14}\text{CO}_2$; little or no lag is observed in the slightly enhanced rate of O_2 consumption noted in the presence of exogenous glucose. Assimilation in part at least, appears to be at the expense of cellular reserves which appear to be replenished or replaced by the assimilated substrate.

C.Toothill

152. 3-(j8-D- GALACTOSIDO)-2-ACETAMIDO-2-DEOXY-D-GALACTOSE. A CRYSTALLINE DISACCHARIDE FROM HUMAN BRAIN GANGLIOSIDES.

E.Klenk, U.W.Hendricks and W.Gielen: *Hoppe-Seylers Z. physiol. Chem.*, 1962, 330, 140-144 (Physiol.-Chem. Inst. Univ., 5 K81n-Lindenthal, Germany) The isolation, separation and identification of the disaccharide is described.

(German) L.Cornish

153. COLORIMETRIC DETERMINATION OF 3,6-ANHYDROGALACTOSE WITH THE INDOLYL-3-ACETIC ACID REAGENT. W.Yaphe: *Nature, Lond.*, 1963, 197, 488-489 (Atlantic Reg. Lab., Nat. Res. Coun., Halifax, Nova Scotia, Canada) The indolyl-3-acetic acid reagent can be used at 23.5° and 37° to determine free 3,6-anhydrogalactose. It shows no advantage, however, over the resorcinol test for the quant. determination of this sugar in a polysaccharide. G.M.Lewis

154. CARBOHYDRATES IN PROTEIN. VEL THE NATURE OF THE CARBOHYDRATE IN OVOMUCOID.

A.Neuberger and H.Papkov: *Biochem. J.*, 1963, 87, 581-585 (Dept. Chem. Path., St. Mary's Hosp. Med. Sch., London, England) Ovomucoid was prep. by a modification of published methods by chromatography on CMcellulose and DEAEcellulose. This protein was digested by the enzyme pronase, and a glycopeptide fraction was obtained by chromatography on Sephadex G-25. Further chromatography on Sephadex G-50 showed considerable retardation, indicating an average

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mol. wt. appreciably below 10000, and this was also indicated by quant. dialysis expt. Evidence is produced from the results of dinitrophenylation and fractionation expt., in which different resins were used, indicating the probable presence in ovomucoid of 3 glycopeptide moieties differing in hexose, hexosamine and amino acid composition.

- 155. ENZYMIC DEBRANCHING OF GLYCOGEN. I. A NEW PATHWAY IN RABBIT MUSCLE FOR THE ENZYMIC DEBRANCHING OF GLYCOGEN.** M.Abdullah and W.J.Whelan. **II. COMBINED ACTION OF OLIGO-1,4'1,4-GLUCANTRANSFERASE AND AMYLO-1,6-GLUCOSIDASE IN DEBRANCHING GLYCOGEN.** D.H.Brown, B.Illingworth and C.F.Cori: Nature, Lond.. 1963, 197, 979-980, 980-982 (Lister Inst. Preventive Med., Chelsea Bridge Rd., London, England) I. A new debranching process has been detected during studies of the action of amylo-1,6-glucosidase prep, on amylopectin and glycogen. The debranching process does not require prior phosphorolysis of glycogen but appears to occur by action of a trans-glucosylase (resulting in chain lengthening rather than chain shortening) which exposes 1:6-bonded side chains to the action of glucosidase. II. Non-phosphorolytic debranching of glycogen in the presence of amylo-1,6-glucosidase prep, is shown to occur by exposure of Of-1,6-linked glucose bonds through the action of an oligo-1,4->1,4-glucantransferase. The latter enzyme transfers maltotriosyl and maltosyl but not glucosyl residues. J.R.Sargent

- 156. PORCINE MUSCLE GLYCOGEN STRUCTURE AND ITS ASSOCIATION WITH OTHER MUSCLE PROPERTIES.** R.N.Sayre, E.J.Briskey and W.G.Hoekstra: Proc. Soc. exp. Biol., N.Y., 1963, 112, 223-225 (Depts. Meat and Animal Sci., Univ. Wisconsin, Madison, Wis., U.S.A.) Three different pig breeds were studied to elucidate the changes of structure of glycogen mol. after death. Post-mortem glycolysis accounted for the loss of a glucose residue per average chain length of glycogen. The importance of anaerobic conditions in decreasing the chain length was shown in Chester White pigs and it was found that chain lengthening could be achieved by feeding animals prior to death with sucrose. Thus it is concluded that the nutritional status of the body at death can complicate the pattern of post-mortem changes which are influenced by inherent genetic factors.

D.N.Wheatley

- 157. α -1,4-GLUCOSANS. XVII. THE MOLECULAR STRUCTURE OF SOME GLYCOGENS.** O.Kjellberg, D.J.Manners and A.Wright: Comp. Biochem. Physiol., 1963, 8, 353-365 (Dept. Chem., Univ. Edinburgh, Scotland) Samples of glycogen obtained from chickens, Ascaris, rabbit, Arenicola, Cardium, Mytilus, horse, pig, Oncorhynchus, cod, mouse and skate were examined by means of enzymic degradation, iodine staining, periodate oxidation and concanavalin A reaction. Chain lengths of 12-15 glucose residues were indicated, together with mol. wt. values of $5\cdot10 \times 10^6$ as measured by turbidity techniques. The feeding of D-galactose to starved rabbits or sucrose to pigs does not produce a liver glycogen with low branching values. Similar chain lengths are shown by lyo- and desmo- glycogens obtained from fed and starved rabbits. M.S. Lave rack

- 158. STUDIES IN CELLULOSE CHEMISTRY. PART VH - ASSAY OF REDUCING END GROUPS BY HILLER AND PACSU'S METHOD.** T.S.A.Padmanabhan, T.N.Rawal

and L.R.Sud: Indian J. Technol., 1963, 1, 99-101 (Defence Res. Lab. (Stores), Kanpur, India).

I.A.B.S.

- 159. CONNECTIVE TISSUE METABOLISM. I. HYALURONIC ACID SYNTHESIS BY CELL-FREE EXTRACTS OF HUMAN TISSUES.** C.H.Altshuler, G.Kinsman and J.Bareta: Arch. Path., Chicago, 1963, 75, 206-211 (Dept. Path., St. Joseph's Hosp., Milwaukee, Wis., U.S.A.) A cell free hyaluronic acid synthesising enzyme system has been prep, from several human mesodermal tissue homogenates. The substrates are uridine diphospho-N-acetyl glucosamine and uridine diphosphoglucuronic acid. R.Mitchell

- 160. SOME FACTORS AFFECTING THE INTERACTION OF HYALURONIC ACID WITH BOVINE PLASMA ALBUMIN.** E.Gramling, W.Niedermeier, H.L.Holley and W.Pigman: Biochim. biophys. A eta, 1963, 69, 552-558 (Arthritis and Rheumatic Dis. Lab., Univ. Alabama Med. Center, Birmingham, Ala., U.S.A.)

In soln. with a low albumin/hyaluronic acid concn. ratio all the albumin was bound to hyaluronic acid to give a Pi complex. In soln. where the ratio was higher free albumin could be demonstrated in the mixture. Some hyaluronic acid always remained free even when an excess of albumin was present. Complex formation appeared to be directly related to the intrinsic ν of the hyaluronic acid. The effect of the relative *) of the soln. was also examined.

B.M.Stevens

- 161. PURIFICATION OF HYALURONATE LYASE ON DEAE-SEPHADEX.** E.Som and F.Ionescu-Stoian: Biochim. biophys. Acta, 1963, 69, 538-543 (Dept. Gen. Biochem. and Immunochem., Dr.J.Cantacuzino Inst., Bucarest, Rumania) Testicular hyaluronate lyase was obtained as an electrophoretically homogeneous prep, from the crude prep, which contained 4-5 electro*, phoretic fractions using a DEAE-Sephadex A-50 (mediumV column. Using pH 6*0, 0#02M phosphate buffer with an ionic strength of 0*08 enzymically inactive proteins were adsorbed while the active component passed through

B.M.Stevens ..

- 162. INFRARED DICHROISM OF SODIUM HYALURONATE?*** F.R.Quinn and F.A.Bettelheim: Biochim. biophys. Acta, 1963, 69, 544-551 (Chem. Dept., Adelphi Coll., Garden City, N.Y., U.S.A.) Films of umbilical cord Na hyaluronate swollen in 82% ethanol were elongated and the i.r. absorption spectra of the dn^e films were taken at different elongations with the electrical vector of polarised i.r. radiation parallel and perpendicular to the direction of elongation. Dichroic ratios were calc. as a function of elongation. Orientations of different atomic groups in the polymer mol. with elongation were interpreted to indicate a rather stiff mol. con*figuration of chains in the gel form. Elongation is suggested to be mainly due to turning and orientation 0* mol. aggregates rather than to uncoiling of a random isotropic chain configuration.

B.M. Stevens

- 163. PREPARATION OF HYALURONIC ACID FROM BOVINE SYNOVIAL FLUID.** G.Matsumura, M.De Salegui, A.Herp and W.Pigman: Biochim. biophys. Acta, 1963, 69, 574-576 (Dept. Biochem., New J^r/k Med. Coll., New York, U.S.A.) Hyaluronic acid was isolated as the cetylpyridinium salt, this was then dissociated in NaCl and the cetylpyridinium chloride extracted with ethanol; coprecipitated protein was removed by adsorption on Fuller's earth.

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B.M.Stevens

164. BINDING OF SODIUM AND POTASSIUM IONS BY HEPARIN. S.Salminen and K.Luomanmaki: Biochim. biophys. Acta, 1963, 69, 533-537 (Wihuri Res. Inst., Helsinki, Finland) The effect of heparin on the relative activities of Na and K was calc. from the distribution of small ions between a heparin soln. and its "Urafiltrate. Activities of Na and K were markedly decreased by heparin. K was preferentially bound. The excess of SO₄ over carboxyl groups in heparin is suggested to be responsible for alkali metal ion binding.

B.M.Stevens

165. MACROMOLECULAR PROPERTIES AND BIOLOGICAL ACTIVITY OF HEPARIN. II. FURTHER ELECTROPHORETIC STUDIES. G.H.Barlow and L.J.Coen: Biochim. biophys. Acta, 1963, 69, 569-571 (Phys. Chem. Dept., Res. Div., Abbott Lab., North Chicago, 111., U.S.A.) Data available on the heparin-streptomycin complex were used to attempt further purification of heparin.

B.M.Stevens

166. SULPHURATED MUCOPOLYSACCHARIDES OF METAPHYSIS CARTILAGE OF NEW-BORN PIGS. A.A.Castellani, S.Ronchi, G.Ferri and M.Malcovati: G. Biochim., 1962, 11, 181-186 (Inst. Chim. Biol.. Univ. Pavia, Italy) The Ca salts of mucopolysaccharides extracted after enzymic digestion of new-born pig metaphysis cartilage were fractionated with increasing quantities of ethanol. At 4CP/o alcohol, S&J of mucopolysaccharide were pptd. and this fraction consisted J* chondroitin sulphate A (6 Oft) and chondroitin sulphate A (4%). At higher alcohol concn. keratosulphate was JW. but in smaller amounts, and also yet smaller founts of xylose. All fractions contained peptide ^Purities.

B.Payne

167. LIGHT CHONDROMUCOPROTEIN FROM METAPHYSIS CARTILAGE IN NEW-BORN PIGS.

A.A.Castellani, B.Bonferoni, S.Ronchi, G.Ferry and M.Malcovati: G. Biochim., 1962, 11, 187-195 (Inst. Chim. Biol., Univ. Pavia, Italy) Chondromucoprotein was prep. from metaphysis cartilage of KL^bY Piglets, and its homogeneity was studied by freeze electrophoresis and by ultracentrifuging. Electrophoresis and sedimentation patterns both showed chondromucoprotein to be homogeneous. Hexoses and pentoses were identified after hydrolysis of chondromucoprotein by (48)³chromatography and chondroitin A (57%) and C (4%) content were determined after digestion with hyaluronidase. Protein content was determined by method of Folin and constituted about 6% of the whole. The results of the analysis are tabulated in some detail.

B.Payne

168. PREPARATION OF SIALOMUCOPOLYSACCHARIDES FROM BRAIN MITOCHONDRIAL FRACTIONS.

G.Brunngraber and B.D.Brown: Biochim. biophys. Acta, 1963, 69, 581-582 (Illinois State Psychiat. Inst. Chicago, Ill., U.S.A.) The material purified was rat or dog brain was free of nucleic acid and protein, dialysable and was not pptd. by cetylpyridinium chloride. Prelim, comm.

B.M.Stevens

V. METABOLISM IN VIVO OF CONNECTIVE TISSUE POLYSACCHARIDES. I. CHONDROITIN SULPHATE C AND KERATOSULPHATE OF NUCLEUS POSUS. II. CHONDROITIN SULPHATE B AND GLUCURONIC ACID OF SKIN. III. CHONDROITIN SULPHATE AND KERATOSULPHATE OF CARTILAGE. R.Pavidson and W. Small: Biochim. biophys. Acta, 1963, 69, 445-452, 453-458, 459-463 (Dept.

Biochem., Duke Univ. Med. Center, Durham, N.C., U.S.A.) I. The ratio of keratosulphate to chondroitin sulphate increased uniformly as a function of age in rabbit nucleus pulposus. Several hormones, notably growth hormones, oestrogens and androgens, altered the composition of mature tissue to that typical of a younger age. The metabolic activity of the polysaccharides was examined and their half lives estimated. Keratosulphate appeared to be extremely inert in the mature animal and probably had a half life greater than 120 days.

II. Gross composition and metabolic activity of skin mucopolysaccharides were examined. Chondroitin sulphate and hyaluronic acid fractions appeared to exist in more than 1 physical state and appeared to change their prop. after synthesis de novo. The biol. half lives were in agreement with those previously reported but were accurate only for young animals or for a portion of the total material. Testosterone caused a marked increase in the skin hyaluronic acid content. Effects of other hormones on the composition and metabolic activity of skin polysaccharides are reported.

III. Labelled glucose appeared first in the galactosamine moiety of the light mucoprotein fraction of cartilage. Isotope disappeared rapidly from this fraction with an accompanying appearance in the insol. residue. Chondroitin sulphate made up approx. 80% of the total polysaccharide and appeared to be relatively inert. Isotope appeared in chondroitin sulphate before keratosulphate indicating that the 2 polysaccharides did not represent part of the same macromolecular structure but this was not established. Effects of several hormones on the incorporation and turnover of isotope are reported.

B.M.Stevens

170. VITAMIN A AND MUCOPOLYSACCHARIDE BIO-SYNTHESIS BY CELL-FREE PARTICLE SUSPENSIONS.

G.Wolf, J.G.Bergan and P.R.Sundaresan: Biochim. biophys. Acta, 1963, 69, 524-532 (Radiocarbon Lab., Univ. Illinois, Urbana, 111., U.S.A.) Particles sedimented from colon homogenates at 20000 x g after debris removal at 1000 x f. synthesised mucopolysaccharide-bound hexosamines from glucose 6-phosphate [G-6-P], glutamine, ATP, UTP, NAD and Mg. Whole homogenate required at least ATP, UTP and NAD absolutely, particles required G-6-P and Mg. 2*8 jmoles hexosamine were formed/100 mg. homogenate protein in 3 hr. incubation at 37°. Corresponding amounts for 20000 x g particles and for microsomes plus cell sap were 7*3 pmoles and 0*6 jmmole. The particles were histol. cell-free and showed no bacterial contamination. Hexosamine formation was approx. linearly related to amount of particle protein. Synthesis was lower if UDP-glucuronic acid and UDP-acetylglucosamine replaced G-6-P. Homogenates from vit. A deficient rats produced 0*27 fmole/100 mg. protein and particles less than 0*1 fmole. A metabolite of vit. A acid, but not vit. A, restored.

B.M.Stevens

171. COMPARATIVE STUDIES ON CARTILAGE AMINO-POLYSACCHARIDE SULPHATES. I. POLYSACCHARIDES FROM SHARK, SKATE, DOGFISH AND FIN WHALE.

A.G.Lloyd, K.S.Dodgson and R.G.Price: Biochim. biophys. Acta, 1963, 69, 496-504 (Dept. Biochem., Univ. Wales, Cardiff, Wales) Adult blue shark, skate and dogfish cartilage contained material corresponding to chondroitin sulphate and keratosulphate. Each of the aminopolysaccharides was characterised by the presence of fractions of widely differing SO₄ content. The polysaccharide mixture from fin whale cartilage had chondroitin sulphate A as major constituent and chondroitin

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sulphate C and keratosulphate in substantially lower amounts. B.M.Stevens

172. ROLE OF NON-COLLAGEN COMPONENTS IN THE MECHANICAL BEHAVIOUR OF TENDON FIBRES. F.R.Partington and G.C.Wood: *Biochim. biophys. Acta.* 1963, 69, 485-495 (Rheumatism Res. Centre, Univ. Manchester, England) Determination of load-extension curves of rat tail tendon fibres showed that if extension was restricted to 2% the slope of the linear portion of the curves was unchanged in successive tests. Trypsin and pure hyaluronidase had no significant effect on the slope. Less pure prep. of hyaluronidase did not change the slope. Damage to the fibres thus indicated appeared to be due to the presence of enzymic impurities which attacked the non-collagenous protein of the inter-fibrillar matrix. This non-collagenous protein appeared to be important in stabilising the fibres. B.M.Stevens

173. HETEROGENEITY OF URINARY ACID MUCOPOLYSACCHARIDES. W.R.Kelley, I.B.Ponct and N.di Ferrante: *Nature, Lond.*, 1963, 197, 1204-1206 (Dept. Physiol., Coll. Med., Univ. Cincinnati, Ohio, U.S.A.) Human urinary acid mucopolysaccharides were digested with papain and chromatographed on Dowex. The hexuronic acid-containing material was further purified on 'ECTEOLA' cellulose column. The presence of a mucopolysaccharide containing glucosamine and neutral sugars is suggested. A different degree of sulphation was apparent in the hexuronic acid-containing fractions. G.M.Lewis

174. HEXOKINASE OF WHITE ADIPOSE TISSUE. D.L.Dipietro: *Biochim. biophys. Acta*, 1963, 67, 305-312 (Baker Clinic Res. Lab., Dept. Med., Harvard Med. Sch., Boston, Mass., U.S.A.) Apparent Km for glucose and fructose, estimated by determining the rate of hexose C-1 oxidation through the hexose monophosphate shunt with added glucose 6-phosphate dehydrogenase and NADP, were 0.07mM and 3mM respectively. A summation of reaction rates was not observed when both sugars were present. Glucose competitively inhib. fructose phosphorylation, although fructose had little or no effect on glucose phosphorylation. The enzyme required ATP specifically and was activated by Mg and Mn. Glucose phosphorylation rates of 30-60 /imoles/min./g. adipose tissue N were observed. B.M.Stevens

175. GALACTOKINASE FROM E. COLI. J.R.Sherman and J.Adler: *J. biol. Chem.*, 1963, 238, 873-878 (Dept. Biochem., Univ. Wisconsin, Madison, Wis., U.S.A.) The kinase is purified approx. 35-40 fold from sonic extracts of the organism. It requires galactose, ATP, and divalent cations and has optimum pH near 8. Equal amounts of galactose 1-phosphate and ADP are formed in the reaction. Near to equilibrium the reaction is approx. 85% complete under specified conditions. This galactokinase is a small protein similar in size to that from yeast, rat liver, and human cells. Several galactokinaseless mutants of *E. coli* contain less than 0.03% of the activity of the bacteria that contain the enzyme. J.N.Ashley

176. PARTIAL CHARACTERISATION OF HEXOKINASE FROM EUGLENA GRACILIS VAR. BACILLARIS. M.M.Belsky and J.Schultz: *J. Protozool.*, 1962, 9, 195-200 (Dept. Biol., Brooklyn Coll., Brooklyn, N.Y., U.S.A.) The enzyme extract was prep. by the glass bead method. The partially purified hexokinase from *E. gracilis* had the following properties; pH optimum

8.0-8.5; an ab's. requirement for Mg and ATP with Mn, Co, Zn and Ca less active or inactive; an apparent Km (glucose) of 5×10^{-4} M; the enzyme was not inhib. by sulphydryl agents but was 24% inhib. by ADP. The relative rates of phosphorylation by the enzyme were: glucose, 1.0; fructose, 1.19; mannose, 0.56. This enzyme prep. was found to also contain phosphohexose isomerase activity. It is concluded that the enzyme activity is localised in the cytoplasmic or small-particle fraction of the cell. *Euglena* hexokinase appears to resemble yeast rather than muscle hexokinase.

R.J.Walker

177. THE POST-NATAL DEVELOPMENT OF HEPATIC FRUCTOKINASE. D.G.Walker: *Biochem. J.*, 1963, 87, 576-581 (Dept. Biochem., Univ. Birmingham, England) Sp. fructokinase is absent from foetal liveis of rats, rabbits and guinea-pigs, and develops immediately after parturition, reaching adult levels of activity 7-10 days later. Fructose tolerance is greatly lowered in the new-born rabbit. This post-natal appearance of hepatic fructokinase in all spp. examined cannot be the reason for the presence of fructose in foetal fluids of only certain spp. *

178. CONSTITUTIVE ALDOSE DEHYDROGENASE IN PSEUDOMONAS FRAGI. R.Weinberg: *Biochim. biophys. Acta*, 1963, 67, 349-358 (Pioneering Lab. Microbiol. Chem., Northern Reg. Res. Lab., Peoria, Ill., U.S.A.) The enzyme was particulate. All sugar substrates were oxidised by a single enzyme to the γ -lactone of the corresponding aldonic acid. Growth was correlated rather with metabolism of the sugar acid than with the sugar oxidation. The enzymes oxidising sugar acids and D-arabinose had different prop., being sol., formed by induction and highly sp. for their individual substrates. B.M.Stevens

179. CHANGES IN LIVER D-GLUCURONOLACTONE DEHYDROGENASE ACTIVITY. C.A.Marsh and A.J. Cam: *Nature, Lond.*, 1963, 197, 1298-1299 (Rowett Res. Inst., Bucksburn, Aberdeen, Scotland) D-Glucuronolactone dehydrogenase in mouse liver increases with age and pregnancy and decreases in animals bearing expt. tumours. G.M.Lewis

180. RIBITOL 5-PHOSPHATE DEHYDROGENASE FROM LACTOBACILLUS PLANTARUM. L.Glaser: *Biochim. biophys. Acta*, 1963, 67, 525-530 (Dept. Biol. Che¹, Washington Univ. Sch. Med., St. Louis, Mo., U.S.A.) The partial purification of an *L. plantarum* (ATCC 8014; enzyme catalysing the reversible reaction of D-ribitol 5-phosphate with NAD or NADP to give D-ribulose 5-phosphate with NADH₂ or NADPH₂ and H) is described. B.M.Stevens

181. PURIFICATION AND PROPERTIES OF GLUCOSE 6-PHOSPHATE DEHYDROGENASE FROM HUMAN. R.B.C. D.Balinsky and R.E.Bernstein: *Biochim. bio²* Acta, 1963, 67, 313-315 (Electrolyte and Metabolic Res. Unit, South African Inst. for Med. Res., Johanna³, burg, S. Africa) A modification and extension of the method of Marks et al. gave 2000- to 3000-fold purification; on 1 occasion 8300-fold purification was achieved. B.M.Stevens

182. RIBITOL DEHYDROGENASE IN AEROBACTER AEROGENES 1033. S.B.Hulley, S.B.Jorgensen and E.C.C.Lin: *Biochim. biophys. Acta*, 1963, 67, 212-225 (Dept. Biol. Chem., Harvard Med. Sch., Boston Mass., U.S.A.) The enzyme acted only on ribitol but was induced by ribitol or D-arabinol providing that

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latter was metabolised. A mutant producing ribitol dehydrogenase constitutively was isolated, although catabolite repression still exerted its influence. Ribitol dehydrogenase was obligatory for ribitol utilisation either aerobically or anaerobically. Anaerobically, the growth rate on ribitol was severely limited by inadequate H acceptors. The addition of fumarate stimulated.

B.M.Stevens

183. NEURAMINIDASE IN MAMMALIAN BRAIN.

E.H.Morgan and C.-B.Laurell: Nature, Lond., 1963, 197, 921-922 (Dept. Clin. Chem., Malmo Gen. Hosp., Univ. Lund, Malmo, Sweden) Fresh homogenates of feline-pig, bovine or human brain release sialic acid on incubation at 37°. It is postulated that this release is due to the action of a brain neuraminidase, since it is ^evented by heating to 100°, and has a definite pH optimum between pH 3.5-4.0. G.M.Lewis

184. SEPARATION OF KETOSE AND ALDOSE BY CHROMATOGRAPHY ON AN ION EXCHANGE COLUMN.

S.Adachi and H.Sugawara: Arch. Biochem., 1963, 100, 468-471 (Lab. Animal Products Technol., Coll. Agric., Tohoku Univ., Sendai, Japan) A modification on the Samuelson-Sjöström method for isolating monosaccharides using anion exchanger in HSO₃⁻ form used for the separation of mono- or di-saccharide ketoses and aldoses in preparative amounts. Stepwise elution with 75% n-propanol and water was used.

B.M.Stevens

185. PURIFICATION AND PROPERTIES OF INVERTASE OF NEUROSPORA. R.L.Metzenberg: Arch. Biochem., 1963, 100, 503-511 (Dept. Physiol. Chem., Univ. Wisconsin, Madison, Wis., U.S.A.) Invertase purified from *N. crassa* contained little or no mannose but small amounts of hexosamine were detected. The enzyme had an unusually high extinction at 280 mji. Physical and kinetic prop. are reported. B.M.Stevens

186. ACTIVATION OF α -GLUCAN PHOSPHORYLASE AND RELATED METABOLIC CHANGES IN DOG MYOCARDIUM FOLLOWING ARREST OF BLOOD FLOW. A.Wollenberger and E.-G.Krause: Biochim. biophys. Acta, 1963, 67, 337-340 (Deutsche Akad. der Wissenschaften zu Berlin, Arbeitsstelle für Kreislauforschung, Berlin-Buch, Germany) Prelim. comm. B.M.Stevens

187. ENZYMIC DEGRADATION OF GANGLIOSIDES. S.R.Korey and A.Stein: Life Sci., 1963, No. 3, 198-203 (Dept. Neural., Einstein Coll. Med., New York, U.S.A.) Rat brain n-butanol extracted gangliosidase degraded poly- and mono-sialogangliosides. Gangliosidase present is believed to be impure, although it is known to have independent neuraminidase and glycosidase activities. K.Jones

188. SOLUBILISATION AND ACTIVATION OF LIVER GLUCURONYLTRANSFERASE BY EDTA. E.Halac and E.Bonevardi: Biochim. biophys. Acta, 1963, 67, 498-500 (Dept. Microbiol., New York Univ. Sch. Med., New York, U.S.A.) B.M.Stevens

189. ENZYMIC SYNTHESIS OF SIALYL-LACTOSE. G.Wjourdian, D.M.Carlson and S.Roseman: Biochem. biophys. Res. Comm., 1963, 10, 352 (Rockham Arthritis Res. Unit, and Dept. Biol. Chem., Univ. Michigan, Ann Arbor, Mich., U.S.A.) Results indicated that sialyl-lactose (2-3) was enzymically synthesized when a washed particulate fraction of rat mammary gland was incubated with cytidine monophospho-sialic acid and lactose. B.Ketterer

190. PROTEOLYTIC ACTIVATION OF GLUCOSE 6-PHOSPHATASE IN NORMAL, DIABETIC AND HEPATIC RAT LIVERS. E.Heise and M.Görlich: Nature, Lond., 1963, 197, 1311-1312 (Dept. for Expt. Chemotherapy, Robert Rossle Clinic, Inst. Med. and Biol., German Acad. Sci., Berlin-Buch, Germany)

The activation of glucose 6-phosphatase by trypsin in homogenates and isolated microsomes from rat liver occurs to the same degree in normal and alloxan-diabetic animals. In rats bearing hepatomas induced by dimethylaminoazobenzene, glucose 6-phosphatase activity was very low and not increased by trypsin.

G.M.Lewis

191. GLUCOSAMINE 6-PHOSPHATE DEAMINASE ACTIVITY DURING CONNECTIVE TISSUE GROWTH.

T.N.Sekhara Varma and B.K.Bachhawat: Biochim. biophys. Acta, 1963, 69, 464-471 (Neurochem. Lab., Dept. Neurol. and Neurosurgery, Christian Med. Coll. Hosp., Vellore, India) Glucosamine 6-phosphate deaminase, which reversibly degraded glucosamine 6-phosphate to fructose 6-phosphate and NH₃, was present in connective tissue developed by s.c. implantation of cotton pellets. Some prop. of the enzyme are described. Carrageenin had no effect on the induction of the enzyme during granulomata development. Pharmacol, high doses of cortisone inhib. the enzymic activity both in ordinary granulomata and those induced by carrageenin.

B.M.Stevens

192. ENZYMIC MODIFICATION OF PHENYLAZOBENZOYL-TAKA-AMYLASE A [PhAB-TAA]. I. ISOLATION OF THE PROTEOLYTICALLY MODIFIED PhAB-TAA.

H.Toda and S.Akabori: J. Biochem., Tokyo, 1963, 53, 95-101 (Inst. Protein Res., Univ. Osaka, Japan) Although Taka-amylase A was resistant to proteolytic enzymes PhAB-TAA containing 1 mole of phenylazobenzoyl/mole protein was susceptible to proteases. Changes in sp. optical rotation and reduced *n* also accompanied the introduction of the phenylazobenzoyl group. PhAB-TAA was partially degraded with 'pronase' and the modified material was cryst. and isolated. Chromatographic behaviour and homogeneity were examined using DEAEcellulose.

B.M.Stevens

193. ACTION PATTERN AND SPECIFICITY OF AN AMYLASE FROM BACILLUS SUBTILIS. J.Robyt and D.French: Arch. Biochem., 1963, 100, 451-467

(Dept. Biochem. and Biophys., Iowa State Univ., Ames, Iowa, U.S.A.) The cryst. a-type amylase showed a dual product specificity for the formation of maltotriose and maltohexaose when allowed to act on amylose, amylopectin, glycogen, 3-amylase limit dextrins, pure individual maltodextrins and cyclic Schardinger dextrins. The dual specificity was pronounced with amylopectin. Nature, amounts and sequences of products were determined by qual. and quant. paper chromatography. Distributions of products from the interior segments of amylopectin and glycogen differed completely from the distribution of products from amylose. Reactions of the maltodextrins were highly sp. and dependent on the mol. size.

B.M.Stevens

194. RATE-DETERMINING NATURE OF ALDOLASE IN GLYCOLYSIS BY RAT-BRAIN PREPARATIONS.

E.G.Brunngraber and J.Iannantuoni: Biochem. J., 1963, 87, 624-631 (Illinois State Psychiatric Inst., Chicago, Ill., U.S.A.) Cell sap and mitochondrial prep, from rat-brain homogenates glycolyse without inactivation at low enzyme concn. Published reports of such inactivation could not be confirmed. In the absence of added yeast

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hexokinase, the rate-limiting steps in the glycolytic sequence are the hexokinase reaction and the availability of ADP. The addition of cryst. yeast hexokinase stimulates glycolysis two- to five-fold, lowers the ATP-ADP ratio, and aldolase becomes rate-limiting. The accumulation of fructose 1,6-diphosphate, the fructose 1,6-diphosphate:those phosphates ratio, stimn. of glycolysis by added aldolase, and the high rate of the 3-phosphoglycerate \rightarrow pyruvate and the glucose \rightarrow fructose 1,6-diphosphate sequences in glycolysis compared with overall glycolysis are cited as evidence of the rate-limiting nature of the aldolase under conditions in which the glycolytic system of cell-sap or cell-sap plus mitochondria was supplemented with added yeast hexokinase.

195. ENZYMIC SYNTHESIS OF COLOMINIC ACID.
D.Aminoff, F.Dodyk and S.Roseman: J. biol. Chem., 1963, 238, PC1177-1178 (Rackham Arthritis Res. Unit, Univ. Michigan, Ann Arbor, Mich., U.S.A.)

Net synthesis of colominic acid (a homopolymer of N-acetylneuraminic acid) occurs when a cell-free particulate prep, from *E. coli* K235 is incubated with cytidine 5'-monophospho-N-acetylneuraminic acid.

J.N.Ashley

196. GLUCOKINASE AND HEXOKINASE IN LIVER IN RELATION TO GLYCOGEN SYNTHESIS. E.Vfiuela. M.Salas and A.Sob: I. biol. Chem., 1963, 238, PC1175-1177 (Dept. Enzymol., Inst. MarShón, Centro de Investigaciones Biológicas, C.S.I.C., Madrid, Spain) The 2 enzymes in rat liver that phosphorylate glucose are separated. One is a typical animal hexokinase; the other has unique prop, and is best designated as a glucokinase, although it readily phosphorylates mannose. Glucokinase forms glucose 6-phosphate as primary product, which is not inhibitory. Glucokinase disappears in animals deprived of food and is absent from diabetic animals.

J.N.Ashley

LIPIDS AND STEROIDS

197. ISOLATION AND CHARACTERISATION OF SATURATED AND UNSATURATED FATTY ACIDS AND ALCOHOLS OF HUMAN SKIN SURFACE LIPIDS. E.Haahti and E.C.Horning: Scand. J. din. Lab. Invest., 1963, 15, 73-78 (Dept. Med. Chem.. Univ. Turku, Finland) Four types of sat. branched chain and branched monounsat. fatty acids from C3.4 to C18 were found in human skin surface lipid. in addition to acids earlier reported. Correspondingly, at least 4 types of branched chain alcohols were detectable, as well as both straight and branched chain monounsat. alcohols in the regiof of C10 to C24.

K.Jones

198. FATTY ACID METABOLISM IN SERRATIA MARCESCENS. IV. THE EFFECT OF TEMPERATURE ON FATTY ACID COMPOSITION. D.G.Bishop and J.L.StUI: J. lipid Res., 1963, 4, 87-90 (Dept. Biochem., Univ. Sydney, Australia) Three medium-chain hydroxy acids in *S. marcescens* grown at 30° are very much reduced in cells grown at 37°. The content of unsat. and cyclopropane acids is the same at 30° and 37°. As the synthesis of unsat. and cyclopropane acids in micro-organisms requires hydroxy acids as intermediates it is suggested that the temp. sensitive reaction is one which

leads to the trapping of hydroxy acids in a bound form. 12 unidentified acids are present in *S. marcescens* grown at 30°. These acids comprise 36% of the total fatty acids of the free lipids but are not found in cells grown at 37°.

J.R.Sargent

199. COMPLEXITY OF MIXTURE OF FATTY ACIDS FROM TUBERCLE BACILLUS. C16 AND C17 ACIDS FROM VIRULENT STRAINS. J.Cason and W.T.Miller: J. biol. Chem., 1963, 238, 883-887 (Chem. Lab., Univ. California, Berkeley, Calif., U.S.A.)

The n-C16 acid fraction from a virulent strain of tubercle bacillus contains approx. 1% of hexadec-10-enoic acid. The branched chain C17 acid fraction contains approx. 20% of 10-methylhexadec-9-enoic acid. The sat. acids in this branched fraction consist of approx. equal amounts of 8- and 10-methylhexadecanoic acids. These virulent tubercle bacilli seem to have a more complicated bio-genetic pathway than has been found for *Mycobacterium phlei*.

J.N.Ashley

200. BIOSYNTHESIS OF LONG CHAIN SATURATED AND UNSATURATED FATTY ACIDS IN ISOLATED PLANT LEAVES [MAINLY RICINUS COMMUNIS]. A.TJames: Biochim. biophys. Acta, 1963, 70, 9-19 (Nat. Inst. Med. Res., Mill Hill, London, England) Labelled acetic, octanoic, decanoic, dodecanoic, tetradecanoic, 9-octadecenoic, hexadecanoic and octadecanoic acids were incorporated into the sat. and unsat. lipid fatty acids. All except the last 2 were precursors of oleic, linoleic and linolenic acids. No oleic acid was synthesised without O₂. Two separate pools of longer chain fatty acids are suggested to exist. In 1, myristic acid is converted to palmitic and stearic acids which are esterified to galactolipid and phospholipid. In the other, myristic acid is converted to palmitic and stearic acids and finally to oleic acid which alone is available for esterification to combined lipid or conversion to linoleic and linolenic acids.

B.M.Stevens

201. BIOSYNTHESIS OF LONG CHAIN FATTY ACIDS

BY LETTUCE CHLOROPLAST PREPARATIONS.

P.K.Stumpf and A.TJames: Biochim. biophys. Acta# 1963, 70, 20-32 (Nat. Inst. Med. Res., London, England) The major site for biosynthesis of sat. C10*-C18 fatty acids and oleic acid in leaves was the chloroplast. In the presence of light, ATP, CoA, Mg, CO₂ *nd inorg. phosphate were required. In the dark synthesis was greatly diminished. NH₃ or 3(p-chlorophenyl)l, 1-dimethylurea, but not DNP, inhibited. Anaerobically, oleic acid biosynthesis was markedly decreased, but sat. acid biosynthesis was relatively unaffected. Isolated chloroplasts were less effective than intact leaves at utilising C8, C10, C12 and C14 sat. fatty acids for oleic acid biosynthesis. Malonic and a-cetic acids were readily utilised.

B.M.Stevens

202. SYNTHESIS OF FATTY ACIDS BY RAT LIVER

SLICES IN TRITIATED WATER. D.W.Foster and

B.Bloom: J. biol. Chem., 1963, 238, 888-892 (Nat. Inst. Arthritis and Metabol. Dis., Bethesda, Md., U.S.A.)

After rat liver slices are incubated in a medium that contains [³H]water, most of the ³H in the isolated long chain fatty acids is present in stearic and palmitic acids, and more ³H is present in the odd, than in the even, numbered C. An exchange reaction, ^³H is essentially complete, probably occurs between Na⁺³H₂O and water before or during synthesis of fatty acids.

J.N.Ashley

203. BIOSYNTHESIS OF ODD- AND EVEN-NUMBERED CEREBROSIDE FATTY ACIDS: EVIDENCE FOR TWO ROUTES. A.K.Hajra and N.S.Radin: Biochim. biophys. Acta, 1963, 70, 97-99 (Mental Health Res. Inst., Univ. Michigan, Ann Arbor, Mich., U.S.A.)

A similar pair of steps appeared to be involved in the formation of lignoceric and cerebronic acids and their close homologues whilst the C-23 a-OH acid and possibly other OH acids appeared to be made by a $C\pm$ degradation of a longer acid. Prelim, comm. B.M. Stevens

204. CONVERSION OF AROMATIC AMINO ACIDS TO FATTY ACIDS BY ADIPOSE TISSUE. D.D.Feller and E.Feist: Biochim. biophys. Acta, 1963, 70, 85-86 (Radioisotope Service, V.A. Hosp., Seattle, Wash., U.S.A.) B.M.Stevens

205. ENZYMIC FORMATION OF FATTY ACID AMIDES OF ETHANOLAMINE BY RAT LIVER MICROSONES. M.Colodzin, N.R.Bachur, H.Weissbach and S.Udenfriend: Biochem. biophys. Res. Comm., 1963, 10, 165 (Lab. Clin. Biochem., N.H.Inst., Bethesda, Md., U.S.A.) A microsomal fraction from the rat liver catalyses the formation of palmityl ethanolamide and ω -er fatty acid amides. The requirements for this system are given. B.Ketterer

206. FATTY ACID METABOLISM IN SERRATIA MARCESCENS. III. THE CONSTITUENT FATTY ACIDS OF THE CELL. D.G.Bishop and J.L.Still: J. Upid Res., 1963, 4, 81-86 (Dept. Biochem., Univ. Sydney, Australia) An analysis of the lipids of the bacterium *Sunarcescens* has shown that palmitic acid and 9,10-Jtoethyene-hexadecanoic acid constitute about $l\&J_0$ of the ω -tel fatty acids. Monounsat. acids account for only about $J^0\%$ of the total fatty acid and consist predominantly of "10-hexadecenoic acid (palmitoleic acid) and 11,12-Tptadecenoic acid (vaccenic acid). Three hydroxy acids that may function as intermediates in the biosynthesis of unsat. fatty acids have also been isolated and characterised. J.R.Sargent

207. CONVERSION OF GLYCINE TO FATTY ACIDS BY ADIPOSE TISSUE. D.D.Feller and E.Feist: Proc. Soc. exp. Biol., N.Y., 1962, 111, 18-21 (Radioisotope Serv., V.A. Hosp., Univ. Washington, Seattle, Wash., U.S.A.) In vitro synthesis of fatty acids in adipose tissue shows that glycine can be a precursor. M.M.Shapland

208. RELATIVE INCORPORATION OF THE VARIOUS PROPIONATE CARBONS INTO FATTY ACIDS BY UCTATING RAT MAMMARY GLAND. P.Cady, S.Abraham and I.L.Chaikoff: Biochim. biophys. Acta, 1963, 70, 118-131 (Dept. Physiol., Univ. California, Berkeley, Calif., U.S.A.) Without glucose, slices incorporated ^{14}C most rapidly from $[2-14]C$ propionate. Δ^2 glucose, fatty acid synthesis from all 3 C was inhibited and incorporation from te- l^1C propionate became as rapid as that from $[2-14]C$ propionate. Low Δ^2 late conc. to the presence of glucose depressed ^{14}C incorporation from $[1-14]C$ propionate; higher acetate Δ^2 cn. depressed conversion from all the propionate C. Even-chain and odd-chain fatty acids were shown by chromatographic analysis to be synthesised from each the propionate C. B.M.Stevens

209. U-OXIDATION OF FATTY ACIDS IN VITRO. I. OVERALL REACTION AND INTERMEDIATE. Δ^2 Wakabayashi and N.Shimazono: Biochim. biophys.

Acta, 1963, 70, 132-142 (Dept. Biochem., Fac. Med., Univ. Tokyo, Japan) ID-Oxidation of straight chain fatty acids was demonstrated in cell free systems from guinea-pig liver. The 6000 x ℓ supernatant fraction was the most active. Incubation of sorbic acid amide, octatrienoic acid amide or capric acid amide with this fraction. NAD and an NADPH₂ generating system produced the corresponding dicarboxylic acid monoamides which were detected by paper chromatography. Incubation of $[2-14]C$ sorbic acid amide with microsomes yielded Δ^2 hydroxy $[2-14]C$ sorbic acid amide. A 105000 XJJ supernatant oxidised Δ^2 hydroxysorbic acid amide to muconic acid amide. The hydroxylating reaction required NADPH₂ and O₂. Catalase did not inhibit. B.M.Stevens

210. INHIBITION OF FATTY ACID SYNTHESIS DURING STARVATION AND ALLOXAN DIABETES. II. FATTY ACID SYNTHESIS IN THE LIVER OF RATS WITH ALLOXAN DIABETES. O.Wieland, L.Neufeldt, S.Numa and F.Lynen: Biochem. Z., 1963, 336, 455-459 (II Med. Univ., Munchen, Germany) Particle-free extracts from livers of male Sprague-Dawley rats made diabetic by i.v. injn. of alloxan (40 mg./kg. body wt.) showed decreased activities of the total system for fatty acid synthesis (from acetate) and of acetyl carboxylase (from acetyl Co A). (German) L.Cohn

211. IN VITRO PRODUCTION OF NON-ESTERIFIED FATTY ACIDS DURING INCUBATION OF VARIOUS TYPES OF ADIPOSE TISSUE FROM FASTING AND FED RATS. I. MOBILISATION OF FATTY ACIDS FROM EPIDIDYMAL, PERINEPHRIC AND SUBCUTANEOUS ADIPOSE TISSUE. C.Munkner: Scand. J. clin. Lab. Invest., 1963, 15, 83-80 (2nd Clin. Intern. Med., Arhus Univ. Sch. Med., Arhus, Denmark) Three kinds of adipose tissue from fasting and fed rats released const. amount of non-esterified fatty acids [NEFA] in vitro. Under various expt. conditions, a difference was found in this mobilisation or assimilation of fatty acids. In all adipose tissues the liberation of fatty acids was inhib. by feeding, and also by the addition of glucose + insulin or of oleate to the medium. Adrenaline increased the liberation of NEFA considerably. K.Jones

212. SYNTHESIS BY THE RAT OF C20 AND C22 POLYEN-ACIDS FROM A¹, 7,10,13-HEXADECATETRAENOIC ACID. E.Klenk: Hoppe-Seylers Z. Physiol. Chem., 1963, 331, 50-55 (Physiol. Chem. Inst., Univ., 5 Köln-Lindenthal, Germany) With the aid of gas chromatography and u.v. spectroscopy. C20 pentaenoic acid and C22 hexaenoic acid were identified in the liver phosphatides of rats after a feeding period of 28 days. (German) L.Cornish

213. INCORPORATION IN VITRO OF $[14]C$ PALMITATE INTO GLYCEROLIPIDS BY VARIOUS CELL COMPONENTS. R.M.Johnson and L.Kerur: Biochim. biophys. Acta, 1963, 70, 152-156 (Inst. Nutr. and Food Technol., Ohio State Univ., Columbus, Ohio, U.S.A.) ^{14}C incorporation into triglycerides, ethanolamine phosphatides and choline phosphatides varied, depending on whether whole homogenates, mitochondria or microsomes plus cytoplasmic supernatant were used and also depending on whether fractions came from normal or from 3 day * regenerating' rat liver. B.M.Stevens

214. INCORPORATION OF $[1-14]C$ LINOLEIC ACID INTO LIPIDS OF POLYMORPHONUCLEAR LEUCOCYTES. P.Elsbach: Biochim. biophys. Acta, 1963, 70, 157-167 (Dept. Med., New York Univ. Sch. Med.. New

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York, U.S.A.) W.b.c. from rabbit peritoneal exudates incorporated [$1-14\text{C}$]linoleic acid when incubated in vitro with linoleic acid bound to albumin. Almost all the ^{14}C appeared in cell lipid in the esterified form, both as phospholipid and as non-phospholipid. 14CO_2 was evolved and amounts of water-sol. radioactivity in water washes of lipid extracts of the w.b.c. increased. Uptake ceased at low temp, and was markedly diminished by inhibn. of anaerobic glycolysis. Interference with oxidative metabolism did not inhibit accumulation.

B.M. Stevens

215. EFFECTS OF PALMITATE ON THE METABOLISM OF W.B.C. FROM GUINEA-PIG EXUDATE. W.H.Evans and P.S.Muellec: *J. lipid Res.*, 1963, 4, 39-45 (Lab. Biochem., Cytochem. Section, Nat. Cancer Inst., Bethesda, Md., U.S.A.) Addition of palmitate to polymorphonuclear w.b.c. in the presence of serum albumin leads to uptake of palmitate and increased O_2 consumption by the cells. These 2 effects were inhib. by fluoride and iodoacetate but not by cyanide or dinitrophenol. Glucose caused a 39% inhibn. in the O_2 uptake by cells (Crabtree effect) in the absence of palmitate; no Crabtree effect occurred in the presence of palmitate. Palmitate had no significant effect on O_2 uptake of guinea-pig circulating blood w.b.c. and no net palmitate uptake was observed with such cells. J.R. Sargent

216. METABOLISM OF GLYCEROLIPIDS. m. REACTIVITY OF VARIOUS ACYL ESTERS OF COENZYME A WITH tt' -ACYLGLYCEROPOHOSPHORYLCHOLINE, AND POSITIONAL SPECIFICITIES IN LECITHIN SYNTHESIS. W.E.M.Lands and I.Merkel. IV. SYNTHESIS OF PHOSPHATIDYLETHANOLAMINE. L.Merkel and W.E.M.Lands: *J. biol. Chem.*, 1963, 238, 898-904, 905-906 (Dept. Biol. Chem., Univ. Michigan, Ann Arbor, Mich., U.S.A.) m. Rat liver microsomes catalyse transfer of acids from their acyl CoA deriv. to the β -hydroxyl group of tt' -acylglycerophosphorylcholine to form lecithin. Unsat. react more rapidly than sat. acyl CoA esters. Hydrolysis of acyl CoA in this system is not due to transfer of the acyl group to water by the acyl transferase, but to a separate hydrolytic enzyme with different kinetic prop. Acyl transfer occurs with preferential esterification of sat. fatty acids with the OL' -hydroxyl group and of unsat. acids with the β -hydroxyl group.

IV. Stereos. labelled diacylglycerophosphorylethanolamirie may be synthesised from either OL' or β -acyl-glycerophosphorylethanolamine [AGPE] by use of a rat liver microsomal prep. Linoleate is a better substrate than stearate for esterification of OL' -AGPE, whilst the reverse is true for the β -AGPE. J.N.Ashley

217. STUDIES ON FATTY LIVER INDUCTION BY 4-AMINOPYRAZOLOPYRIMIDINE. J.F.Henderson: *J. lipid Res.*, 1963, 4, 68-74 (Dept. Pharmacol., George Washington Univ. Sch. Med., Washington, D.C., U.S.A.) Injn. of 4-aminopyrazolopyrimidine (APP) into mice increased total liver lipids. The increase was largely accounted for as neutral lipid. Phospholipid was unchanged. APP inhib. incorporation of [14C]acetate into lipids of liver slices in vitro but oxidation of [^{14}C]acetate or [14C]palmitate by slices in vitro was unaffected. APP decreased total lipid levels in plasma, this being accounted for entirely by clearance in triglycerides and cholesterol. APP markedly inhib. incorporation of [14C]orotic acid into RNA but not of [14C]glycine into proteins of liver and plasma. Hyperlipaemia

elicited by Triton WR-1339 was inhib. by APP.

J.R. Sargent

218. INCORPORATION OF [14C]FORMATE INTO EHRLICH ASCITES TUMOUR LIPIDS. G.V.Marinetti and E.R.M.Kay: *Biochim. biophys. Acta*, 1963, 70, 168-175 (Dept. Biochem., Univ. Rochester Sch. Med. and Dent., Rochester, N.Y., U.S.A.) The time course of incorporation into nuclear and cytoplasmic HP^{id} was examined. Paper chromatography and hydrolysis indicated that phosphatidylserine and, to a lesser extent, phosphatidylethanolamine were the most active phosphatides. However, after 3 hr. incubation ninhydrin-neg.i P-free lipids contained most of the radioactivity. These lipids released fatty acids and ninhydrin-pos., water-sol. labelled compounds only after prolonged hydrolysis, and had paper chromatographic prop, differentiating them from all known neutral lipids and phosphatides. They were tentatively identified as fatty acid amides of amino acids or peptides. Decarboxylation of phosphatidylserine to phosphatidylethanolamine and direct methylation of phosphatidylethanolamine to lecithin were not major metabolic pathways. B.M.Stevens

219. PRESENCE OF ORNITHINE IN BACTERIAL LIPIDS. M.-A.Lanéelle, G.Lanéelle and J.Asselineau: *Biochim. biophys. Acta*, 1963, 70, 99-101 (Lab. Chim. biol., Fac. Sci., Toulouse, France) In *Mycobacterium* No. 1217, ornithine was not a constituent of phospholipid but was found in combination with fatty acids whose prop. of solubility and adsorbability made separation from phospholipid difficult. Prelim, comm.

(French) B.M.Stevens

220. DISTRIBUTION OF INORGANIC PHOSPHATE [Pi] IN A BIPHASIC SYSTEM CONSISTING OF CHLOROFORM-MET HANOL-WATER. H.Bader: *Biochim. biophys. Acta*, 1963, 70, 87-89 (Inst. Chim. Biol.. Fac. Med., Strasbourg, France) The cleaning of Pi from lipids was better the lower the Pi in the extracted material, the higher the pH of the wash water and the lower the % of methanol in the total mixture.

B.M.Stevens

221. A COLORIMETRIC METHOD FOR THE QUANTITATIVE MEASUREMENT OF TOTAL LIPIDS IN TISSUES. R.P.Dales: *Nature*, Lond., 1963, 197, 1120-1121 (Dept. Zool., Bedford Coll., London, England) Consistent results in the quant. estimation of oil in a tissue may be made within an accuracy of 2% down to least 2 mg. oil by satn. of the lipid with Oil Red O dissolved in triethyl phosphate with addition of a few drops of Teepol. The excess colourant is removed by extract^{at} in water and the dye dissolved in the lipid is estimated^{given} colorimetrically. G.M.Lewis

222. MIGRATION OF AN ACYL GROUP IN GLYCEROL DERIVATIVES. IV. MIGRATION OF AN ACYL GROUP UPON BOILING OF GLYCEROL DERIVATIVES WITH A MIXTURE OF ACETIC ANHYDRIDE AND ACETIC ACID. M.A.Hoefnagel, A.van Veen and P.E.Verkaade: *Rec. Trav. chim. Pays-Bas*, 1962, 81, 461-464 (Ost-Chem. Lab., Technical Univ., Delft, Netherlands).

G.C.Barr

223. FACTICE CHROMATOGRAPHY: AN AUTOMATICALLY MONITERED, LIQUID-GEL SYSTEM FOR SEPARATION OF NON-POLAR LIPIDS. J.Hirsch: *J. lipid Res.*, 1963, 4, 1-10 (Rockefeller Inst., New York, U.S.A.) A chromatographic system for separation of cholesterol, esters, triglycerides, diglycerides and monoglycerides is comprised of a liquid gel with factice (a hydrophobic polymer) as stationary phase and aq. acetone as moving

Phase. Cholesterol esters with fatty acid chain lengths from 2-18 C are eluted as individual peaks and similar separations are possible with triglycerides and methyl esters of fatty acids. Elution is performed with a single solvent system and detection of lipid in eluates is achieved by automatic differential refractometry,

J.R.Sargent

224. CHANGES IN THE LIPOLYTIC ACTIVITY OF THE GUINEA-PIG MAMMARY GLAND AT PARTURITION.

D.S.Robinson: *I. lipid Res.*, 1963, 4, 21-23 (External Staff of M.R.C., Dunn Sch. Pathol., Oxford, England)

Clearing factor lipase activity of guinea-pig mammary gland remains const. during pregnancy until immediately before parturition. A marked increase then occurs until at parturition the activity per gland is about 100 times greater than during pregnancy. Activity persists at this high level after parturition provided suckling is continued. Prevention of suckling reduces lipase activity.

J.R.Sargent

225. A SENSITIVE METHOD FOR QUANTITATIVE MICRODETERMINATION OF LIPIDS. A.Karmen, T.Walker and R.L.Bowman: *J. lipid Res.*, 1963, 4, 103-106 (Lab. Tech. Development, N.H.I., Bethesda, Md., U.S.A.)

The method is based on volatility differences between solute and solvent. Soln. is passed into a miniature gas chromatographic column at room temp. Carrier gas is passed through and the effluent assayed in a hydrogen flame ionisation detector. When solvent has been completely volatilised the remaining Materials in the column (solutes) are pyrolysed and assayed in the ionisation detector.

J.R.Sargent

226. GLASS FIBRE PAPER STRIP CHARRING: A RAPID AND SIMPLE METHOD FOR MONITORING COLUMN CHROMATOGRAPHY OF LIPIDS. P.Ways: *J. lipid Res.*, 1963, 4, 101-103 (Dept. Biochem., Univ.

Washington, Seattle, Wash., U.S.A.) Effluent samples are applied to glass fibre, then charred. O.D. of charred spots can be used as a quant. method of estimating phospholipid.

J.R.Sargent

227. PRECURSORS OF METHYL KETONES IN BUTTER.

B.van der Ven, P.H.Begemann and J.C.M.Schogt: *J. lipid Res.*, 1963, 4, 91-95 (Unilever Res. Lab., Vlaardingen, Netherlands) Butterfat, when treated with Girard-T reagent, yields a series of 6 pyrazolones, responding to 6 even numbered p-ketoacids (C₆ to C₁₆). This is in agreement with the formation of 6 odd-numbered methyl ketones (C₅ to C₁₅) on subjecting butterfat to steam-deodorisation. The presence in butterfat of nonvolatile p-ketoacid esters has been proved. If they are glycerides, their amount is estimated at 0.02P%. J.R.Sargent

228. LIPIDS OF HUMAN ADRENALS. C.Riley: *Biochem. J.*, 1963, 87, 500-507 (Stephen Ralli Lab., Royal Sussex County Hosp., Brighton, England) Lipids were extracted from a series of human adrenal glands obtained at autopsies and surgical operations and were fractionated by chromatography on silicic acid. The fatty acids covered from the sterol esters, triglycerides and phospholipids were studied by gas chromatography. Stress or nin. with corticotrophin depleted the sterol esters and increased the phospholipids; the free cholesterol was unacted. Evidence was found of the presence of significant amounts of a sterol diol. The fatty acids of the sterol esters differed appreciably from those found in blood especially in their lower content of linoleic acid and their higher content of oleic acid. The triglycerides resembled those found in human depot fat. It was suggested that the

adrenal may utilise cholesterol linoleate preferentially in the biosynthesis of steroids. *

229. EFFECT OF AGE AND RESTRAINT ON POST-PRANDIAL LIPAEMIA CLEARANCE IN DOGS. H.Sobel and H.V.Thomas: *Proc. Soc. exp. Biol., N.Y.*, 1963, 112, 206-209 (V.A. Hosp., Sepulveda, Calif., U.S.A.)

Dogs divided into 4 groups according to age were fed 1 g. of pure lard/lb. body wt. in a meat diet. The level of blood lipids were investigated. The oldest animals developed a much later peak of lipaemia than the young animals. The expt. was repeated when dogs were restrained in Pavlov rigs. Under stress lipaemia was reduced even though the urine analysis showed corticoids in the excreta. It was thought that there was probably increased clearance under restraint. The concn. of non-esterified fatty acids in the blood was not altered by stress.

D.N.Wheatley

230. CHEMISTRY OF LIPIDS OF POSTHAEMOLYTIC RESIDUE OR STROMA OF R.B.C. XL STRUCTURE OF GLOBOSIDE, THE MAIN MUCOLIPID OF HUMAN R.B.C. T.Yamakawa, S.Yokoyama and N.Handa:

J. Biochem., Tokyo, 1963, 53, 28-36 (Dept. Chem., Inst. Infectious Dis., Univ. Tokyo, Japan) Globoside was purified by repeated silicic acid column chromatography. The component fatty acids were mainly C₂₂-C₂₄ with nervonic acid predominating. N-acetylgalactosaminoyl(l->6)galactose was isolated by mild acid hydrolysis and charcoal chromatography. Several methylated hexoses were obtained by complete methylation and methanolysis and were identified by gas-liquid chromatography. The formula N-acetylgalactosaminoyl(l->6)-galactosyl(l->4)galactosyl(I ->4)glucosyl-ceramide is proposed.

B.M.Stevens

231. LIPID COMPONENTS OF [RUNNER BEAN] LEAVES. HI. ISOLATION AND CHARACTERISATION OF MONO- AND DI-GALACTOSYL DIGLYCERIDES AND LECITHIN [THE MAJOR GLYCOLIPIDS AND PHOSPHOLIPID].

P.S.Sastray and M.Kates: *Biochim. biophys. Acta*, 1963, 70, 214-216 (Div. Appl. Biol., Nat. Res. Council, Ottawa, Canada) Prelim, comm.

B.M.Stevens

232. INHIBITION BY GLUCOSE OF THE ETHIONINE INDUCED FATTY LIVER. L.Campagnari-Visconti, F.Campagnari and D.Koch-Wesen: *Proc. Soc. exp. Biol., N.Y.*, 1962, 111, 479-482 (Dept. Med., Western Res. Univ., Sch. Med., Cleveland, Ohio, U.S.A.) Increase in triglyceride in the liver of rats seems to be due to a blocking of the release, and to fat mobilisation into the liver from the periphery (e.g. during fasting) after i.p. injn. of ethionine. Oral administration of glucose to treated animals seems to inhibit only the mobilisation of fat and so prevents build-up in the liver.

M.M.Shapland

233. LIPID COMPONENTS OF THE RESPIRATORY CHAIN.

J.M.Hafkenscheid, J.Links and E.C. Slater: *Biochim. biophys. Acta*, 1963, 70, 202-204 (Lab. Physiol. Chem., Univ. Amsterdam, Netherlands) Effects of ubiquinol on acetone extracted heart muscle prep, and the possible relationship of ubiquinone to the antimycin- and BAL-sensitive factors were examined.

B.M.Stevens

234. TRANSMETHYLATION REACTIONS IN BACTERIAL LIPIDS. J.H.Law, H.Zalkin and T.Kaneshiro: *Biochim. biophys. Acta*, 1963, 70, 143-151 (Dept. Chem., Harvard Univ., Cambridge, Mass., U.S.A.)

Agrobacterium tumefaciens grown with methyl labelled

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methionine produced lipids containing N-methylethanolamine, N,N-dimethylethanolamine and choline with labelled methyl groups and labelled cyclopropane acids. The rate of methylated base formation, but not that of cyclopropane acid formation, paralleled growth. In this organism and in *E. coli* and *Serratia marcescens*, cyclopropane acid formation took place mainly during late logarithmic growth and in the stationary phase. Both H and C of methionine methyl groups were incorporated into cyclopropane rings. A mutant with blocked methionine synthesis formed cyclopropane acids from methionine methyl groups; incorporation was not diluted by a no. of Ci. donors.

B.M.Stevens

235. LIPID COMPOSITION OF HUMAN C.S.F. M.H.Hack and F.M.Helmy: Proc. Soc. exp. Biol., N.Y., 1962, 111, 421-423 (Dept. Med., Tulane Univ. Sch. Med., New Orleans, La., U.S.A.) Lipid extract of human c.s.f. contained phosphatidyl ethanolamine, ethanolamine plasmalogen, sphingomyelin, phosphatidyl choline and a small amount of choline plasmalogen. Neutral lipids were present as triglycerides, cholesterol and cholesterol ester. A plasmalogen resembling cardiolipin was present in low concn. but cerebrosides were not detected.

M.M.Shapland

236. STRUCTURE OF SULPHATIDES. P.Stoffyn and A.Stoffyn: Biochim. biophys. Acta, 1963, 70, 218-220 (McLean Hosp., Res. Lab., Belmont, Mass., U.S.A.) The SO₄²⁻ was shown to be located at C-3 of the galactopyranoside moiety. Prelim, comm.

B.M.Stevens

237. EFFECT OF LIGHT AND STREPTOMYCIN ON THE INCORPORATION OF SULPHATE INTO SULPHOLIPIDS IN EUGLENA GRACILIS. A.Abraham and B.K.Bachhawat: Biochim. biophys. Acta, 1963, 70, 104-106 (Wellcome Res. Unit, Christian Med. Coll. Hosp., Vellore, S. India) Light had no effect on SO₄²⁻ uptake and activation but was required for sulpholipid synthesis; streptomycin inhib. active SO₄²⁻ formation. Prelim, comm. B.M.Stevens

238. DIRECT CONVERSION OF SULPHATIDES INTO CEREBROSIDES [BY TREATMENT WITH A 0.05 N SOLUTION OF ANHYDROUS HYDROGEN CHLORIDE IN METHANOL FOR FOUR HOURS AT ROOM TEMPERATURE]. P.Stoffyn and A.Stoffyn: Biochim. biophys. Acta, 1963, 70, 107-108 (McLean Hosp. Res. Lab., Belmont, Mass., U.S.A.) Prelim, comm.

B.M.Stevens

239. QUANTITATIVE ESTIMATION OF SULPHATES IN LIPID EXTRACTS. E.Martensson: Biochim. biophys. Acta, 1963, 70, 1-8 (Dept. Med. Biochem., Univ. Gothenburg, Sweden) The method was based on a reductive SO₄²⁻ analysis applied directly to the lipid extract. Since a hydrolysis step was unnecessary the method was less complicated and likely to be freer from error than previous methods.

B.M.Stevens

240. ORIGIN OF METHYL KETONES FOUND IN STEAM DISTILLATES OF MILK FAT. R.C.Lawrence and J.C.Hawke: Nature, Lond., 1963, 197, 1276-1277 (Dairy Res. Inst., Palmerston North, New Zealand)

Methyl ketones were prep. from milk fat obtained following injn. of [carboxy-¹⁴C]acetate into a cow. C₉, C₁₁, C₁₃ and C₁₅ methyl ketones had the highest sp. activity. The pattern of labelling of these methyl ketones was markedly similar to the labelling of C₁₀, C₁₂, C₁₄ and C₁₆ fatty acids demonstrated previously. It is suggested that methyl ketones and their corresponding acid with one more C atom have a common precursor in J-keto acids.

J.R.Sargent

241. PHOSPHOLIPID PATTERNS IN SUBCELLULAR FRACTIONS OF ADULT AND IMMATURE RAT ORGAN^{IG} JJ.Biezenski, T.H.Spaet and A.L.Gordon: Biochim. biophys. Acta, 1963, 70, 75-84 (Dept. Haematol., Lab. Div., Montefiore Hosp., New York, U.S.A.)

Phospholipid contents of whole tissue, nuclear, mitochondrial, microsomal and supernatant fractions of immature liver, kidney, uterus and ovary and the distribution of phospholipids in the cytoplasmic fraction were determined. Amounts and % distributions of lipid serine, ethanolamine, choline, N and sphingomyelin in lipid extracts of all fractions of the 4 organs of ad:^{...} and immature rats were also examined. High lipid choline and fairly high ethanolamine with little serine, sphingo^{"#1} myelin or 'other' phospholipids were found in phospholip^P rich mitochondria and microsomes. In phospholipid-poor nuclei and supernatant, choline phospholipids, 'cephalin'^{*} and 'other'^{*} were approx. equally divided. With age, 'cephalins' and 'other'^{*} phospholipids decreased whilst lecithins increased.

B.M.Stevens

242. PHOSPHOLIPID FRACTION FROM OX HEART MUSCLE WHICH ACTIVATES CYTOCHROME $\frac{f}{e}$ OXIDASE. M.Cohen and W.W.Wainio: J. biol. Chem., 1963, 238, 879-882 (Bureau Biol. Res., Rutgers - Stay Univ., New Brunswick, N.J., U.S.A.) A phospholip^{*} fraction is very effective for activation of the partially purified prep. 2-4-1*5 of cytochrome $\frac{f}{e}$ oxidase. Addition of 0.047 mg. of active fraction stimulates the reaction t_{1/2} half-max. rate. This amount of phospholipid correspond* approx. to a 1:1 mol. ratio of phospholipid:cytochrome P. This active fraction is composed mainly of lysophosphatides, of which 65% contain ethanolamine and 21% contain serine. There is a minor inositol-containing component. The fatty acids are 54% stearic, 25% linoleic, 20% palmitic, and a trace of oleic acid.

J.N.Ashley

243. ROLE OF PHOSPHATIDES IN NON-ENZYMIC BROWNING. H.S.Burton and D.J.McWeeny: Nature, Lond., 1963, 197, 1086-1087 (Food Sci. and Plant Hlth. Divn., Min. Agric., London, England)

Aq. dispersions of lecithin from egg yolk were treated with various additives and their affect on the browning reaction studied at 40°. Chromophore development was much more rapid in the presence of glycine than of glucose. Addition of Na metabisulphite retards the re* action while ascorbic acid causes more browning. f_{err}? f sulphate caused an even more rapid browning reaction iⁿ the lecithin/glycine system. Esterification of glycine reduced the browning while phenylglycine reacted w^t lecithin to give a dark solid. The browning reactions of phosphatides and unsat. acids are presumed to be due to carbonyl/amino reaction.

GM^{wis}

244. HYDROLYSIS OF SYNTHETIC MIXED-ACID PH^{SS} PHATIDES BY PHOSPHOLIPASE A FROM HUMAN PANCREAS. L.L.M.van Deenen, G.H.De Haas and C.H.T.Heemskerk: Biochim. biophys. Acta, 1963, 295-304 (Dept. Biochem., Lab. Org. Chem., State Univ., Utrecht, Netherlands) L-a-phosphatidyl

ethanolamines were readily hydrolysed in an aq. *9*^{ex}%/fl⁶ Unlike the animal poison enzymes, the pancreatic enzy did not attack synthetic lecithins unless deoxycholate o* synthetic phosphatidic acid were present. Mixed acid^{co11*} lecithins and phosphatidyl ethanolamines containing binations of stearic and lauric acids, stearic and oleic acids or palmitic and linolenic acids in different ^{rno}/_{he} positions were used to investigate the site of action. A* enzyme always liberated the p-esterified fatty acids.

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^attached fatty acid constituents being recovered in the tyso compounds. B.M.Stevens

245. LECITHIN-CHOLESTEROL SOLS. L.Saunders: J. Pharm., Lond., 1963, 15, 155-156 (Sch. Pharm., Brunswick Sq., London, England) Further studies were made of these sols, formed by ultrasonic irradiation. J.M.Whitmarsh

246. THIN-LAYER CHROMATOGRAPHIC SEPARATION OF SPHINGOSINE AND RELATED BASES. K.Sambasivarao and R.H.McCluer: J. lipid Res., 1963, 4, 106-108 (Dept. Physiol. Chem., Ohio State Univ., Columbus, Ohio, U.S.A.) A rapid thin-layer chromatographic method for the qual. separation and identification of the free bases of erythrosphingosine, threo-sphingosine, dihydrosphingosine, phytosphingosine and ³*0-methylsphingosine is described. The developing solvent used was CHCl₃:MeOH:2N NH₃ 40:10:1 and the Pots were stained with ninhydrin. J.R.Sargent

^7. BREAKDOWN OF PHOSPHOLIPIDS IN MILD ALKALINE HYDROLYSIS. H.Brockerhoff: J. lipid Res., 1963, 4, 96-99 (Fisheries Res. Board Canada, Technol. Station, P.O.Box 429, Halifax, Nova Scotia, Canada) Deacylation of phospholipids by mild alk. hydrolysis is usually accompanied by some hydrolysis of phosphate ester bonds. This undesired side reaction is ^pressed by polar solvents. Deacylation with lithium Wroxide in chloroform: methanol (2:8) will cause the breakdown of not more than 0¹% of egg lecithin. J.R.Sargent

^8. BIOCHEMISTRY OF PLASMALOGENS. H. HAEMOLYTIC ACTIVITY OF SOME PLASMALOGEN DERIVATIVES. E.L.Gottfried and M.M.Rapport: J. lipid Res., 1963, 4, 57-62 (Dept. Med. and Biochem., Einstein Coll. Med., Yeshiva Univ., New York, U.S.A.) A series of lysophosphatides was prep, from the plasma-³gens phosphatidyl choline and phosphatidyl ethanolamine ^a their haemolytic activity compared with that of ³*Palmitoyl lysolecithin. The nature of the linkage of hydrocarbon chain (acylester, OL -J-unsat. ether, or ³-yl ether) did not affect lytic activity. Unsatn. in the hydrocarbon chain of lysolecithins decreased lytic activity except: in the case of lysocephalins. J.R.Sargent

24% PHOSPHOLIPID INTERRELATIONSHIPS IN RAT EPIDIDYMAL TISSUE AND SPERMATOZOOA. J.W.Scott, R.M.C.Dawson and I.W.Rowlands: Biochem. J., 1963, 87, 507-512 (Agric. Res. Counc. Inst., Animal Physiol., Babraham, Cambridge, England) Phospholipid analyses of spermatozoa-rich exudates obtained from rat epididymal tissue indicated that spermatozoa accumulate choline plasmalogen (or its ¹⁴C analogue) as they pass through the epididymis. The coricn. of lecithin and phosphatidylethanolamine was higher in the spermatozoa-rich exudates from the head than in those from the tail of the epididymis, but it is certain whether this is caused by a change in the ¹⁴C-labeled lipids or by contamination of the exudates by phospholipids arising from the tissue. The epididymal pool rapidly becomes labelled when ³H-¹⁴C-lecithin is inj. and the sp. activity is above that of ³H-¹⁴C-lycer-phosphorylcholine up to 40 hr. after administration of the [32p]phosphate.

V*JHROMBOPLASTIC ACTIVITY OF PHOSPHATIDYL-HANOLAMINE FROM NATURAL AND SYNTHETIC SOURCES. D.L.Turner, R.R.Holburn, M.Desipin, M.J. Tocantis: J. lipid Res., 1963, 4,

52-56 (Cardenza Fndn., Jefferson Med. Coll., Philadelphia, Pa., U.S.A.) Improvements are de-

scribed in the prep. of phosphatidylethanolamine from hen's egg and in die prep. of intermediates used in the synthesis of dioleoyl-phosphatidylethanolamine. Both prep. were potent accelerators in the Hicks-Pitney test and moderately active in the thromboplastin generation test. J.R.Sargent

251. IDENTIFICATION OF A BACTERIAL PHOSPHOLIPID AS AN O-ORNITHINE ESTER OF PHOSPHATIDYL GLYCEROL. U.M.T.Houtsmuller and L.L.M.van Deenen: Biochim. biophys. Acta, 1963, 70, 211-213 (Dept. Biochem., Lab. Org. Chem., State Univ., Utrecht, Netherlands) Prelim, comm.

B.M.Stevens
252. PHOSPHOLIPID AND PLASMALOGEN SYNTHESIS IN RAT BRAIN HOMOGENATES. H.G.Carr, H.Haeber and J.J.Eiler: Biochim. biophys. Acta, 1963, 70, 205-207 (Dept. Pharm. Chem., Univ. California Med. Center, San Francisco, Calif., U.S.A.) Palmitaldehyde was not a precursor of the unsat. ether group of plasmalogens; stearic and palmitic acids were incorporated into unsat. ether groups much less efficiently than into phospholipid acyl ester groups.

B.M.Stevens
253. SYSTEM FOR PRECISE GRADIENT ELUTION CHROMATOGRAPHY: APPLICATION TO THE CHROMATOGRAPHY OF SMALL AMOUNTS OF PHOSPHATIDES ON COLUMNS OF SILICIC ACID. D.F.H.Wallach and G.L.Nordby: Biochim. biophys. Acta, 1963, 70, 188-201 (Dept. Biol. Chem., Harvard Med. Sch., Boston, Mass., U.S.A.) An apparatus using precise and predetermined linear or non-linear eluant gradients and const. flow rates is described. A mathematical treatment of gradient production by differential flow techniques, permitting selection of a wide variety of gradients is given. Examples of elution of phosphatides from silicic acid are described.

B.M.Stevens
254. QUANTITATIVE STUDY OF ERYTHROCYTE-LYSOLECITHIN INTERACTION. C.Klibansky and A.de Vries: Biochim. biophys. Acta, 1963, 70, 176-187 (Rogoff Med. Res. Inst., Dept. Expt. Biol., Tel Aviv Univ., Petah Tikva, Israel) The amount of lysolecithin attached to r.b.c., suspended in plasma enriched in lysolecithin by the action of snake venom phospholipase A, depended on the lysolecithin concn. Amount of lysolecithin attached was correlated with the r.b.c. shape. The amount of lysolecithin attached induced spherling but not haemolysis. Albumin reversed lysolecithin attachment and corresponding shape changes. Attachment of lysolecithin did not cause quant. changes in r.b.c. membrane phospholipids but a loss of cholesterol occurred in some cases.

B.M.Stevens
255. SELECTIVE INCORPORATION OF FATTY ACIDS INTO PHOSPHOLIPIDS OF MATURE RED CELLS. E.Mulder, J.de Gier and L.L.M.van Deenen: Biochim. biophys. Acta, 1963, 70, 94-96 (Dept. Biochem., Lab. Org. Chem., State Univ., Utrecht, Netherlands) Further expt. involving dietary changes demonstrated that the selectivity of fatty acid uptake in phospholipids of circulating r.b.c. was identical with that of labelled fatty acid incorporation in vitro. Prelim, comm.

B.M.Stevens
256. ENZYMIC PATHWAYS OF GLYCERIDE AND PHOSPHOLIPID SYNTHESIS IN AORTIC HOMOGENATES. Y.Stein, O.Stein and B.Shapiro: Biochim. biophys.

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Acta, 1963, 70, 33-42 (Dept. Med. B, Hadassah Univ. Hosp., Jerusalem, Israel) Rabbit and dog aortic homogenates incorporated [$1\text{-}^{14}\text{C}$]linoleic acid into neutral lipids and phospholipids in the presence of Mg^{2+} -glycerophosphate, CoA and ATP. Triglycerides and diglycerides contained most of the radioactivity found in the neutral lipids, while lecithin, lyssolecithin and phosphatidyl ethanolamine contained most of the activity of the phospholipid fraction. An alternative pathway for lecithin synthesis in which lyssolecithin was the immediate precursor was present. ATP and CoA were required. When lyssolecithin was the precursor, [$1\text{-}^{14}\text{C}$]linoleic acid was found only in the β -position of the lecithin; with Mg^{2+} -glycerophosphate, both α - and β -positions were labelled. Purified lecithin promoted linoleic acid incorporation into phospholipids.

B.M.Stevens

257. UPTAKE OF LIPIDS BY HUMAN α -LIPOPROTEIN. L.A.E.Ashworth and C.Green: *Biochim. biophys. Acta*, 1963, 70, 68-74 (Dept. Biochem., Univ. Liverpool, England) α -Lipoprotein bound many Celite-dispersed lipids but showed considerable discrimination amongst sterol and vit. A deriv. Plant sterols competed with cholesterol for mol. binding sites but palmitic acid and cholesterol did not compete. A no. of anionic dyes were bound. Methyl Orange, which was bound to the greatest extent, competed with cholesterol but not with palmitic acid. β -Lipoproteins (Sf2-10) were severely damaged by incubation with lipid coated Celite.

B.M.Stevens

258. LIPOPROTEIN LIPASE OF MAMMARY GLAND AND CORRELATION OF ITS ACTIVITY TO LACTATION. O.W.McBride and E.D.Korn: *J. lipid Res.*, 1963, 4, 17-20 (Lab. Cell. Physiol. and Metab., Nat. Heart Inst., Bethesda, Md., U.S.A.) Marked increase in the activity of guinea-pig mammary gland lipoprotein lipase occurs immediately preceding parturition. Max. levels are reached within 2 hr. post-partum, this level persisting until cessation of suckling when the enzyme becomes undetectable within 18 hr. Most of the lipoprotein lipase activity in mammary gland appears to be accounted for as activity in retained milk.

J.R.Sargent

259. NEGATIVELY STAINED LIPOPROTEIN MEMBRANES: THE VALIDITY OF THE IMAGE. J.B.Finean and M.G. Rumsby: *Nature*, Lond., 1963, 197, 1326-1327 (Dept. Med. Biochem., Univ. Birmingham, England)

Unfixed, neg. stained lipoprotein prep. are a multiphase system. Low angle diffraction patterns obtained may be due to lipid, possibly cholesterol, separating from the lipoprotein structure during drying.

G.M.Lewis

260. A WATER-SOLUBLE LIPID COMPLEX OBTAINED IN THE MACROMOLECULAR PHASE BY GEL FILTRATION OF HUMAN BILE. E.Thureborn: *Nature*, Lond., 1963, 197, 1301-1302 (Dept. Surg. II, Univ. Gothenberg, Sweden) By gel filtration of native human bile, all the cholesterol and phospholipids were eluted in an opalescent green water soln. in the macromol. phase, mol. wt. more than 40000-50000; they comprised more than 2/3 of the solids in this phase.

G.M.Lewis

261. MONOGLYCERIDE TRANSACYLASE OF RAT INTESTINAL MUCOSA. B.Clark and G.Hilbscher: *Biochim. biophys. Acta*, 1963, 70, 43-52 (Dept. Med. Biochem. and Pharmacol., Univ. Birmingham, England) The enzyme occurred both as a sol. protein in the cell sap and tightly associated with subcellular structures. A partially purified particulate enzyme prep.

was examined with respect to cofactor requirements, pH optimum and substrate specificity. Palmitic acid, ATP and CoA could be replaced by palmitoyl CoA. The reaction product was identified as diglyceride.

B.M.Stevens

262. PURIFICATION OF Ct - AND J -HYDROXYSTEROI DEHYDROGENASES FROM PSEUDOMONAS TESTOSTERONI BY GEL FILTRATION. S.Delin and J.Pora*: *Biochim. biophys. Acta*, 1963, 67, 197-200 (Inst. Biochem., Univ. Uppsala, Sweden) A simple and efficient method is described. The enzymes appeared to be of small mol. size.

B.M.Stevens

263. BRAIN NADH₂-TETRAAZOLIUM REDUCTASE ACTIVITY, LIPOAMIDE DEHYDROGENASE AND ACTIVATING LIPIDS. A.Giuditta and H.J.Strecker: *Biochim. biophys. Acta*, 1963, 67, 316-318 (Inst. U.G. Genetics and Biophys., Naples, Italy) A large part of the easily sol. NADH₂-2- F -iodophenyl-3,5-nitrophenyl-5-phenyltetraazolium chloride [INT] reductase activity was due to lipoamide dehydrogenase: the slight activity of NADPH₂ oxidoreductase with INT was enhanced by lipids and detergents.

B.M.Stevens

264. APPLICATION OF HUBENERS 200-HYDROXYSTEROID-DEHYDROGENASE [200-SD] ON THE MICROCHEMICAL IDENTIFICATION AND SEPARATE OF STEROIDS. H.D.Henning and J. Zander: *Hoppe**, Seylers Z. physiol. Chem., 1962, 330, 31-37 (Univ. Frauenklin., 5 KClm-Lindenthal, Germany) The stereosp. enzymic reduction-oxidation with 20i8-SD of 12 steroid keto-alcohols is described. Full expt. detail are given.

(German) I.Corniff

265. LIPASE AND ESTERASE ACTIVITIES OF THE PANCREAS AND SMALL INTESTINE OF THE CHICK. B.M.Laws and J.H.Moore: *Biochem. J.*, 1963, 87, 632-638 (N.I.R.D., Shinfield, Reading, England) The lipase activity of the chick pancreas was constant from 1 to 30 days of age, but the esterase activity of the small intestine increased markedly from 1 to 10 days of age. Although lipase activity was confined almost entirely to the pancreas and esterase activity to the small intestine, both enzymes appeared to be present in both tissues. Esterase activity was greatest in the duodena** whereas lipase activity was greatest in the upper small intestine. Certain prop. of the 2 enzymes such as pH optima and substrate specificity are described.

266. DIGLYCERIDE KINASE AND OTHER PATHWAY* FOR PHOSPHATIDIC ACID SYNTHESIS IN THE ERYTHROCYTE MEMBRANE. L.E.Hokin and M.R.Hold: *Biochim. biophys. Acta*, 1963, 67, 470-484 (Dept. Physiol. Chem., Univ. Wisconsin, Madison, Wis., U.S.A.) Synthesis of phosphatidic acid by diglyceride kinase in human r.b.c. ghosts was 10-40 times more active than synthesis by phosphorylation of monoglyceride followed by acylation and 2500 times more active than synthesis by acylation of Of-glycerophosphate. Diglyceride kinase activity was as great or greater than the Na⁺ plus K⁺ dependent, ouabain inhib., ATPase of the r.b.c. membrane. Effects of detergents, state of substrate dispersion, freezing of ghosts, Na and K and ouabain have been examined. The kinetic curve at 37° for phosphatidic acid synthesis from diglyceride showed a rapid initial component, followed after approx. 1 min. by a slower component.

B.M.Stevens

267. PHOSPHATIDIC ACID PHOSPHATASE IN THE ERYTHROCYTE MEMBRANE. L.E.Hokin, M.R.Hokin and D.Mathison: *Biochim. biophys. Acta*, 1963, 67, B5-497 (Dept. Physiol. Chem., Univ. Wisconsin, Madison, Wis., U.S.A.) A Mg dependent P_{t} -phosphatidic acid phosphatase was found in r.b.c. membrane h was stim. by Na and, to a lesser extent, by Li, jyi*. K and Rb. Cs had little effect. No Mg dependent Na stim. activity was observed with p-phosphatidic acid %' lysophosphatidic acid although both were hydrolysed. J*-Glycerophosphate was very feebly hydrolysed. 10^{-4} M Be inhib. the Mg dependent phosphatidic acid phosphatase by 30%; 10^{-3} M Be inhib. completely. Cs and F inhib. the Na stimn. The initial phosphatidic acid phosphatase activity was at least 41 ± 6 micromoles/mg. dry wt. of ghosts/hr. which compared favourably with the activity of the Na plus K dependent, ouabain inhib., ATPase of r.b.c. membrane. B.M.Stevens
268. CHOLESTEROL ESTERS AND THE SYNTHESIS OF MILK FAT. R.D.McCarthy and S.Patton: *Biochim. biophys. Acta*, 1963, 70, 102-103 (Dept. Dairy Sci., Pennsylvania State Univ., University Park, Pa., $\text{H}_2\text{S}^{+}\text{A}^-$) Cholesterol esters of milk were shown to have a remarkably active metabolic history and the mammary gland was shown to be capable of synthesising milk cholesterol esters, glycerides and phosphatides from fatty acids. Prelim. comm. B.M.Stevens
269. CRYSTALLISATION OF TRIHYDROXYCOPROSTANIC ACID FROM HUMAN BILE. J.B.Carey, jun. and G.A.D.Haslewood: *J. biol. Chem.*, 1963, 238, PC855-856 (Dept. Med., Univ. Minnesota Med. Sch., Minneapolis, Minn., U.S.A.) The acid is isolated from the bile of patients with bile fistulae, and is characterised as the methyl ester. This is strong evidence that the acid is a natural constituent of human bile, and is indeed an intermediate in conversion of endogenous cholesterol into cholic acid in man. J.N.Ashley
270. HYDROLYSIS AND UTILISATION OF CHOLESTEROL ESTERS FOR STEROID SYNTHESIS BY CANINE ADRENAL HOMOGENATES. R.E.Dailey, L.Swell and C.R.Treadwell: *Arch. Biochem.*, 1963, 100, 360-363 (UA^A Centre, Martinsburg, W.Va., U.S.A.) ar. H_2O^{+} Cholesterol esters of palmitic, oleic, linoleic and CO_2H^{+} acids were hydrolysed independently of added where NAD^{H}_2 generating system was added. The rate of H_2O^{+} hydrolysis was lower than homologues for unsat. fatty acid esters when compared in a monoglyceride from a single dog. B.M.Stevens
271. TWO-DIMENSIONAL PAPER CHROMATOGRAPHY OF ESTERYL ESTERS. A NEW METHOD FOR THE SEPARATION OF CRITICAL PAIRS. C.Michalec, Z.Kohoutek and M.Sulc and J.Mestan: *J. Chromatography*, 1962, 9, 237-241 (Lab. Protein Met. and Proteosynthesis Charles Univ., Prague, Czechoslovakia) Cholesteryl esters have been satisfactorily separated by combining adsorption chromatography on paper impregnated with H_2O^{+} gel in the first direction, followed by treated phase. Partition chromatography on the silica gel chromatopaper impregnated with paraffin oil. After drying, chromatograms were sprayed with either phosphomolybdic acid or heated for 5 min. at $80-90^\circ$ or with antimony esters in if. R_f values of cholesterol and 19 cholestryl in both systems are tabulated. P.D.Dawkins
272. STEROIDS. CCXI. CENTRIFUGALLY ACCELERATED PAPER PARTITION CHROMATOGRAPHY OF STEROIDS. J.S.Matthews and M.De Los Angeles Cervantes: *J. Chromatography*, 1962, 9, 195-198 (Syntex Res. Labs., Mexico City, Mexico) An apparatus is described for centrifugally accelerated partition chromatography of steroids on Whatman no. 1 paper discs impregnated with the stationary phase. For separations to occur the centrifugal velocity must be low and at velocities above 200-250 r.p.m. the steroids remain on the line of application. R_f values are not independent of the velocity. Using the procedure described, separations are complete within 10-15 min. P.D.Dawkins
273. THIN-LAYER CHROMATOGRAPHY OF STEROLS AND STEROIDS. J.Avigan, D.S.Goodhan and D.Steinberg: *J. lipid Res.*, 1963, 4, 100-101 (Sect. on Metabolism, Lab. Cell Physiol. and Metabolism, N.I.H., Bethesda, Md., U.S.A.) Thin layer chromatographic systems for the separation of cholesterol and its precursors and for separating cholesterol, pregnenolone, androstane-3, 17-dione, progesterone, androstane-3-OH-ol, 17-one, 3-acetate, androstane-17-one are described. J.R. Sargent
274. IDENTIFICATION OF THE D-GLUCOSIDES OF STIGMASTEROL, SITOSTEROL AND CAMPESTEROL IN TOBACCO AND CIGARETTE SMOKE. A.G.Kallianos, F.A.Shelburne, R.E.Means, R.K.Stevens, R.E.Lax and J.D.Mold: *Biochem. J.*, 1963, 87, 586-600 (Liggett and Myers Tobacco Co., Res. Dept., Durham, N.C., U.S.A.) A mixture of the D-glucosides of stigmasterol, sitosterol and campesterol has been isolated from a commercial blend of flue-cured, Burley, Maryland and Turkish tobaccos (0.044% of the dry wt. of tobacco), and the smoke of cigarettes manufactured from the same blend of tobaccos ($1.59\text{ mg./1000 cigarettes}$). After acid hydrolysis of the glucosides the free sterols were separated by gas chromatography and the individual compounds were identified by their i.r. absorption and mass spectra. By using the above techniques, together with catalytic hydrogenation, the relative amounts of the sterols in the mixture was 60% of stigmasterol, 25% of sitosterol and 15% of campesterol. V.M.Wootton
275. NEW ASSAY FOR CHOLESTEROL AND CHOLESTEROL ESTERS IN SERUM WHICH IS NOT AFFECTED BY BILIRUBIN. A.L.Babson, P.A.Shapiro and G.E.Philips: *Clin. chim. Acta*, 1962, 7, 800-804 (Dept. Biochem., Wama-Lambert Res. Inst., Morris Plains, N.J., U.S.A.) The bilirubin is removed from the ethanol-ethylacetate extract by an adsorbent. Cholesterol esters are estimated by adding an excess of solid digitonin and assaying the cholesterol remaining in soln. This method is thought to be the fastest and simplest yet devised for determining cholesterol esters. V.M.Wootton
276. CHOLESTEROL CONTENT OF HUMAN SERUM LIPOPROTEINS OBTAINED BY DEXTRAN SULPHATE PRECIPITATION AND BY PREPARATIVE ULTRACENTRIFUGATION. D.Kritchevsky, S.A.Tepper, P.Alanovic and R.H.Furman: *Proc. Soc. exp. Biol.*, N.Y., 1963, 112, 259-262 (Wistar Inst. of Anat. and Biol., Philadelphia, Pa., U.S.A.) Lipoprotein cholesterol can be removed from serum by pptn. with 0.04 ml. of dextran sulphate (5%) and 0.1 ml. of 11-1% CaCl_2 soln. to 1 ml. of serum. The ppt. is removed by centrifugation. The resultant analysis of Of- and β -lipoprotein cholesterol compares closely with ultracentrifugation analyses. Oxalate has been

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shown to be an interference in the colorimetric analysis of β -lipoprotein cholesterol. D.N.Wheatley

277. EFFECT OF EGG YOLK SIZE ON YOLK CHOLESTEROL CONCENTRATION. E.L.Nichols, W.W.Marion and S.L.Balloin: Proc. Soc. exp. Biol., N.Y., 1963, 112, 378-380 (Dept. Poultry Sci., Iowa State Univ. Sci. Technol., Ames, Iowa, U.S.A.) Cholesterol content of egg yolks was found to vary inversely with the yolk size in Rhode Island Red hens. There appeared to be a different rate of deposition of cholesterol into the yolks of 2 strains of White Leghorn hens selected for large yolked egg laying and small yolked egg laying. The solid content of ova increased rapidly until they become 3 g. in wt. and then the solid content increases slowly with the increase in ova size.

D.N.Wheatley

278. PAPER CHROMATOGRAPHY OF SOME CHOLESTEROL DERIVATIVES. C.Michalec: J. lipid Res., 1963, 4, 110-111 (Lab. Proteosynthesis and Protein Metab., Charles Univ., Prague, Czechoslovakia) A method for one-dimensional separation of cholesterol, α -cholesterol, α -coprostanol and β -coprostanol on aluminium hydroxide or silica gel impregnated papers is described. Cholesterol and β -cholesterol are separated by chromatography in a 2nd dimension. J.R. Sargent

279. DETECTION OF KETOSTEROIDS ON CHROMATOGRAMS. R.Stupnicki and E.Stupnicki: J. Chromatography, 1962, 9, 235-237 (Inst. Animal Physiol. and Nutr.; Jablonna, nr. Warsaw, Poland) Ketosteroids were detected on paper chromatograms developed in the Bush system A at 34° on Whatman No. 1 paper by the following series of manipulations at room temp: (1) Dipping in 2,4-dinitrophenylhydrazine in 2N HCl and holding in air for 10 min. (2) washing in aq. Na₂CO₃, (3) washing in alk. KMnO₄ to remove excess hydrazine by oxidation, (4) washing in ascorbic acid soln. to remove MnO₂ formed from (3), and finally washing in tap water and air drying. The ketosteroids give yellow, orange and red spots. P.D.Dawkins

280. DETECTION OF STEROIDS ON CHROMATOPLATES USING A NON-DESTRUCTIVE METHOD. G.S.Boyd and H.R.B.Hutton: Biochim. biophys. Acta, 1963, 69, 419-420 (Dept. Biochem., Univ. Edinburgh, Scotland) Various inorg. phosphors, which fluoresce green under the Hg u.v. lamp, were mixed with the Silica Gel G used; substances absorbing between 240 and 280 mji showed as dark spots on examination in u.v. light. Prelim. comm. B.M.Stevens

281. DEMONSTRATION OF STEROIDAL FUNCTIONAL GROUPS ON PAPER CHROMATOGRAMS. II. α -KETOLS AND GLYCOLS. S.C.Pan: J. Chromatography, 1962, 9, 81-91 (Squibb Inst. Med. Res., New Brunswick, N.J., U.S.A.) Spot tests for steroids which form HCHO, CH₃CHO, a non-volatile aldehyde or non-volatile acid on periodate oxidation on paper chromatograms are described. Certain steroidal glycols can be detected by a borate-phenol red spray, and primary and secondary GK-ketols have been demonstrated and distinguished from each other on paper chromatograms by a modified tetrazolium reduction. P.D.Dawkins

AMINO ACIDS, PEPTIDES AND PROTEINS

282. FREE RADICAL IN MICHAELI COMPLEX OF D-AMINO ACID OXIDASE. K.Yagi and T.Ozawa: Biochim. biophys. Acta, 1963, 67, 635-687 (Dept. Biochem., Sch. Med., Nagoya Univ., Japan) Electron spin resonance studies carried out on the cryst. Michaelis complex and on the mother liquid showed that both contained a free radical. Prelim. comm.

B.M.Stevens

283. CARRIER AMINO ACID STOICHEIOMETRY IN AMINO ACID TRANSPORT IN EHRLICH ASCITES CELLS. J.A.Jacquez: Biochim. biophys. Acta, 1963, 71, 15-33 (Div. Expt. Chemotherapy, Sloan-Ketterini Inst. Cancer Res., New York, U.S.A.) The initial flux of L-tryptophan in 'exchange diffusion' and in 'competition' expt. with other amino acids was significantly increased by certain amino acids. For straight chain amino acids with aliphatic side chains, the stimn. was increased progressively and almost constantly with each additional C in the side chain. In competition expt. branching of the chain decreased the stimn. of initial flux. A model of the transport system in which ratio of arnin^a acid to carrier is 1:1 is shown to predict the stimn. in exchange diffusion expt. but a ratio of 2:1 must be assumed to predict the stimn. in competition expt. also.

B.M.Stevens

284. CHANGE IN THE CHARGE ON FAD BY FORMING MODEL OF THE ENZYME-SUBSTRATE COMPLEX OF D-AMINO ACID OXIDASE. K.Yagi and T.Ozawa: Biochim. biophys. Acta, 1963, 67, 319-320 (Dept. Biochem., Sch. Med., Nagoya Univ., Japan) ^T_{cyst} shoulder at 490 mfi in the absorption spectrum of the apo-enzyme-FAD-benzoate complex was shown to be characteristic for the enzyme-substrate model and not to be a prop. of the holo-enzyme.

M.Stevens

285. AMINO ACIDS IN THE PROTEINS FROM ARAGONITE AND CALCITE IN THE SHELLS OF MYTILUS CALIFORNIANUS. P.E.Hare: Science, 1963, 139, 216²¹⁷ (Div. Geol. Sci., California Inst. Technol., Pasadena^a Calif., U.S.A.) Hydroxylysine and hydroxyproline are absent in the calcified proteins of M. californicus^b. The org. matrices from the calcite layers have a higher ratio of acidic to basic amino acids than the aragonitic shell units. The uncalcified periostracum and outer ligament have very few acidic residues. G.M.Lewis

286. STUDIES ON INTRACELLULAR AMINO ACIDS. ⁰_{PENICILLIUM ROQUEFORTI} E.Meyers and S.G.Knipling: Mycologia, 1961, 53, 115-121 (Squibb Inst. Med. Res., New Brunswick, N.J., U.S.A.) ^P_{roQuefotgi} found to have an intracellular amino acid pool comp⁰ 5 to 15% of the total cell N₂ and containing most coffin amino acids, except proline and hydroxyproline. T⁰ qual. pattern of the pool was similar in both vegetative cells and spores. Evidence is given for an internal po⁰ replenishment mechanism in N₂ depleted cells.

J.G.Brown

287. NEW TECHNIQUES FOR THE CHROMATOGRAPHY OF SULPHUR AMINO ACIDS ON PAPER. J.Fondarai + C.Richert: J. Chromatography, 1962, 9, 261-26²⁶ (Lab. Physique, Fac. Med. Pharm., Marseille, France) (French)

P.D.Dawkins

288. METHOD FOR THE IMPROVED RESOLUTION OF BASIC AMINO ACIDS ON THE AUTOMATIC AMINO ACID ANALYSER. D.R.Kominz: J. Chromatography,

of

1962, 9, 253-254 (Nat. Inst. Arthritis and Met. Dis., Nat. Inst. Hlth., Public Hlth. Service, U.S. Dept. Hlth., Education and Welfare, Bethesda, Md., U.S.A.)

Notes. P.D.Dawkins

289. GAS CHROMATOGRAPHY OF THE AMINO ACID ESTERS IN AMMONIA. H.A.Saroff, A.Karmen and J.W.Healy: I. Chromatography, 1962, 9, 122-123 (Nat. Inst. Arthritis and Met. Dis. and Nat. Heart Inst., N.I.H.. Public Hlth. Service, U.S. Dept. Hlth., Education and Welfare, Bethesda, Md., U.S.A.)

Notes. P.D.Dawkins

290. NOTE ON CONVERSION OF AMINO GROUP OF AMINO ACIDS INTO NITROGUANIDINO GROUP.

N.Heyboer, G.H.Visser and K.E.T.Kerling: Rec. Trav. chim. Pays-Bas, 1962, 81, 69-72 (Org. Chem. Lab., Univ., Leiden, Netherlands) 2-Methyl-L-nitroisourea has been used as a reagent to convert amino groups of fglycine, L-ornithine, D- and L-lysine to the nitro-Buanidino groups. Lysine and ornithine deriv. were obtained in 50% yields. The glycine deriv. under some conditions could be obtained in IAPjo yield. G.C.Barr

291. DECOMPOSITION OF NINE AMINO ACIDS DURING CHROMATOGRAPHY ON PAPER. V.Moses: I. Chromatography, 1962, 9, 241-243 (Bio-org. chem. group, Lawrence Rad. Lab., Univ. California, Berkeley, Calif., U.S.A.) Decomposition of 9 amino acids run ^{li}* Phenol-water and n-butanol-propionic acid-water ^Invents was considerably reduced by pretreatment of Whatman No. 4 paper with oxalic acid. P.D.Dawkins

292. EXAMINATION OF OPTICALLY EXCITED AMINO ACIDS BY ELECTRON SPIN RESONANCE AT VERY LOW TEMPERATURE. P.Douzou, M.Ptak and C.Ropars: Nature, Lond., 1963, 197, 1105-1106 (Lab. Biophys. Museum Nat. d'Histoire Naturelle, Paris, France) ^E*Pt. on the electron spin resonance of phenylalanine and ^{tr}Yptophan at the temp. of liquid N₂ suggested that ^radiations centred on 3650A produce a metastable dynamic [^]figuration. G.M.Lewis

²⁹3. SYNTHESIS OF POLY-tt-AMINO-ACRYLIC ACID. K.Heyns and H.Heinecke: Hoppe-Seylers Z. physiol. Chem., 1963, 331, 45-49 (Chem. Staatinst., Org. Chem., Hamburg, Germany).

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^ USE OF THE NINHYDRIN REACTION FOR QUANTITATIVE ESTIMATION OF AMINO GROUPS IN INSOLUBLE SPECIMENS. P.A.Kendall: Nature, Lond., 1963, 197, 1305-1306 (Dept. Zool., King's Coll., Univ. London, London, England) Using denatured ^LVsozyme for test material, a technique for satisfactory ^determination of amino groups in insol. proteins is des e d , in which the material is shaken in a boiling water ^{ert}! for 15> min. with the reagent ^Rent» then extracted with [^]anol prior to colorimetry or spectrophotometry. G.M.Lewis

*^{Q:} THE SULPHUR BALANCE IN WOOL. J.C.Fletcher. A.Robson and J.Todd: Biochem. J., 1963, 87, 560-567 (Wool Ind. Res. Assn., Torridon, Leeds, England) ^P difficulties in reaching a satisfactory S balance for [^]o^o1 have been mainly due to incorrect determinations of to? ^cysteine content which provides more than 90#> of the L5¹ S. In the colorimetric methods used previously ^{1/4}lytic losses of cystine were hard to assess. The prob fo? [^] as been reinvestigated by using 3 different methods ^cystine determinations. Out of a total S content of

3*66% for a sample of Australian Merino 64s quality wool, cystine, cysteine and methionine provided 3 •33%. O-IOf and 0*12% respectively. The deficit of 0*11% is within the error of the total S determination, but it is probable that some is present in the form of lanthionine, cysteic acid and sulphate. +

296. THE OCCURRENCE OF BIS-(2-AMINO-2-CARBOXYETHYL) TRISULPHIDE IN HYDROLYSATES OF WOOL AND OTHER PROTEINS. J.CFletcher and A.Robson: Biochem. J., 1963, 87, 553-559 (Wool Ind. Res. Assn., Torridon, Leeds, England)

The S-containing compound formed in highest yield by the decomposition of cystine during the acid hydrolysis of wool and other proteins has been identified as bis-(2-amino-2-carboxyethyl) trisulphide. Its identity was confirmed by synthesis by 2 different methods. The trisulphide may be concerned in certain enzyme reactions involving S. Bis-(2-amino-2-carboxyethyl) tetrasulphide has also been tentatively identified as present in small amounts in wool hydrolysates. *

297. SPECIFIC EFFECTS IN THE INTERACTION BETWEEN IONISED GELS AND AMINO ACIDS. J.FeitelsoiK Biochim. biophys. Acta, 1963, 66, 229-236 (Dept. Phys. Chem.. Hebrew Univ.. Jerusalem, Israel)

Effects sp. for each amino acid in interaction with a highly swollen ion-exchange gel are discussed separately from purely electrostatic interactions of the cationic or dipolar form of the mol. The degree of dissociation in the gel was compared to that in soln. for the different spp. Absorption studies showed that sp. effects for cationic amino acids were much more pronounced than those of similar dipolar mol. The temp. dependence of the sp. interactions showed that they were enthalpy effects.

B.M.Stevns

298. ACYLMINO ACID DEACYLASE FROM KIDNEY. H.Hazama, M.Kitagawa and Y.Yamamura: J. Biochem., Tokyo, 1963, 53, 117-123 (Dept. Neuropsychiatry, Fac. Med.. Kyushu Univ., Fukuoka, Japan) The enzyme catalysed the hydrolysis of long chain N-acyl-amino acids. With valine and phenylalanine, lauroyl or myristoyl groups were the most susceptible to hydrolysis. The effect of pH on the hydrolysis of N-palmitoyl-L-aspartic acid differed from the effect of pH on the hydrolysis of other palmitoyl-amino acids. B.M.Stevens

299. TRYPTOPHAN SYNTHETASE LEVELS IN E. COLI, SHIGELLA DYSENTERIAE AND TRANSDUCTION HYBRIDS. R.B.Eisenstein and C.Yanofsky: J. Bact., 1962, 83, 193-204 (Dept. Microbiol., Western Reserve Univ., Cleveland, Ohio, U.S.A.)

*^{S.} dysenteriae and ^{E.} coli strains K-12 and B were found to produce low levels of tryptophan synthetase. although some hybrids formed by the introduction of the gene cluster concerned with tryptophan synthesis from ^{S.} dysenteriae into ^{E.} coli, produced high levels of this enzyme system. A revertant obtained from a tryptophan-requiring mutant also formed high levels of the enzyme. The gene(s) responsible for the high enzyme production was shown to be linked to the cluster of genes concerned with tryptophan synthesis. Stimn. of growth by tryptophan precursors, sensitivity to inhibn. by 5-methyltryptophan and the repression of the enzyme formation by anthranilic acid suggested that high enzyme production in the strains examined results from a partial block in the tryptophan pathway and not from die resistance to repression by tryptophan. The conversion of shikimic acid 5-phosphate to anthranilic acid appears to be the partially blocked reaction in the strains studied. C.Toothill

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- 300. DETECTION OF TRYPTOPHAN SYNTHESISING ENZYME IN RAUWOLFIA SERPENTINA BENTH.**
B.C.Bose and R.Vijayvargiya: J. Pharm., Lond., 1963, 15, 215 (M.G.M. Med. Coll., Indore, India)
The presence of the enzyme in R. serpentina Benth, a higher plant, was demonstrated. J.M.Whitmarsh
- 301. INTERFERENCE BY REACTIONS OF KYNURENINE METABOLISM IN THE ESTIMATION OF TRYPTOPHAN PYRROLASE IN RAT LIVER HOMOGENATE [WHEN A DOUNCE, HAND-OPERATED HOMOGENISER REPLACED A WARING BLENDOR FOR TISSUE DISPERSION],** M.V.Jago, J.F.Nelson and S.Rose: Biochim. biophys. Acta, 1963, 67, 513-516 (Dept. Physiol., Univ. Melbourne, Parkville, Viet., Australia). B.M.Stevens
- 302. MECHANISM OF TYROSINE OXIDATION BY MUSHROOM TYROSINASE.** S.Osaki: Arch. Biochem., 1963, 100, 378-384 (Dept. Chem., Florida State Univ., Tallahassee, Fla., U.S.A.) The mechanism was examined spectrophotometrically and by O₂ uptake studies using an O₂ galvanocell. Results indicated a mechanism in which tyrosine combined reversibly with the tyrosine site on the enzyme and the complex then broke down to yield dopa and enzyme. Dopa reacted reversibly with the dopa site on the enzyme to yield a dopa-enzyme complex. This split, yielding, after probable intermediate nonenzymic steps, dopa-chrome and enzyme. Tyrosine also reacted reversibly at the dopa site giving an unreactive tyrosine-enzyme complex. Km and max. velocities were observed. An equation derived assuming this mechanism gave an adequate explanation of the induction period and other kinetic peculiarities. B.M.Stevens
- 303. STUDIES ON L-TYROSINE O-SULPHATE.**
- I. PREPARATION AND PROPERTIES OF POTASSIUM J₂-HYDROXYPHENYL PYRUVIC ACID [35s]SULPHATE. F.A.Rose and G.M.Powell. II. IDENTIFICATION OF £-HYDROXYPHENYL PYRUVIC ACID [35s]SULPHATE AS A METABOLITE OF L-TYROSINE O[35s]SULPHATE IN THE RAT. G.M.Powell, F.A.Rose and K.S.Dodgson. III. THE METABOLIC FATE OF THE L-TYROSINE O[35s]SULPHATE RESIDUE OF 35s-LABELLED RABBIT FIBRINOPEPTIDE B. J.G.Jones, K.S.Dodgson, G.M. Powell and F.A.Rose: Biochem. J., 1963, 87, 548-553 (Dept. Biochem., Univ. Coll., Cardiff, Wales)
- I. Potassium £-hydroxyphenylpyruvic acid [35s]sulphate has been prep, by the action of [35s]chlorosulphonic acid on j₂-hydroxyphenylpyruvic acid under strictly controlled conditions. The prop, of the ester have been compared with those of the parent phenol. The ester displays keto-enol tautomerism and undergoes spontaneous conversion into jD-hydroxybenzaldehyde [35s]sulphate in soln. above pH 11. Spontaneous conversion into jg-hydroxyphenylacetic acid [35s]sulphate has been observed on paper chromatograms.
- II. £-Hydroxyphenylpyruvic acid [35s]sulphate has been identified as a metabolite of L-tyrosine O[35s]-sulphate in the rat. The metabolite is unstable and undergoes spontaneous conversion into jD-hydroxybenzaldehyde [35s]sulphate at room temp, and alk. pH and into £-hydroxyphenylacetic acid [35s]sulphate in the presence of urine and at neutral pH.
- III. Fibrinopeptide B, prep, from the fibrinogen of rabbits receiving Na235sO₄, contains a L-tyrosine O[35s]sulphate residue. The metabolic fate of this residue, after i.p. or i.v. injn. of the labelled fibrinopeptide into rabbits, has been compared with that of free

potassium L-tyrosine O[35s]sulphate. The latter compound is rapidly eliminated unchanged in the urine together with smaller amounts of j⁺-hydroxyphenylacetic acid [35s]sulphate. Similarly, no significant desulphation of the peptide-bound L-tyrosine O[35s]sulphate residue of fibrinopeptide B occurs in vivo, although the behaviour on Dowex 50 columns of the 35s-labelled material that is eliminated in the urine shows that the 35 S is no longer associated with fibrinopeptide. Labelled metabolites in urine emerge from Dowex 50 (H⁺) columns in 2 peaks, the positions of emergence of these peaks during the elution procedure coinciding approx. with those obtained when the urines of rabbits receiving free L-tyrosine O[35s]sulphate are similarly fractionated. The results suggest that fibrinopeptide B is degraded in vivo with the liberation of free L-tyrosine O[35s]sulphate, some of which is metabolised further to yield jD-hydroxyphenylacetic acid [35s]sulphate. •

- 304. VALINE BIOSYNTHESIS. V. CHARACTERISTICS OF PURIFIED DIHYDROXY ACID DEHYDRATASE FROM SPINACH LEAVES.** M.Kanamori and R.L.Wixom: J. biol. Chem., 1963, 238, 998-1005 (Dept. Biochem. Sch. Med., Univ. Arkansas, Little Rock, Ark., U.S.A.) The dehydratase is purified 120-fold. The optimum pH is 8-0-8-2, and Mg is needed for max. activity, although Mn and Co stimulate to a less extent. The enzyme catalyses conversion of ttiS-dihydroxyisovaleric acid into (2-oxoisovaleric acid, both of which are intermediates in microbial synthesis of valine. OKfi-Dihydroxy-jS-methyl-n-valeric acid is dehydrated into OL-oxo-£-methyl-n-valeric acid which are steps in microbial synthesis of i¹⁰* leucine. The purified enzyme prefers threo to erythro isomers and is distinct from several other known dehydratases. The significance of this dehydratase in plant^{**} is shown by conversion of a-acetolactic acid, O⁺S-di^{*} hydroxyisovaleric acid, and GK-oxoisovaleric acid into valine in presence of a crude extract and suitable co-factors. Similarly a#-dihydroxy-fi-methyl-n-valeric acid has furnished isoleucine. J.N.Ashley

- 305. REACTIONS OF SULPHUR CONTAINING AMINO ACIDS. I. DECOMPOSITION OF CYSTINE, CYSTEINE CYSTINE-DIHYDANTOIN. LANTHIONINE AND LANTHIONINE-DIHYDANTOIN IN AQUEOUS SOLUTIONS.** H.Zahn and E.Golsch: Hoppe-Seylers Z. physiol. Chem., 1962, 330, 38-45 (Techn. Hochschule Aachen, Germany). (German) LCorm*

- 306. ENZYMIC SYNTHESIS OF CYSTEINE FROM PHOSPHOSERINE AND SULPHIDE.** A.Sentenac, F.Chapey and P.Fromageot: Biochim. biophys. Acta, 1963, & 672-673 (Section Autonome Chim. Biol., Dépt. Biologie, Centre d'Etudes Nucléaires de Saclay, Gif-sur-Yvette, Seine et Oise, France). (French) B.M.Steven*

- 307. DEMONSTRATION AND CHARACTERISATION OF CYSTEINE SULPHOXIDE LYASE IN THE CRUCIFERAE.** M.Mazelis: Phytochemistry, 1963, 2, 15-22 (Dept. Food Sci. Technol., Univ. California, Davis, Calif., U.S.A.) An enzyme which degrades cysteine sulphoxides has been purified about 11-fold from ^{b1?c}_{11?1}^{co u} buds, and its prop, examined. The name⁺-alkylsufP^{w1n1y} alanine alkyl sulphenate lyase (deaminating) (cystein^{?es} sulphoxide lyase) has been proposed. B.H.DaVi

- 308. GLUTAMATE OXIDATION IN THE DIFFERENTIATING SLIME MOULD. I. IN VIVO.** B.E.Wright and S.Bard. n. IN VITRO. M.BrUhmtiller and B.E.Wright

Biochim. biophys. Acta. 1963. 71, 45-49. 50-57
 (John Collins Warren Lab., Huntington Mem. Hosp., Sj&ston, Mass., U.S.A.) I. During Dictyostelium discoideum differentiation the conversion of glutamate to CO₂/unit protein increased 7-fold and the concn. of intracellular glutamate increased approx. 10-fold. Alterations in the ratio of concn. of intracellular glutamate: Km of glutamic acid dehydrogenase accounted for the increase in glutamate oxidation.

II. Formation of CO₂ from glutamate was inhib. by anaerobic conditions both in vivo and in extracts in vitro. $\text{t}^2\text{-Oxoglutarate}$ was decarboxylated at the same rate as $\text{L}\text{-Glutamate}$ and competitively diluted out 14CO_2 from $\text{L}\text{-14C}]\text{glutamate}$. The rate of glutamate oxidation in vitro appeared to be substrate controlled throughout differentiation.

B.M.Stevens

³*9. EFFECT OF ANAEROBOSIS ON GLUTAMINE UTILISATION BY EHRLICH ASCITES TUMOUR CELLS. E.Kvamme and G.Svenneby: Cancer Res., 1963, 23, 291-299 (Ullevil Hosp., Central Lab., Oslo, Norway) Glutamine was metabolised faster aerobically than anaerobically. Equiv. amounts of NH₃ were formed in both cases. Aerobically, glutamine was accounted for largely as glutamate, aspartate and alanine, anaerobically only as glutamate. Cells preincubated in air showed higher aerobic glutamine utilisation than cells preincubated in N_2 . The latter increased their utilisation after a lag. Increased utilisation was not due to increased permeability of glutamine nor to effects on glutaminase I, transaminases, glutamine synthetase or L-amino acid oxidase. N^{32}P , malonate, transaconitate or AS2O₃ had little effect. Slutamine disappearance. AS2O₃ markedly reduced P^{32}Ue of O₂ uptake by glutamine. 10-3M Bromothymol blue stim. glutamate and NH₃ production in cells or homogenates aerobically or anaerobically.

B.M.Stevens

³*10. ENZYMIC CYCLISATION OF L-GLUTAMINE AND L-GLUTAMINYL PEPTIDES. M.Messer: Nature, Lond., 1963, 197, 1299 (Gastroenterol. Res. Unit, Royal Children's Hosp., Melbourne, Australia) Crude $\text{L}\text{-Glutaminyl peptidase}$ from papaya latex contains an enzyme which liberates ammonia from L-glutamine between pH 7-12 and forms Pyroglutamyl carboxylic acid, which was identified and chromatographically. D-glutamine was not affected, iodine action was not inhib. by dialysis, treatment with Na^+ -acetate or EDTA. Glutamine deriv. such as L-glutamyl-leucine and L-glutaminy-L-asparagine were N^{14}C -unlabelled and converted to ninhydrin-neg. compounds.

G.M.Lewis

³*11. GLUTAMINE SYNTHETASE. I A COMPARATIVE STUDY OF DISTRIBUTION IN ANIMALS AND ITS INHIBITION BY DL-ALLO-6-HYDROXYLYSINE. C.Wu: Comp. Biochem. Physiol., 1963, 8, 335-351 (Dept. of Med. Univ. Michigan Med. Sch., Ann Arbor, Mich. U.S.A.) A method for estimating the glutamine synthetase activity of tissues relying upon the Wirkung of the enzyme to form glutamylhydroxamate is described. Amongst vertebrates the brain was a constant source and in fact ureotelic reptiles and birds were the only source. Enzymic activity in the higher mammals and birds was obtained from liver, also in the mammal kidney, bird heart and liver of uricotelic animals. DL-Allo-6-hydroxylysine inhibited the synthetase activity; this was non-competitive with respect to glutamate.

M.S.Laverack

³*12. CRYSTALLINE L-ASPARTATE 4-CARBOXY-LYASE. M.Wilson: Biochim. biophys. Acta, 1963. 67. 345-

348 (Dept. Biochem., Univ. Leicester, England) The crystn. of the enzyme from an Achromobacter sp. and some of its prop. are described. Prelim, comm.

B.M.Stevens

313. GUINEA-PIG SERUM L-ASPARAGINASE. PROPERTIES, PURIFICATION AND APPLICATION TO DETERMINATION OF ASPARAGINE IN BIOLOGICAL SAMPLES. D.B.Tower, E.L.Peters and W.C.Curtis: J. biol. Chem., 1963, 238, 983-993 (Lab. Neurochem.. Nat. Inst. Neurol. Dis. and Blindness, Bethesda, Md., U.S.A.)

Asparaginase activity of guinea-pig serum is independent of strain, sex or dietary intake of asparagine, but it is a function of age. Sp. activities of neonatal sera are approx. 10% of the adult level, and there is a progressive rise with increase of age of the animals. The enzyme is purified approx. 200-fold in $IOP\%$ yield from serum. It has a high degree of specificity for L-asparagine and requires no cofactors. The optimum pH is 9*6.

J.N.Ashley

314. FORMATION OF BOUND PHOSPHOHISTIDINE FROM ADENOSINE [32p]TRIPHOSPHATE IN MITOCHONDRIA. J.B.Peter and P.D.Boyer: J. biol. Chem., 1963, 238, PC1180-1182 (Dept. Physiol. Chem., Univ. Minnesota, Minneapolis, Minn., U.S.A.)

AT32P when incubated with rat liver mitochondria forms [32p]phosphohistidine. ATP potentiates the ability of oligomycin and $\text{m}-\text{chlorocarbonyl cyanide phenylhydrazone}$ to inhibit the inorg. phosphate-ATP exchange reactions of mitochondria.

J.N.Ashley

315. BOUND PHOSPHOHISTIDINE AS INTERMEDIATE IN PHOSPHORYLATION REACTION OF OXIDATIVE PHOSPHORYLATION CATALYSED BY MITOCHONDRIAL EXTRACTS. J.B.Peter, D.E.Hultquist, M.DeLuca, G.Kreil and P.D.Boyer: J. biol. Chem., 1963, 238, PC1182-1184 (Dept. Physiol. Chem., Univ. Minnesota, Minneapolis, Minn., U.S.A.) Bound phosphohistidine is formed from AT³²p and from inorg. [32p]_pphosphate by a sol. enzyme system from rat liver. Thus a phosphorylation reaction of oxidative phosphorylation occurs which is independent of electron transport. The significance of the results and possible mechanisms of all of the inorg. P uptake reactions of oxidative phosphorylation are discussed.

J.N.Ashley

316. OCCURRENCE OF γ -HYDROXYARGININE IN PLANTS. E.A.Bell and A.S.L.Tirimanna: Nature, Lond., 1963, 197, 901-902 (Dept. Biochem., King's Coll., London, England) A guanidino compound found in extracts of the seeds of 17 spp. of Vicia was purified by ion exchange chromatography and identified as γ -hydroxyarginine.

G.M.Lewis

317. VARIATION OF ARGINASE IN LUNG TISSUE OF DOMESTIC ANIMALS. K.Lange and K.T.Kossman: Naturwissenschaften, 1963, 50, 21 (Physiol. Chem. Inst., Univ., Mflnster, Germany). AJ.Wansbrough

318. EFFECT OF HYDROXYLYSINE ON ASCITES CELL GROWTH IN VITRO. F.R.Leach: Exp. Cell Res., 1963, 29, 162-165 (Dept. Biochem., Oklahoma State Univ., Stillwater, Okla., U.S.A.) Hydroxylysine could not spare or replace lysine in the growth of ascites H cells in suspension, in contrast to its growth stimulating abilities and lysine-sparing action in micro-organisms. The lack of uptake was not the reason for its failure to replace or spare lysine, as shown by autoradiographic studies.

K.Jones

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319. ACTIVITY OF SERUM TRANSAMINASE AFTER CARNITINE ADMINISTRATION. E.Strack, Y.Han, H.Aurich and W.Rotzsch: Hoppe-Seylers Z. physiol. Chem., 1963, 331, 33-40 (Physiol.-Chem. Inst. Univ., Leipzig, Germany) The activities of alanine- and aspartate-transaminase in rat serum increase with small doses of ca mi tine but decrease with larger doses. Other possible factors for these activities have been eliminated. (German) I.Cornish
320. SERINE BIOSYNTHESIS FROM HYDROXYPYRUVATE IN PLANTS. J.E.Willis and H.J.Sallach: Phytochemistry, 1963, 2, 23-28 (Dept. Physiol. Chem., Univ. Wisconsin Med. Sch., Madison, Wis., U.S.A.) Serine is biosynthesised in plant extracts by a transamination reaction between L-alanine and hydroxypyruvate. L-alanine is the most active amino group donor of a no. of amino acids investigated. Green leaves are the richest source in plants of the transaminase enzyme. B.H.Davies
321. NON-ENZYMIC TRANSAMINATION BETWEEN ORNITHINE AND GLYOXYLATE. J.Cabello, C.Basilio, V.Prajoux and M.Plaza: Arch. Biochem., 1963, 100, 512-515 (Inst. Quím. Fisiol. Patol., Esc. Med., Univ. Chile, Santiago, Chile) Ornithine and glyoxylic acid transaminated spontaneously. Heating in the presence of Al markedly increased the reaction rate. The reaction appeared to be an Of-transamination yielding glycine and a-keto-6-aminovaleric acid. The latter was in equilibrium with its cyclic form A⁺-pyrroline-2-carboxylic acid. B.M.Stevens
322. FRACTIONATION OF HISTONES OF WALKER 256 CARCINOSARCOMA BY COMBINED CHEMICAL AND CHROMATOGRAPHIC TECHNIQUES. L.S.Hnilica and rf.Busch: J. biol. Chem., 1963, 238, 918-924 (Dept. Biochem., Baylor Univ. Coll. Med., Houston, Tex., U.S.A.) Four main fractions 2a, 2b, 1 and 3, which migrate with decreasing rates during electrophoresis in starch gel, are obtained from the histones. Arginine and glycine each constitute 12% of the total amino acid residues in fraction 2a. Lysine, serine, and alanine constitute 14, 10 and 10%, respectively, of the total amino acid residues in fraction 2b. This is the purest fraction and proline accounts for 81% of the total amino-terminal amino acids. Lysine and alanine constitute 27 and 18%, respectively, of the amino acid residues in fraction 1, which contains several amino-terminal amino acids. Arginine, alanine, glutamic acid, and leucine each comprise approx. 10% of the total amino acid residues in fraction 3, in which alanine is the main amino-terminal amino acid. There are marked differences in the sp. activities of the different histone fractions 1 hr. after injn. of L-[14c]lysine into tumour-bearing rats; the activities decreased in the order 3, 2a, 2b and 1. Thus the alkali sol. and 'residual' nuclear proteins are a complex mixture of proteins. J.N.Ashley
323. PHYSICO-CHEMICAL STUDIES OF THE PROT-AMINES. I. IRIDINE (FROM SALMO IRIDEUS). M.Gehatia and C.Hashimoto: Biochim. biophys. Acta, 1963, 69, 212-221 (Inst. Phys. Chem. Univ. Frankfurt am Main, Germany) A soln. of iridine from S. irideus in pH 7'3, 0.05M triethanolamine hydrochloride buffer was examined at 20° by ultracentrifugation, pycnometry, refractometry and viscometry. The estimated increment of JI was 1.91 when the concn. of iridine chloride was expressed in g./g. soln. The partial sp. vol. was 0.66 ml./g. jg was 0^b74. The diffusion coeff.. evaluated from the ultracentrifugal diagram by the method of max. gradient, was 13^b0 x 10⁻⁷. The mol. wt. was 4100. The intrinsic 1 was 8^b16. Assuming that the mol. behaved as a flexible rod, a diam. of 0^b76 m/i and a length of 10^b45 m/i were calc.
- (German) B.M.Stevens
324. PROTAMINE-HEPARIN COMPLEX AS A SUBSTRATE FOR PLASMIN. H.B.W.Greig and E.M.Cornelius: Biochim. biophys. Acta, 1963, 67, 658-668 (Coag. Res. Lab., South African Inst. Med. Res., Johannesburg, South Africa) A i. ethod for estimating the proteolytic activity of plasL-L* using a protamine-heparin complex as substrate is described. Optimum conditions of substrate concn., pH and temp, were determined. Digestion by plasminogen-streptokinase mixtures was shown to be biphasic. B.M.Stevens
325. SYNTHESIS OF PROTECTED HEPTAPEPTIDE RELATED TO EVOLIDINE [FROM LEAVES OF EVODIA XANTHOXYLOIDES]. N-BEJNZYLOXYCARBONYL-L-LEUCYL-L-PROLYL-L-VALYL-L-ASPARAGINYL-L-LEUCYL-L-SERYL-L-PHENYLALANINE BENZYL ESTER. H.Nesvadba and G.T.Young: Tetrahedron Letters, 1963, 6, 361-363 (Sanabo Res. Lab., Vienna, Austria) Letter. I.A.B.S.
326. TURNOVER OF LIVER GLUTATHIONE IN TRAUMA. S.C.Kalser and L.V.Beck: Biochem. J., 1963, 87, 618-623 (Dept. Pharmacol., Sch. Med., Univ., Pittsburgh, Pa., U.S.A.) GSH synthesis by the liver was studied in vivo in control and tourniquet-traumatised mice. Liver GSH was isolated, and (a) the rate of entrance of L-[³⁵S]cysteine into liver GSH (I) as well as (b) the rate of disappearance of 35s from liver GSH (II) were followed. In the studies in which (a) was measured* similar turnover times were observed for both groups. Since traumatised mice had lower concn. of liver GSH, the turnover rate for the groups of traumatised mice was only about one-half that of the control groups. Although results from the groups of traumatised mice showed similar turnover times for the controls and the groups of traumatised mice when measured by (a), the turnover times of control groups were much longer than those of the groups of traumatised mice when measured by (b). A possible explanation for this discrepancy is discussed. •
327. EVIDENCE FOR INTERMEDIATE IN SYNTHESIS OF γ -GLUTAMYL-a-AMENOBUTYRYLGLYCINE BY GLUTATHIONE SYNTHETASE. J.S.Nishimura, E.A. Dodd and A.Meister: J. biol. Chem., 1963, 238, PC1179-1180 (Dept. Biochem., Tufts Univ. Sch. Med., Boston, Mass., U.S.A.) In reaction mixtures that contain ATP and glutathione synthetase, γ -glutamyl-tt-aminobutyrate is converted, in absence (but not in presence) of an acceptor (such as NH₂OH, glycine), &^{to} an activated form, which is probably γ -glutamyl-O^{*}" aminobutyryl phosphate. J.N.Ashley
328. ENZYMIC INVESTIGATIONS OF PARTIALLY W*/* FIED HOG KALLIKREIN. D.A.Chambeis, C.Bosser, J.M.Greep and G.L.Nardi: Nature, Lond., 1963, 197, 1300-1301 (Dept. Surg., Harvard Med. Sch., Boston, Mass., U.S.A.) Kallikrein and trypsin can be differentiated by their activity towards synthetic substrates^a benzoyl arginine ethyl ester, benzoyl arginine methyl ester and toluene sulphonyl arginine methyl ester. G.M.^{ewte} A
329. ISOLATION AND STRUCTURE OF FORTUTTINE; * PEPTEDOLIPID OF MYCOBACTERIUM FORTUTTUM.

E.Vilkas, A.Miquel and E.Lederen Biochim. biophys. Acta, 1963, 70, 217-218 (Inst. Chim. des Substances Naturelles, Gif-sur-Yvette, Seine-et-Oise, France) The peptidolipid of M. fortuitum, contained only L-amino acids. Prelim, comm. (French) B.M.Stevens

^{330.} DETECTION OF PEPTIDES ON PAPER WITH PHENYL ISOTHIACONATE. I.Sjöquist and J.Sjöquist: Biochim. biophys. Acta, 1963, 71, 210-212 (Dept. Physiol. Chem., Univ., Lund, Sweden). B.M.Stevens

^{331.} SYNTHESIS OF THE C-TERMINAL TETRAPEPTIDE SEQUENCE DERIVED FROM GLUCAGON. H.C.Beyerman and J.S.Bontekoe: Rec. Trav. chim. Pays-Bas, 1962, 81, 699-709 (Org. Chem. Lab., Technische Hogeschool, Delft, Netherlands) The synthesis has ^{HS?} achieved of ^{*c*} tetrapeptide L-Leu-L-Met-L-Asp ^{H^A-L-Thr}. This has been achieved by the use of a ^{*S2}-butyl ester group to protect the terminal carboxyl F^{up} and by the use of a ^{tert}-butoxy group to protect the ^a-hydroxyl group of threonine. G.C.Barr

^{332.} TRICHLOROACETIC ACID-PRECIPITATED PROTEINS [TO GIVE THREE FRACTIONS] OF SEMINAL PLASMA IN BULL, BUFFALO AND GOAT [BEFORE AND AFTER STORAGE AT ROOM TEMPERATURE]. K.A.Abraham and P.M.Bhargava: J. Reprod. Fertil., p 1%3, 5, 277-280 (Reg. Res. Lab., Hyderabad, India) ^{fr**Um.} comm. H.E.H.Jones

^{333.} EFFECT OF ACID PRECIPITATION ON THE SOLUBILITY AND THE ELECTROPHORETIC CHARACTERISTICS OF PLASMA PROTEINS. K.A.Abraham and P.M.Bhargava: Indian J. Chem., 1963, 1, 124-130 (Reg. Res. Lab., Hyderabad, India). LA.B.S.

^{334.} STARCH-GEL ELECTROPHORESIS OF PIG SERUM PROTEINS. R.K.Scopes: Nature, Lond., 1963, 197, £201-1202 (Low Temp. Res. Sta., Downing St., Cambridge, England) Pig serum proteins may be separated in ^{22°/26°} components during 1 day by starch gel electrophoresis using a discontinuous buffer system in ^{ertical} apparatus; up to 10 samples may be characterized simultaneously. G.M.Lewis

^{335.} HAEMOGLOBIN, X. ANALYSIS OF THE α - AND β -CHAINS OF THE NORMAL HUMAN Hb FROM ITS TRYPSIN CLEAVAGE PRODUCTS. G.Braunitzer, Ph.Rudloff and N.Hilschmann: Hoppe-Seylers Z. physiol. Chem., 1963, 331, 1-32 (Max-Planck-Institut für Biologie, Münster, Germany) Selective enzymic hydrolysis of Pted ^{wi*} modern methods of peptide sequencing determination led to the full elucidation of the α - and β -chains of Hb. Expt. details are given. (German) L.Cornish

^{336.} EFFECT OF NEUTRAL SALTS ON THE LIGHT ABSORPTION AND MAGNETIC SUSCEPTIBILITY OF HEMOGLOBIN AND METHAEMOGLOBIN. bijSt. ^{Hele} H.J.Thiele and L.Scheler: Biochim. biophys. Acta, 1963, 661, 282-284 (Inst. Pharmakol., Univ. Greifswald, Germany) Prelim, comm. B.M.Stevens

^{337.} ULTRIPL P_H OF SOME MEMBERS OF THE HEMOGLOBINE FAMILY [SEPARATED BY STARCH GEL ELECTROPHORESIS]. H.Tsuyuki and R.E.A.Gadd: Biochim. biophys. Acta, 1963, 71, 219-221 (Fisheries Research Board of Canada, Technol. Station, Vancouver, B.C., Canada) Prelim, comm. B.M.Stevens

^{338.} NEW VARIANT OF ABNORMAL METHAEMOGLOBIN: Hb MRadom. K.Murawski, Z.Szymanowska and J.Kozlowska: Biochim. biophys. Acta, 1963, 69, 442-444 (Dept. Biochem., Inst. Haematol., Warsaw, Poland) The variant had different spectrochem. prop. from those of known Hb M types. Prelim, comm. B.M.Stevens

^{339.} ACETYLATED HUMAN Hb. E.Bucci, C.Fronticelli, L.Bellelli, E.Antonini, J.Wymaa and A.R.Fanelli: Arch. Biochem., 1963, 100, 364-368 (Inst. Biol. Chem., Univ. Rome, Italy) Prep. of varying degrees of acetylation were stable and spectroscopically indistinguishable from normal Hb in the visible region. Mol. wt. appeared to be reduced to approx. half the normal at higher degrees of acetylation. Isoelectric points shifted downwards to pH 3*5-5.0 depending on the degree of acetylation. At approx. $SQfJo$ acetylation, the highest achieved, the protein still combined reversibly with 02 but the value of the coeff. n of the Hill equation was reduced and became dependent on pH. The value of the log. of p_f was below normal and tended to be independent of pH. The no. of SH groups titratable with jg-mercuribenzoate was reduced to 0. B.M.Stevens

^{340.} REDUCTION OF HUMAN FERRIHAEMOGLOBIN A IN THE PRESENCE OF Cysteine AND THE EFFECT OF CARBON MONOXIDE. W.R.Holmquist and J.R.Vinograd: Biochim. biophys. Acta, 1963, 69, 337-354 (Gates and Crellin Lab. Chem., Pasadena, Calif., U.S.A.)

The rate of reduction in the presence of cysteine was studied as a function of Hb level, cysteine level, temp., pH, ionic strength, stereospecificity, atm. composition and method of Hb isolation. A mechanism is suggested. CO inhib. the reduction. In the absence of other reductants, ferriHb was reduced by CO, the rate of such reduction being accelerated by u.v. light. Evidence for the formation of a ferriHb-NH₃ complex in aq. soln. is described. Extinction coeff. for several Hb compounds at various X are given. B.M.Stevens

^{341.} PURIFICATION OF γ -GLOBULIN FRAGMENTS BY GEL FILTRATION. M.Tan and W.V.Epstein: Science, 1963, 139, 53-54 (Dept. Med., Univ. California Sch. Med., San Francisco, Calif., U.S.A.) Sephadex was used to separate the 3*5 S univalent fragments of human γ -globulin from 7 J5 bivaTent globulin after digestion with papain. G.M.Lewis

^{342.} SOME PHYSICAL STUDIES ON THE TWO α -GLYCOPROTEINS OF FOETAL CALF SERUM. K.J.Turner: Biochim. biophys. Acta, 1963, 69, 518-523 (Commonwealth Serum Lab., Melbourne, Australia) The major component had an ϵ of 3*4 and a mol. wt. of 47000. The minor component, a macroglobulin, had an ϵ of 20 and a mol. wt. of 990000. It is suggested that the macroglobulin may be an aggregate of die 3*4.3 fraction. B.M.Stevens

^{343.} INTERACTION OF HUMAN PLASMA ALBUMIN AND REDUCED GLUTATHIONE [GSH]. L.Libenson and M.Jena: Arch. Biochem., 1963, 100, 441-450 (Div. Med., Western Pennsylvania Hosp., Pittsburgh, Pa., U.S.A.) Albumin was reduced on incubation with GSH at pH 2*5-4*7 to a product with the electrophoretic mobility of the plasma O_L-globulins. No reaction between albumin S-S and GSH occurred at pH 2*0 or pH 5*0-9*0. Reduction and electrophoretic modification gave similar pH curves with optima at approx. pH 3*6. The curves were similar to those for the activity of intracellular proteinases activated by GSH. Behaviour of albumin

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towards GSH at various pH in the presence of urea indicated that the reactivity of GSH and the accessibility of protein S-S were limiting factors in the reaction. Mixed disulphides appeared to be formed during the reduction reaction. These were stable at low pH and readily decomposed in slightly alk. soln. B.M.Stevens

344. SEPARATION OF POLYPEPTIDES BOUND BY ALBUMIN IN HUMAN PLASMA. A.L.Rubin, G.D. Lubash, K.F.Aronson and P.F.Davison: *Nature*, Lond., 1963, 197, 1009-1010 (Dept. Med., Cornell Univ. Med. Coll., New York, U.S.A.) Dialysis of human albumin against 1 N acetic acid caused the release of up to 10% peptide material due, presumably, to exposure of binding sites by change of configuration of the albumin to expanded form. The peptides released had an amino acid composition quite distinct from that of albumin itself, which did not suffer any hydrolytic or proteolytic breakdown. The results support the view that albumin has an important function in the transport of biol. active polypeptides.

G.M.Lewis

345. ISOLATION OF HUMAN THROMBIN [FROM PLASMA FRACTION HO]. K.D.Miller and W.H.Copeland: *Proc. Soc. exp. Biol.*, N.Y., 1962, 111, 512-514 (Div. Labs, and Res., New York State Dept. Hlth., Buffalo, N.Y., U.S.A.) M.M.Shapland

346. TRANSFORMATION OF FIBRINOGEN INTO FIBRIN. I. KINETICS OF THE pH CHANGE ASSOCIATED WITH THE CLOTTING OF FIBRINOGEN. E.Mihalyi and I.H.Billick: *Biochim. biophys. Acta*, 1963, 71, 97-108 (Lab. Cellular Physiol. and Metab., Nat. Heart Inst., Bethesda, Md., U.S.A.) When the initial pH was 5.5-8*0 the reaction followed first order kinetics. Above pH 8.0 two reactions were apparent, 1 producing and the other absorbing H⁺. This biphasic curve could be analysed in terms of 2 consecutive first order reactions. The rate of the reaction below pH 8 and of the first reaction above were concluded to be equal to the rate of the proteolytic step, whereas the rate of the second reaction above pH 8 is concluded to be equal to the rate of the polymerisation step.

B.M.Stevens

347. PURIFICATION OF HUMAN PLASMINOGEN AND PLASMIN BY GEL FILTRATION ON SEPHADEX AND CHROMATOGRAPHY ON DIETHYLAMINOETHYL-SEPHADEX. K.C.Robbins and L.Summaria: *J. biol. Chem.*, 1963, 238, 952-962 (Biochem. Res. and Development Dept., Michael Reese Res. Foundn., Chicago, IL, U.S.A.) Plasminogen is prep, in very pure form from human plasma Fraction 1112*3 by a modification of Kline's method followed by either gel filtration through Sephadex or chromatography on DEAE-Sephadex. Plasminogen of the same purity can also be prep, by direct chromatography of extracts of the same plasma fraction on DEAE-Sephadex. These methods are simple and reproducible and they give excellent yields. Very pure plasmin, prep, by activation of the proenzyme with a trace of urokinase in glycerol, is isolated by chromatography on DEAE-Sephadex. Plasminogen and plasmin are prep, with sp. activities of 19*5 and 21*4 casein units per mg. of protein, or 123 and 140 casein units per mg. of N, respectively. The proenzyme and enzyme are homogeneous immunochem. and in the ultracentrifuge, but they are heterogeneous electrophoretically.

J.N.Ashley

348. ISOLATION OF PHOSVTIN FROM THE PLASMA OF THE LAYING HEN. P.J.Heald and P.M.McLachlan:

Biochem. J., 1963, 87, 571-576 (Twyford Lab. Ltd., Twyford Abbey Road, London, England) Phosvitin has been isolated from the plasma of the untreated laying hen by a simple procedure. The overall yields vary from 39 to 67% of the phosphoprotein P present in the original plasma samples. The material isolated contains 10*07 P and 11*02% N. The amino acid composition is identical with that of yolk phosvitin. The sedimentation constant, s_{20,w}, of 3*11 agrees with that of authentic

**20, w,

*

yolk phosvitin, and the rate of release of phosphate on acid hydrolysis is also similar to that of phosvitin. It is pointed out that phosvitin in the plasma probably exists in a complex chem. different from that in the yolk.

349. INVESTIGATIONS OF SUINT. I. COMPOSITION OF ORGANIC ACIDS FROM FLEECES OF DIFFERENT ORIGIN. C.Kowala, Z.H.Kranz and K.E.Murray: *Aust. J. Chem.*, 1962, 15, 832-840 (Div. Org. Cheifc C.S.I.R.O. Chem. Res. Labs., Melbourne, Australia)

Procedure for isolating the bulk of water-sol. suint acid⁵ from 7 wool samples is described. These are methylated and when examined by gas chromatography, 23 amino acids were identified. Large qual. and quant. difference were found between samples, and the composition of ay samples was complex.

D.G.Upshaw

350. ELASTASE AND ELASTIN. II. PARTIAL PURIFICATION AND PROPERTIES OF ACTIVATION OF PRO-ELASTASE. F.Lamy and S.Tauber: *J. biol. Chem.*, 1963, 238, 939-944 (Dept. Anat., Univ. Pittsburgh Sch. Med., Pa., U.S.A.) Proelastase of pig pancreas is purified 40-fold; the product is contaminated with chymotrypsinogen but not with trypsinogen. Activate proelastase requires active trypsin; the reaction is rapid and is proportional to concen. of proelastase (with excess of trypsin), and to trypsin (up to 75% of complete activation). Approx. 1*1 fig. of trypsin is needed for each P₁₀ elastolytic unit activated. An assay for proelastase is described; trypsin in large excess, proelastase, and elastin are mixed, and the amount of sol. polypeptid liberator by the action of the newly formed elastase OP₁₀ elastin is determined.

J.N.Askey

351. CHARACTERISATION OF A NEW TYPE OF C₂O⁵⁻ LINKAGE IN RESILIN, A RUBBER-LIKE PROTEIN. S.O.Andersen: *Biochim. biophys. Acta*, 1963, 67, 249-262 (Zoophysiol. Lab. B, Univ. Copenhagen, Denmark) Native resilin showed a bright blue fluorescence due to 2 compounds connected to the P₁₀; but liberated by prolonged acid or alk. hydrolysis. UV-absorption spectra showed max. at 286 and 283 mμ respectively in acid and at 322 and 317 mμ in alkali. The shift occurred near neutrality and was accompanied by increased fluorescence. Spot tests indicated both were α-amino acids with a phenolic group. Tests for diphenols ana maoie nuciei were neg. One compound was a diamine dicarboxylic acid, the other a triaminotricarboxylic acid. In resilin the NH₂ of the compounds did not react with dinitrofluorobenzene. The degree of cross-linking from amounts of the 2 compounds agreed with resilin from physical measurements.

J.N.Ashley

352. EFFECT OF IONS ON THE GLUTAMIC DEHYDRO-GENASE REACTION. A.Péna-Díaz, A.Gómez-Puyou and J.Guzmán-García: *Arch. Biochem.*, 1963, 100, 426-430 (Dept. Bioquím., Fac. Med., Univ. Nac. Autónoma México, Ciudad Universitaria D.F., Mexico) Glutamic dehydrogenase activities of rat liver homogenate

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and rat liver acetone dried powders or activity of the ^CYst. enzyme were higher in the presence of phosphate and Na than with phosphate and K. A similar but greater effect was apparent when SO₄ replaced phosphate. When Cl⁻ replaced phosphate, activity was slightly higher with K than with Na. Km and results with different substrates indicated that the ions affected the participation of α-oxoglutarate. Na and K had no effect on ^{J*} activities of cryst. lactic and malic dehydrogenases under similar conditions.

B.M.Stevens

35a. LOW MOLECULAR WEIGHT FORMS A TYPE A BOTULINUM TOXIN. II. ACTION OF PEPSIN ON INTACT AND DISSOCIATED TOXIN. J.Wagman: Arch. Biochem., 1963, 100, 414-421 (U.S. Army K Biol. Lab., Fort Detrick, Frederick, Md., U.S.A.) Fwied type A toxin with a mol. wt. of approx. 900000 ^{**\$} irreversibly dissociated at pH 9-2 with little loss in toxicity. The principal component formed had an S ^{???}. No reaggregation was observed on readjustment to pH 3.8. Intact toxin was highly resistant to pepsin but the ⁵-toxin was extensively degraded. A considerable amount of toxicity was retained. In some expt. significant quantities of these toxic fragments diffused through cellulose dialysing membranes.

B.M.Stevens

35b. DETERMINATION OF THE MOLECULAR WEIGHT OF POLY-L-LYSINE. A.Yaron and A.Bergen: Biochim. biophys. Acta, 1963, 69, 397-399 (Dept. Biophys., Weizmann Inst. Sci., Rehovoth, Israel) The poly-lysine was either converted to polycarbobenzoyllysine, ^{2e} intrinsic ^{*?} of which was determined in dimethyl-¹⁴C amide or ^v measurements were made on polylysine ¹⁴C bromide in salt-free aq. soln.

B.M.Stevens

35c. EFFECT OF TRYPSIN ON LIVER MICROSOMES. (Lust and P.Drochmans: J. cell Biol., 1963, 16, 81-^{*2} (Cancer Res. Inst., Univ. California Med. Center, San Francisco, Calif., U.S.A.) Livers of Wistar rats were homogenised in unbuffered 0.25M sucrose PH ⁷ isotonic soln. of NaCl and veronal-acetate-HCl at 7%⁵, and centrifuged. The microsomal fractions were suspended and incubated with 4.0-15.0 mg. trypsin and in 10% tris buffer fixed in OSO₄ and embedded in agarose followed by methacrylate. The trypsin removed ¹⁴C from the ⁸h surfaced vesicles and the total contents of the pellet were decreased. Homogeneous? Particles which occur within the smooth vesicles to ¹⁴C in densely with phosphotungstic acid sediment on ¹⁴C-microsome pellet and remain unchanged by ^{ps}m treatment.

P.Barow

35d. DIFFERENT STRUCTURAL FORMS OF REVERSIBLY DISOCUTED GLUTAMIC DEHYDROGENASE: RELATION BETWEEN ENZYMIC ACTIVITY AND MOLECULAR WEIGHT. C.Frieden: Biochem. biophys. Res. Comm., 1963, 10, 410 (Dept. Biol. Chem., Washington Univ. Sch. Med., St. Louis, Mo., U.S.A.) Compounds which dissociate glutamic dehydrogenase at high enzyme concn. also inhibit enzyme activity. Posed that these compounds cause a change in formation of the sub-units.

B.Ketterer

35e. FRACTIONAL SOLUBILISATION OF HAEMOPROTEINS AND PARTIAL PURIFICATION OF CARBON MONOXIDE BINDING CYTOCHROME FROM [RABBIT] LIVER MICROSOMES. T.Omura and R.Sato: Biochim. biophys. Acta, 1963, 71, 224-226 (Inst. Protein Res., Osaka Univ., Kita-ku, Osaka, Japan) Two haemoproteins were successfully separated. Prelim. comm.

B.M.Stevens

358. ISOLATION AND CHARACTERISATION OF URINARY γ-GLOBULINS. P.Cornillot, R.Bourillon, J.Michon and R.Got: Biochim. biophys. Acta, 1963, 71, 89-96 (Lab. Biochim., Fac. Med., Paris, France)

The γ-globulin fraction obtained by pptn. with 2M (NH₄)₂SO₄ and DEAEcellulose chromatography was separated by chromatography on Sephadex G-100 into several ultracentrifugally homogeneous components of differing mol. wt. Urinary ⁷γ γ-globulin showed the same physico-chem. and immunochem. characteristics as plasmatic γ-globulin. The ^{3.5} JJ globulin differed in immunochem. behaviour and mol. wt. The ^{2.2} γ-globulin was slightly antigenic and contained more glucides than the other 2 fractions. No γ-globulin with j > lower than 2 was found in urine.

(French) B.M.Stevens

359. COMPOSITION OF BOVINE SUBMAXILLARY MUCINS. W.Pigman and Y.Hashimoto: Biochim. biophys. Acta, 1963, 69, 579-580 (Biochem. Dept., New York Med. Coll., New York, U.S.A.)

B.M.Stevens

360. COW'S K-CASEIN. CHARACTERISATION OF THE RENNIN-SENSITIVE LINKAGE. P.Jollès, C.Alais and J.Jollès: Biochim. biophys. Acta, 1963, 69, 511-517 (Lab. Chim. biol., Fac. Sci., Univ. Paris, France)

K -Casein was reduced by LiBH₄. A ppt. and a supernatant containing a substance sol. in 12% TCA and not dialysable were obtained and seemed to be closely related to para-7t-casein and K-caseino-glycopeptide respectively. Phenylalaninol was detected in the ppt. LiBH₄ appeared to reduce the rennin sensitive linkage in Ji -casein. This appeared to be an ester linkage involving the carboxyl group of the C-terminal phenylalanine residue of para-Jt-casein. (French) B.M.Stevens

361. SHAPE AND VOLUME OF THE CRYSTAL OF D-AMINO ACID OXIDASE MICHAELIS COMPLEX.

K.Yagi and T.Ozawa: J. Biochem., Tokyo, 1963, 53, 162-163 (Dept. Biochem., Sch. Med., Nagoya Univ., Japan).

B.M. Stevens

362. PURIFICATION OF CYTOCHROME $\frac{c}{2}$ AND OTHER HAEMOPROTEINS FROM WHEAT GERM.

A.R.Wasserman, J.C.Garver and R.H.Burris: Phytochemistry, 1963, 2, 7-14 (Dept. Biochem., Coll. Agric., Univ. Wisconsin, Madison, Wis., U.S.A.)

A large-scale method has been described for the extraction and purification of cytochrome $\frac{c}{2}$ as well as some other haemoproteins, from wheat germ. The quantities isolated were sufficient for extensive physical and chem. studies.

B.H.Davies

363. DISTINCTION OF CYTOCHROMES A AND $\frac{c}{2}$ BY CHEMICAL REACTIVITY. M.Morrison and S.Horie: Biochim. biophys. Res. Comm., 1963, 10, 160

(Dept. Biochem., Med. Res. Inst., City of Hope Med. Center, Duarte, Calif., U.S.A.) Evidence is presented to show that in a purified cytochrome oxidase prep, there are 2 cytochrome components, one which combines with CO and the other which does not. These correspond to cytochromes $\frac{c}{2}$ and $\frac{a}{2}$ respectively.

B.Ketterer

364. ELECTRON TRANSFER SYSTEM. II. BINDING OF CYTOCHROME $\frac{c}{2}$ BY RECONSTITUTED NADH₂ OXIDASE. S.H.Richardson and L.R.Fowler: Arch. Biochem., 1963, 100, 547-553 (Inst. Enzyme Res., Univ. Wisconsin, Madison, Wis., U.S.A.) A reconstituted NADH₂ oxidase complex bound varying amounts of cytochrome $\frac{c}{2}$. Addition of cytochrome $\frac{c}{2}$ above a

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certain const. level did not further increase NADH₂ oxidase activity. Evidence for interaction between the polybasic cytochrome protein and particle bound phospholipid is presented. A bound form of cytochrome c was shown to be necessary for NADH₂ oxidase activity.

B.M.Stevens

365. ACTOMYOSIN-LIKE PROTEIN IN MITOCHONDRIA OF THE MOUSE LIVER. S.A.Nefakh and T.B.Kazakova: Nature, Lond., 1963, 197, 1106-1107 (Lab. Enzymol., Dept. Biochem., Inst. Expt. Med., Kirovski Prospect 69/71, Leningrad, U.S.S.R.) An actomyosin-like

protein could be extracted from mouse liver mitochondria, which polymerised on addition of very small amounts of myosin A and showed ATPase activity. It is considered that this protein, through its contractility, regulates die permeability of the mitochondrial membrane, releasing factors which stimulate cytoplasmic glycolysis when ATP concn. is diminished. The actomyosin-like protein could not be extracted from cancer cells.

G.M.Lewis

366. OPTICAL-ROTATORY DISPERSION OF MYOSIN A. II. EFFECT OF DIOXANE AND JJ-CHLOROMERCURIBENZOATE [PCMB]. Y.Tonomura, K.Sekiya and K.Imamura. m. **EFFECT OF ATP AND INORGANIC PYROPHOSPHATE [PPi].** Y.Tonomura, K.Sekiya, K.Imamura and T.Tokiwa: Biochim. biophys. Acta, 1963, 69, 296-305, 305-312 (Res. Inst. for Catalysis. Fac. Sci., Hokkaido Univ., Sapporo, Japan)

II. Myosin A a-helical content, estimated from bo in the Moffitt-Yang plot, was 57-61%. Addition of 8-10 vol. % dioxane to myosin A in 0.6M KCl at pH 7*0 initially increased the helical content by several % and activated ATPase. Helical content and ATPase activity then decreased gradually. After 2 hr. the helical content had decreased by a few % but ATPase had disappeared. Immediately after dioxane addition, sp. rotatory power at 500*0 mji showed a max. at approx. 10% dioxane as did ATPase activation. The helical content of alk. inactivated myosin remained const. PPi prevented dioxane altering the helical content. 3-4 moles PCMB/105 g. myosin A increased ATPase max. velocity at 20° from 0.22 to 0.44 mmoles inorg. phosphate/min./g. and Km from 1^B3 to 1.5 x 10⁻⁴M. Temp. dependence of max. velocity increased. 8 moles PCMB inhib. ATPase. Helical content rose after 4 moles PCMB and fell after 8. In Spectrophotometric titrations indicated that in 0.5M KCl 'abnormal' tyrosine increased from 3.6-3.7 moles to 6.2-7.0 moles and 5.5 moles/10⁵ g. protein respectively on adding PPi or ATP. EDTA gave no change. In 0.5M NaCl 'normal' and 'abnormal' tyrosine could not be distinguished and adding ATP gave no significant change in the dissociation state of tyrosine. The electrostatic interaction factor of the dissociation of 'normal' tyrosine was measured under various conditions. In 0.6M KCl PPi decreased the helical content while ATP increased it by several %. ADP gave no change. In 0.6M NaCl, ATP increased the helical content by several % with or without Mg and even in the presence of EDTA.

B.M.Stevens

367. POST-MORTEM LABILITY OF SKELETAL MUSCLE PROTEINS. R.K.Scopes and R.A.Lawrie: Nature, Lond., 1963, 197, 1202-1203 (Low Temp. Res. Sta., Cambridge, England) Several protein components of the sarcoplasmic complex in pig and beef muscle are unstable and either denature or are isoelectrically precipitated by the post-mortem pH fall in muscle, both if this is extensive (low ultimate pH) and/or fast. Many of the constituents are stable and show no diminution in starch gel patterns.

G.M.Lewis

368. INTERMOLECULAR DEFECT OF COLLAGEN IN EXPERIMENTAL LATHYRISM. J.Gross: Biochim. biophys. Acta. 1963, 71, 250-252 (Dept. Med.. Harvard Med. Sch.. Massachusetts Gen. Hosp., Boston. Mass., U.S.A.) Extracted lathyritic collagen readily formed striated fibrils in vitro on warming to body temp., but the fibrils did not become insol. with time as did normal collagen. Prelim, comm.

B.M.Stevens

369. ELASTIC COAT OF THE ARTERIAL WALL STUDIED WITH THE AID OF COLLAGENASE. O.Hassler, M.Wiren and S.Herbertsson: Acta path. microbiol., scand., 1963, 57, 15-20 (Histol. Dept., Univ. Uppsala. Sweden) Collagenase digests native collagen at physiol. temp. and pH. This enzyme produces an effective isolation of the elastic component, which suffered less alteration than after treatment with acids or alkali. The only change that could be found by histo-chem. examination was that a pos. but non-sp. SH-reaction was obtained after digestion.

I.Friedmann

370. TROPOCOLLAGEN: SIGNIFICANCE OF PROTEASE-INDUCED ALTERATIONS. A.L.Rubin, D.Pfahl, P.T. Speakman, P.F.Davison and F.O.Schmitt: Science. 1963, 139, 37-38 (Dept. Biol.. M.I.T.. Cambridge. Mass., U.S.A.) Purified tropomyosin from calf or guinea-pig skin was treated with pepsin. Terminal or near terminal covalently bonded peptides were liberated whose amino acid composition was strikingly different from the composition of the pepsin-resistant triple-helix body of the macromol. Pepsin also converted most of the j8- to a-chains, suggesting that the interchain link is a external to the body of the mol. and probably involves peptides. The role of these prop. in bioregulatory mechanisms is briefly discussed.

G.M.Lewis

371. INTERFERENCE BY AMMONIUM SULPHATE WITH THE ESTIMATION OF PROTEINS BY THE BIURET REACTION. P.G.Stanley: Nature, Lond., 1963, 187, 1108 (Wellcome Lab. the Unit Clin. Invest.. Royal North Shore Hosp. of Sydney. Crow's Nest, N.S.W., Australia) A concn. of as little as 0.08M (NH₄)₂S₀* in a sample of egg albumin interferes appreciably with the estimation of protein of the biuret reaction.

GMM

372. EXTENT OF REDUCTION OF WOOL PROTEINS 0* THIOLS. J.A.Maclaren: Aust. J. Chem., 1962, 15, 824-831 (Div. Prot. Chem.. C.S.I.R.O. Wool Res. Labs.. Parkville, Victoria, Australia) Carboxy-methylation of reduced Merino wool and estimation of the residual disulphide was used to measure the reduction of disulphide groups by dil. soln. of ethanethiol, benzenethiol, toluene-CU-thiol, aminoethanethiol, ¹⁴C₆H₅SH and cysteine, in aq. n-propanol, the wool fibres remaining intact throughout the process. Toluene-CU-thiol was the most effective thiol giving 92% reduction in 2 days, increasing to 99% with repeated reduction-carboxymerinylation cycles. Lincoln 36's wool was 100% reduced after 2 cycles.

D.G.Upal

373. BINDING OF CARBOHYDRATE COMPONENTS IN PROTEINS. F.Michael, E.-A.Ostmann and G.W.Müller: Tetrahedron Letters, 1963, 2, 115-119 (Org.-Chem. Inst. Univ., Münster, Westf., Germany) Mild hydrolysis of pure albumin, and also of a glycopeptide, led to the isolation of a peptide of the pepopeptide ¹⁴N-LL-asparagyl-β-D-glucosamine. This linkage is probably of general occurrence in proteins.

(German)

I.A.B.S.

OBSERVATIONS OF THE MECHANISM OF FIBRINOLYSIS IN A TWO PHASE SYSTEM. R.E.Max-Well, V.Lewandowski and V.S.Nickel: Biochem. biophys. Res. Comm., 1963, 10, 150 (Res. Lab., Park Davis and Co., Ann Arbor, Mich., U.S.A.) Lysis of * Preformed clot of fibrin was found to depend on contact time as well as concn. and phase distributions of plasminogen activator and inhibitor.

B.Ketterer

ACTION OF N-BROMOSUCCINIMIDE ON HUMAN Hb AND ITS POSSIBLE BEARING ON HAEM-GLOBIN LINKAGE. G.J.S.Rao and H.R.Cama: Biochim. biophys. Acta, 1963, 71, 139-149 (Dept. Biochem., Indian Inst. Sci., Bangalore, India) Reaction of N-bromosuccinimide with the haem groups of Hb brought about the appearance of the characteristic absorption peaks of Hb and release of inorg. Fe from the haem groups. Urea was necessary for reaction at pH 4.0 but not at pH 7.0. The spectrum showed no peak in the Soret region at pH 7.0 unless urea or sucrose were present. 8M urea produced effect at pH 3.5-4.5. From this and the dependence of the release of inorg. Fe on the urea concn. it is tested that haem groups are 'buried' within the globin B.M. Stevens

INTERACTION OF BROMOTHYMOL BLUE WITH Hb AND ITS EFFECT ON THE OXYGEN EQUILIBRIUM. J.Antonini, J.Wyman, R.Moretti and A.Rossi-Fanelli: Biol. Aim. biophys. Acta, 1963, 71, 124-138 (Inst. Biol. Chem., Univ. Rome, Italy) The affinity of the dye was much greater for the deoxy- than for the oxy-form of human Hb. The dye had a marked effect on O₂ equilibrium. This difference in behaviour was not seen in myoglobin or in those modified forms of Hb which have simple hyperbolic O₂ equilibrium curves. B.M. Stevens

DENATURATION OF PROTEINS. IV. CONALBUMIN AND FERRIC-CONALBUMIN IN UREA SOLUTION, A.N.Blazer and H.A.McKenzie: Biochim. biophys. Acta, 1963, 71, 109-123 (Physico-chem. Unit, Univ., Sydney, Australia) At pH below 4.2 conalbumin undergoes reversible changes in optical rotation, sedimentation and extent depending on ionic strength and concentration, greatly increased by urea. At pH 5.8-7.8, urea produces disorganised conalbumin producing rotation and ν changes. Fe-conalbumin changes pH 8 pI. Fe-conalbumin was also more stable at pH 9.0. Expt. with cysteine indicated S-S stabilised. Acid and urea produced similar rapid changes in the Fe-conalbumin u.v. spectrum tyrosine and tryptophan region; Fe-albumin changes were slower. The absorbancy of Fe-conalbumin at 292 m μ in cone. urea soln. order. At pH 5.9 and 30° apparent order with to urea was 14. Changes in Fe-conalbumin with Hg^{2+} PH 9.6-10.2 were irreversible. Prelim, expt. on min 'renaturation' are described. B.M.Stevens

GENERAL REACTION OF DFP WITH PROTEINS. I. DIRECT EFFECT ON ENZYMIC ACTIVITIES, T. urachi: Biochim. biophys. Acta, 1963, 71, 239-255; ²DePt. Biochem., Nagoya City Univ. Sch. Med., ²ya, Japan) Prelim, comm. B.M.Stevens

EFFECT OF UREA ON BEHAVIOUR OF THE PROTEIN "MOIETY" OF HUMAN SERUM CL-LIPOPROTEINS IN SOLUTION. S.S.Sanbar and P.Alaupovic: Biochim. Biophys. Acta, 1963, 71, 235-236 (Cardiovascular Res. Sta., Oklahoma Med. Res. Inst., Oklahoma City, U.S.A.) The isolated protein appeared to be

a monomer which aggregated in 0.15M NaCl, phosphate buffer or barbital buffer; addition of urea or a pH increase produced a partial dissociation to the monomeric form without denaturation. Prelim, comm.

B.M.Stevens

380. TITRATION BEHAVIOUR OF DIMETHYLAMINO-NAPHTHALENE-PROTEIN CONJUGATES [i.e. CONJUGATES WITH BOVINE PANCREATIC RNase AND EGG WHITE LYSOZYME]. M.Young: Biochim. biophys. Acta, 1963, 71, 206-208 (Lab. Cell. Physiol. and Metab., Nat. Heart Inst., Bethesda, Md., U.S.A.)

B.M.Stevens

381. Jb-TYPE CYTOCHROMES FROM MUNG BEAN SEED-LINGS, m. STRUCTURE OF CYTOCHROME b 555. H.Shichi, D.P.Hackett and G.Funatsu. IV. PURIFICATION AND PROPERTIES OF CYTOCHROME J23 (b-559). H.Shichi, H.E.Kasinsky and D.P.Hackett: J.biSl. Chem., 1963, 238, 1156-1161, 1162-1166 (Dept. Biochem.. Univ. California, Berkeley, Calif., U.S.A.) m. The mol. wt. of cytochrome Jb-555 is approx. 13500; 1 mol. of protohaem is present. Hydrolysis gives 122 amino acids and 12 mol. of NH₃ per mole of protein; there are considerably more acidic- than basic-amino acids. Native cytochrome Jb-555 has no free titratable thiol groups, but 6 are present after reduction with NaBH₄. Disulphide linkages are probably involved in maintenance of the tertiary structure of the protein. The amino-terminal amino acid is probably alanine. Alanine, glycine and serine are obtained after hydrazinolysis. The nature of the linkage between protohaem and apocytochrome b-555 is examined by testing the ability of a modified prosthetic group or apoprotein to reconstitute the cytochrome. Protohaem Fe, the carboxyl groups of protohaem, and histidine in the protein are all probably involved in the binding.

IV. A £-type cytochrome, which appears to be identical with cytochrome J₂₃, and which has absorption max. at 559, 529, and 425 m μ in the reduced form, is isolated from the sol. fraction of etiolated mung bean seedlings. Purification of cytochrome J23 from broad bean leaves is effected by chromatography on DEAE- and CM-cellulose. Cytochrome Jb3 is partially sol. in sat. (NH₄)₂SO₄ at pH 5.0. It is readily reduced by Na₂S₂O₄, cysteine and ascorbic acid. It is autoxidisable; the reduced form does not combine with CO. The prosthetic group is protohaem, and the mol. wt. is estimated to be approx. 28000.

J.N.Ashley

382. CROSS-LINKING OF COLLAGEN AND GELATIN DURING ACETYLATION. J.Bello and H.R.Bello: Biochim. biophys. Acta, 1963, 69, 562-564 (Dept. Biophys., Roswell Park Mem. Inst., Buffalo, N.Y., U.S.A.)

B.M.Stevens

383. CONSTITUTION OF THE CROSS-LINKAGES IN ELASTIN. S.M.Partridge, D.F.Elsden and J.Thomas: Nature, Lond., 1963, 197, 1297-1298 (Low Temp. Res. Sta., Cambridge, England) A purified yellow fluorescent peptide obtained from elastin after treatment with proteolytic enzymes followed by amino- and carboxy-peptidases was analysed and found to contain glycine, alanine and proline in the ratio 1:1:2 and small quantities of other amino acids. Evidence from titration, end-group assays and formation of DNP deriv. indicated that, in the native protein, 3 or 4 peptide chains spring from 2 carboxyl and 2 amino groups in the chromophore, thus generating the cross-linked structure. A prelim, examination of the products of acid hydrolysis of the coloured peptide has been made.

G.M.Lewis

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- 384. PRESENCE OF PHOSPHATE-MEDIATED CROSS-LINKAGES IN HARD TISSUE COLLAGENS.** A.Veis and R.J.Schlueter: *Nature, Lond.*, 1963, 197, 1204 (Dept. Biochem., Northwestern Univ. Med. Sch., Chicago, 111., U.S.A.) Bovine dentine collagen, decalcified with EDTA exhibits markedly different swelling and solubility characteristics in comparison with bovine corium collagen, although resembling it in amino acid and carbohydrate composition. Dentine collagen contained 0*4% residual P, probably in the form of PO₄, though resistant to the action of venom and spleen phosphodiesterases. The unusual prop. of dentine collagen may be ascribed to the presence of cross linkages mediated by PO₄-groups. G.M.Lewis
- 385. RECOVERY OF THE INTACT STRUCTURE OF TAKA-AMYLASE A [TAA] AFTER REDUCTION OF ALL DISULPHIDE LINKAGES IN EIGHT MOLAR UREA.** T.Isemura, T.Takagi, Y.Maeda and K.Yutani: *J. Biochem., Tokyo*, 1963, 53, 155-161 (Div. Phys. Chem., Inst. Protein Res., Univ., Osaka, Japan) TAA was reduced by Na thioglycolate in 8M urea-0*01M EDTA to give a linear polypeptide with 9 SH. Removal of thioglycolate and urea followed by air oxidation under suitable conditions produced a protein with approx. 50% of the enzymic activity of native TAA and prop., approaching those of native TAA. This protein was shown to be a mixture of completely renatured TAA and partly renatured TAA. The completely renatured TAA was isolated by crystn. and its prop. were shown to coincide with those of native TAA. B.M.Stevens
- 386. COMPARATIVE ANTIGENICITY OF NATIVE AND 'DESIALISED' OROSOMUCOID IN RABBITS.** E.Athineos, M.Thornton and R.J.Winzler: *Proc. Soc. exp. Biol., N.Y.*, 1962, 111, 353-356 (Dept. Biol. Chem., Univ. Illinois Coll. Med., Chicago, 111., U.S.A.) Removal of sialic acid, a terminal sugar, from human orosomucoid by neuraminidase treatment resulted in increased antigenicity of the protein, indicating it is not an important determinant antigenic group. M.M.Shapland
- 387. INTERACTION OF AZO-DYES WITH PROTEINS. II. ULTRAVIOLET SPECTRAL CHANGES OCCURRING ON ADDING PROTEIN TO AQUEOUS SOLUTIONS OF METHYL ORANGE.** W.B.Forbes and B.Milligan: *Aust. J. Chem.*, 1962, 15, 841-850 (Div. Prot. Chem., C.S.L.R.O. Wool Res. Labs., Parkville, Victoria, Australia) New theory on the interaction of Methyl Orange and related dyes with proteins in aq. soln. is proposed. D.G.Upshall
- 388. PHYSICO-CHEMICAL PROPERTIES OF OL-CRYSTAL LIN FROM OX LENS.** S.K.Niyogi and V.L.Koenig: *Biochim. biophys. Acta*, 1963, 69, 283-295 (Dept. Biochem., Northwestern Univ. Med. Sch., Chicago, 111., U.S.A.) α -Crystallin was purified by repeated pptn. at its isoelectric point. Electrophoretic analyses in acid and alkali at various ionic strengths indicated 1 component. Sedimentation expt. at pH above 3*0 and various ionic strengths also indicated 1 component. At pH 3*0 and below, depending on ionic strength 2 or 3 components appeared. Sedimentation and v expt. indicated that the dissociation was reversible. Sedimentation, * and light-scattering data at pH 2*0 and various ionic strengths indicated unfolding leading to dissociation. Sedimentation and light-scattering data at pH 9*1 and 6 ionic strengths between 0-1 and 0-6 indicated almost 2-fold aggregation at higher ionic strengths possibly accompanied by a change

in mol. shape. Mol. wt. and dimensions were calc. fr°JJJ sedimentation, * and partial sp. vol. data at pH 9*1 art 6 ionic strengths. B.M.Stevei*

- 389. COUNTER-CURRENT DISTRIBUTIONS OF RENIN-SUBSTRATE AND SERUM PROTEINS IN POLYETHYL GLYCOL-SALT SYSTEMS.** K.E.Lentz, L.T.Skeggs, J.H.Hochstrasser and J.R.Kahn: *Biochim. biophys. Act.**, 1963, 69, 263-270 (Dept. Med. and Surgery, V.A. Hosp., Cleveland, Ohio, U.S.A.) Aq. 2 phase partitioning systems for proteins were prep. from polyethylene glycols and inorg. salt soln. Effects of mol. wt. range of the glycol, relative proportion of water, pH, temp, and nature of inorg. cations and anions on the tot* solubilities and relative phase distributions of albumin, y-globulin, total serum proteins and renin substrate w#* examined. Na₂SO₄, (NH₄)₂SO₄ and Li₂SO₄ systems wej formulated for counter-current distributions of renin sujstrate and unfractionated serum. Purification by batch-wise partitioning preceded distribution of renin substrata Substrate purities up to 24300 Goldblatt units/g. protein were obtained. Serum was resolved into several groups of proteins including y-globulins with widely differing K values. B.M.Stevei*

- 390. ENZYMIC ACTION ACROSS THIN MEMBRANE.** A.Rothen: *J. colloid Sci.*, 1962, 17, 124-135 (Rockefeller Inst., New York, U.S.A.) A protect!^ blanket of plastic with a structure tight enough to P^{rev}*.w the free diffusion of trypsin mol._f lets the enzyme throw when an adequate substrate is located under the blanket This was shown by following the appearance of labeU⁶⁰ trypsin across the blanket and also by measuring the enzymic activity of the material which had crossed tn^c blanket. G.C.Barf

- 391. DENATURATION OF PROTEINS. I. SEDIMENTATION, DIFFUSION, OPTICAL ROTATION, VISCOSITY AND GELATION IN UREA SOLUTIONS OF OVALBUMIN AND BOVINE SERUM ALBUMIN [BSA].** H.A.McKenzie, M.B.Smith and R.G.Wake: *H. ULTRAVIOLET ABSORPTION SPECTRA OF BSA AND OVALBUMIN IN UREA AND IN ACID SOLUTION.* A.N.Glazer, H.A.McKenzie and R.G.Wake: *Biochim. biophys. Acta*, 1963, 69, 222-239, 240-248 (Phys.-Chem. Unit, Univ. Sydney, Australia) I. At pH 3-10, BSA showed a very rapij_p initial increase in laevorotation and t in cone, urea so at 25°. At low pH, ovalbumin behaved similarly, but near neutrality and above the changes were much slow. Kinetics of the optical rotation change for ovalbumin resembled those described by Simpson and Kauzmann *ve with some differences. The proteins appeared to be random coil polymers. 'Unfolded' proteins tended to aggregate slowly in 7M urea especially at neutral and all pH. Ovalbumin aggregated more readily than BSA. Aggregation in BSA appeared to be largely a S-S -SB ^ exchange but this was only partly true for ovalbumin. effects of j>-chloromercuribenzoate were examined. tt. Acid and urea produced similar rapid shifts in BSA spectrum. pH effects on the rate of change of tn^c.el difference spectrum at 287 mfi [A2873 at pH 0-5-4**.el similar to effects on jjj, *> and optical rotation. A cld soir variable effects on the ovalbumin spectrum. In uraf.hei the spectrum changed immediately at low pH. At nif.^ pH the spectrum changed with time. The change in A287 apparently followed first-order kinetics at 25 °J_{on} pH 6-1 and 30° and pH 7-8. Apparent orders of reacu with respect to urea were 7-6 ± 0*5 and 7-8 ± 0^Z. Change with time of optical rotation in 7M urea at P"

$\text{pH } 25^\circ$ was not simple first order. The half-time was inversely proportional to the $13^{*}5$ power of the urea concn.

B.M.Stevens

³⁹² CHROMATOGRAPHY OF POLYLYSINE. J.W.Stewart and M.A.Stahmann: *J. Chromatography*, 1962, 9, 233-235 (Dept. Biochem., Univ. Wisconsin, Madison, Wis., U.S.A.) Partial hydrolysates of polylysine have been fractionated on CM-cellulose columns using an exponential gradient of NaCl. The peak no. in the order of remergence from the column were shown, by paper chromatography with authentic compounds, to be equal with the no. of lysine residues/mol. in the responding peak. The plot of the log. of the peak no. of lysine residues/mol. against NaCl molarity at saturation with a linear gradient, disclosed a simple relationship between mol. wt. and the eluent concn. Samples are produced to suggest this to be a general relationship for the chromatography of other polyelectrolytes on substituted cellulose ion-exchange columns.

P.D.Dawkins

³⁹³ THE DISTRIBUTION OF CERTAIN PROTEINS, POLYPEPTIDES AND POLYAMINES IN AN AQUEOUS-PHENOL SYSTEM. G.R.Shepherd and P.A.Hopkins: *Biochem. biophys. Res. Comm.*, 1963, 10, 103 (Los Alamos Scientific Lab., Univ. California, Los Alamos, N.Mex., U.S.A.) The influence of NaCl concn. in Partitioning of certain proteins, polypeptides and polyamines is described.

B.Ketterer

³⁹⁴ CHARACTERISATION OF THE DIFFERENCE SPECTRUM OF DnSOPROPYLPHOSPHORYL-a-CHYMO-i&YPSIN [DIP-CT] VERSUS a-CHYMOTRYPSIN [CT]. [V. ENVIRONMENT OF TRYPTOPHYL RESIDUES.]

L.Oppenheimer, J.Mercouhoff and G.P.Hess: *Biochim. biophys. Acta*, 1963, 71, 78-88 (Dept. Biochem., Cornell Univ., Ithaca, N.Y., U.S.A.) Comparison of the difference spectra of amino acid deriv. in media varying in polarity. The difference spectrum of ¹⁴N-tryptophan amide in 20% v/v glycerol versus this of ¹⁴N-tryptophan amide in water indicated that 1 or more tryptophyl residues in DIP-CT were in a less polar medium than the analogous Q₁₄-residues. The effect of urea denaturation on the DIP-group sus CT difference spectrum indicated that the DIP group did not become a chromophore. Herskovits and Towinski's solvent perturbation method and sp. Option of CT and DIP-CT tryptophyl residues by ¹⁴C-nosuccinimide indicated that the DIP-CT versus CT ¹⁴C-yield was caused by tryptophyl residues inaccessible to urea and N-bromosuccinimide. • B.M.Stevens

³⁹⁵ HNSTON-OGSTON EFFECT IN THE ULTRACENTRIFUGATION OF SOLUTIONS OF DENATURED COLLAGEN. P.T.Speakman: *Biochim. biophys. Acta*, 1963, 69, 480-484 (Dept. Biol., M.I.T., Cambridge, Mass., U.S.A.) Collacen, denatured by raising the temp. of acid-sol. collagen dissolved in NaCl-acetic acid small. consisted of 2 main protein spp., a and \$ and a ¹⁴C-an? Quantitatively a ¹⁴C-sp. ¹⁴C-collagen. The ratio of the ¹⁴C-peaks of the a- and p-proteins could be calc. from the ¹⁴C-P of ¹⁴C areas of the schlieren a- and jS-peaks and JV S¹⁴SIL¹⁴C peaks. This method of calcn. was checked by comparing the a/p ratios of 2 denatured collagen fractions quant. separated by salt gradient elution from a cellulose column with the ratio in the collagen soln. which was the starting material on the column.

B.M.Stevens

³⁹⁶ DETERMINATION OF THE CONTAMINATION WITH BLOOD PROTEINS OF PERFUSED ORGANS OF

RABBIT. ELECTROPHORETIC STUDY OF SOLUBLE PROTEINS. R.Depieds, G.Cartouzou, H.Gignoux and C.Cartouzou: *C.R. Soc. Biol.*, Paris, 1962, 156, 1444-1449 (Lab. Parasitol., Fac. Med., Marseille, France)

Rabbits received injn. of ¹³Li-labelled rabbit albumin. The liver, kidney and tongue were perfused with saline for 2 hr. and the level of albumin in tissues estimated by paper, agar and starch gel electrophoresis. The kidney was contaminated with 0*118 ml. blood/g. tissue, the liver with 0.071 ml./g. and the tongue with 0.008 ml./g. Starch gel electrophoresis was the most suitable method for the separation of sol. tissue proteins. (French) M.A.Price

³⁹⁷ OXIDATION-REDUCTION POTENTIAL OF CYTOCHROME b₅ IN SOLUBLE AND PARTICULATE FORM WITH REFERENCE TO THE ROLE OF LIPID. Y.Kawai, Y.Yoneyama and H.Yoshikawa: *Biochim. biophys. Acta*, 1963, 67, 522-524 (Dept. Biophys. Biochem., Fac. Sci., Univ., Tokyo, Japan) The much lower potential of cytochrome b₅ in particulate form appeared to be attributable to some sort of combination of the haemoprotein with lipid. Prelim, comm.

B.M.Stevens

³⁹⁸ LATENCY AND SOLUBILISATION OF THE MITOCHONDRIAL ASPARTATE TRANSAMINASE OF RAT CEREBRAL CORTEX. O.Z.Sellinger and D.L.Rucker: *Biochim. biophys. Acta*, 1963, 67, 504-507 (Dept. Biochem. and Nutr., Tulane Univ., Sch. Med., New Orleans, La., U.S.A.)

B.M.Stevens

³⁹⁹ PHYSICO-CHEMICAL STUDIES ON BOVINE

y-GLOBULIN. F.H.Chowdhury and P.Johnson:

Biochim. biophys. Acta, 1963, 66, 218-228 (Dept. Colloid Sci., Cambridge, England) Fluorescence depolarisation measurements in neutral soln. yielded rotational relaxation times much lower than expected from the translational dynamic prop. 6M urea produced only a smaller further reduction in relaxation time. From the simple dispersion, the Ac of 213*0 mjj and the low -bo values in the Moffitt and Yang equation, obtained from optical rotation measurements over a range of X, it is suggested that non-polar amino acid residues may be important in controlling internal folding within the mol. core but that much internal flexibility remains outside this core. Low LiBr concn. produced small changes in optical rotatory prop. Higher LiBr concn. produced an opposite trend, probably involving denaturation. Above 5M LiBr solubility was considerably reduced.

B.M.Stevens

NUCLEIC ACIDS, NUCLEOPROTEINS AND NUCLEOTIDES

⁴⁰⁰ REQUIREMENT FOR MULTIPLE FACTORS FOR THE ATP-LINKED REDUCTION OF NAD BY SUCCINATE.

R.L.Prairie, T.E.Conover and E.Racker: *Biochem. biophys. Res. Comm.*, 1963, 10, 422-427 (Dept. Biochem., Public Hlth. Res. Inst., City of New York, Inc., N.Y., U.S.A.) The reduction of NAD by succinate via cytochrome b₅ flavoprotein brought about by sub-mitochondrial particles requires certain sol. factors from mitochondria. B.Ketterer

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- 401. FLAVOPROTEIN OXIDISING NADPH₂ ISOLATED FROM LIVER MICROSOMES.** H.Nishibayashi, T.Omura and R.Sato: *Biochim. biophys. Acta.* 1963, 67, 520-522 (Inst. Protein Res., Osaka Univ., Kita-ku, Osaka, Japan) The NADPH₂ oxidase requiring vit. K₃. 1,4-naphthoquinone or 1,2-naphthoquinone was purified and the possibility of its identity with the previously isolated flavoprotein NADPH₂-cytochrome ϵ reductase is discussed. Prelim, comm. B.M.Stevens
- 402. EFFECT OF NAD ON THE FORMATION OF SULPHUR-35 LABELLED SUBSTANCES IN A PARTICLE-FREE SUPERNATANT OF MOUSE [FURTH] MAST-CELL TUMOUR.** L.Spolter, L.I.Rice and W.Maix: *Biochim. biophys. Acta*, 1963, 69, 583-584 (Dept. Biochem., Univ. Southern California Sch. Med., Los Angeles, Calif., U.S.A.) NAD enhanced SQ 4^{2-} incorporation into a low mol. wt. SO 4^{2-} -containing fraction as well as into heparin. Prelim, comm. B.M.Stevens
- 403. SUCCINATE LINKED NAD REDUCTION IN SUB-MITOCHONDRIAL PARTICLES.** H.L.W and I.Vallin: *Biochim. biophys. Acta*, 1963, 69, 361-374 (Wenner-Gren Inst., Univ. Stockholm, Sweden) Reduction of added NAD by succinate catalysed by beef heart particles required ATP specifically. Six NAD analogues tested were reduced at almost the same rate as NAD but NADP was only reduced very slowly. Phosphate and ADP influenced the reduction rate, the effect being pronounced if both were added. The effect of NADH₂ was marked only if the NAOH₂ was present at concn. at least equal to those of NAD. Respiratory inhibitors acting in the flavin region of the respiratory chain blocked the reaction. B.M.Stevens
- 404. NEO-GUANYLIC ACID. A NEW NUCLEOTIDE FROM RNA.** W.J.F.Hemmings: *Biochim. biophys. Acta*, 1963, 68, 284-292 (Arthur Guinness Son. and Co., Dublin, Ireland) Neo-guanylic acid, found in certain prep. of brewers' yeast RNA, appeared to be 1-ribosylguanine (2')^{3'}-phosphate. The changes in u.v. absorption in acid and alk. soln. shown by guanine, neo-guanylic acid and 8-azaguanine ribonucleoside are described. B.M.Stevens
- 405. ISOLATION AND IDENTIFICATION OF 3'-AMINO-3'-DEOXYADENOSINE FROM CORDYCEPS MILITARIS.** A.J.Guarino and N.M.Kredich: *Biochim. biophys. Acta*, 1963, 68, 317-319 (Dept. Biol. Chem., Univ. Michigan, Ann Arbor, Mich., U.S.A.) B.M.Stevens
- 406. BIOSYNTHESIS OF A NEW XANTHINE RIBONUCLEOTIDE BY BEEF ERYTHROCYTES.** D.Hatfield, H.S. Forrest and J.B.Wyngaarden: *Biochim. biophys. Acta*, 1963, 68, 322-324 (Dept. Biochem., Duke Univ. Med. Center, Durham, N.C., U.S.A.) The compound is tentatively identified as (3-ribosylxanthine) 5'-phosphate. Prelim, comm. B.M.Stevens
- 407. FINE STRUCTURE OF CYTOSINE.** D.J.Brown and J.M.Lyall: *Aust. J. Chem.*, 1962, 15, 851-857 (Dept. Med. Chem., John Curtin Sch. Med. Res., Canberra, Australia) 4-amino-1, 2-dihydro-2-oxopyrimidine is found to be the predominant tautomeric form in aq. soln., indicated by study of the ionisation const. and u.v. spectra of cytosine, methylated deriv. and related compounds. D.G.Upshall
- 408. ENZYMIC SYNTHESIS OF CYTIDINE MONOPHOSPHO-2-KETO-3-DEOXY-OCTONATE.** M.A.Ghalambor and E.C.Heath: *Biochem. biophys. Res. Comm.*, 1963, 10, 346 (Rockham Arthritis Res. Unit and Dept.

- Bacterial.. Univ. Michigan, Ann Arbor, Mich., U.S.J A purified enzyme from *E. coli* is described which cata* lyses the formation of cytidine monophospho-2-keto-3* deoxyoctonate from 2-keto-3-deoxyoctonate and CTP. , B.Ketterer
- 409. EFFECT OF OROTIC ACID ON PYRIDINE NUCLEO[TIDES AND CHOLESTEROL SYNTHESIS.** S.Rajalaksh D.S.R.Sarma and P.S.Sarma: *Indian J. exp. Biol.* 1963, 1, 63-66 (Dept/Biochem., Indian Inst. Scu. Bangalore, India) Rats receiving orotic acid have been found to exhibit a significant fall in NAD, recognisable even after as short a period as 3 days. The dec^u" of the level of this adenine containing coenzyme is not due to enhanced NADase activity but to decreased syn* ^ thesis. The reduced synthesis appears to be a manifest** tion of adenine deficiency induced by prolonged feeding of orotic acid to rats kept on a purified diet. Further, these rats show a reduced ability to incorporate [2- \pm 4C* glycine into liver proteins, and synthesise cholesterol from both labelled acetate and mevalonic acid. There is a lowering in the activities of xanthine oxidase, catala* and NADase. These effects due to dietary orotic acid are reversible with an exogenous supply of adenine. The mechanism by which orotic acid seems to act is by creating a disturbance in the metabolic balance betw/e purine and pyrimidine nucleotides. •
- 410. BREAKDOWN OF ATP BY PLANT MITOCHOND^** K.C.Sikka, Y.P.Gupta and N.B.Das: *Indian J. exp. Biol.*, 1963, 1, 111-112 (Div. Soil Sci. and Agric. Chem., Indian Agric. Res. Inst.. New Delhi, India) Mitochondria prep, freshly from germinated berseem (*Trifolium alexandrinum* Linn.) possess ATPase activity. The terminal phosphate is released almost completely during 10 min. and the second labile phosphate in 60 min. Na deoxycholate activates the enzyme. The activity of AMPase in the above prep, is low, while inorg. pyrophatase activity is high, more than 60% of the total phosphate being liberated in 2'5 min. •
- 411. ENDOGENOUS ATP LEVELS IN HUMAN AMNION CELLS DURING APPLICATION OF HIGH HYDROSTAT^ PRESSURE.** J.V.Landau and R.A.Peabody: *Exp. Cell Res.*, 1963, 29, 54-60 (V.A. Hosp., Albany, N.Y., U.S.A.) FL human amnion cells at 35° displayed an increase in ATP during pressure application and a rapid return to normal levels on release of pressure. The rise in ATP was more rapid at 2°, and the lower temp, prevent efficiently the return to the normal values. There was concomitant change in ADP and no AMP was detected. Primary amnion cells showed no increase in ATP on pressure application. KJO*
- 412. UNAVAILABILITY OF CHROMAFFIN GRANULE A FOR METABOLIC REACTIONS.** P.B.Hagen and C.W. Toews: *Biochim. biophys. Acta*, 1963, 71, 201-204 (Dept. Biochem., Univ. Manitoba, Winnipeg, Canada) ATP was stored in a form in which it was unable to participate in enzymic reactions so long as the granule remained intact. B.M.S*
- 413. ABSORPTION SPECTRUM OF FMN SEMIQUINO** S.Nakamura, T.Nakamura and Y.Ogura: *J. Bloc* Tokyo, 1963, 53, 143-146 (Dept. Biophys. Biocnej. Fac. Sci., Univ., Tokyo, Japan) The spectrum partly reduced FMN in HCl soln. was analysed and the value of the 'effective semiquinone formation const.' was estimated graphically. Using this value of K tn*, absorption spectrum of semiquinone was shown to hav.

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^{max.}, at 350 and 490 mji with extinction coeff. of $10 \cdot 0 \times 10^3$ and $9 \cdot 4 \times 10^3$ respectively. K increased with increasing $[V\dot{T}']$ but the semiquinone spectrum was unchanged within the pH range tested. B.M.Stevens

⁴¹⁴ U. INTERACTION OF METHYL GREEN WITH DNA AS OBSERVED BY A NEW METHOD OF USING HYDROGEN PEROXIDE. T.Kurozumi, K.Kurihara, Y.Hachimori and K.Shibata: J. Biochem.. Tokyo, 1963, 53, 135-142 (Tokugawa Inst. for Biol. Res., Tokyo, Japan) Methyl Green in soln. faded rapidly on addition of H_2O_2 but Methyl Green bound to DNA did not fade. Hence from spectroscopic measurement of the rate of fading of a DNA Methyl Green mixture the concn. of p^A could be calc. The measurement could be made immediately after preparing the mixture. The binding of Methyl Green by native and heat denatured DNA was [^] small. B.M.Stevens

⁴¹⁵ GLUCOSYLATED DNA FROM A TRANSDUCING PHAGE FOR BACILLUS SUBTILIS. L.Takahashi: Biochem. biophys. Res. Comm., 1963, 10, 289 (Graduate Dept. Biochem., Brandeis Univ., Waltham, Mass., U.S.A.) A transducing phage for B. subtilis, ^{ptg} 2, contains a sugar as an integral part of its DNA which has been identified tentatively as glucose. B.Ketterer

⁴¹⁶ DENATURATION AND RENATURATION OF DNA OF POLYOMA VIRUS. R.Weil: Proc. nat. Acad. Sci., Wash., 1963, 49, 480-487 (Div. Biol., Chem., Chem. Eng., California Inst. Technol., Pasadena, Calif., U.S.A.) Thermal denaturation of polyoma DNA followed by rapid cooling resulted in a DNA prep, with increased infectivity. This prep. contained 2 bands when examined by density gradient centrifugation, both bands showing about the same degree of infectivity. One band corresponds to largely renatured DNA, the other to denatured DNA. Polyoma DNA infectivity was not destroyed by formamide treatment, but was destroyed by treatment with formamide together with formaldehyde. JJ^{\wedge} at-denatured DNA renatured readily when incubated in $IOrt$ namide. J.R.Sargent

⁴¹⁷ STABILITY OF DNA IN GLYCOL SOLUTION. [^]Eliasson, E.Hammersten, T.Lindahl, LBjörk and J.C.Laurent: Biochim. biophys. Acta, 1963, 68, 234-239 (Dept. Bacteriol., Karolinska Inst., Stockholm, Sweden) A sharp transition in the secondary structure of DNA in electrolyte containing glycol soln. occurred at $25 \text{ si } A_{260}$ as J^{ud} sed by an increase in absorbancy at 200 mji in V decrease in % and transforming activity. Changes $Ht \cdot anc \cdot absorb \cdot ncy$ at lower temp, were reversible and $LJ^{\wedge}L^{\wedge}$ related with any change in transforming activity. $\bullet 1? \cdot$ scattering expt. suggested that DNA aggregated in yco_1 . B.M.Stevens

⁴¹⁸ FURTHER OBSERVATIONS ON THE CHEMICAL TERMINATION OF DNA IN ANIMAL TISSUES. L.Ovtrup and K.Roos: Biochim. biophys. Acta, 1963, 68, 425-433 (Dept. Histol., Univ. Göteborg, Sweden) On the effects of hot $HClO_4$ as measured by the $4^{\wedge}en$ ylamine reaction were extended to low mol. wt. whose compounds. From the observed absorbancy/absorbance of deoxyribose the absorbancy for DNA extrapolated to zero time is shown to approx. to the value expected for the purine deoxyribose present. Without extrapolation pyrimidine deoxyribose interfered. Results obtained by this chem. method were compared with results obtained from a microbiol. assay for DNA. An analysis of the

sources of errors in the chem. method was made. B.M.Stevens

⁴¹⁹ MECHANISM OF [PHAGE] DNA MELTING. T.I.Tikchonenko, G.A.Perevertajlo and E.Dobrov: Biochim. biophys. Acta, 1963, 68, 500-502 (Oncol. Dept., Inst. Microbiol. and Epidemiol., Acad. Med. Sci., Moscow, U.S.S.R.) Prelim, comm. B.M.Stevens

⁴²⁰ DNA TYPE ATTRIBUTABLE TO A BACTERIAL ENDOSYMBIOTE IN THE PROTOZOAN CRITHIDIA (STRIGOMONAS) ONCOPELTI. J.Marmur, M.E.Cahoon, Y.Shimura and H.J.Vogel: Nature, Lond., 1963, 197, 1228-1229 (Graduate Dept. Biochem., Brandeis Univ., Waltham, Mass., U.S.A.) Examination of DNA samples from C. oncopelti by buoyant density technique revealed the presence of 3 DNA bands. When the endosymbiote was isolated from disrupted cells by differential centrifugation, the banding pattern of its DNA corresponded with the minor band of density $1^{\wedge}691$ g./ml. The calc. base composition resembles that for DNA from various bacteria, pleuropneumonia-like organisms and kappa. G.M.Lewis

⁴²¹ THE DISTRIBUTION OF NUCLEOTIDES IN DEOXYRIBONUCLEIC ACID. G.B.Petersen: Biochem. J., 1963, 87, 495-500 (D.S.I.R., Plant Chem. Div., Palmerston North, New Zealand) A combination of paper chromatography and paper electrophoresis has been used to separate many of the products obtained through the action on DNA of diphenylamine in acid soln. followed by phosphomonoesterase. Thirty-four products, consisting of oligonucleotides containing up to 9 pyrimidine residues, were separated and identified with respect to base composition and chain length. Many of these represent mixtures of isomeric sequences in unknown proportions. The amounts of these components in digests of calf-thymus and herring testis DNA were measured. Although many of the sequences were present in amounts significantly different from those expected on the basis of a random distribution of nucleotides in DNA, the distribution patterns of the DNA from the two sources differed considerably from each other. Products consisting of consecutive sequences of 4 deoxycytidylic acid residues were found in both types of DNA and in DNA of Alcaligenes faecalis and Pseudomonas aeruginosa. Polycytidylic acids of chain length longer than 4 were not detected in any of the 4 DNA digests. It was concluded that, if it is present, the sequence consisting of 5 deoxycytidylic acid residues flanked by purine nucleotides must occur in less than $60P\%$ of the expected random amount in calf-thymus and herring-testis DNA and less than $17f\%$ of the random amount in the 2 bacterial DNA samples. *

⁴²² DETERMINATION OF TOTAL DEOXYRIBOSE OF DNA. P.Schmid, C.Schmid and D.C.Brodie: J. biol. Chem., 1963, 238, 1068-1072 (Dept. Pharm. Chem., Sch. Pharm., Univ. California Med. Center, San Francisco, Calif., U.S.A.) A kinetic analysis of the reactions that give quant. formation of colour from deoxyribosyl compounds and indole gives optimum conditions for the colorimetric determination of DNA. After hydrolysis of DNA, or a nucleoside or ribosyl compound, the hydrolysate is treated with the indole reagent and aq. HCl and the extinction of the colouration produced is determined. J.N.Ashley

⁴²³ DISTRIBUTION OF PROTEIN ANTIGENS AMONG E. COLI RIBOSOMES. G.Quash: Biochim. biophys. Acta, 1963, 68, 330-332 (Service du Dr. Wahl, Inst.

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Pasteur, Paris, France) In. E. coli, Ag linked to strain characteristics appeared to be heterogeneously distributed whereas ribosomal common Ag were homogeneously distributed. Prelim, comm. B.M.Stevens

424. ENZYMIC DEGRADATION OF THYMUS NUCLEOPROTEIN. E.Fredericq: Biochim. biophys. Acta, 1963, 68, 167-176 (Inst. Phys. Chem., Univ., Liège, Belgium) Gel forming calf deoxyribonucleoprotein showed a complete loss of rigidity either when the DNA was split into 2 parts (on the average) by DNase II or when a few peptide bonds were split by trypsin or chymotrypsin. In the former case 8% of the deoxyRNP was solubilised, in the latter 50%.* After short exposure to ultrasound had similar effects to DNase II. Recombined histone nucleates were more rapidly hydrolysed by DNase than native deoxyRNP and differences in the solubilisation of DNA and histones were found. Complexes of polynucleotides and protein were characterised by paper electrophoresis after prolonged hydrolysis of deoxyRNP with DNase and trypsin. B.M.Stevens

425. THYMUS DEOXYRIBONUCLEOPROTEIN. III. SEDIMENTATION BEHAVIOUR. G.Giannoni and A.R.Peacocke: Biochim. biophys. Acta, 1963, 68, 157-166 (Dept. Biochem., Univ., Oxford/ England) 5 of fresh soln. of different deoxyRNP prep, in dil. phosphate buffer, examined using u.v. absorption methods, were reproducible to within $Htfo$ and extrapolated to 32 at infinite diln. This, together with light scattering and n measurements, confirmed that the deoxyRNP consisted of discrete mol. with configurations of moderately stiff coils. The shape of the sedimenting boundary was const, at different salt concn. in spite of dissociation. Within any 1 deoxyRNP mol. a range of stability of histone binding to DNA was concluded to exist. Analysis of supernatant fractions showed that histones of smaller arginine and greater lysine content were bound least strongly. B.M.Stevens

426. FINE STRUCTURE OF DEOXYRIBONUCLEOPROTEIN COMPONENT OF NUCLEUS. AN ELECTRON MICROSCOPIC STUDY UTILISING AUTORADIOGRAPHY TO LOCALISE DNA SYNTHESIS. E.D.Hay and J.P.Revel: J. cell. Biol., 1963, 16, 29-51 (Dept. Anat., Harvard Med. Sch., Boston, Mass., U.S.A.) 8-10 day old regenerating forelimbs of Salamander larvae, Ambystoma opacum and A. maculatum previously inj. i.p. with 1 and 5 pc [3H]thymidine were fixed in Bouin's soln. for light microscopy and in OsO₄ for E.M. study. Autoradiographs of 5-10 μ m and 0.05-1.0 p sections treated with alkali to remove the emulsion were prep. A deoxyRNP meshwork of interconnected filaments of 50-75A diam. is dispersed throughout the interphase nucleus during DNA synthesis. Dense chromatin centres were noted in chromosomes and interphase nuclei where DNA was not synthesised. The functional significance of variations in the deoxyRNP structure is discussed. P.Barlow

427. FRACTIONATION AND CHARACTERISATION OF NUCLEAR RNA FROM RAT LIVER. M.B.Sporn and W.Dingman: Biochim. biophys. Acta, 1963, 68, 387-400 (Lab. Neurochem., Nat. Inst. of Neurol. Diseases and Blindness, Bethesda, Md., U.S.A.) Four fractions with j_s of 6, 19, 33 and above 40 were obtained by sucrose gradient centrifugation. Absorption spectra, changes in extinction at 260 m*μ*J and 280 m*μ*J on a K_2 hydrolysis, changes in extinction at 260 m*μ*J on heating and kinetics of RNase digestion were examined for each. Microsomal, supernatant and whole tissue RNA were

similarly examined. The 33 and 19 £ nuclear RNA resembled ribosomal RNA. The 6 J nuclear RNA had physical prop, distinct from those of cytoplasmic supernatant RNA. Nuclei also contained a group of RNA with heterogeneous sedimentation prop. B.M.Stevens

428. ISOLATION AND PROPERTIES OF TOTAL NUCLEIC RIBONUCLEIC ACID OF RAT LIVER. B.Reiner, J.A. Bain and D.P.Groth: J. biol. Chem., 1963, 238, 1085-1090 (Dept. Pharmacol., Emory Univ., Atlanta, Ga., U.S.A.) The isolation in substantially quant. yield and largely free from DNA and protein is described. W& methods, which minimise degradation, include a step that simult. inhibits nuclease activity and increases ease of extraction. Cytoplasmic RNA is quant. isolated. The materials are characterised by chromatography and sealmentation, and a chromatographic elution method that does not need the use of strong alkali is described. The effects of chromatography and storage on dissociation of RNA are reported. The base composition of main chromatographic fractions of nuclear RNA shows a i inverse relationship to rat tissue DNA. * J.N.Ashley

429. DISSOCIATION PROPERTIES OF RNA. I. TITRATION OF RAT LIVER RNA AND MODEL POLYNUCLEOTIDES. R.A.Cox: Biochim. biophys. Acta, 1963, 68, 401-410 (Nat. Inst. for Med. Res., Mill Hill, London, England) The dissociation curve obtained on titrate high mol. wt. RNA at 0.4° from pH 7 to pH 3 differed from that obtained by titration from pH 3 to pH 7. Approx. 50% of the titratable groups dissociated over pH range pH 7-11.6. Calf thymus DNA was titrated at 25°. Few or no titratable groups were ionised at pH 11.4 but ionisation was complete at pH 11.6. A broader dissociation curve was obtained by titrating from pH 11.6 and was reversible from pH 3 upwards. A partly denatured sample had a curve intermediate between the 2. The complex of polytfdenylic [poly-A] and polyuridylic [poly-U] acids was stable at pH 4-10.7 and 20°. At t_{fore} extreme pH, dissociation to polynucleotides occurred. The alk. form of poly-A interacted reversibly with poly-U but hysteresis was found in acidic soln. B.M.Stevens

430. ISOLATION OF NATURALLY OCCURRING POLYADENYLATE FROM CALF THYMUS NUCLEI. M.Edmonds and R^Abrams: J. biol. Chem., 1963, 238, PC1186-1187 (Res. Dept., Montefiore Hosp., Pittsburgh, Pa., U.S.A.) Polyadenylate is isolate by chromatography, from calf thymus nuclei. Of all t₂' RNA present in the nuclei only polyadenylate serves as primer for synthesis of further polyadenylate. With the use of polythymidyl acid-cellulose columns it is possible to detect small amounts of polyadenylate. active as primer in polymerisation of ATP. in RNA prep, from several sources. J.N.Ashley

431. METHOD FOR ISOLATION OF 2'-O-METHYL RIBONUCLEOSIDES AND Ni-METHYLADENOSE FROM RNA. R.H.Hall: Biochim. biophys. Acta, 1963, 68, 278-283 (Dept. Expt. Therapeutics, Roswell Park Mem. Inst., Buffalo, N.Y., U.S.A.) A nucleosid mixture obtained by enzymic hydrolysis of yeast sol. RNA was resolved into major fractions by partition chromatography. Minor components were then isolate by paper chromatography. 1 g. RNA yielded 1-2 mg. 2'-O-methylated deriv. and 3-0 mg. Ni-methyladenine. The ratios of 2'-O-methyladenosine to 2'-O-methyluridine and of 2'-O-methylguanosine to 2'-O-methylcytidine may be close to 1. B.M.Stevens

432. POLARISABILITY THEORIES OF POLYNUCLEOTIDE HYPOCHROMISM. I. H.DeVoc. II. JJ.Weiss: Nature. Lond. 1963, 197. 1295-1296. 1296 (Section on Rhys. Chem., Natl. Inst. of Mental Hlth.. Bethesda. Md., U.S.A. and King's Coll., Univ. of Durham, Newcastle-on-Tyne, England). G.M.Lewis

433. FATE OF NUCLEI, DNA AND DNase IN THE COURSE OF AUTOLYSIS. J.L.van Lancker and R.L. Holtzer: Lab. Invest., 1963, 12, 102-105 (Pathol. Dept.. Wisconsin Univ. Med. Sch., Madison, Wis.. U.S.A.) DNA and DNase estimations and nuclear counts of mouse liver undergoing autoysis for varying time revealed an unaltered DNA and nuclear count up to 6 hr. although most of DNase is released after 1 hr. A.M.Mackay

434. HAEMAGGLUTINATION INDUCED BY NUCLEIC ACIDS. Ushiyama: Nature. Lond. 1963, 197, 912 (Dept. Legal Med. Univ. Tokyo, Hongo, Tokyo, Japan) R.b.c. of human, sheep, guinea-pig and J²bit after treatment with trypsin can be agglutinated by yeast RNA and sperm DNA, the effect being inhib. by a and human albumin. G.M.Lewis

435. EFFECTS OF DEUTERIUM ON THE THERMAL TRANSITION OF NUCLEIC ACIDS. H.R.Mahler. G.Dutton and B.D.Mehrotra: Biochim. biophys. Acta, 1963, 68, 199-210 (Chem. Lab.. Indiana Univ.. Bloomington, Ind.. U.S.A.) No significant differences in total hyperchromicity or in midpoint or width of transition were found when die thermal helix to coil transitions of 3 DNA and 4 RNA were examined, by means of absorption-temp. profiles, after extensive high temp, incubation in water or in deuterium oxide. Base composition varied from 32*5 to 65 and 40 to 64 mole % guanine plus cytosine for DNA and RNA respectively. In a medium containing $1\cdot5 \times 10^{-3}$ M NaCl, $1\cdot5 \times 10^{-4}$ M Na citrate and $1\cdot0 \times 10^{-3}$ M MgCl₂, transition temp. for alanine, tyrosine and valine transfer RNA were 73°, 5*5° and 49*5° respectively. B.M.Stevens

436. INTERACTION OF NUCLEIC ACIDS WITH PIAMINES. H.R.Mahler and B.D.Mehrotra: Biochim. biophys. Acta, 1963, 68, 211-233 (Chem. Lab.. Indiana Univ.. Bloomington, Ind.. U.S.A.) Aliphatic diamines increased the helix to coil transition midpoint (T_m) as determined by absorbancy-temp. profiles in double stranded DNA. A decrease in ionic strength induced the rise in T_m [ATm3 and the strength of interaction]. ATm was proportional to amine concn. when ionic strength was low but reached a limiting value at high concn. When saturated with diaminopentane was reached at 10^{-2} M at 10^{-4} M at low ionic strength. ATm was highest with the C₅ amine. Single stranded DNA. RNA acid polyadenylic acid did not show the effect. Related to the mole % adenine plus thymine or $\text{G} + \text{T}$ was proportional to T_m . Proportionality were 13 and -0*477° at high and low ionic strengths respectively. B.M.Stevens

437. NUCLEIC ACID CHANGES IN THE STORAGE TISSUE OF SEEDS DURING GERMINATION. J.H.Cherry: Biochim. biophys. Acta, 1963, 68, 193-198 (Seed Pioneering Res. Lab.. Southern Utilisation Res. Development Div.. Agric. Res. Service, U.S. Dept. Agric.. New Orleans, La., U.S.A.) During germination die RNA content increased to a 2-fold max. in the first 2-6 days and thereafter decreased. The pattern was similar for 4 varieties

of mature and immature seed and for the same variety produced in 2 locations. In corn scutellum the RNA content increased 20% on the first day of germination and decreased thereafter. The DNA content of peanut cotyledons and corn scutella did not change significantly during germination. B.M.Stevens

438. BIOCHEMICAL CHANGES IN PROGRESSIVE MUSCULAR DYSTROPHY. I. NUCLEIC ACID METABOLISM IN NORMAL AND DYSTROPHIC RABBIT AND MOUSE LIVER, BRAIN AND MUSCLE. U.Srivastava, A.Devi and N.Sarkar: Expt. Cell Res., 1963, 29. 289-297 (Dept. Biochem.. Fac. Med.. Laval Univ.. Quebec, Canada) In muscles, livers and brains of rabbits and mice with progressive nutritional and hereditary muscular dystrophy, the concn. of DNA and RNA increased while that of free nucleotides steadily decreased. Protein concn. also declined, decreasing by 28% of tile control in acute stage of dystrophy. The changes were more marked in rabbits, and DNA only increased in guinea-pigs. These changes in all tissues could be reversed by supplying vit. E, and DNA changes could be considered as an index of the degree of progression of the disease. K.Jones

439. CHROMATOGRAPHIC SEPARATION OF RNases IN CORN. CM.Wilson: Biochim. biophys. Acta, 1963, 68, 177-184 (Crops Res. Div., Agric. Res. Service, U.S. Dept. Agric.. Urbana, Ill.. U.S.A.) RNase A secreted from the scutella and found in seedling root supernatant soln. was eluted from CM-cellulose by pH 6*0 buffer. RNase B was eluted by pH 8-0 buffer. RNase B was adsorbed on to mitochondria but could be removed with 0-5M KCl. pH optima were 5-0 for RNase A and 6*2 for RNase B. Both were stim. by KCl at die optimum pH. Mg d2 stim. RNase A at pH 5*0 and inhib. it at pH 5*8 whereas RNase B was stim. at pH 5*8. A third RNase resembling RNase A in chromatographic behaviour and RNase B in pH optimum was isolated but may have been an artifact. B.M.Stevens

440. DISTRIBUTION OF RNASE IN CORN, CUCUMBER AND SOYABEAN SEEDLINGS. EFFECTS OF ISOLATION MEDIA. C.M.Wilson and J.C.Shannon: Biochim. biophys. Acta, 1963, 68, 311-313 (Crops Res. Div., Agric. Res. Service, U.S. Dept. Agric., Urbana, Ill., U.S.A.) B.M.Stevens

441. CONCENTRATION AND DESALTING OF RIBONUCLEASE. G.W.Rushizky, A.E.Greco, R.W.Hartley, jun. and H.A.Sober: Biochem. biophys. Res. Comm., 1963, 10, 311 (Lab. Biochem., Nat. Cancer Inst.. Nat. Inst. Hlth.. Public Hlth. Service, U.S. Dept. Hlth., Education and Welfare, Bethesda, Md., U.S.A.) Various ribonucleases were extractable into phenol without loss of activity; this finding was the basis of a desalting technique. B.Ketterer

442. INHIBITION OF SUCCINOADENYLATE KINASE SYNTHETASE OF E. COLI BY ADENOSINE AND GUANOSINE-5'-MONOPHOSPHATES. J.B.Wyngaarden and R.A.Greenland: J. biol. Chem., 1963, 238, 1054-1057 (Dept. Med.. Duke Univ. Med. Center, Durham, N.C., U.S.A.) The enzyme, from *E.coli*, is inhib. by various purine nucleoside 5'-monophosphates and GDP. AMP, succino-AMP, guanosine 5'-phosphate and deoxyguanosine 5'-phosphate are competitive inhibitors of inosine 5'-phosphate. Inhib. by AMP may play an important part in physio 1. modulation of activity of the

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kinosynthetase reaction. GDP is a competitive inhibitor of GTP in this reaction. The enzyme has greater affinity for GDP than for GTP, and intracellular levels of these 2 compounds are such that GDP may also function actively in regulation of the kinosynthetase.

J.N.Ashley

443. ADENOSINE TRIPHOSPHATE-CREATINE PHOSPHOTRANSFERASE FROM OX BRAIN: PURIFICATION AND ISOLATION. T.Wood: Biochem. J. 1963, 87, 453-462 (Dept. Biochem., Maudsley Hosp., London, England) ATPase-creatine phosphotransferase

(EC 2.7.3.2) has been isolated in a pure form from ox brain, via the following steps: (a) extraction with KC1 soln.; (b) removal of inert protein with acetone; (c) pptn. with Mg acetate; (d) acetone fractionation; (e) (NH4)2SO4 fractionation; (f) chromatography on DEAE-Sephadex. Three peaks of enzyme activity were obtained: two due to interconvertible forms of the pure enzyme produced on the column, and a third minor peak due to association with other proteins. The pure enzyme had prop. similar to those of the enzyme from muscle but was markedly activated by thiols. The enzyme content of ox brain was calc.

444. PURINE RIBONUCLEOSIDE AND DEOXYRIBONUCLEOSIDE PHOSPHORYLASE IN HUMAN ERYTHROCYTES. C.-H.De Verdier and B.J.Gould: Biochim. biophys. Acta, 1963, 68, 333-341 (Dept. Clin. Chem., Univ. Hosp., Uppsala, Sweden) The enzymes were purified by chromatography on DEAEcellulose and CM-Sephadex columns. Characteristics are described. The 2 activities could not be separated but inactivation expt. and kinetic studies in which ribonucleoside and deoxyribonucleoside acted alternatively as inhibitor and substrate indicated that 2 separate enzymes existed.

B.M.Stevens

BIOSYNTHESIS OF PROTEINS AND NUCLEIC ACIDS

445. THE INCORPORATION OF AMINO ACIDS INTO 'METHYLM POOR' AMINO ACID TRANSFER RIBONUCLEIC ACID. J.L.Starr: Biochem. biophys. Res. Comm., 1963, 10, 181 (Dept. Med., North Western Univ. Sch. Med., Wesley Mem. Hosp., Chicago, 111, U.S.A.) 'Methyl poor' s-RNA obtained from methionine-starved *E. coli* incorporated amino acids comparably with normally methylated s-RNA, except for arginine.

B.Ketterer

446. THERMAL DENATURATION AND AMINO ACID BINDING ABILITY OF SOLUBLE RNA. M.Arca, C.Calvori, L.Frontali and G.Tecce: Biochem. biophys. Res. Comm., 1963, 10, 117 (Inst. di Fisiol. Generale, Univ. Roma, Italy) The incorporation of isoleucine into sol. RNA by extracts of *B. stearothermophilus* stopped abruptly at 80° although amino acid activating enzymes from this organism are active at this temp.

B.Ketterer

447. INCORPORATION OF METHYL GROUPS INTO AMINO ACID TRANSFER RIBONUCLEIC ACID. J.L.Starr: Biochem. biophys. Res. Comm., 1963, 10, 428 (Dept. Med., Northwestern Univ. Sch. Med., Wesley Mem. Hosp., Chicago, 111, U.S.A.) Evidence is given consistent with the suggestion that methylated bases found in

trace amounts in s-RNA are native to this fraction.

B.Ketterer

448. ON THE STABILITY OF TRANSFER-RNA TERMINAL NUCLEOTIDE SEQUENCE IN YEAST. R.Rosset and R.Monier: Biochem. biophys. Res. Comm., 1963, 10, 195 (Inst. Chim. Biol., Fac. Sci., Marseille, France)

A small turnover of terminal AMP, but no turnover in terminal CMP was demonstrated in transfer-RNA from exponentially growing yeast.

B.Ketterer

449. KINETICS OF TRANSFER RNA SYNTHESIS. IN E. COLL J.E.M.Midgley: Biochim. biophys. Acta, 1963, 68, 354-364 (Carnegie Inst. of Washington, Dept. of Terrestrial Magnetism, Washington, D.C., U.S.A.) In exponentially growing cells [¹⁴C]uracil was incorporated into transfer RNA [s-RNA] bypassing the intracellular nucleotide pool. Uridine and pseudouridine nucleoside phosphate residues were labelled at the same rate. s-RNA labelling was delayed by approx. 1.5 min. compared to other RNA components. With [³²P]orthophosphate, labelling of s-RNA uridine and pseudouridine 5'-phosphate residues suffered a greater kinetic delay than the uridine 5'-phosphate residues of the remaining newly formed RNA. The large intracellular pool delayed 32P entry into all RNA fractions. Incubation in chloramphenicol greatly reduced kinetic delay in [¹⁴C]uracil entry into s-RNA uridine and pseudouridine phosphates.

When newly formed RNA synthesised with chloramphenicol was incubated with homologous DNA-agar more hybridisable RNA was found than in controls.

B.M.Stevens*

450. INTERACTION BETWEEN RAT LIVER RIBOSOMES AND SOLUBLE RNA. W.S.Bont, L.Bosch, H.Bloemendaal, H.Hilders and F.Huizinga: Biochim. biophys. Acta, 1963, 68, 487-490 (Dept. Biochem., Antoni van Leeuwenhoek-Huis, Amsterdam, Netherlands) The fractionation of ribosomes derived from microsomes which had been incubated with sol. [³²P]RNA, GTP and sol. enzymes is described. Prelim. comm.

B.M.Stevens*

451. NUCLEOTIDE SEQUENCES ADJACENT TO THE 5'-TERMINI OF YEAST SOLUBLE RIBONUCLEIC ACIDS. D.Bell, R.V.Tomlinson and G.M.Tener: Biochem. biophys. Res. Comm., 1963, 10, 304 (Univ. British Columbia, Vancouver, B.C., Canada) Expt. are described demonstrating the existence of GMP, UMP, AMP and CMP as 5'-terminal groups in s-RNA.

B.Ketterer

452. PAPER CHROMATOGRAPHY OF TRANSFER RNA ON DIETHYLAMINOETHYL-CELLULOSE. K.B.Jacobson and S.Nishimura: Biochim. biophys. Acta, 1963, 68, 490-493 (Biol. Div., Oak Ridge Nat. Lab., Oak Ridge, Tenn., U.S.A.) Transfer RNA was resolved into several amino acid sp. types. Prelim. comm.

B.M.Stevens

453. SPECIFIC PARTIAL HYDROLYSIS PROCEDURE FOR SOLUBLE RNA. D.W.Veiwoerd and W.Zillig: Biochim. biophys. Acta, 1963, 68, 484-486 (Max-Planck Inst. fur Biochem., Mtinchen, Germany) A sp. partial hydrolysis at the 5-ribosyl uridylic acid sites and at the 3-ribosyl uridylic acid sites was obtained although the resulting oligonucleotides were not separated.

B.M.Stevens

454. FRACTIONATION OF SOLUBLE RNA BY CHROMATOGRAPHY ON DEAE ION EXCHANGERS. Y.Kawade, T.Okamoto and Y.Yamamoto: Biochim. biophys. Res. Comm., 1963, 10, 200 (Inst. for Virus Res., Kyoto Univ., Kyoto, Japan) Some fractionation of s-RNA

from yeast has been obtained using DEAE ion exchangers and an NaCl gradient at pH 5. B.Ketterer

⁴⁵ 5. LARGE SCALE PREPARATION OF YEAST 'SOLUBLE' RIBONUCLEIC ACID. R.W.Holley: Biochem. biophys. Res. Comm., 1963, 10, 186 (U.S. Plant, Soil and Nutrition Lab., Soil and Water Conservation Res. Div., Agric. Res. Service, U.S. Dept. Agric. and Dept. Biochem., Cornell Univ., Ithaca, N.Y., U.S.A.) An earlier procedure has been modified to simplify handling large quantities of yeast for s-RNA prep.

B.Ketterer

*⁵ 6. THE UTILISATION IN VIVO OF MOUSE NUCLEIC ACID METABOLITES LABELLED WITH RADIOACTIVE PRECURSOR SUBSTANCES. M.R.Schwarz and W.O. Rieke: Lab. Invest., 1963, 12, 92-101 (Anat. Dept., Washington Univ. Med. Sch., Seattle, Wash., U.S.A.) ⁷ ⁸ s.c. or i.p. [3H]uridine injn. was given to adult mice, few hr. later, sarcoma cells were transplanted i.p. freely, or inside a dialysis bag. Lymphoid cells from a mouse receiving [3H]uridine over several days were also inj. i.P. to a non-labelled sarcoma bearing mouse. In some expt. [3H]adenine or cultured bone marrow-cells were used. Autoradiographs of the transplanted cells removed at various times were prep. Nucleic acid labelling was noted in all the expt., even at a time when only traces of administered nucleoside are present.

A.M.Mackay

457. NUCLEOTIDE INTERCONVERSIONS. VIII. THYMINE-SPARING EFFECT ON THE UTILISATION OF DEOXYCYTIDINE BY CHICK-EMBRYO MINCE. G.F.Maley and F.Maley: Biochim. biophys. Acta, 1963, 68, 293-301 (Div. Lab. and Res., New York State Dept. Hlth., Albany, N.Y., U.S.A.) Almost ² ³ ⁴ ⁵ ⁶ ⁷ ⁸ C2-14C]deoxycytidine or [2-14c]deoxy-^j ⁹ ¹⁰ ¹¹ ¹² ¹³ ¹⁴ ¹⁵ ¹⁶ ¹⁷ ¹⁸ ¹⁹ ²⁰ ²¹ ²² ²³ ²⁴ ²⁵ ²⁶ ²⁷ ²⁸ ²⁹ ³⁰ ³¹ ³² ³³ ³⁴ ³⁵ ³⁶ ³⁷ ³⁸ ³⁹ ⁴⁰ ⁴¹ ⁴² ⁴³ ⁴⁴ ⁴⁵ ⁴⁶ ⁴⁷ ⁴⁸ ⁴⁹ ⁵⁰ ⁵¹ ⁵² ⁵³ ⁵⁴ ⁵⁵ ⁵⁶ ⁵⁷ ⁵⁸ ⁵⁹ ⁶⁰ ⁶¹ ⁶² ⁶³ ⁶⁴ ⁶⁵ ⁶⁶ ⁶⁷ ⁶⁸ ⁶⁹ ⁷⁰ ⁷¹ ⁷² ⁷³ ⁷⁴ ⁷⁵ ⁷⁶ ⁷⁷ ⁷⁸ ⁷⁹ ⁸⁰ ⁸¹ ⁸² ⁸³ ⁸⁴ ⁸⁵ ⁸⁶ ⁸⁷ ⁸⁸ ⁸⁹ ⁹⁰ ⁹¹ ⁹² ⁹³ ⁹⁴ ⁹⁵ ⁹⁶ ⁹⁷ ⁹⁸ ⁹⁹ ¹⁰⁰ ¹⁰¹ ¹⁰² ¹⁰³ ¹⁰⁴ ¹⁰⁵ ¹⁰⁶ ¹⁰⁷ ¹⁰⁸ ¹⁰⁹ ¹¹⁰ ¹¹¹ ¹¹² ¹¹³ ¹¹⁴ ¹¹⁵ ¹¹⁶ ¹¹⁷ ¹¹⁸ ¹¹⁹ ¹²⁰ ¹²¹ ¹²² ¹²³ ¹²⁴ ¹²⁵ ¹²⁶ ¹²⁷ ¹²⁸ ¹²⁹ ¹³⁰ ¹³¹ ¹³² ¹³³ ¹³⁴ ¹³⁵ ¹³⁶ ¹³⁷ ¹³⁸ ¹³⁹ ¹⁴⁰ ¹⁴¹ ¹⁴² ¹⁴³ ¹⁴⁴ ¹⁴⁵ ¹⁴⁶ ¹⁴⁷ ¹⁴⁸ ¹⁴⁹ ¹⁵⁰ ¹⁵¹ ¹⁵² ¹⁵³ ¹⁵⁴ ¹⁵⁵ ¹⁵⁶ ¹⁵⁷ ¹⁵⁸ ¹⁵⁹ ¹⁶⁰ ¹⁶¹ ¹⁶² ¹⁶³ ¹⁶⁴ ¹⁶⁵ ¹⁶⁶ ¹⁶⁷ ¹⁶⁸ ¹⁶⁹ ¹⁷⁰ ¹⁷¹ ¹⁷² ¹⁷³ ¹⁷⁴ ¹⁷⁵ ¹⁷⁶ ¹⁷⁷ ¹⁷⁸ ¹⁷⁹ ¹⁸⁰ ¹⁸¹ ¹⁸² ¹⁸³ ¹⁸⁴ ¹⁸⁵ ¹⁸⁶ ¹⁸⁷ ¹⁸⁸ ¹⁸⁹ ¹⁹⁰ ¹⁹¹ ¹⁹² ¹⁹³ ¹⁹⁴ ¹⁹⁵ ¹⁹⁶ ¹⁹⁷ ¹⁹⁸ ¹⁹⁹ ²⁰⁰ ²⁰¹ ²⁰² ²⁰³ ²⁰⁴ ²⁰⁵ ²⁰⁶ ²⁰⁷ ²⁰⁸ ²⁰⁹ ²¹⁰ ²¹¹ ²¹² ²¹³ ²¹⁴ ²¹⁵ ²¹⁶ ²¹⁷ ²¹⁸ ²¹⁹ ²²⁰ ²²¹ ²²² ²²³ ²²⁴ ²²⁵ ²²⁶ ²²⁷ ²²⁸ ²²⁹ ²³⁰ ²³¹ ²³² ²³³ ²³⁴ ²³⁵ ²³⁶ ²³⁷ ²³⁸ ²³⁹ ²⁴⁰ ²⁴¹ ²⁴² ²⁴³ ²⁴⁴ ²⁴⁵ ²⁴⁶ ²⁴⁷ ²⁴⁸ ²⁴⁹ ²⁵⁰ ²⁵¹ ²⁵² ²⁵³ ²⁵⁴ ²⁵⁵ ²⁵⁶ ²⁵⁷ ²⁵⁸ ²⁵⁹ ²⁶⁰ ²⁶¹ ²⁶² ²⁶³ ²⁶⁴ ²⁶⁵ ²⁶⁶ ²⁶⁷ ²⁶⁸ ²⁶⁹ ²⁷⁰ ²⁷¹ ²⁷² ²⁷³ ²⁷⁴ ²⁷⁵ ²⁷⁶ ²⁷⁷ ²⁷⁸ ²⁷⁹ ²⁸⁰ ²⁸¹ ²⁸² ²⁸³ ²⁸⁴ ²⁸⁵ ²⁸⁶ ²⁸⁷ ²⁸⁸ ²⁸⁹ ²⁹⁰ ²⁹¹ ²⁹² ²⁹³ ²⁹⁴ ²⁹⁵ ²⁹⁶ ²⁹⁷ ²⁹⁸ ²⁹⁹ ³⁰⁰ ³⁰¹ ³⁰² ³⁰³ ³⁰⁴ ³⁰⁵ ³⁰⁶ ³⁰⁷ ³⁰⁸ ³⁰⁹ ³¹⁰ ³¹¹ ³¹² ³¹³ ³¹⁴ ³¹⁵ ³¹⁶ ³¹⁷ ³¹⁸ ³¹⁹ ³²⁰ ³²¹ ³²² ³²³ ³²⁴ ³²⁵ ³²⁶ ³²⁷ ³²⁸ ³²⁹ ³³⁰ ³³¹ ³³² ³³³ ³³⁴ ³³⁵ ³³⁶ ³³⁷ ³³⁸ ³³⁹ ³⁴⁰ ³⁴¹ ³⁴² ³⁴³ ³⁴⁴ ³⁴⁵ ³⁴⁶ ³⁴⁷ ³⁴⁸ ³⁴⁹ ³⁵⁰ ³⁵¹ ³⁵² ³⁵³ ³⁵⁴ ³⁵⁵ ³⁵⁶ ³⁵⁷ ³⁵⁸ ³⁵⁹ ³⁶⁰ ³⁶¹ ³⁶² ³⁶³ ³⁶⁴ ³⁶⁵ ³⁶⁶ ³⁶⁷ ³⁶⁸ ³⁶⁹ ³⁷⁰ ³⁷¹ ³⁷² ³⁷³ ³⁷⁴ ³⁷⁵ ³⁷⁶ ³⁷⁷ ³⁷⁸ ³⁷⁹ ³⁸⁰ ³⁸¹ ³⁸² ³⁸³ ³⁸⁴ ³⁸⁵ ³⁸⁶ ³⁸⁷ ³⁸⁸ ³⁸⁹ ³⁹⁰ ³⁹¹ ³⁹² ³⁹³ ³⁹⁴ ³⁹⁵ ³⁹⁶ ³⁹⁷ ³⁹⁸ ³⁹⁹ ⁴⁰⁰ ⁴⁰¹ ⁴⁰² ⁴⁰³ ⁴⁰⁴ ⁴⁰⁵ ⁴⁰⁶ ⁴⁰⁷ ⁴⁰⁸ ⁴⁰⁹ ⁴¹⁰ ⁴¹¹ ⁴¹² ⁴¹³ ⁴¹⁴ ⁴¹⁵ ⁴¹⁶ ⁴¹⁷ ⁴¹⁸ ⁴¹⁹ ⁴²⁰ ⁴²¹ ⁴²² ⁴²³ ⁴²⁴ ⁴²⁵ ⁴²⁶ ⁴²⁷ ⁴²⁸ ⁴²⁹ ⁴³⁰ ⁴³¹ ⁴³² ⁴³³ ⁴³⁴ ⁴³⁵ ⁴³⁶ ⁴³⁷ ⁴³⁸ ⁴³⁹ ⁴⁴⁰ ⁴⁴¹ ⁴⁴² ⁴⁴³ ⁴⁴⁴ ⁴⁴⁵ ⁴⁴⁶ ⁴⁴⁷ ⁴⁴⁸ ⁴⁴⁹ ⁴⁵⁰ ⁴⁵¹ ⁴⁵² ⁴⁵³ ⁴⁵⁴ ⁴⁵⁵ ⁴⁵⁶ ⁴⁵⁷ ⁴⁵⁸ ⁴⁵⁹ ⁴⁶⁰ ⁴⁶¹ ⁴⁶² ⁴⁶³ ⁴⁶⁴ ⁴⁶⁵ ⁴⁶⁶ ⁴⁶⁷ ⁴⁶⁸ ⁴⁶⁹ ⁴⁷⁰ ⁴⁷¹ ⁴⁷² ⁴⁷³ ⁴⁷⁴ ⁴⁷⁵ ⁴⁷⁶ ⁴⁷⁷ ⁴⁷⁸ ⁴⁷⁹ ⁴⁸⁰ ⁴⁸¹ ⁴⁸² ⁴⁸³ ⁴⁸⁴ ⁴⁸⁵ ⁴⁸⁶ ⁴⁸⁷ ⁴⁸⁸ ⁴⁸⁹ ⁴⁹⁰ ⁴⁹¹ ⁴⁹² ⁴⁹³ ⁴⁹⁴ ⁴⁹⁵ ⁴⁹⁶ ⁴⁹⁷ ⁴⁹⁸ ⁴⁹⁹ ⁵⁰⁰ ⁵⁰¹ ⁵⁰² ⁵⁰³ ⁵⁰⁴ ⁵⁰⁵ ⁵⁰⁶ ⁵⁰⁷ ⁵⁰⁸ ⁵⁰⁹ ⁵¹⁰ ⁵¹¹ ⁵¹² ⁵¹³ ⁵¹⁴ ⁵¹⁵ ⁵¹⁶ ⁵¹⁷ ⁵¹⁸ ⁵¹⁹ ⁵²⁰ ⁵²¹ ⁵²² ⁵²³ ⁵²⁴ ⁵²⁵ ⁵²⁶ ⁵²⁷ ⁵²⁸ ⁵²⁹ ⁵³⁰ ⁵³¹ ⁵³² ⁵³³ ⁵³⁴ ⁵³⁵ ⁵³⁶ ⁵³⁷ ⁵³⁸ ⁵³⁹ ⁵⁴⁰ ⁵⁴¹ ⁵⁴² ⁵⁴³ ⁵⁴⁴ ⁵⁴⁵ ⁵⁴⁶ ⁵⁴⁷ ⁵⁴⁸ ⁵⁴⁹ ⁵⁵⁰ ⁵⁵¹ ⁵⁵² ⁵⁵³ ⁵⁵⁴ ⁵⁵⁵ ⁵⁵⁶ ⁵⁵⁷ ⁵⁵⁸ ⁵⁵⁹ ⁵⁶⁰ ⁵⁶¹ ⁵⁶² ⁵⁶³ ⁵⁶⁴ ⁵⁶⁵ ⁵⁶⁶ ⁵⁶⁷ ⁵⁶⁸ ⁵⁶⁹ ⁵⁷⁰ ⁵⁷¹ ⁵⁷² ⁵⁷³ ⁵⁷⁴ ⁵⁷⁵ ⁵⁷⁶ ⁵⁷⁷ ⁵⁷⁸ ⁵⁷⁹ ⁵⁸⁰ ⁵⁸¹ ⁵⁸² ⁵⁸³ ⁵⁸⁴ ⁵⁸⁵ ⁵⁸⁶ ⁵⁸⁷ ⁵⁸⁸ ⁵⁸⁹ ⁵⁹⁰ ⁵⁹¹ ⁵⁹² ⁵⁹³ ⁵⁹⁴ ⁵⁹⁵ ⁵⁹⁶ ⁵⁹⁷ ⁵⁹⁸ ⁵⁹⁹ ⁶⁰⁰ ⁶⁰¹ ⁶⁰² ⁶⁰³ ⁶⁰⁴ ⁶⁰⁵ ⁶⁰⁶ ⁶⁰⁷ ⁶⁰⁸ ⁶⁰⁹ ⁶¹⁰ ⁶¹¹ ⁶¹² ⁶¹³ ⁶¹⁴ ⁶¹⁵ ⁶¹⁶ ⁶¹⁷ ⁶¹⁸ ⁶¹⁹ ⁶²⁰ ⁶²¹ ⁶²² ⁶²³ ⁶²⁴ ⁶²⁵ ⁶²⁶ ⁶²⁷ ⁶²⁸ ⁶²⁹ ⁶³⁰ ⁶³¹ ⁶³² ⁶³³ ⁶³⁴ ⁶³⁵ ⁶³⁶ ⁶³⁷ ⁶³⁸ ⁶³⁹ ⁶⁴⁰ ⁶⁴¹ ⁶⁴² ⁶⁴³ ⁶⁴⁴ ⁶⁴⁵ ⁶⁴⁶ ⁶⁴⁷ ⁶⁴⁸ ⁶⁴⁹ ⁶⁵⁰ ⁶⁵¹ ⁶⁵² ⁶⁵³ ⁶⁵⁴ ⁶⁵⁵ ⁶⁵⁶ ⁶⁵⁷ ⁶⁵⁸ ⁶⁵⁹ ⁶⁶⁰ ⁶⁶¹ ⁶⁶² ⁶⁶³ ⁶⁶⁴ ⁶⁶⁵ ⁶⁶⁶ ⁶⁶⁷ ⁶⁶⁸ ⁶⁶⁹ ⁶⁷⁰ ⁶⁷¹ ⁶⁷² ⁶⁷³ ⁶⁷⁴ ⁶⁷⁵ ⁶⁷⁶ ⁶⁷⁷ ⁶⁷⁸ ⁶⁷⁹ ⁶⁸⁰ ⁶⁸¹ ⁶⁸² ⁶⁸³ ⁶⁸⁴ ⁶⁸⁵ ⁶⁸⁶ ⁶⁸⁷ ⁶⁸⁸ ⁶⁸⁹ ⁶⁹⁰ ⁶⁹¹ ⁶⁹² ⁶⁹³ ⁶⁹⁴ ⁶⁹⁵ ⁶⁹⁶ ⁶⁹⁷ ⁶⁹⁸ ⁶⁹⁹ ⁷⁰⁰ ⁷⁰¹ ⁷⁰² ⁷⁰³ ⁷⁰⁴ ⁷⁰⁵ ⁷⁰⁶ ⁷⁰⁷ ⁷⁰⁸ ⁷⁰⁹ ⁷¹⁰ ⁷¹¹ ⁷¹² ⁷¹³ ⁷¹⁴ ⁷¹⁵ ⁷¹⁶ ⁷¹⁷ ⁷¹⁸ ⁷¹⁹ ⁷²⁰ ⁷²¹ ⁷²² ⁷²³ ⁷²⁴ ⁷²⁵ ⁷²⁶ ⁷²⁷ ⁷²⁸ ⁷²⁹ ⁷³⁰ ⁷³¹ ⁷³² ⁷³³ ⁷³⁴ ⁷³⁵ ⁷³⁶ ⁷³⁷ ⁷³⁸ ⁷³⁹ ⁷⁴⁰ ⁷⁴¹ ⁷⁴² ⁷⁴³ ⁷⁴⁴ ⁷⁴⁵ ⁷⁴⁶ ⁷⁴⁷ ⁷⁴⁸ ⁷⁴⁹ ⁷⁵⁰ ⁷⁵¹ ⁷⁵² ⁷⁵³ ⁷⁵⁴ ⁷⁵⁵ ⁷⁵⁶ ⁷⁵⁷ ⁷⁵⁸ ⁷⁵⁹ ⁷⁶⁰ ⁷⁶¹ ⁷⁶² ⁷⁶³ ⁷⁶⁴ ⁷⁶⁵ ⁷⁶⁶ ⁷⁶⁷ ⁷⁶⁸ ⁷⁶⁹ ⁷⁷⁰ ⁷⁷¹ ⁷⁷² ⁷⁷³ ⁷⁷⁴ ⁷⁷⁵ ⁷⁷⁶ ⁷⁷⁷ ⁷⁷⁸ ⁷⁷⁹ ⁷⁸⁰ ⁷⁸¹ ⁷⁸² ⁷⁸³ ⁷⁸⁴ ⁷⁸⁵ ⁷⁸⁶ ⁷⁸⁷ ⁷⁸⁸ ⁷⁸⁹ ⁷⁹⁰ ⁷⁹¹ ⁷⁹² ⁷⁹³ ⁷⁹⁴ ⁷⁹⁵ ⁷⁹⁶ ⁷⁹⁷ ⁷⁹⁸ ⁷⁹⁹ ⁸⁰⁰ ⁸⁰¹ ⁸⁰² ⁸⁰³ ⁸⁰⁴ ⁸⁰⁵ ⁸⁰⁶ ⁸⁰⁷ ⁸⁰⁸ ⁸⁰⁹ ⁸¹⁰ ⁸¹¹ ⁸¹² ⁸¹³ ⁸¹⁴ ⁸¹⁵ ⁸¹⁶ ⁸¹⁷ ⁸¹⁸ ⁸¹⁹ ⁸²⁰ ⁸²¹ ⁸²² ⁸²³ ⁸²⁴ ⁸²⁵ ⁸²⁶ ⁸²⁷ ⁸²⁸ ⁸²⁹ ⁸³⁰ ⁸³¹ ⁸³² ⁸³³ ⁸³⁴ ⁸³⁵ ⁸³⁶ ⁸³⁷ ⁸³⁸ ⁸³⁹ ⁸⁴⁰ ⁸⁴¹ ⁸⁴² ⁸⁴³ ⁸⁴⁴ ⁸⁴⁵ ⁸⁴⁶ ⁸⁴⁷ ⁸⁴⁸ ⁸⁴⁹ ⁸⁵⁰ ⁸⁵¹ ⁸⁵² ⁸⁵³ ⁸⁵⁴ ⁸⁵⁵ ⁸⁵⁶ ⁸⁵⁷ ⁸⁵⁸ ⁸⁵⁹ ⁸⁶⁰ ⁸⁶¹ ⁸⁶² ⁸⁶³ ⁸⁶⁴ ⁸⁶⁵ ⁸⁶⁶ ⁸⁶⁷ ⁸⁶⁸ ⁸⁶⁹ ⁸⁷⁰ ⁸⁷¹ ⁸⁷² ⁸⁷³ ⁸⁷⁴ ⁸⁷⁵ ⁸⁷⁶ ⁸⁷⁷ ⁸⁷⁸ ⁸⁷⁹ ⁸⁸⁰ ⁸⁸¹ ⁸⁸² ⁸⁸³ ⁸⁸⁴ ⁸⁸⁵ ⁸⁸⁶ ⁸⁸⁷ ⁸⁸⁸ ⁸⁸⁹ ⁸⁹⁰ ⁸⁹¹ ⁸⁹² ⁸⁹³ ⁸⁹⁴ ⁸⁹⁵ ⁸⁹⁶ ⁸⁹⁷ ⁸⁹⁸ ⁸⁹⁹ ⁹⁰⁰ ⁹⁰¹ ⁹⁰² ⁹⁰³ ⁹⁰⁴ ⁹⁰⁵ ⁹⁰⁶ ⁹⁰⁷ ⁹⁰⁸ ⁹⁰⁹ ⁹¹⁰ ⁹¹¹ ⁹¹² ⁹¹³ ⁹¹⁴ ⁹¹⁵ ⁹¹⁶ ⁹¹⁷ ⁹¹⁸ ⁹¹⁹ ⁹²⁰ ⁹²¹ ⁹²² ⁹²³ ⁹²⁴ ⁹²⁵ ⁹²⁶ ⁹²⁷ ⁹²⁸ ⁹²⁹ ⁹³⁰ ⁹³¹ ⁹³² ⁹³³ ⁹³⁴ ⁹³⁵ ⁹³⁶ ⁹³⁷ ⁹³⁸ ⁹³⁹ ⁹⁴⁰ ⁹⁴¹ ⁹⁴² ⁹⁴³ ⁹⁴⁴ ⁹⁴⁵ ⁹⁴⁶ ⁹⁴⁷ ⁹⁴⁸ ⁹⁴⁹ ⁹⁵⁰ ⁹⁵¹ ⁹⁵² ⁹⁵³ ⁹⁵⁴ ⁹⁵⁵ ⁹⁵⁶ ⁹⁵⁷ ⁹⁵⁸ ⁹⁵⁹ ⁹⁶⁰ ⁹⁶¹ ⁹⁶² ⁹⁶³ ⁹⁶⁴ ⁹⁶⁵ ⁹⁶⁶ ⁹⁶⁷ ⁹⁶⁸ ⁹⁶⁹ ⁹⁷⁰ ⁹⁷¹ ⁹⁷² ⁹⁷³ ⁹⁷⁴ ⁹⁷⁵ ⁹⁷⁶ ⁹⁷⁷ ⁹⁷⁸ ⁹⁷⁹ ⁹⁸⁰ ⁹⁸¹ ⁹⁸² ⁹⁸³ ⁹⁸⁴ ⁹⁸⁵ ⁹⁸⁶ ⁹⁸⁷ ⁹⁸⁸ ⁹⁸⁹ ⁹⁹⁰ ⁹⁹¹ ⁹⁹² ⁹⁹³ ⁹⁹⁴ ⁹⁹⁵ ⁹⁹⁶ ⁹⁹⁷ ⁹⁹⁸ ⁹⁹⁹ ¹⁰⁰⁰ ¹⁰⁰¹ ¹⁰⁰² ¹⁰⁰³ ¹⁰⁰⁴ ¹⁰⁰⁵ ¹⁰⁰⁶ ¹⁰⁰⁷ ¹⁰⁰⁸ ¹⁰⁰⁹ ¹⁰¹⁰ ¹⁰¹¹ ¹⁰¹² ¹⁰¹³ ¹⁰¹⁴ ¹⁰¹⁵ ¹⁰¹⁶ ¹⁰¹⁷ ¹⁰¹⁸ ¹⁰¹⁹ ¹⁰²⁰ ¹⁰²¹ ¹⁰²² ¹⁰²³ ¹⁰²⁴ ¹⁰²⁵ ¹⁰²⁶ ¹⁰²⁷ ¹⁰²⁸ ¹⁰²⁹ ¹⁰³⁰ ¹⁰³¹ ¹⁰³² ¹⁰³³ ¹⁰³⁴ ¹⁰³⁵ ¹⁰³⁶ ¹⁰³⁷ ¹⁰³⁸ ¹⁰³⁹ ¹⁰⁴⁰ ¹⁰⁴¹ ¹⁰⁴² ¹⁰⁴³ ¹⁰⁴⁴ ¹⁰⁴⁵ ¹⁰⁴⁶ ¹⁰⁴⁷ ¹⁰⁴⁸ ¹⁰⁴⁹ ¹⁰⁵⁰ ¹⁰⁵¹ ¹⁰⁵² ¹⁰⁵³ ¹⁰⁵⁴ ¹⁰⁵⁵ ¹⁰⁵⁶ ¹⁰⁵⁷ ¹⁰⁵⁸ ¹⁰⁵⁹ ¹⁰⁶⁰ ¹⁰⁶¹ ¹⁰⁶² ¹⁰⁶³ ¹⁰⁶⁴ ¹⁰⁶⁵ ¹⁰⁶⁶ ¹⁰⁶⁷ ¹⁰⁶⁸ ¹⁰⁶⁹ ¹⁰⁷⁰ ¹⁰⁷¹ ¹⁰⁷² ¹⁰⁷³ ¹⁰⁷⁴ ¹⁰⁷⁵ ¹⁰⁷⁶ ¹⁰⁷⁷ ¹⁰⁷⁸ ¹⁰⁷⁹ ¹⁰⁸⁰ ¹⁰⁸¹ ¹⁰⁸² ¹⁰⁸³ ¹⁰⁸⁴ ¹⁰⁸⁵ ¹⁰⁸⁶ ¹⁰⁸⁷ ¹⁰⁸⁸ ¹⁰⁸⁹ ¹⁰⁹⁰ ¹⁰⁹¹ ¹⁰⁹² ¹⁰⁹³ ¹⁰⁹⁴ ¹⁰⁹⁵ ¹⁰⁹⁶ ¹⁰⁹⁷ ¹⁰⁹⁸ ¹⁰⁹⁹ ¹¹⁰⁰ ¹¹⁰¹ ¹¹⁰² ¹¹⁰³ ¹¹⁰⁴ ¹¹⁰⁵ ¹¹⁰⁶ ¹¹⁰⁷ ¹¹⁰⁸ ¹¹⁰⁹ ¹¹¹⁰ ¹¹¹¹ ¹¹¹² ¹¹¹³ ¹¹¹⁴ ¹¹¹⁵ ¹¹¹⁶ ¹¹¹⁷ ¹¹¹⁸ ¹¹¹⁹ ¹¹²⁰ ¹¹²¹ ¹¹²² ¹¹²³ ¹¹²⁴ ¹¹²⁵ ¹¹²⁶ ¹¹²⁷ ¹¹²⁸ ¹¹²⁹ ¹¹³⁰ ¹¹³¹ ¹¹³² ¹¹³³ ¹¹³⁴ ¹¹³⁵ ¹¹³⁶ ¹¹³⁷ ¹¹³⁸ ¹¹³⁹ ¹¹⁴⁰ ¹¹⁴¹ ¹¹⁴² ¹¹⁴³ ¹¹⁴⁴ ¹¹⁴⁵ ¹¹⁴⁶ ¹¹⁴⁷ ¹¹⁴⁸ ¹¹⁴⁹ ¹¹⁵⁰ ¹¹⁵¹ ¹¹⁵² ¹¹⁵³ ¹¹⁵⁴ ¹¹⁵⁵ ¹¹⁵⁶ ¹¹⁵⁷ ¹¹⁵⁸ ¹¹⁵⁹ ¹¹⁶⁰ ¹¹⁶¹ ¹¹⁶² ¹¹⁶³ ¹¹⁶⁴ ¹¹⁶⁵ ¹¹⁶⁶ ¹¹⁶⁷ ¹¹⁶⁸ ^{1169</}

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balanced or unbalanced growth. A normal correlation of RNA:protein with growth rate was found in most media. RNA accumulation was halted during adjustment to a poorer medium. Under some conditions of cultivation, however, regulation of RNA synthesis broke down and unusual amounts of RNA accumulated. All such conditions appeared to impose an amino acid restriction on the cells.

B.M. Stevens

465. CHARACTERISATION OF THE RNA FORMED UNDER CONDITIONS OF RELAXED AMINO ACID CONTROL IN E. COLI F.C.Neidhardt and L.Eidelic: *Biochim. biophys. Acta.* 1963. 68. 380-388 (Dept. Biol. Sci., Purdue Univ., Lafayette, Ind., U.S.A.) The RNA contained 23 μ , 16 JS and 4-8 S components. When RNA overproduction occurred in the absence of protein synthesis, as when cells were transferred from amino acids to minimal medium, the accumulation pattern resembled that of normal cells inhib. by chloramphenicol. 23 μ and 16 S RNA were present as abnormal ribosomes and proportionately less of these were formed than of sol. RNA. At least part of the sol. RNA had amino acid accepting activity. When RNA overproduction occurred with some concomitant protein synthesis, as during adenosine inhib., the accumulated RNA appeared as apparently normal 50 μ , 30 μ and sol. RNA in normal proportions.

B.M.Stevens

466. NATURE OF A DEOXYNUCLEOTIDE POLYMERASE-DNA COMPLEX. D.Billen: *Biochim. biophys. Acta.* 1963, 68, 342-353 (Section of Rad. Biol., Dept. Biol. Univ. Texas M.D.Anderson Hosp., Houston, Tex., U.S.A.) All the polymerase was associated with DNA after sucrose gradient centrifugation of *E. coli* strain 15 A IT extracts. Variable quantities of thymidine and deoxynucleotide monophosphate phosphorylating enzymes were associated with the complex. Ribosomal contamination complicated. Extracts obtained using the pressure cell showed a different distribution pattern for the complex from that shown by extract obtained by alumina grinding. Association of polymerase with DNA was similar in extracts from cells showing extremes of DNA synthesising ability in vivo. X-radiation of cells had no effect. *E. coli* polymerase complexed with calf thymus or bacterial DNA on mixing and showed sucrose gradient sedimentation patterns like that of the extracted complex.

B.M.Stevens

467. SIZE OF NUCLEUS AS A MEASURE OF SYNTHESISING ACTIVITY (AUTORADIOGRAPHIC STUDIES WITH [3H]CYTIDINE AND [3H]PHENYL ALA NINE). E.StBcker: *Naturwissenschaften* 1963, 50, 2. 44-45 (Pathol. Inst., Univ., Wttrzburg, Germany) Good correlation between RNA and protein synthesis and nuclear size was obtained using the method described, in the liver epithelium of normal and thioacetamide-stimulated rats. Nuclear vacuoles present in active cells also, appeared to be labelled in relation to synthetic activity.

(German) AJ.Wansbrough

468. AUTORADIOGRAPHIC STUDIES ON NUCLEIC ACID TURNOVER IN ASCITES TUMOURS. M.EDA. H.Wrba and H.H.Muth: *Naturwissenschaften*. 1963. 50. 2. 46 (Pathol. Inst., Univ., Munich, Germany)

[3H]thymidine was used to observe the difference in activity between inner and outer zones of solid s.c. implanted tumours. Activity in the outer zone was greatest during the first 24 hr. after implantation, but even greater in the inner zone from 24-48 hr. The labelling index was compared with that of the free ascites tumour cells.

(German) AJ.Wansbrough

469. EFFECT OF DEUTERIUM OXIDE ON INCORPORATION OF PHOSPHOROUS-32 INTO RAT LIVER DNA. D.A.Bray and J.F.Thomson: *Proc. Soc. exp. Biol., N.Y.* 1962, 111. 380-383 (Div. Biol. and Med. Res. Argonne Nat. Lab., 111. U.S.A.) With increasing concn. of D₂O, there was a progressive decrease in DNA synthesis. In rats in which 30% of body H₂O was replaced by D₂O the incorporation of 32P into DNA was reduced about 1/5 of normal.

M.M.S.12 p a

470. DISTINCT CISTRONS FOR THE TWO RIBOSOMAL RNA COMPONENTS. S.A.Yankofsky and S.Spiegelmaier: *Proc. nat. Acad. Sci., Wash.* 1963. 49. 538-544 (Dept. Microbiol., Univ. Illinois, Urbana, IL, U.S.A.) Specific hybrid formation was used to determine whether 16S and 23S ribosomes are derived from the same or different complementary sequences of DNA. The data establish that (a) max. amounts of RNA hybridising per unit of DNA differs for the 2 ribosome spp., (b) at satn. concn. of RNA the amount of hybrid formed is additive when 16S and 23S RNA are present together, (c) competitive action of the 2 RNA spp. for the same DNA site is absent. It is concluded that 16S and 23S ribosomal RNA are derived from DNA sequences unique to each.

J.R.Sargeant

471. RNA POLYMERASE OF AZOTOBACTER VINELANDII II. FORMATION OF DNA-RNA HYBRIDS WITH SINGLE-STRANDED DNA AS PRIMER. R.C.Warner, H.H.Samuel, M.T.Abbott and J.S.Krakow: *Proc. nat. Acad. Sci., Wash.* 1963. 49. 533-538 (Dept. Biochem., New York Univ. Sch. Med., New York, U.S.A.) A DNA hybrid is formed during synthesis of RNA by highly purified *A. vinelandii* RNA polymerase. The hybrid was detected by density gradient centrifugation in Cs₂SO₄, where its buoyancy is intermediate between DNA and RNA. The hybrid is resistant to RNase and can be thermally denatured to yield single-stranded DNA and RNA.

J.F.Sargent

472. SPECIES VARIATION OF RNA METHYLASE. P.R.Srinivasan and E.Borek: *Proc. nat. Acad. Sci., Wash.* 1963. 49. 529-533 (Dept. Biochem., Columbia Univ., New York, U.S.A.) From studies of patterns of methylation of transfer RNA by RNA methylases from different spp. it is concluded that methylation is highly ordered within a sp. and varies inter-spp. RNA from a given source while fully methylated, with respect to its homologous methylating enzymes, can be further methylated by enzymes from different sources.

J.R.Sargeant

473. COMPETITION BETWEEN TRITIATED THYMIDYLIC ACID AND 5-METHYLDEOXYCYTIDINE INCORPORATE INTO BONE MARROW DEOXYRIBONUCLEIC ACID. L.Beneš and J.Soška: *Folia Biol., Praha* 1963. 9. 75-76 (Inst. Biophysics, Czech. Acad. Sci., Brno, Czechoslovakia). << M.S.Laverack

474. SYNTHESIS OF DNA DURING THE CYCLE OF DIVISION OF TRYPARASOMA MEGA. M.Steinert: *Protistolog.* 1962. 9. 203-211 (Lab. Parasit., Inst. Sci. and Appl. Res. Katanga, B.P. 2922 Elisabethville, Katanga, Congo) [3H]Thymidine autoradiographic methods were used to investigate the cycle of DNA synthesis during division in *T. mega* of mean generation time of 18.9 hr. for this sp. *consists* of 4 stages: G₁, S, G₂, D. The S stage is the phase of DNA synthesis of both the nucleus and the kinetochore. The cell divides during stage D, beginning with the first division of the kinetochore. The close time relationship between the 2 DNA synthesising bodies suggests the v

Genetic function of the kinetonudeus.

(French) R.J.Walker
475. KINETICS OF MEGACARYOCYTE PROLIFERATION.

L.E.Feinendegen, N.Odarchenko, H.Cottier and V.P.Bond: Proc. Soc. exp. Biol., N.Y., 1962, 111, 177-182 (Med. Res. Center, Brookhaven Nat. Lab., Upton, L.I., U.S.A.) [3H]Thymidine was used as a ³²P marker. The transit time for the most immature recognisable stage of megacaryocytic development to Vifgacaryocytic disintegration was found to be approx. 10 hr. Evidence was obtained that the elements of the earlier stage originate from precursors which continuously synthesise DNA 1-3 days prior to development.

M.M.Shapland
476. HOMOLOGY TEST BETWEEN THE NUCLEIC ACID OF AN RNA VIRUS AND THE DNA IN THE HOST CELL. R.H.Doi and S.Spiegelman: Science, 1962, 138, 1270-1272 (Dept. Microbiol., Univ. Illinois, Urbana, 111, W.A.S.A.). The RNA of bacteriophage MS02 labelled with ³²P did not form hybrids with DNA from its host, Nsail, whereas 3H-labelled ribosomal RNA did form hybrids. It is therefore evident that there are no differences in the DNA complementary to the viral RNA. Implications of the results for replication and transition of RNA are discussed. G.M.Lewis

477. RNA METABOLISM IN THE PLASMA CELL SEQUENCE. J.Mitchell and G.J.V.Nossal: Nature, Lond., 1963, 197, 1121-1122 (Walter and Eliza Hall Inst., Univ. - Melbourne, Australia). Popliteal lymph node cells from rats immunised with Salmonella typhimurium flagella were treated with [3H]uridine. While blast cells incorporated uridine rapidly, mature plasma cells showed little RNA turnover. Most, if not all, RNA synthesis occurred in the nucleus, some moving later to cytoplasm. When [3H]uridine was inj. into the foot of a mature plasma cell did not become labelled. Synt? ³²P leucine incorporation to estimate protein synthesis# it was shown * a blast cells turn over 30 times as much RNA as mature cells for each mol. leucine taken. G.M.Lewis

478. INTERACTION BETWEEN POLYURIDYLIC ACID AND ISOLATED MICROSONES FROM EHRLICH ASCITES TUMOUR CELLS. S.Pedersen and T.Hultin: Biochim. biophys. Acta, 1963, 68, 328-330 (Wenner-Gren Inst., Stockholm, Sweden). Polyuridylic acid sol. added to microsomes without the participation of enzymes or P³²P-linked energy firmly enough to prevent pairing with subsequently added polyadenylic acid. Prelim, comm. B.M.Stevens

479. A CHARACTERISTIC MESSENGER RNA IN THE STEM OF INDUCED FORMATION OF CATECHOL IDISING ENZYMES IN PSEUDOMONAS EFFUSA. M.Mamato, H.Yamagishi and K.Nozu: Biochem. Phys. Res. Comm., 1963, 10, 379 (Dept. Applied Radiation Centre of Osaka Prefecture, Sakai, & Japaⁿ). Induced enzyme formation in ³²P³²P³² was found to be associated with an increase in tyrosine and a new component sedimenting somewhat faster than 16S. B.Ketterer

480. INTERACTION OF RIBOSOMES AND SOME SYNTHETIC POLYRIBONUCLEOTIDES. T.Okamoto and M.Takami: Biochim. biophys. Acta, 1963, 68, 325-327 (Res. Inst. for Nuclear Med. and Biol., Hiroshima Univ., Hiroshima, Japan). Polyuridylic acid, but not polyadenylic acid or polycytidyllic acid, was shown to interact with ribosomes. Prelim, comm. B.M.Stevens

481. OBSERVATIONS ON THE POSSIBLE NATURE OF THE GENETIC CODE. T.H.Jukes: Biochem. biophys. Res. Comm., 1963, 10, 155 (American Cyanamid Co., Agricultural Div., Princeton, NJ., U.S.A.)

A triplet code is postulated in which each triplet contains a 'pivotal' base which may be subject to change without altering the coding function. B.Ketterer

482. ORIGIN AND BIOLOGICAL INDIVIDUALITY OF THE GENETIC DICTIONARY. D.Giacomoni and S.Spiegelman: Science, 1962, 138, 1328-1331 (Dept. Microbiol., Univ. Illinois, Urbana, 111, U.S.A.). Sol. RNA in extracts of E.coli does not form hybrids with DNA at the temp. range (30-55°) suitable for complex formation with informational or ribosomal RNA, but does so between 70-75° under ionic conditions that allow formation of hydrogen bonds. The hybrids formed are specific, resistant to RNase, and indicate that only a small proportion of the DNA is complementary to sol.-RNA mol. It is suggested that sol.-RNA is formed on a DNA template; it saturates DNA at about 0.02%, which is consistent with a degenerate genetic code. G.M.Lewis

483. E.M. STUDIES OF RIBOSOMAL CLUSTERS SYNTHESISING Hb. J.R. Warner, A.Rich and C.E.Hall: Science, 1962, 138, 1399-1403 (Biol. Dept., M.I.T., Cambridge, Mass., U.S.A.). Reticulocytes incubated with [14C]amino acids were lysed and fractionated by a sucrose density gradient method. The protein synthesising fraction was found to consist of clusters of 5 ribosomes, which sedimented at 170 S compared with 76 S for the single ribosome units. E.M. examination revealed threads holding the ribosomal units together; these are thought to be single strands of RNA. possibly the messenger RNA in control of the synthesis of Hb. G.M.Lewis

484. CELL FREE SYSTEM FOR PROLINE INCORPORATION INTO PROTEIN CLEAVED BY COLLAGENASE. M.Urivetsky, V.Kranz and E.Meilman: Arch. Biochem., 1963, 100, 478-485 (Med. Res. Dept., Long Island Jewish Hosp., New Hyde Park, New York, U.S.A.). A system containing skin microsomes incorporated [14C]proline into ribosomal protein with a low collagen content. Conversion of proline to hydroxyproline could not be demonstrated. The ribosomal protein acted as substrate for purified bacterial collagenase, dialysable peptides being released. Two of these were shown to be Gly.Pro.Hydro. and Gly.Pro.Ala. Both contained 14C. B.M.Stevens

485. A SOLUBLE AMINO ACID INCORPORATING SYSTEM. A.Kaji, H.Kaji and G.D.Novelli: Biochem. biophys. Res. Comm., 1963, 10, 406 (Biol. Div., Oak Ridge Nat. Lab., Oak Ridge, Tenn., U.S.A.)

An RNA polymerase prep. from E.coli has been found to stimulate the incorporation of amino acids in the presence of ATP generator, GTP and s-RNA. This incorporation is not accountable for by ribosome contamination.

B.Ketterer
486. CELL-FREE PROTEIN SYNTHESIS: ASSOCIATION OF VIRAL RNA AND E. COLI RIBOSOMES. R.Haselkorn, V.A.Fried and J.E.Dahlberg: Proc. nat. Acad. Sci., Wash., 1963, 49, 511-517 (Committee on Biophysics, Univ. Chicago, IL, U.S.A.). Tobacco yellow mosaic virus [TYMV] RNA associates with JL-³²P ribosomes in the absence of cofactors other than Mg. The complex formed consists of 1 mol. of viral RNA and one 70S ribosome and is capable of incorporating amino acids into protein in a suitable system. ³²P of the ribosomes bind viral RNA, the same fraction functioning in the amino acid incorporating

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system. Binding of viral RNA to ribosomes is reversed in 10^{-4} M Mg. Both 30S and 50S ribosomes also appear to contain sites for viral RNA attachment. J.R.Sargent

- 487. INCORPORATION OF [^{14}C]LEUCINE INTO RAT LIVER RIBOSOMES: EFFECT OF SOLUBLE FRACTION FROM MUSCLE OF NORMAL DIABETIC AND INSULIN TREATED RATS.** I.G.Woo: *Biochim. biophys. Acta.* 1963, 68, 411-417 (Dept. Biochem., Univ., Cambridge, England) Sol. fraction from skeletal muscle would substitute for sol. fraction from liver in catalysing [^{14}C]leucine incorporation. No differences between muscle sol. fractions from normal, insulin treated and alloxan diabetic rats were found. B.M.Stevens
- 488. EFFECT OF HYDROXYLAMINE ON RABBIT RETICULOCYTE RIBOSOMES.** D.W.Allen: *Biochim. biophys. Acta.* 1963, 68, 418-424 (John Collins Warren Lab., Huntington Mem. Hosp., Boston, Mass., U.S.A.) Salt free NH₂OH released labelled polypeptides from ribosomes labelled by prior incubation with [^{14}C]amino acids, without disintegrating the ribosomes. Incubation of labelled ribosomes in a cell free system in which labelled polypeptide was released as Hb produced a proportional decrease in the fraction released by NH₂OH. Treatment with either NH₂OH or puromycin rendered the microsomal label unsusceptible to further release by the other. Electrophoretic patterns of material released were similar but unlike Hb. Max. release occurred with 3M NH₂OH after 8-10 min. B.M.Stevens

- 489. BIOSYNTHESIS OF dopa Hb.** F.Chapeville, G.Cartouzou and S.Lissitzky: *Biochim. biophys. Acta.* 1963, 68, 496-499 (Dépt. Biol., Centre d'Etudes Nucléaires, Gif-sur-Yvette, Seine-et-Oise, France) When dopa combined with the sol. RNA sp. for tyrosine was added to an in vitro Hb synthesising system dopa was incorporated into the positions normally occupied by tyrosine. Prelim, comm. (French) B.M.Stevens

- 490. FORMATION OF Hb IN THE PRESENCE OF [ISO-TOPIC] HYDROGEN-3-L-VALYL-L-LEUCINE.** J.P.Burnett, jun. and F.Haurowitz: *Hoppe-Seylers Z. physiol. Chem.*, 1963, 331, 67-76 (Dept. Chem., Indiana Univ., Bloomington, Ind., U.S.A.) In the synthesis of Hb in chicken r.b.c. free Val and Leu are incorporated after activation. Although the N-terminal sequence is Val-Leu, no direct incorporation of [^3H]Val-Leu was observed. It is suggested that the dipeptide is hydrolysed to the labelled amino acids, which are then randomly incorporated. Possible mechanisms are also discussed. LCornish

- 491. THE [^{2-14}C]GLYCINE INCORPORATION IN VITRO INTO DUCK HAEMOGLOBIN FRACTIONATED BY CHROMATOGRAPHY.** L.Bianco and E.Lazzarini: *G.Biochim.*, 1962, 11, 157-161 (Centro Studi Nucleari E.Fermi, Politecnico di Milano, Italy) [^{2-14}C]Glycine was incorporated by incubation into duck Hb, and the resultant material was fractionated on an alumina column. It was found that the haem and globin incorporated [^{2-14}C]glycine at the same rate but to a different extent. B.Payne

- 492. INCORPORATION OF [^{14}C]GLYCINE INTO THE SUBUNITS OF COLLAGENS FROM NORMAL AND LATHYRITIC ANIMALS.** G.R.Martin, K.A.Piez and M.S.Lewis: *Biochim. biophys. Acta.* 1963, 69, 472-479 (Nat. Inst. Dental Res., Bethesda, Md., U.S.A.)

14c appeared first in the primary subunits O₁ and Q₂ and later in p₁ and p₂. O₁ and O₂ were labelled at the sp^{c} rates. In lathyritic animals the formation of p₁ and p₂ was markedly reduced although collagen synthesis proceeded. This defect was apparent long before gross lathyritic symptoms appeared. B.M.Steven!

- 493. COLLAGEN METABOLISM WITH OXYGEN-18 AS A TRACER.** D.Fujimoto and N.Tamiya: *Biochim. biophys. Acta.* 1963, 69, 559-561 (Med. Sch., Tokyo Med. and Dental Univ., Bunkyo-ku, Tokyo, Japan) ^{18}O incorporation from air into the hydroxyproline of various chick embryo fractions is described. B.M.Steven!

- 494. ACTION OF AMINOACETONITRILE ON BONE COLLAGEN IN TISSUE CULTURE.** G.R.Martin and P.Goldhaber: *Biochim. biophys. Acta.* 1963, 69, 508-519 (Nat. Inst. Dental Res., Bethesda, Md., U.S.A.) Aminoacetonitrile increased the amount of collagen extractable with 1M NaCl from 5 day mouse calvaria grown under conditions which led to new osteoid format¹⁰ within 2 weeks; when uniformly labelled L-[^{14}C]prolin¹⁰ was present in the culture fluid aminoacetonitrile depressed the sp. activity of hydroxyproline in the residue but not in the salt extract. B.M.Steven!

- 495. PROTEIN SYNTHESIS IN REGENERATING LIVERS - OF RATS INVESTIGATED WITH ^3H -LABELLED AMINO ACIDS.** W.Busanny-Caspari and M.Deimel: *Z. Ges. exp. Med.*, 1963, 136, 456-465 (Inst. Med. Isotope Res., Univ. Cologne, Germany) Previously partial hepatectomised rats were killed 3 hr. to 14 days after operation and 1 hr. after i.p. injn. of 3-7 me [^3H]phenylalanine or 4 me [^3H]lysine. The sp. radioactivity of proteins of the liver remnant showed a well marked ini¹¹rise after hepatectomy, with a max. after 9 hr.; sp. radioactivity then declined to a min. at 16 hr. followed by a subsequent rise to a 2nd max. 28 hr. after operation. The wt. of the liver remnant increased in linear fashion after operation. Liver proteins showed virtually no in¹¹crease for the first 16 hr. after hepatectomy and only slight¹¹increased at the same rate as liver wt. The possible significance of these observations is discussed.

- (German) P.F.Meyer

- 496. UTILISATION OF EXOGENOUS PROLINE BY THE YEAST CANDIDA UTILIS.** J.H.Miller and E.S.Kemp: *Science*, 1963, 139, 105-106 (Nat. Inst. Arthritis and Metab. Dis., N.I.H., Bethesda, Md., U.S.A.)

- Exponentially growing *C. utilis* cells incorporate [^{14}C]proline into protein. Studies of the kinetic flow of the labelled mol. indicated that 2 pools of proline may be present. Most of the exogenous proline is converted to other amino acids in the glutamic acid family when t_{1/2} concn. is 10^{-5} M or greater. The great variation in P₁ and P₂ concn. and sp. activity of these precursors leads to a distribution of radioactivity in protein which is cone, in P₁ although most of the exogenous material was converted to other compounds. G.M.^{et al}

- 497. SERUM PROTEIN SYNTHESIS BY EMBRYONIC AND NEONATAL CHICKS.** R.Asofsky, Z.Trnka and G.J.Thorbecke: *Proc. Soc. exp. Biol., N.Y.* 1962, 117, 497-499 (Dept. Path., New York Univ. Sch. Med., New York, U.S.A.) Embryonic and neonatal chicks produce, in addition to albumin and several O₁ and P₁-globulins, at least 3 proteins of y-globulin-like elect¹² phoretic mobility but distinct from y-globulin. Formation of y-globulin and /fe-macroglobulin could not be shown. MMShapland

498. SYNTHESIS OF α -ACID GLYCOPROTEIN BY THE ISOLATED PERFUSED RAT LIVER. E.J.Sarcione: Arch. Biochem., 1963, 100, 516-519 (Div. Med., Roswell Park Mem. Inst., Buffalo, N.Y., U.S.A.) ^{14}C from ^{14}C glucose was incorporated into the galactose, $^{\text{N}}$ annose and glucosamine and [^{14}C]leucine into the Protein of plasma α -acid glycoprotein. Only negligible amounts of ^{14}C were incorporated in the absence of the Uver. [^{14}C]Leucine was incorporated into the protein of α -acid glycoprotein 2 \times 2 times more rapidly than into albumin of the perfusing blood. B.M.Stevens

499. MAINTENANCE OF THE ACCURACY OF PROTEIN SYNTHESIS AND ITS RELEVANCE TO AGEING.

L.E.Orgel: Proc. nat. Acad. Sci., Wash., 1963, 49, 517-521 (Univ. Chem. Lab., Cambridge, England) Sources of error in the protein synthetic mechanism are discussed. Sources of error which lead to errors in the protein synthetic mechanism itself are considered to be cumulative. It is demonstrated that if the freq. of error Production bears a slight linear dependence on the concn. of errors already present then the error freq. increases exponentially with time. The possible significance of these considerations is discussed in relation to the ageing Mechanism. J.R.Sargent

500. CHEMICAL REACTIVITY OF A MACROMOLECULE AS A FUNCTION OF ITS AGE. H.Walter: Biochim. biophys. Acta, 1963, 69, 410-411 (Med. Res. Programmes, V.A. Hosp., Long Beach, Calif., U.S.A.) Young Hb bound more 51cr than old Hb. B.M.Stevens

501. NUCLEAR PROTEIN SYNTHESIS IN Vicia faba. Sister Augustine Mattingly: Exp. Cell Res., 1963, 29, 314-326 (Dept. Biol., Brescia Coll., Owensboro, Ky., U.S.A.) By using a newly developed technique for isolating cytoplasm-free prep. of *V. faba* nuclei and autobiography, differences in rate and pattern of nuclear incorporation of [^3H]lysine, arginine and tryptophan in meristematic cells were studied. Lysine was incorporated most rapidly, and tryptophan, least. A comparison of nuclear prep. and root tip smears indicated that lysine utilisation occurred in all stages of the cell cycle in varying degrees. K.Jones

502. BIOSYNTHESIS OF PROTEINS. V. FUNCTION OF NUCLEIC ACIDS IN THE INCORPORATION OF AMINO ACIDS IN PROTEINS, IN A CELL FREE SYSTEM OF *E. COLI*. W.Doerfler, W.Zillig, E.Fuchs and M.Albers: Hoppe-Seylers Z. physiol. Chem., 1962, 330, 96-123 In Max-Planck-Inst. Biochem., Munich, Germany) Incorporation requires enzymes, ATP, sol. RNA, ribosomes and high mol. wt. nucleic acids. The effects of nucleic acids are discussed in detail. DNA prep. acts in the biosynthesis of messenger RNA; the rate is increased by spermine. Actinomycin C3 and proflavine inhibits the synthesis of RNA; enzymic degradations are discussed. (German) I.Coraish

ACTION OF PROTEINS SYNTHESISED BY SUBCELLULAR FRACTION FROM PSEUDOMONAS-P. T.Tohida, H.Takahashi and B.Marao: J. Biochem., Tokyo, 1963, 53, 124-134 (Div. Enzymol., Inst. te Miciobiol., Univ. Tokyo, Japan) Proteins fractionated on DEAE-cellulose columns and by $\text{Li}_{\text{N}}\text{O}_4$ fraction. Amino acid incorporation expt. indicated SO_4^{2-} protein synthesis in exponentially growing cells. Mg^{2+} Produced by incubating a cell suspension with uramide, EDTA and KCl at pH 8.0 and centri-

fuging at 15000 $\times \text{g}$ for 5 min.. were homogenised with chilled Tris(hydroxymethyl)aminomethane-HCl buffer containing DNase and MgCl₂ and centrifuged at 15000 $\times \text{g}$ for 20 min. The ppt. resuspended in 0.005M MgCl₂ was again centrifuged at 15000 $\times \text{g}$ for 20 min. The resulting ppt. [MgP] showed heterogeneous protein synthesis. MgP synthesised 2 types of proteins eluted from DEAE-cellulose with low NaCl concn. and 0.5N KOH respectively. The bulk of free proteins found in intact cells were absent from MgP products. Nascent proteins were loosely attached to MgP ribosomes, being released by lowering Mg concn. or DEAE-cellulose treatment. B.M.Stevens

504. FEEDBACK INHIBITION OF ACETYLGLUTAMINE SYNTHETASE BY ARGinine IN *E. COLI*. S.Vyas and W.K.Maas: Arch. Biochem., 1963, 100, 542-546 (Dept. Microbiol., New York Univ. Sch. Med., New York, U.S.A.) A method for measuring N-acetylglutamate formation in resting suspensions of *E. coli* K-12 is described. Dependence on substrate concn., concn. of cells and pH were examined. Evidence is presented for inhibn. by arginine of the enzyme catalysing the reaction, viz. acetylglutamate synthetase. The formation of this enzyme was also shown to be repressed by arginine. B.M.Stevens

505. REGULATION OF BIOSYNTHESIS OF A HEAT SENSITIVE β -D-GALACTOSIDASE IN [BACTERIA] *SHIGELLA DYSENTERIAE*. S.Sarkar and S.E.Luria: Biochim. biophys. Acta, 1963, 68, 506-508 (Dept. of Biol., M.I.T., Cambridge, Mass., U.S.A.) Prelim. comm. B.M.Stevens

506. QUANTITATIVE STUDIES ON ENZYME REPRESSION IN DEVELOPING CHICK EMBRYO AND NEWLY HATCHED CHICK. J.B.Walker: Proc. Soc. exp. Biol. N.Y., 1963, 112, 245-247 (Dept. Biochem., Baylor Univ. Med. Coll., Houston, Tex., U.S.A.) The enzyme repression (neg. feedback control) of the arginine-glycine transaminase system has been achieved with creatine (very effective), guanidinoacetate (highly effective) and to a lesser extent by citrulline in chick embryo livers when eggs received these substances. It was found that glycine and citrulline administered together could reduce the enzyme level even further. The enzyme system could be induced in newly hatched chicks given creatine before hatching by feeding them a complete diet. The enzyme rose to normal levels in 6 days. D.N.Wheatley

507. MECHANISM OF D-GLUTAMYLTRANSFERASE REPRESSION IN [CULTURED] MAMMALIAN CELLS [VIZ. MOUSE SUBCUTANEOUS-STRAIN L]. J.Paul and P.F.Fottrell: Biochim. biophys. Acta, 1963, 67, 334-336 (Biochem. Dept., Univ. of Glasgow, Scotland). B.M.Stevens

508. REPRESSION OF ARGINOSUCCINASE IN *CHLAMYDOMONAS REINHARDTII*. G.A.Hudock: Biochem. biophys. Res. Comm., 1963, 10, 133 (Biol. Lab., Harvard Univ., Cambridge, Mass., U.S.A.) It is demonstrated that arginosuccinase is repressible by arginine in the unicellular green alga *C. reinhardtii* and there is an indication that repression by endogenous arginine may occur. B.Ketterer

509. IN VITRO COMPLEMENTATION IN THE TRYPTOPHAN SYNTHETASE SYSTEM OF *NEUROSPORA*. Y.Sufama: Biochem. biophys. Res. Comm., 1963, 10, 144 (Dept. Biol., U.C.S.D., La Jolla, Calif., U.S.A.) When extracts of 2 strains of *Neurospora*, each producing

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defective tryptophan synthetases, were mixed together higher activity was obtained than would be expected from the individual activities of the 2 extracts. B.Ketterer

- 510. CONTROL BY URACIL OF CARBAMYL PHOSPHATE SYNTHESIS IN E. COLI.** L.Gorini and S.M.Kalman: *Biochim. biophys. Acta.* 1963, 69, 355-360 (Dept. Bacteriol. and Immunol., Harvard Med. Sch^{ff}, Boston, Mass., U.S.A.) Uracil inhib. arginine synthesis slightly in wild type. W and K12 strains. A mutant in which uracil produced an abs. requirement for arginine was selected. Evidence that uracil repressed the formation of enzymes producing carbamyl phosphate is presented. NH₄ carbamate counteracted inhibn. of mutant growth by uracil. B.M.Stevens

MINERAL METABOLISM

(See also Physiology: Body fluids and Electrolytes)

- 511. EFFECTS OF pH AND INHIBITORS ON SOME PROPERTIES RELATED TO METAL BINDING IN BOVINE CARBONIC ANHYDRASE.** S.Lindskog: *J. biol. Chem.* 1963, 238, 945-951 (Enzyme Chem. Group, Inst. Biochem., Univ. Uppsala, Sweden) The visible absorption spectrum of the enzymically active Co deriv. of bovine Carbonic anhydrase suffers a reversible change with change of pH. Only 2 spp. are involved in the neutral pH region. Another spectral change, reversible by sufficient increase in pH, is caused by inhibitors - either 'metal-poison' type or sulphonamides. Although both the native enzyme and the Co-enzyme bind acetazolamide strongly, the metal free enzyme binds virtually no inhibitor. The no. of protons liberated per chelating site when Zn is bound to the apoenzyme increases by approx. one as the pH is increased from 6 to 9. If methazolamide (a sulphonamide-type inhibitor) is included at pH 9, one proton less is liberated. One proton is taken up on binding of the inhibitor by the native enzyme at the same pH. The results show that one of the ligand groups probably becomes uncoupled from the metal at neutral or weakly acid pH, and inhibitors compete with this group or another ligand for a coordination site of the metal ion. J.N.Ashley

- 512. METAL CHELATES OF ADENOSIDE TRIPHOSPHATES.** M.M.T.Khan and A.E.Martell: *J. phys. Chem.* 1962, 66, 10-15 (Chem. Dept., Clark Univ., Worcester, Mass., U.S.A.) The stability constants of the 1:1 chelates of ATP with divalent ions of biol. occurrence are reported. It is found that the stabilities increase in the sequence: Ba < Sr < Ca < Mg < Co < Mn < Zn < Ni < Cu. Structures for these chelates are suggested. G.C.Barr

- 513. MITOCHONDRIAL FORMATION AND HYDROLYSIS OF ATP IN THE PRESENCE OF SOME RARE-EARTH IONS.** D.Neubert: *Biochim. biophys. Acta.* 1963, 69, 399-402 (Dept. Physiol. Chem., Johns Hopkins Univ. Sch. Med., Baltimore, Md., U.S.A.) Ions of La, Pr, Nd and Sm did not appear to have direct toxic effect on ATP synthesis or breakdown. B.M.Stevens

- 514. PHOSPHOPROTEINS AND ION TRANSPORT OF CEREBRAL CORTEX SLICES.** K.Ahmed, J.D.Judah and

H.Wallgren: *Biochim. biophys. Acta.* 1963, 69, 428-430 (Wistar Inst. Anat. Biol., Philadelphia, Pa., U.S.A.) Phosphoprotein turnover and Na transport appeared to be related. Prelim, comm. B.M.Stevens

- 515. CATION REQUIREMENTS FOR THE FORMATION OF ATP FROM A HIGH ENERGY INTERMEDIATE OF OXIDATIVE PHOSPHORYLATION.** J.J. Scocca and G.B.Pinchot: *Biochim. biophys. Acta.* 1963, 71, 193-195 (McCollum-Pratt Inst., Johns Hopkins Univ., Baltimore, Md., U.S.A.) Mg was required. B.M.Stevens

- 516. EFFECTS OF METALLIC IONS AND REDUCING AGENTS ON THE INCORPORATION OF AMINO ACIDS INTO SOLUBLE RNA AND MICROSOMAL PROTEIN.** A.Devi and N.Sarkar: *Biochim. biophys. Acta.* 1963, 68, 254-262 (Dept. Biochem., Fac. Med., Laval Univ., Quebec, Canada) [14c]Leucine incorporation into sol. RNA, catalysed by activating enzyme in rat liver high speed supernatant, increased 2-3 fold when Co was added as well as Mg. No other metal replaced Co⁺. Ni, cysteine, glutathione and EDTA and, to a lesser extent, ascorbic acid inhib. this activation. Cystine and methionine were ineffective. Rat Walker tumour or Sarcoma 180 supernatants also showed Co activation. Dialysing any of the supernatants gave a further 3-fold activation. ATP was not needed for Co activation; hydroxamic acid was formed when liver supernatant was incubated with leucine, Co and NH₂OH. RNA and albumin did not replace supernatant. In vivo [14c]leucine incorporation into rat protein was increased 25-35% if was administered with the [14c]leucine. B.M.Stevens

- 517. UPTAKE, DISTRIBUTION AND EXCRETION OF FOUR RADIONUCLIDES IN AUSTRALORBIS GLABRAT^A (PLANORBIDAE).** C.R.Johnson, C.R.Angel and B.G. Erickson: *Amer. J. trop. Med. Hyg.*, 1962, 11, 855-860 (U.S. Army Trop. Res. Med. Lab., New York, U.S.A.) ⁸⁵Sr, ⁵⁹Fe, ⁸⁶Rb and ²²Na were incorporated into media in which the snail *A. glabratus* was growing. The uptake, distribution, and degradation of each of the nuclides was studied. This snail takes up ⁸⁵Sr, concentrates Sr > Fe > Rb > Na. ⁵⁹Fe was the only isotope transferred to the egg in appreciable quantities. The snail may serve as a biol. indicator of low level radioactivity. The application of radioactive isotopes to studies of the ecology and population dynamics of snail intermediate hosts of parasitic diseases is proposed. A.A.Zimmernai

- 518. RADIOACTIVITY OF BIOLOGICAL MATERIALS FROM BRAZILIAN AREAS RICH IN THORIUM COMPOUNDS.** E.Penna-Franca and O.G.de Freitas: *Nature*, Lond., 1963, 197, 1062-1063 (Inst. de Biofis., & Janeiro, Brazil) A variety of plant and animal materials obtained from areas in Brazil where the ²²⁸Ra content of the soil is high were analysed for content of ²²⁸Ra and γ -activity. Prelim, results indicate that internal irradiation of plants and animals due to radio active contaminants should be relatively unimportant. G.M.J.

- 519. EFFECT OF FLUOROACETATE ON UPTAKE OF YTTRIUM-91 IN RABBITS.** J.Dearnaley: *Nature*, Lond., 1963, 197, 1218-1219 (M.R.C. Bone Isotopes Res. Unit, Churchill Hosp., Oxford, England) I.p. inj. of fluoroacetate into rabbits increased the citrate content of the heart 6-fold. After subsequent injn. of ⁹¹yttrium chloride, the yttrium content of the heart and other soft tissues was not increased above the level of control rabbits. G.M.J.

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520. ELECTRON PARAMAGNETIC RESONANCE OF MANGANESE ION AND CUPRIC ION IN SPORES. U.Windle and L.E.Sacks: *Biochim. biophys. Acta.* 1963, 66, 173-179 (Western Reg. Res. Lab., Albany, Calif., U.S.A.) The Mn spectra observed in a no. of different bacterial spores were different from those of responding vegetative cells and most other frlant materials, having a single broad curve 460-510 Gauss ^{1/2}le with a sextet hyperfine pattern superimposed, ruminant or autodaving of *Bacillus megaterium* spores ^{1/2}e and most of the Mn and the residual cellular matter ^{1/2}hibited only the small sextet hyperfine spectrum. The spectrum for Cu in spores was consistent with bonding to ^{1/2}tein^{1/2} y ^{1/2}hilised clean spores did not exhibit a free radical spectrum on prolonged storage in air. So, . B.M.Stevens

^{1/2} 1. MICRODETERMINATION OF Mg IN BIOLOGICAL FLUIDS. C.Bohuon: *Clin. chim. Acta.* 1962, 7, 811-17 (Lab. Leon Grimbert, Groupe Hosp., Necker des Infants Malades, Paris, France) A simple, precise rapid micromethod for the estimation of Mg in some fluids is described. Mg metabolism can be studied, this method, in babies or small animals such as rats mice. V.M.Wootton

^{1/2} 1. SENSITIVE METHOD FOR THE DETERMINATION OF SERUM COPPER. D.Mikac-Dević: *Clin. chim. Acta.* 1962, 7, 788-793 (Med. Fac., Univ. Zagreb ne^{1/2}o³p^{1/2}f Cr^{1/2}* Sto^{1/2}janović, Zagreb, Yugoslavia) This method for serum Cu needs only 0.5 or 0.25 ml. of serum. The proteins are ptdt. with TCA. The centrifuging e s made alk. with aq. NH₄OH and buffered with chaelis buffer. Then the 1,5-diphenylcarbohydrazide ^{1/2}gent was added, and the complex formed was extracted with CHCl₃. Precision and accuracy of the method were statistically tested. V.M.Wootton

^{1/2} 2. DETERMINATION OF SMALL AMOUNTS OF COPPER IN ORGANIC MATTER. Analytical Methods Committee: *Analyst.* 1963, 88, 253-258. I.A.B.S.

524. DITHIZONE METHOD FOR DETERMINING ZINC IN ORGANIC MATERIAL. G.Westoo: *Analyst.* 1963, 88, 287-291 (Dept. Nutr. Food Hyg., Nat. Inst. Publ. Hlth., Stockholm, Sweden). L.A.B.S.

525. MICROESTIMATION OF ZINC IN HUMAN BLOOD ^{1/2}UM. M.fernková and B.Konrád: *Biochim. ^{1/2}I^{1/2}ys. Acta*, 1963, 71, 190-192 (Lab. Dermatol. Coll-chem., J.E.Purkyne's Univ., Brno, Czechoslovakia) entry was combined with chromatographic Zn ^{1/2}ration so that masking reagents need not be used. B.M.Stevens

^{1/2} 26. ANTAGONISTIC RELATIONSHIP BETWEEN DIETARY CADMIUM AND ZINC. W.C.Supplee: *Science*, 1963, 139, 119-120 (Dept. Poultry Sci., Coll. Agric., Univ. Maryland, College Park, Md., U.S.A.) The growth of chicks decreased and sp. abnormalities of hocks and feathers increased when Cd was added to a Zn^{1/2}deficient diet. Bleaching and ulceration of the gizzard lining was also observed. All these changes were partially prevented by increase in the Zn G.M.Lewis

^{1/2} 27. DEHYDROGENASE OF YEAST. In ^{1/2}-LACTIC CYTOCHROME C REDUCTASE, A MN-C-FLAynDprytGTYL, nom. *Azymur-VPAQT*. Gregolin and T.P.Singer: *Biochim. biophys. Acta*, 1963, 67, 201-218 (Ford Inst. Med. Res., Henry Ford

Hosp., Detroit, Mich., U.S.A.) The D-lactic cytochrome reductase of the respiratory particles was solubilised and isolated in an apparently homogeneous form. Only D-lactate and D-Gt-hydroxybutyrate were oxidised at appreciable rates and only phenazine methosulphate and cytochrome f served as electron carriers. Enzyme action appeared to be irreversible. The reductase contained 1 mole FAD/50000 ± 5000 g. protein and 1 g. atom Zn²⁺/2000-27000 g. protein. Partial reversible removal of the flavin was possible but the Zn was very tightly bound. B.M.Stevens

528. EFFECT OF TRIVALENT CHROMIUM ON GALACTOSE ENTRY IN RAT EPIDIDYMAL FAT TISSUE.

W.Mertz and E.E.Roginski: *J. biol. Chem.*, 1963, 238, 868-872 (Section Exp. Liver Dis., Nat. Inst. Arthritis and Metabol. Dis., Bethesda, Md., U.S.A.) Cr³⁺, which is the active ingredient of the glucose tolerance factor [GTF], potentiates the effect of insulin on uptake of glucose by fat tissue GTF deficient rats. The effect of Cr and insulin on penetration of the poorly metabolised sugar, D-[1-14C]galactose, in epididymal fat tissue is studied. Addition of 0-01 jgg. of Cr in vitro, which is ineffective by itself, increased the rates of entry in presence of one milli-unit of insulin by 3*8 times after incubation for 15 min. This amount of insulin did not increase rates of entry in GTF deficient animals, and 0.01 fig. of Cr is needed to show an effect of insulin in vitro. These effects are observed in GTF-deficient animals only, in which the impaired function is restored nearly to the level found in rats-on the GTF-sufficient wheat-casein diet. Thus the site of action of Cr is on the sugar transport mechanism. Cr may be an esseftial cofactor for insulin. J.N.Ashley

529. THE INTERACTION OF MERCURIC CHLORIDE WITH RIBONUCLEIC ACIDS AND POLYRIBONUCLEOTIDES. Y.Kawade: *Biochem. biophys. Res. Comm.*, 1963, 10, 204 (Inst. Virus Res., Univ., Kyoto, Japan) The effect of interaction of mercuric chloride with yeast s-RNA, poly-A, poly-U and poly-A-poly-U on u.v. absorption spectrum and f is described. B.Ketterer

530. REVERSIBLE REACTION OF MERCURIC ION AND DOUBLE-STRANDED POLYNUCLEOTIDES. STEP-FUNCTION THEORY AND ITS SIGNIFICANCE.

S.Katz: *Biochim. biophys. Acta.* 1963, 68, 240-253 (Dept. Biophys., Univ., Buffalo, N.Y., U.S.A.) The theory specifies 2:1 base:Hg complexes which bridge the double helix as the sites of reaction when the ratio concn. of Hg added:concn. of base [r] is not greater than 0.5. Hg-thymidine complexes appear to be most readily formed. Necessarily the Watson-Crick helix is perturbed. The min. perturbation is taken to be an axial chain shift by 1 base spacing. When combined with stoicheiometric data on complexing of Hg and nudesides, the chain-shift mechanism enables a quant. evaluation of the average no. of H⁺released by double stranded polynucleotide in the interval between r being 0 and 0.5. The mercurimetric pH-stat titration curve of highly ordered adenylic-thymidylic polymer as compared to DNA is largely explained. B.M.Stevens

531. CHANGES IN BONE MASS AND DENSITY IN LIVING RATS DURING THE MANIPULATION OF CALCIUM INTAKE. H.Schraer, W.J.Siar and R.Schraer: *Arch. Biochem.*, 1963, 100, 393-398 (Biophys. Lab., Dept. Phys., Pennsylvania State Univ., University Park, Pa., U.S.A.) 28 5-week-old males were divided into

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4 groups receiving a low Ca diet with 0.025% Ca_f , 0.17% Ca, 0.91% Ca and 1.49% Ca added as CaHPO_4 and CaCO_3 respectively. Standardised radiographs taken after 10, 17, 38, 45, 52 and 59 days were photodensitometrically analysed at 2 femoral sites and across the seventh caudal vertebra. Changing from the 0.67% Ca pre-expt. diet to the 0.02% Ca diet produced a decrease in femoral mass in 24 hr. Density and mass values were the same in the 2 groups receiving most Ca throughout. Ca balances were run from days 10-17, 38-45 and 52-59. Retention levels were reflected by changes in bone mass. When rats fed 0.025% Ca for 52 days were placed on the 0.91% Ca diet, femoral density rose rapidly but vertebral density was unchanged.

B.M.Stevens

532. CALCIUM AND STRONTIUM UPTAKE BY RAT LIVER AND KIDNEY MITOCHONDRIA. F.R.Mraz: Proc. Soc. exp. Biol., N.Y., 1962, 111, 429-431 (Biol. Lab., Hanford Labs., Gen. Elect. Co., Richland, Wash., U.S.A.) Uptake of ^{85}Sr by mitochondria was reduced to a greater degree by added Ca than was the uptake of ^{45}Ca and increased to a greater degree than $^{45}\text{Ca}^y *^c$ addition of Sr.

M.M.Shapland

533. COMPARATIVE STUDIES OF THE METABOLISM OF STRONTIUM AND BARIUM IN THE RAT. P.H.Blight and D.M.Taylor: Biochem. J., 1963, 87, 612-618 (Dept. Physics, Inst. Cancer Res., Royal Cancer Hosp., London, England) The comparative metabolism of ^{85}Sr and ^{140}Ba has been studied in the ends and shaft of the femur, in molar and incisor teeth, and in soft tissues of 6-8 week-old and 13-month-old rats. The uptake of both ^{85}Sr and ^{140}Ba in bone decreases with age and more ^{140}Ba than ^{85}Sr is retained. Both ^{85}Sr and ^{140}Ba are taken up continuously by the incisor teeth of young and old animals, uptake being greater in the old rat. Concn. of both ^{85}Sr and ^{140}Ba in the soft tissues are generally similar to those in blood. Both ^{85}Sr and ^{140}Ba are cone, by the submaxillary gland. The possible mechanisms of deposition of ^{140}Ba in bones and teeth are discussed.

534. TIME-DEPENDENT EFFECT OF POTASSIUM ION ON L-THREONINE DEHYDROGENASE. M.L.Green: Biochim. biophys. Acta, 1963, 67, 682-685 (Dept. Biochem., John Curtin Sch. Med. Res., Australian Nat. Univ., Canberra, A.C.T., Australia) Prelim. comm.

B.M.Stevens

535. A SODIUM ION PLUS POTASSIUM ION STIMULATED ATPase IN 'MICROSOMAL' FRACTIONS FROM RAT LIVER. A.Schwartz: Biochim. biophys. Acta, 1963, 67, 329-331 (Dept. Pharmacol., Baylor Univ. Coll. Med., Houston, Tex., U.S.A.) Fractions having a Na plus K stim. ATPase, which was inhib. by ouabain, consisted essentially of endoplasmic reticulum.

B.M.Stevens

536. APPARENT UNCOUPLING OF THE SODIUM ION AND POTASSIUM ION ACTIVATION OF THE HUMAN ERYTHROCYTE MEMBRANE ATPase. A.Askari and J.C.Fratantoni: Biochim. biophys. Acta, 1963, 71, 232-234 (Dept. Pharmacol., Cornell Univ. Med. Coll., New York, U.S.A.) The prep. and prop. of an ATPase associated with r.b.c. membrane fragments which was activated by Na or K are described. Prelim. comm.

B.M.Stevens

537. ROLE OF PHOSPHOPROTEINS IN ION TRANSPORT* INTERACTIONS OF SODIUM WITH CALCIUM AND POTASSIUM IN LIVER SLICES. J.D.Judah and K.Ahmed: Biochim. biophys. Acta, 1963, 71, 34-44 (Wistar

Inst. Anat. Biol., Philadelphia, Pa., U.S.A.) Changes in ATP and phosphoprotein turnover observed in low Na media were in part due to Ca influx. Addition of Na reversed the changes, the amount of Na required depending on the external Ca concn. Smaller amounts of Na were required to stimulate ATP turnover than for phosphoprotein. Li did not stimulate phosphoprotein turnover although ATP activity was increased. Na, Ca, ouabain and promethazine competed for phosphoprotein groups. K appeared to be necessary for a dephosphorylating reaction of the phosphoproteins observed within 30 sec. of K addition. This was blocked by ouabain and promethazine.

B.M.

Stevens

538. IRON METABOLISM IN AVIAN ERYTHROBLASTOS C.le Q.Darcel, S.Dziubalo and R.Bather: Nature, Lond., 1963, 197, 1299-1300 (Animal Pathol. Lab., Canada Dept. Agric., Animal Dis. Res. Inst. (Western Lethbridge, Alberta, Canada) Combined electro-phoretic and autoradiographic studies in normal and leukaemic chickens inj. with ^{59}Fe showed that in leukaemic blood, marked radioactivity occurred in a compound migrating with the speed of ferritin and little appeared in Hb. Non-haem Fe in the liver was markedly elevated, but no free Fe was detected in mature or primitive blood cells. Possible explanations of these findings are considered.

G.M.Lewis

539. INACTIVATION DURING FUNCTIONING OF 3-HYDROXYANTHRANILATE OXIDASE RESULTING FROM OXIDATION OF BOUND FERROUS IRON. R.A.Mitchell, H.H.Kang and L.M.Henderson: I. biol. Chem., 1963, 238, 1151-1155 (Dept. Biochem.. Agric. Exp. Station, Oklahoma State Univ., Stillwater, Okla., U.S.A.) The oxidase, which cleaves S-br hydroxyanthranilate between C-3 and C-4, rapidly becomes inactive when stored at low temp., in absence of Fe. Removal of Fe by dialysis causes inactivation. Gel filtration through a Sephadex G-25 column gives a fully active enzyme free of unbound Fe. This desalted enzyme is rather unstable when stored and is rapidly inactivated during catalysis. This inactivation is directly related to the amount of product formed. Various reducing agents retard inactivation, which is due to oxidation of enzyme bound Fe by 'active' or bound O. The enzyme is not highly sensitive to chelating agents. This agrees with the view that in phenolytic oxygenases the function of the enzyme-bound Fe is to bind and activate O rather than the org. substrate.

J.N.Ashie

540. CHELATION OF IRON BY SUGARS. PJ.Charley, B.Sarkar, CF.Stitt and P.Saltman: Biochim. biophys. Acta, 1963, 69, 313-321 (Dept. Biochem., Sch. M* Univ. S. California, Los Angeles, Calif., U.S.A.) Reducing sugars and polyols formed sol. stable com V^f with metal ions at alk. pH. The sp. pH conditions and concn. of Fe and fructose necessary for complex forma $^{\text{io}}$ are described. The existence of the complex was evi c^{lo} by its solubility at alk. pH, its characteristic spectral prop., titration and redox measurements and direct titr i^{lo} . The Fe-fructose was pptd. from aq. soln. with ethanol or other org. solvents. At pH 9.0 the complex contained 2 Fe:2 fructose:1 Na. The complex dissolved rapidly through a Visking sac. It was isoionic at pH 4-4.7.

B.M.Stevens

541. DECREASE OF HAEM & CONTENT IN THE HEART MUSCLE OF COPPER-DEFICIENT SWINE. R.Lemberg, N.Newton and L.Clarke: Aust. J. exp. Biol. med. sci.

1962, 40, 367-372 (Inst. Med. Res., Royal North Shore Hosp., Sydney, N.S.W. Australia) Two samples of heart muscle from Cu-deficient pigs and a control sample from a normal pig were analysed for haem and protohaem. The haem content was greatly reduced in Cu deficiency. The low haem content could be due either to a role of Cu in haem synthesis (distinct from synthesis of the whole enzyme) or to a lack of Cu in the biosynthesis of the holoenzyme at an early stage. Loss of cytochrome oxidase activity in Cu deficiency appears to be entirely due to this factor and this loss cannot therefore prove that Cu is necessary for cytochrome oxidase activity, although it does not exclude this possibility.

B.A.Stone

OTHER BODY CONSTITUENTS

542. ENZYMIC ANALYSIS OF CoA. G.Michal and H.-U.Bergmeyer: Biochim. biophys. Acta, 1963, 67, 599-616 (G.F.Boehringer und Soehne GmbH, Mannheim, Biochem. Abteilung Tutzing/Obb., Germany) Our methods were checked for reproducibility, specificity and applicability to pure substances and crude extracts. The method using β -hydroxyacyl-CoA dehydrogenase was applicable to all materials and allowed differentiation between reduced and total CoA but specificity was low. The thiokinase method gave erroneous results at first but after modification gave a sp. assay for reduced CoA in both crude and pure prep. Phosphotrans-Q^{Ac}Vlase was highly sp. for CoA and assayed reduced γ well in pure prep., but was unreliable in crude extracts. The titratable cleavage enzyme was very sp. for reduced CoA and could be used in both crude and pure prep. but was too unstable for routine work.
543. INCREASE IN LIVER ACETYL COENZYME A DURING KETOSIS. O.Wieland and L.Weiss: Biochem. biophys. Res. Comm., 1963, 10, 333 (Lab. fur Klinische Biochem., II Med. Klinik, Univ. Munchen, Germany) The level of acetyl-CoA in the livers of non-diabetic rats rendered ketotic by withdrawal of insulin and administration of corticoids and of rats made ketotic by fat feeding is 2.5-3.0 times that of controls.
544. PREPARATION OF MALONYL-CoA BY THIOESTER CHANGE. R.A.Kloss and J.E.Dickinson: Biochim. Biophys. Acta. 1963, 70, 90-91 (Chem. Dept., Northern Illinois Univ., DeKalb, Ill., U.S.A.) Prelim. comm.
545. ¹⁴CO₂ FIXATION AND ACCUMULATION OF MALONIC ACID IN AMPHIBIAN HYBRIDS (RANA PIPIENS FEMALE x R. SYLVATICA. MALE). S.Cohen: Exp. Cell Res., 1963, 29, 207-211 (Dept. Biochem., Vanderbilt Univ. Sch. Med., Nashville, Tenn., U.S.A.) Radioactive malonic acid accumulated in the hybrid (R. pipiens x R. sylvatica) embryos grown in medium containing ¹⁴CO₂. However, the results did not show clearly whether this accumulation was the primary event in the initiation of the development of the embryo. Other radioactive metabolites derived from ¹⁴CO₂ in both the normal and hybrid embryos were also identified.

K.Jones

546. HAEMATIN PROSTHETIC GROUPS OF SOME ANIMAL PEROXIDASES. I. PREPARATION AND PROPERTIES OF AN ETHER-SOLUBLE HAEMATIN FROM MILK PEROXIDASE. D.B.Morell and P.S.Clezy: Biochim. biophys. Acta, 1963, 71, 157-164 (Inst. Med. Res., Royal North Shore Hosp., Sydney, Australia) The prosthetic haematin group of milk peroxidase was shown to contain a strongly electrophilic substituent conjugated to the porphyrin ring. This substituent was labile to strong alkali and to certain adsorbents. The haematin was covalently bound to the apoenzyme through ester or amide bonds. The linkage could be broken by alkali and by HI or HBr in acetic acid. The latter reagent yielded a haematin retaining the characteristic electrophilic group.

B.M.Stevens

547. SPECTROSCOPIC STUDY OF HAEMATIN COMPOUNDS IN THE SORET REGION. P.S.Clezy and D.B.Morell: Biochim. biophys. Acta, 1963, 71, 165-171 (Sch. Chem., Univ. New South Wales, Sydney, Australia) Absorption spectra of substituted haemin chlorides and alk. haemamins in the 350-430 mμ region are given. Alk. haemamins in ether showed a single band. Haemin chlorides in benzene or diethyl ether exhibited 2 max. but in acetic acid only a single band was observed. For haemin chlorides in ether, the position of 1 band depended on the electrophilic character of the substituents conjugated to the porphyrin ring. This band was major when the substituents were highly electrophilic. The other band of shorter λ predominated where substituents were weakly electrophilic or non-electrophilic, and showed no correlation with the nature of the substituents.

B.M.Stevens

548. ACTION OF DIAZOMETHANE ON HAEMIN CHLORIDES. P.S.Clezy and D.B.Morell: Biochim. biophys. Acta, 1963, 71, 150-156 (Sch. Chem., Univ. New South Wales, Sydney, Australia) Reaction in ethereal soln. gave a spectroscopically identifiable sp. with an absorption max. near 600 mp. This compound was decomposed by acid to give the porphyrin corresponding to the original haemin chloride. Alk. haemamins or porphyrin-Cu complexes were unaffected by diazomethane.

B.M.Stevens

549. FORMATION IN VITRO OF (i)-STERCOBILIN FROM BILIRUBIN. I.T.Kay, M.Weimer and C.J.Watson: J. biol. Chem., 1963, 238, 1122-1123 (Dept. Med., Univ. Minnesota, Minneapolis, Minn., U.S.A.) Bilirubin is smoothly hydrogenated to give (db)-stercobilinogen (isolated as stercobilin in 15-20% overall yield by oxidation in air in presence of CuSO₄) in presence of a large amount of 10% Pd-C in acetic acid at 60° and 1 atm. of H₂.

J.N.Ashley

550. ACCUMULATION OF HAEMATINS BY POLYCHAETES. R.P.Dales: Nature, Lond., 1963, 197, 1302 (Dept. Zool., Bedford Coll., London, England) Darkening of many polychaete annelids with age is due to accumulation of haematin, possibly due to normal Hb breakdown.

G.M.Lewis

551. ISOLATION AND IDENTIFICATION OF THE SEX ATTRACTANT OF THE AMERICAN COCKROACH. M.Jacobson, M.Beroza and R.T.Yamamoto: Science, 1963, 139, 48-49 (Entomol. Res. Divn., U.S. Dept. Agric., Beltsville, Md., U.S.A.) The sex attractant of Periplaneta americana was collected from many females over which air was passed and condensed in cooled vessels containing a little dil. HCl. The material was

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extracted with hexane and chromatographed on silicic acid. The pure compound was identified as 2, 2- dimethyl- 3-isopropylidene-cyclopropyl propionate, and the hydrogenated form synthesised. It elicits a response in males at levels below 10-14 μg . G.M.Lewis

552. ISOLATION AND IDENTIFICATION OF CANTHAXANTHIN IN THE LESSER FLAMINGO (PHOENICON-AIAS MINOR). H.Thommen and H.Wackernagel: *Biochim. bioiis. Acta.* 1963, 69, 387-396

(Abteilung für Vitamin- und Ernährungsforschung der Fa. F.Hoffmann-La Roche und Co. A.G., Basel, Switzerland) Canthaxanthin was the main pigment in the feathers and skin. A surprisingly high concn. of carotenoid was found in liver and small amounts in heart and kidney. Smaller amounts of esterified astaxanthin and traces of β -carotene were also found. Carotenoids were isolated by column and thin layer chromatography and identified by u.v. absorption max.

(German) B.M.Stevens

553. FLAVONOID PIGMENTS IN MARBLED WHITE BUTTERFLY (MELANARGIA GALATHEA SEITZ). S.J.Morris and R.H.Thomson: *Tetrahedron Letters.* 1963, 2, 101-104 (Chem. Dept., The Univ.. Aberdeen, Scotland) Letter. I.A.B.S.

554. PURINE BASES OF THE WHITE BODIES OF OCTOPUS VULGARIS. E.Farina, B.Farina and E.Leone: *G. Biochim..* 1962, 11, 141-145 (Inst. Biochim. Applicata. Univ. Sassari, Sardinia, Italy)

Deproteinised AgNO_3 extracts of white body homogenates of *O.vulgaris* were examined by chromatography for purine bases. The following bases were found in quantities expressed as mg. purine base/100 g. white body: guanine 360, adenine 780, and hypoxanthine 426. D.Payne

555. COMPARATIVE STUDY OF TRIMETHYLAMINE N-OXIDE BIOSYNTHESIS. J.R.Baker, A.Struempler and S.Chaykin: *Biochim. biophys. Acta,* 1963, 71, 58-64 (Dept. Biochem. Biophys., Univ. California, Davis, Calif., U.S.A.) In animals, synthesis from trimethylamine appeared to be restricted to vertebrates, at least 1 example of each class having been shown to be competent to carry out the reaction. At least some elasmobranchs and fresh and salt water teleosts synthesised trimethylamine N-oxide, but many spp. did not produce detectable amounts under present assay conditions. No synthesis of trimethylamine N-oxide by plants was demonstrated in vitro but there was some evidence that certain plants carried out the synthesis in vivo.

B.M.Stevens

556. ENZYMIC OXIDATION OF CYSTEAMINE TO HYPOTAURINE IN THE PRESENCE OF SULPHUR DONORS. D.Cavallini, C.De Marco and R.Scandurra: *G. Biochim.,* 1962, 11, 196-207 (Inst. Chim. Biol., Univ. Modena, Italy) An enzyme capable of oxidising cysteamine to thiotaurine and hypotaurine in presence of elementary S (or thiopyruvate or Na sulphide) was extracted from horse kidney. The mechanism of the reaction was studied. Hypotaurine was the primary product, but this was transsulphurated to thiotaurine when suitable quantities of polysulphides were present.

B.Payne

557. PRE-LUMIRHODOPSIN AND THE BLEACHING OF VISUAL PIGMENTS. T.Yoshizawa and G.Wald: *Nature, Lond.*, 1963, 197, 1279-1286 (Biol. Lab., Harvard Univ., Cambridge, Mass., U.S.A.) Direct spectrophotometry at liquid N_2 temp, of the product of irradiation of rhodopsin confirms the existence of pre-

lumirhodopsin. The status of this compound in the chain of intermediates involved in the bleaching of rhodopsin and iso-rhodopsin is evaluated. G.M.Lewrt

558. OXIDATION OF 4(5)-IMIDAZOLONE-5(4)-PROPIONIC ACID TO HYDANTOIN-5-PROPIONIC ACID BY [A COMMERCIAL PREPARATION OF MILK] OXIDASE. H.Hassall and D.M.Greenberg: *Biochim. biophys. Acta.* 1963, 67, 507-510 (Dept. Biochem.. Univ. California, San Francisco, Calif., U.S.A.)

B.M.Stevens

559. ABSORPTION SPECTRA OF RETINAL OIL GLOBULE IN TURKEY, TURTLE AND PIGEON. G.K.Strother: *Exp. Cell Res..* 1963, 29, 349-355 (Phys. Dept., Pennsylvania State Univ., University Park, Pa., U.S.A.)

There was no important difference between absorption spectra of globules of the same colour in the spp. studied. All the coloured globules studied acted as sharp cut-off filters for visible light, with some decrease in absorption for wavelengths shorter than 400 m(i). The coloured oil globules of the pigeon retina are suggested to be responsible for the red shift in the spectral response of this animal as compared with the frog. Kjones

560. SEPARATION OF 2-AMINO-4-HYDROXY-PTERINES THROUGH ION EXCHANGE CHROMATOGRAPHY. H.Rembold and L.Buschmann: *Hoppe-Seylers Z. physiol. Chem.,* 1962, 330, 132-139 (Max-Planck-Inst. Biochem., Munich, Germany)

Dowex 1X8 gives a good separation, but this can be further improved by re-chromatography on a cellulose column. Full expt. details are given.

(German) LCornish

ENZYMES

561. KINETICS OF ENZYME CATALYSED REACTION* WITH TWO OR MORE SUBSTRATES OR PRODUCTS, n. INHIBITION: NOMENCLATURE AND THEORY.

IE. PREDICTION OF INITIAL VELOCITY AND INHIBITION PATTERNS BY INSPECTION.

W.W.Cleland: *Biochim. biophys. Acta.* 1963, 67, 173-187. 188-196

(Dept. Biochem., Coll. Agric., Univ. Wisconsin, Madison, Wis., U.S.A.)

n. A nomenclature to describe different types of inhibn. is proposed. Rate equations for inhibn. and methods for distinguishing between various types of inhibn. and for obtaining inhibn. and kinetic const. from expt. data are discussed. Examples of the type of information obtainable from inhibn. studies are given.

III. A general method for predicting initial velocity and dead end and product inhibn. patterns by inspection of the mechanism is presented. The method is applicable to any non-random mechanism without alternate react* sequences. Several examples of the application of to C₁₀ method are given.

B.M.Stevens

562. REACTION KINETICS OF RESPIRATORY ENZYMES STUDIED BY ELECTRON SPIN RESONANCE ABSORPTION.

Y.Imai, A.Hirai and R.Kado: *Biochim.,* 1963, 67, 687-690 (Dept. Physio¹;

Fac. Med., Univ., Kyoto, Japan) Fungal glucose oxidase and pig heart succinate dehydrogenase were examined. Prelim. comm.

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B.M.Stevens

563. TIME COURSE OF CONSECUTIVE REACTIONS CATALYSED BY EXO-ENZYMES. K.Hiromi and S.Ono: I. Biochem.. Tokyo. 1963. 53. 164-166 (Lab. Biophys. Chem., Coll. Agric., Univ. Osaka Prefecture, Sakai. Japan) The time courses of exo-enzyme catalysed degradation of substrates having 2 attackable bonds and of linear substrates of a high degree of polymerisation are discussed theoretically. Prelim, comm. B.M.Stevens

564. ISOELECTRIC POINT OF NATIVE AND SIALIDASE TREATED HUMAN SERUM CHOLINESTERASE. O.Svensmark and P.Kristensen: Biochim. biophys. Acta. 1963, 67. 441-452 (Inst. Neurophysiol.. Univ. Copenhagen. Denmark) Electrophoretic mobility determined by paper electrophoresis at pH 2*8-9*6 with corrections for electro-osmosis, evaporation, paper structure and adsorption of protein to paper. Orosomucoid and caeruloplasmin were used as control proteins. The electric point of native cholinesterase was 2*9-3-0, that of sialidase treated cholinesterase was 6*7-7*0. At pH 8*6 native cholinesterase had a mobility of -3-1 * 10*5 sq. cm./V/sec. and sialidase treated cholinesterase of -0.2 x 10*5 sq. cm./V/sec. At pH 4-9-6 the ability of sialidase treated cholinesterase was 2-9 * 10*5 units above that of native cholinesterase; at pH 2*8 this difference was decreased to approx. 2 x 10*5 units. B.M.Stevens

565. DEVELOPMENT OF ENZYMIC FERMENTATION. I YEAST ENZYMES. II MUSCLE ENZYMES. P.Ohlmeyer, W.Kutscha and W.Russman. II. MUSCLE ENZYMES. P.Ohlmeyer and K.Grill: Hoppe-Seylers Z. physiol. Chem., 1962, 330, 1-ii. 12-20 (Leibniz-Kolleg Univ., 74 Tübingen, Germany) I. After cytolysis of baker's yeast, 6% of total alcohol dehydrogenase [ADH] activity was in the sediment and 23% was solubilised by enzyme development or incubation. On homogenisation 90% of ADH, ructokinase [PFK] and aldolase were in the supernatant; ADH activity decreased on aerobic termination. PFK was found in the supernatant of homo-S₂1⁶⁸ of Peas. The fermentation potential of a homologate of baker's yeast was 5% of that of the intact cells. A homogenate of bovine muscle contained no PFK in the presence of AMP, lactic acid was produced via D-fructose diphosphate. The muscle enzymes and the S₂1⁶⁸ enzymes show similar relationships to cell structure, decreases during storage, for both frog muscle and K₆muscle» latter contained equal amounts of soluble bound lactate dehydrogenase. B.M.Stevens (German) I.Cornish

V CHROMATOGRAPHY OF TAKA-AMYLASE A [TAA] ON DIETHYLAMINOETHYL-CELLULOSE COLUMN. H.Toda and S.Akabori: J. Biochem., Tokyo, 1963, 53, 102-110 (Inst. for Protein Res., TAA U.S.A.) Chromatography of crystalline TAA showed the presence of small amounts of inactive ¹⁴C-Takadiastase column. A procedure for a simplified chromatographic preparation of homogeneous enzyme is described. 'Takadiastase' extract was chromatographed on cellulose thereby separating alk. protease, Takadiastase and TAA directly. B.M.Stevens

L-L-MALATE: NADP OXIDOREDUCTASE (DECARBOXYLATING) FROM GERMINATING FLAX-RUST DROSOPHILES. M.A.Johnson and D.S.Frear: Phytochemistry, 1963, 2, 75-83 (Dept. Agric. Biochem., North Dakota State Univ., Fargo, N.Dak., U.S.A.) The enzyme was purified more than 20-fold and partially

characterised. The prep, catalysed the oxidative decarboxylation of L-malic acid to pyruvic acid, optimally in the presence of NADP and Mn and at pH 7*6. Oxaloacetic acid was decarboxylated at pH 5. Other enzymic studies on the prep, were carried out. B.H.Davies

568. ENZYMIC ACTIVATION AND CLEAVAGE OF D- AND L-MALATE. J.R.Stem: Biochim. biophys. Acta, 1963, 69, 435-437 (Dept. Pharmacol., Sch. Med., Western Reserve Univ., Cleveland, Ohio. U.S.A.)

Two separate enzymes catalysed formation of malyl-CoA and of acetyl-CoA and glyoxylate from malate; free malyl-CoA was not the substrate of the malate cleavage reaction. Prelim, comm. B.M.Stevens

569. PROSTHETIC GROUP OF SUCCINIC DEHYDROGENASE. I. FLUORESCENCE AND ENZYMIC HYDROLYSIS OF THE FLAVIN PEPTIDE. R.Strom and P.Cerletti: G. Biochim.. 1962. 11. 208-220 (Inst. Chim. Biol. Univ., Rome, Italy) The prosthetic group of succinic dehydrogenase obtained from beef heart mitochondria, which has been split from protein and purified by gel filtration, was fluorescent only in acid media with max. at pH 2-6-2-8. Max. fluorescence of mononucleotide was 85% of equimol. amount of riboflavin. Fluorescence of the dinucleotide was 10% less than the mononucleotide. Fluorescence of the mononucleotide was quenched 20% at pH 2*8 by 0-05M adenosine. By using different proteolytic enzymes the prosthetic group was shown to be bound to different peptides, but all the compounds had similar fluorimetric characteristics. B.Payne

570. MECHANISM OF THE SUCCINIC DEHYDROGENASE CATALYSED REACTION. O.Gawron, AJ.Glaid, J.Francisco and T.P.Fondy: Nature, Lond., 1963, 197, 1270-1272 (Dept. Chem., Duquesne Univ., Pittsburgh, Pa., U.S.A.) Studies of the succinic dehydrogenase catalysed exchange reaction between protons present in the medium and chlorosuccinate or succinate indicate that one of the 2 H atoms removed from a trans pair on the substrate is removed at a much faster rate than the other. A mechanism for succinic dehydrogenase action is proposed whereby one of the substrate H is removed as a protein (fast exchange) and the other is initially removed as a hydride ion (slow exchange). J.R.Sargent

571. COENZYME Q AND SUCCINATE-TETRAZOLIUM REDUCTASE ACTIVITY OF NEONATAL RAT KIDNEY. Proc. Soc. exp. Biol., N.Y., 1962, 111, 230-233 (Dept. Path., Univ. Minnesota Sch. Med., Minneapolis, Minn., U.S.A.) Low succinate-tetrazolium reductase activity of tubular elements of neonatal rat kidney cortex is due to low activity of die primary dehydrogenase and a lack of coenzyme Q. M.M.Shapland

572. NEW NAD-DEPENDENT SPECTRAL SPECIES OF LIPOAMIDE DEHYDROGENASE. C.Veeger and V.Massey: Biochim. biophys. Acta, 1963, 67, 679-681 (Lab. Physiol. Chem., Univ., Amsterdam, Netherlands) Prelim, comm. B.M.Stevens

573. STARCH GEL ELECTROPHORESIS OF CITRATE CONDENSING ENZYME FROM PIG HEART. L.Broder and P.A.Srere: Biochim. biophys. Acta, 1963, 67, 626-632 (Dept. Biol. Chem., Univ. Michigan, Ann Arbor, Mich., U.S.A.) The enzyme existed in vitro as 2 distinct spp. separable by electrophoresis. Several mild treatments interconverted, suggesting that separate forms arose during purification. It is suggested that the 2

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differed only in the state of reduction of their thiol groups.

B.M.Stevens

574. IMMUNOCHEMICAL STUDIES WITH CITRATE CONDENSING ENZYME. L.Broder and P.A.Srere: *Biochim. biophys. Acta*, 1963, 67, 617-625 (Dept. Biol. Chem., Univ. Michigan, Ann Arbor, Mich., U.S.A.) Antisera to pig heart enzyme was prep, in rabbits. Interaction of enzyme and anti-enzyme was independent of pH between 6-3 and 8*9 and of temp, at 0° and 37°. Reaction was complete within 10 min. of mixing. Heat inactivated enzyme, acetyl CoA, CoA or citrate had no effect. Enzyme inactivated by acetylation retained some reactivity towards anti-enzyme. j>-Mercuribenzoate treated enzyme reacted normally. Pig liver and kidney and pigeon heart and breast muscle enzymes reacted with the Ab in the same way as the pig heart enzyme. Pigeon liver and dog heart, liver and kidney enzymes reacted partially; moth flight muscle and rabbit heart enzymes remained completely uninhib.

B.M.Stevens

575. PHYSICOCHEMICAL STUDIES ON CITRATE OXALOACETATE LYASE FROM AEROBACTER AERogenes. T.J.Bowen and L.J.Rogers: *Biochim. biophys. Acta*, 1963, 67, 633-640 (Dept. of Biochem., Univ. of Leeds, Leeds, England) The prep, from A. aerogenes, was homogeneous in the analytical ultracentrifuge and on free boundary electrophoresis. Effects of temp., protein concn., cysteine and urea on stability were examined. The diffusion coeff. was $4*16 \times 10^{-7}$ sq. cm./sec. with $4*3-6^B 4$ mg. protein/ml. JS was 16*2. The mol. wt. was 3^A.8000 by the sedimentation-diffusion method and 314000 by a Trautmann plot derived from approach to equilibrium expt.

B.M.Stevens

576. CRYSTALLINE PSEUDOMONAS CYTOCHROME OXIDASE. I. ENZYMIC PROPERTIES WITH SPECIAL REFERENCE TO THE BIOLOGICAL SPECIFICITY.
II. SPECTRAL PROPERTIES OF THE ENZYME.
m. PROPERTIES OF THE PROSTHETIC GROUPS.
T.Yamanaka and K.Okunuki: *Biochim. biophys. Acta*, 1963, 67, 379-393, 394-406, 407-416 (Dept. Biol., Fac. Sci., Univ. Osaka, Nakanoshima, Osaka, Japan)
I. One mole enzyme aerobic ally oxidised 154 moles and 600 moles of reduced cytochrome fi-551/min. at 16° and 27° respectively. Anerobically 250 moles were oxidised/min./mole enzyme in the presence of NO₂" at 19°. The absorption spectrum indicated the presence of haem A2 and a ξ -type haem. Very little activity was shown towards reduced beef cytochrome ξ but reduced tunny fish cytochrome ξ was oxidised more rapidly. Reduced Physarum polyccephalum cytochrome c was not oxidised by the enzyme but was oxidised by cytochrome ξ . Reduced wheat cytochrome ξ was oxidised faster by cytochrome a than by the Pseudomonas oxidase. Reduced Porphyra tenera cytochrome-553 was oxidised by the Pseudomonas oxidase but not by cytochrome a.

II. The haem $\xi 2$ 0C-band was at 655 mp, 629 and 652 mfi and 625 mji at pH 7[#]6, 7*0 and 5'6 respectively in Na₂S₂O₄ reduced enzyme. The absorbancy also varied with pH. The y-band, which had a much lower absorbancy, remained at 460 mji at all pH. In ascorbate reduced enzyme the (X-band did not vary with pH. With cyanide the haem $\xi 2$ (X-band was at 617 mji and the y-band had max. at 443 and 472 mji. With CO the absorbancy of the haem $\xi 2$ CX-band was greatly reduced and the y-band disappeared. NO₂" or NO added to Na₂S₂O₄ reduced enzyme produced a max. at 665 mfi and abolished the y-band. With ascorbate reduced enzyme NO₂" or NO

produced a bump at 570 mji. Hydroxylamine produced complicated effects. None of the reagents appreciably affected the haem ξ spectrum.

III. Haem ξ was easily cleaved from the protein with HCl-acetone. Haematin $\xi 2$ was insol. in acetone and hence easily removed. Haematin $\xi 2$ and haem $\xi 2$ h^A a-bands at 684 mjj and 626 mfi respectively. Pyridine, cyanide, NO and CO deriv. of haem $\xi 2$ had a-bands at 620 mji, 632 mfi, 625 mji and 644 mji respectively. T^A y-bands of haematin 1/2 and its deriv. contained 2 or 3 peaks. The ratio y-band absorbancy/a-band absorbancy was very much lower for haematin 22 and its deriv. than for other haems. The haem remaining on the protein after HCl-acetone treatment was removed by Ag₂SO₄ treatment and shown to be haematohaem. The absorpti spectra of haem $\xi 2$ and the Pseudomonas oxidase are co&pared.

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577. MULTIPLE ENZYME CHANGES IN PLASMA OF NORMAL AND TUMOUR-BEARING MICE FOLLOWING INFECTION WITH LACTIC DEHYDROGENASE [LDH] AGENT. A.L.Notkins, R.E.Greenfield, D.Marshall^A L.Bane: *J. exp. Med.*, 1963, 117, 185-195 (Microbe Lab., Natl. Inst. Dental Res., N.I.H., Bethesda, Md., U.S.A.) Within 72 hr. of the injn. of LDH agent W^{*} normal mice 5 (LDH, isocitric and malic dehydrogenase^{si} phosphohexose isomerase and GOT) of the 7 enzymes studied in the plasma were raised. There was a marked increase in enzyme activity of the plasma of mice bearing tumours and infected with LDH. Activities of the tumour-bearing mice were not raised if they were not infected, but did show a late increase which appeared to be related to tumour growth. The results suggest that contamination with LDH agent may have been responsible for raised enzyme activities previously attributed to the tumour.

H.E.H.jones

578. LOCALISATION OF A LACTIC DEHYDROGENASE [LDH] ISOZYME IN NUCLEI OF YOUNG CELLS IN THE ERYTHROCYTE SERIES. E.S.Vessell and A.G.Bearn: *Proc. Soc. exp. Biol., N.Y.*, 1962, 111, 100-104 (Rockefeller Inst., New York, U.S.A.) LDH is o z^A 5 is absent in the anucleated mature r.b.c. of man and guinea-pig but is present in the earlier forms which are nucleated or contain primary nuclear products.

M.M.Shap^{inf}

579. MODIFIED TECHNIQUE FOR DIRECT STAINING WITH NITRO-BLUE TETRAZOLIUM OF LACTATE DEHYDROGENASE [LDH] ISO-ENZYMES ON AGAR ELECTROPHORESIS. R.J.Wieme, M.van Sande, D.Karcher, A.Lowenthal and H.J.Van der Helm: *Clin. chim. Acta*, 1962, 7, 750-754 (Lab. Med. Clin., Univ. Ghent, Belgium) A new procedure for the detection of LDH iso-enzymes by the tetrazolium method is described. The substrate soln. is stabilised by agar 0-9%, and poured directly on top of the electrophoresis plate and left to set; this is then incubated at 37°. This method is useful in a clinical laboratory, as many samples can be run in parallel. It is also more accurate for calculating relative activities since neither enzyme nor substrate is lost in the incubating fluid. Plotting the area of the scanned peaks against enzyme activity yields an S-shaped response curve.

V.M.Wooff

580. VISUALISATION OF DIFFERENT NAD AND NADH DEHYDROGENASE ISOENZYMES ON AN AGAR-GEL PLATE. G.Broun and S.Avrameas: *Nature*, Lond., 1963, 197, 1208 (Inst. de Recherches Sci. sur le Cancer, Villejuif (Seine), France) A tetrazolium

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574.

Method is described for the visualisation of dehydrogenase enzymes separated by electrophoresis in agar gel. The technique has been applied to lactic, malic, isocitric, glutamic, β -hydroxybutyric, and glucose 6-phosphate dehydrogenases in rat liver. G.M.Lewis

581. BIOCHEMICAL INVESTIGATIONS OF CRYSTAL-LINE ISO-ENZYMES OF LACTATE DEHYDROGENASE FROM HUMAN ORGANS. E.D.Wachsmuth and G.Pfleiderer: Biochem. Z., 1963, 336, 545-556 (Inst. Biochem., Univ. Frankfurt/Main, Germany)

H_2O_2 extracts of human brain, heart and kidney obtained post mortem were treated with Ca phosphate gel. Iso-enzymes of lactate dehydrogenase could be cryst. with $(\text{NH}_4)_2\text{SO}_4$ at 50-60% satn. and eluted as distinct fractions by applying a NaCl gradient to a column of DEAE sephadex. The five iso-enzymes behaved differently under various conditions of activity.

(German) L.Cohn

582. MOLECULAR HETEROGENEITY OF LACTIC DEHYDROGENASE DURING DEVELOPMENT OF THE SNAIL ARGOBUCCINUM OREGONENSE REDFIELD.

Goldberg and J.N.Cather: J. cell. comp. Physiol., 1963, 61, 31-37 (Dept. Zool., North Dakota St. Univ., Fargo, N. Dak., U.S.A.) In the uncleaved egg, 5° *U. oregonense*, 5 distinct lactic dehydrogenases were detected by disc electrophoresis of the homogenate 1% acrylamide gel. During development of the egg, these disappeared, possibly contributions of gonadal tissue to the oocyte, while 2 others appeared, probably associated with differentiation of appropriate synthetic mechanisms. Indian Botanic Garden G.M.Lewis

583. PURIFICATION, KINETIC AND IMMUNOCHEMICAL STUDIES OF MAJOR VARIANTS OF LACTIC DEHYDROGENASE FROM HUMAN LIVER, HEPATOMA, AND

LYTHROCYTES; COMPARISON WITH MAJOR VARIANT OF HUMAN HEART LACTIC DEHYDROGENASE. J.S.Nisselbaum and O.Bodansky: J. biol. Chem., 1963, 238, 969-974 (Div. Enzymol. and Metabol., Sloan-Kettering Inst. Cancer Res., New York, U.S.A.) Purification of the various variants is described. Km values for NAD and its analogues, pyruvate, and lactate are determined for these variants. Km values for nicotinamide inosine dinucleotide, lactate, and pyruvate differentiate the liver and hepatoma variants from the r.b.c. and heart variants. The ratios of rates of reduction of thio-NAD, 3-acetylpyridine dinucleotide, and 3-acetylpyridine inosine dinucleotide to NAD differentiate between the same 2 groups of variants. Inhib. studies with sp. antisera also with this classification of variants. J.N.Ashley

584. CRYSTALLISATION OF BINARY AND TERNARY COMPLEXES OF HORSE LIVER ALCOHOL DEHYDROGENASE WITH NADH₂ AND WITH NADH₂ AND ISOBUTYRAMIDE. T.Yonetani and H.Theorell: Arch. & ther., 1963, 100, 554-556 (Nobel Med. Inst., Helsingborg, Sweden) Crystals suitable for X-ray crystallography were prepared. B.M.Stevens

585. TETRAHIAZOTETE REDUCTASE OF A FACULTATIVE ANAEROBIC BACTERIUM. F.Pichinoty and P.Vliardi-Rouvier: Biochim. biophys. Acta, 1963, 59, 366-378 (Lab. Chim. Bact., Centre Nat. Rech. Sci., Paris, France) The tetrathionate reductase activity of extracts was measured using benzyl viologen as the reductase to hydrogenase and measuring H₂

consumption in Warburg manometers. Km and activation energy were measured. The pH optimum was also determined. Cyanide and N₃⁻ inhib. Aerobic cultures did not reduce tetrathionate. Atm. O₂ reversibly inhib. the reductase. In anaerobic cultures enzyme synthesis was induced by tetrathionate; in aerobic cultures O₂ completely repressed its formation.

(French) B.M.Stevens

586. PURIFICATION OF NITRATE REDUCTASE OF ACHROMOBACTER FISCHERI. J.C.Sadana, R.Rama Rao and M.D.Joshi: Biochim. biophys. Acta, 1963, 67, 340-342 (Nat. Chem. Lab., Poona, India) The sp. activity of the enzyme from *A. fischeri* was increased 2.5-fold to 210 jimoles NO₂⁻ formed/mg. protein/hr. and the absorption bands observed previously were shown to be due to cytochrome impurities. Prelim, comm.

B.M.Stevens

587. HYDROGENASE SYSTEM OF CLOSTRIDIUM

PASTEURIANUM. R.C.Valentine, L.E.Mortenson and J.E.Carnahan: J. biol. Chem., 1963, 238, 1141-1144 (Central Res. Dept., E.I.du Pont de Nemours and Co., Wilmington, Dela., U.S.A.) The enzyme system of *C. pasteurianum* responsible for liberation of H from aq. Na dithionite is separated into 2 components. One of these, ferredoxin, is purified 60-fold; it is an electron-transferring protein which couples hydrogenase with various electron donors and acceptors. Its prop. and role in the H-evolving system are discussed. J.N.Ashley

588. PURIFICATION AND SOME PROPERTIES OF DIFFERENT FORMS OF HYDROGEN DEHYDROGENASE.

D.H.Bone, S.Bernstein and W.Vishniac: Biochim. biophys. Acta, 1963, 67, 581-588 (Dept. Microbiol., Yale Univ., New Haven, Conn., U.S.A.) The enzyme was purified 300-fold using MnCl₂ to stabilise. The product was heat stable and showed diminished sensitivity to $\text{J}(\text{J})$ -chloromercuribenzoate and smaller Km. The reaction of MnCl₂ with the enzyme protein was rapid and reversible. High concn. of NaCl and tris(hydroxymethyl)aminomethane buffer denatured irreversibly. The enzymic reaction could be reversed to produce H₂ from NADH₂. B.M.Stevens

589. INHIBITOR, ISOTOPIC AND KINETIC STUDIES ON HYDROGEN DEHYDROGENASE. D.H.Bone: Biochim. biophys. Acta, 1963, 67, 589-598 (Dept. Microbiol., Yale Univ., New Haven, Conn., U.S.A.) The

oxidised form of the *Hydrogenomonas ruhlandii* enzyme was inhib. by 2,3-dimercaptopropanol, cyanide, S₂O₄²⁻, S²⁻, SO₃²⁻ and thioglycolate. Reduction of the enzyme with NADH₂ or H₂ diminished the effectiveness of these inhibitors but made the enzyme sensitive to $\text{J}(\text{J})$ -chloromercuribenzoate inhibn. Kinetic analysis and inhibitor expt. indicated that the enzyme was reduced with H₂ to give a proton and that the reduced enzyme was then oxidised with NAD giving NADH₂. Exchanges between H₂ and [3H]water and between [3H]water and NADH₂ were catalysed. Analysis of NAD enzymically reduced with 3H₂ showed that the 3H was in the β -position of NADH₂. The enzyme action had a lag phase which was eliminated by preincubation with H₂ or NADH₂.

B.M.Stevens

590. COMPARATIVE STUDY OF PEROXIDASE ACTIVITY OF Hb. METHAEMOGLOBIN AND Hb-HAPTOGLOBIN COMPLEX. M.Waks, J.Yqn, J.Moretti and M.F.Jayle: Biochim. biophys. Acta, 1963, 67, 417-424 (Lab. Chim. Biol., Fac. Méd., Paris, France) Kinetic const. for Hb and metHb were determined using oxygenated water as oxidising substrate and guaiacol as

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- electron donor. K_m and k_s for the Hb catalysed reaction did not differ significantly from the values for the Hb-haptoglobin complex. The character of the inhibn. produced by high guaiacol concn., however, differed.
 (F rench) B.M. Stevens
591. PEROXIDASE AS OXIDASE: REACTION BETWEEN OXYGEN-18 AND DIHYDROXYFUMARATE. F.K.Anan and H.S.Mason: Biochim. biophys. Acta. 1963. 67. 321-323 (Dept. Biochem., Univ. Oregon Med. Sch., Portland, Ore., U.S.A.) B.M.Stevens
592. OXIDATION OF HOMOGENTISIC ACID CATALYSED BY HORSE RADISH PEROXIDASE. B.N.La Du and V.G. Zannoni: Biochim. biophys. Acta. 1963. 67. 281-287 (Nat. Inst. Arthritis and Metab. Dis., Bethesda, Md., U.S.A.) In the presence of SH compounds products similar to those obtained by spontaneous reaction of benzoquinoneacetic acid with SH agents were obtained. Catalase, cytochromejg, Hb and metHb did not catalyse the reaction. A no. of aromatic compounds containing disubstituted OH or NH₂ in the α -position were oxidised. B.M.Stevens
593. PURIFICATION AND PROPERTIES OF MONO-AMINEOXIDASE. L.M.Barbato and L.G.Abood: Biochim. biophys. Acta, 1963, 67, 531-541 (Dept. Psychiatry, Univ. Illinois Coll. Med., Chicago, Ill., U.S.A.) Beef liver mitochondrial MAO was purified 20-fold. Phenanthroline inhibn., apparently noncompetitively by Lineweaver-Burk criteria. Phenylcyclopropylamine gave a strictly competitive and irreversible inhibn.; effects of pH on activity suggested the presence of two MAO. Phenylcyclopropylamine inhibn. was independent^a O₂ or K cyanide. The differential action of O₂ and K cyanide on iproniazid inhibn. was also examined. B.M.Stevens
594. OXIDATIONS AND TRANSHYDROGENATIONS INVOLVING PYRIDINE-DINUCLEOTIDES CATALYSED BY BOVINE MILK XANTHINE OXIDASE. D.A.Gilbert: Nature, Lond., 1963, 197. 1066-1068 (Chester Beatty Res. Inst., Royal Cancer Hosp., Fulham Rd., London, England) Xanthine oxidase present in milk catalyses the oxidation of added NADH₂; the flavin prosthetic group of the enzyme is the catalytic activity involved in the oxidation. Milk xanthine oxidase also catalyses transhydrogenation reactions using NADH₂ as substrate and various pyridine nucleotides as acceptors. The latter include 3-acetylpyridine, and 3-formylpyridine nucleotides and their corresponding hypoxanthine deriv. J.R.Sargent
595. SPECIFICITY OF RAT BRAIN ACETYLCHOLINESTERASE FOR N-ALKYL ANALOGUES OF ACETYLCHOLINE. K.N.Mehotra and W.C.Dauterman: J. Neurochem., 1963, 10, 119-123 (Dept. Entomol., Cornell Univ., Ithaca, N.Y., U.S.A.) A freeze-dried powder of whole rat brain homogenised in water was used to study AChase activity toward 17 compounds of the general structure CH₃COOCH₂.CH₂N⁺[(CH₂)_nCH₃](CH₂)_nCH₃] [(CH₂)_{n'}CH₃]I⁻. Activity tended to decrease as the values of n and n' increased but substitution of the ethylene group between COO and N⁺ by butylene or propylene resulted in almost complete loss of activity. R.Woodman
596. THERMAL INACTIVATION OF ACETYLCHOLINESTERASE. M.H.Coleman and D.D.Eley: Biochim. biophys. Acta, 1963, 67, 646-657 (Univ.. Nottingham, England) Thermal inactivation of the mammalian r.b.c. enzyme was accompanied by a decrease in K_m although the substrate inhibn. const. was unchanged. The time course involved 2 first order processes. These data would be explained if a second, less active enzyme, differing in the spacing of anionic and esteratic sites, formed from the native enzyme and was inactivated independently. Salt stabilised the enzyme soln. The V for optimum thermal inactivation was 6* 5-7* 5. Energy and entropies of inactivation were determined from $t_{1/2}$ C*eff. of the rate const. B.M.Steven
597. SIMPLIFIED AND IMPROVED METHOD OF PRE^wTION OF ACETYLCHOLINESTERASE OF THE EEL S-ELECTRIC ORGAN. A.B.Hargreaves, A.G.Wanderley^wF.Hargreaves and H.S.Goncalves: Biochim. biophys. Acta. 1963, 67. 641-646 (Inst. Biofis.. Univ. Brasília de Janeiro, Brazil) The enzyme was pptd.* pH 5-1, adsorbed on tricalcium phosphate gel, eluted with 2&lo sat. MgSO₄, pptd. with 6570 sat. MgSO₄ and chromatographed and rechromatographed on DEAE-cellulose. The product was almost homogeneous on ultracentrifugation and paper electrophoresis. S was 4. Bia Stevog
598. PEROXIDASE AND ACID PHOSPHATASE ACTIVITIES IN PIG THYROID [CYTOPLASMIC FRACTIONS]. T.Hosoya: J. Biochem., Tokyo, 1963, 53, 86-87. (Inst. Endocrinol., Gunma Univ., Maebashi, Japan)*. B.M.S.ve*
599. REPRESSION OF ALKALINE PHOSPHATASE IN HUMAN CELL CULTURES BY CYSTINE AND CYSTEINE. R.P.Cox and C.M.Macleod: Proc. nat. Acad. Sci. Wash., 1963, 49, 504-510 (Dept. Med., New York Univ. Sch. Med., N.Y., U.S.A.) Alk. phosphatase in established human cell cultures is repressed by cystine and cysteine. 40 hr. are required for substantial repression of alk. phosphatase by these amino acids. Observations described suggest that repression is caused by interference with enzyme synthesis or activation rather than by sulphhydryl inhibn. of alk. phosphatase. J.R. Sargent
600. PERIODIC ACTIVATION OF LYSOSOMAL ENZYMES DURING REGENERATION OF THE LIVER. R.L.P.Adams: Biochem. J., 1963, 87, 532-536 (Dept. Biochem., Univ., Oxford, England) Liver acid DNase and acid phosphatase show marked increases in total activity after partial hepatectomy in the rat. For the first 20 hr. the increase in free activity is proportionally less. However, the total activity is reduced by 70% the free activity, and it is suggested that this is due to cessation of lysosome synthesis before cell division. β -Glucuronidase and, to a lesser extent, arylsulphatase show increased free activities at 14 hr. after hepatectomy which may be related to increased microsomal acivity at this time. • J.R. Sargent
601. ACID PHOSPHATASE ACTIVITY DURING GROWTH AND SYNCHRONOUS DIVISION OF TETRAHYMENAL PYRIFORMIS. B.Klamer and R.A.Fennell: ^wRes., 1963, 29, 166-175 (Res. Div., Parke Davis and Co., Ann Arbor, Mich., U.S.A.) The acid phosphatases of T. pyriformis were localised cytochemically, studied quant. and separated by starch-gel electrophoresis procedures. From the expt. data, it is suggested that these phosphatases are involved in catabolic processes; there is an increased synthesis of enzyme in cells under adverse physiol. conditions. B. G.
602. PURIFICATION AND IDENTIFICATION OF KIDNEY HISTAMINASE. R.Kapeller-Adlerand^wH.Macfarlane: Biochim. biophys. Acta, 1963, 67, 542-565 (Dept. Clin. Chem., Univ. Edinburgh, Scotland) A rather stable, apparently homogenous

prep. was purified from cortex extracts by chromatography and electrophoresis. In a large no. of expt., histaminase travelled towards the anode as 1 band at pH above 5² and was located between CC-and p-globulins of Iowan serum. No histaminase migration occurred at pH 3⁰ and 5-15. The prep. contained no diamine oxidase. J* acted specifically on histamine and its ring-N substituted deriv. such as 1-methyl-4-(j8-aminoethyl)imidazole (1-methylhistamine) and 1-methyl-5-(p-aminoethyl)imidazole (1, 5-methylhistamine). Spectrophotometric and chem. expt. indicated that the enzyme contained FAD and pyridoxal phosphate. B.M.Stevens

603. HYDRAZIDASE. I. PURIFICATION AND SPECIFICITY. II. INHIBITION BY FLUORIDE. I.Toida: J. Biochem.. Tokyo. 1963, 53, 14-17, 18-22 (Dept. Biochem., Res. Inst. Tuberculosis, Japan Anti-tuberculosis Association, Kiyose-machi, Tokyo, Japan) I. The mycobacterial enzyme decomposing hydrazides to hydrazine was purified 200-500 fold. Prep. had no proteolytic activity and was sp. for acid hydrazides. II. Inhib. was reversible and competitive and did not require phosphate. The inhibiting action was fairly rapid. Ac²⁺ ions includin^g M²⁺ and Fe did not relieve the inhib. on benzoyl hydrazide was less inhib. than action on other substrates. B.M.Stevens

604. RECOVERY OF THE INTACT STRUCTURE OF MURAMIDASE (LYSOZYME) AFTER REDUCTION OF L DISULPHIDE LINKAGES IN EIGHT MOLAR UREA, ^frmai, T.Takagi and T.Isemura: J. Biochem., Tokyo. 1963, 53, 1-6 (Dept. Biol., Fac. Sci., Osaka Univ.) Hen's egg white muramidase was H₂O₂ and air oxidation under appropriate conditions bduCed a good yield of completely renatured enzyme which was isolated by crystn. The prop. of the renatured enzyme coincided well with those of native muramidase. B.M.Stevens

605. ENZYME REACTIONS WITH PHENOLIC COMPOUNDS: EFFECT OF o-METHYLTRANSFERASE ON A SUBSTRATE OF FRUIT POLYPHENOL IDASE [PPO]. B.J.Finkle and R.F.Nelson: 'Nature. Lond.' 1963, 197, 902-903 (Western Reg. Res. Lab., Agric. Res. Service, U.S.Dept. Agric., Albany, Calif., U.S.A.) Caffeic acid and chlorogenic acid were then treated with o-methyltransferase; they could not be oxidised by PPO extracted from peach or apple although the parent compounds were rapidly oxidised to products. G.M.Lewis

J²ETABOLISM OF THIOPYRIMIDINES AND THIOMIKJES. S-METHYLATION WITH S-ADENOSYL-HIONINE TRANSMETHYLASE AND CATABOLISM AMMALIAN TISSUES. C.N.Remy: J. biol. Chem., V7/238, 1078-1084 (Gen. Med. Res. Programme, V1v-J?os-P- Syracuse, N.Y.. U.S.A.) Tissues, parti^{lly} of various mammalian species, contain a system that catalyses S-methylation of S²Vs³ substituted Pyrimidines and 6-thio-substituted oNcV. The system is inhib. by the methylated reaction series of substrates and by a wide variety of no² substituted purines and pyrimidines, and by physiol. fN³N⁴-thiols. This system, which is the supernatant fraction of the cell, is different from other thiol transmethylases in mammalian tissues. J.N.Ashley

607. N-ALKYL GROUP SPECIFICITY OF CHOLINE ACETYLASE [CA] FROM RAT BRAIN. W.C.Dauerman and K.N.Mehotra: J. Neurochem., 1963, 10, 113-117 (Dept. Entomol., Cornell Univ., Ithaca, N.Y., U.S.A.) Of 17 N-alkyl substituted analogues of choline, crude CA (as a cysteine-treated acetone powder of whole brain) acetylated only 4 as follows: R(CH₃)₃-34 units activity; R(CH₃)₂C₂H₅¹² 24 units; R(CH₃)₂-n-C₃H₇-20 units; R(CH₃)₂-n-C₄H₉-15 units, where R ≈ OHCH₂.CH₂N+. Tert. alcohols and those analogues containing more than 2 C atoms between the N and OH positions in R were inactive. With the 4 active compounds Km increases as the alkyl chain lengthens. R. Woodman

608. FACTORS AFFECTING LEVELS OF UREA CYCLE ENZYMES IN RAT LIVER. R.T.Schimke: J. biol. Chem., 1963, 238, 1012-1018 (Nat. Inst. Arthritis and Metabol. Dis., Bethesda, Md., U.S.A.) All conditions that cause breakdown of protein and increased excretion of urea, such as feeding a protein-rich diet, starvation, or administration of corticosteroids are associated with increases in all 5 urea cycle enzymes proportional to the increase in synthesis of urea. Intact adrenals are not needed for increase in enzyme levels produced by a high protein diet. No individual amino acid or urea, given in the diet, or a sp. urea cycle substrate, causes any alteration in the levels of the urea cycle enzymes. The steady state, free, intracellular concn. of arginine, citrulline, and ornithine are const, under various conditions that cause alterations in excretion of urea and enzyme levels. Adrenalectomy causes 70-80% decrease in activity of arginase, whereas the other 4 enzymes are decreased by, at the most, 30%. Arginase activity is unchanged when rats are fed an arginine-free diet, whereas the activities of the other 4 enzymes are increased up to 2-fold. Simult. administration of L-ethionine abolishes the increased levels of arginase and ornithine transcarbamylase produced by administration of cortisone acetate. J.N.Ashley

609. CARBONIC ANHYDRASE ACTIVITY OF MAMMARY TISSUES. D.W.C.Brown and G.Bialy: Endocrinology, 1963, 72, 662-663 (Worcester Found. Exp. Biol., Shrewsbury, Mass., U.S.A.) High carbonic anhydrase activity was observed in lactating post partum mammary tissue of rats and mice. That of cows and rabbits was less active, and rat mammary tumour tissue had low activity. H.C.Jones

610. COMPARISON OF VIRULENCE AND ACTIVITY OF SOME ENZYMES OF LISTEMA MONOCYTOGENES. F.Stricker, J.Fisera, V.Krcmery and M.Ferencik: Folia Microbiol., 1963, 2, 89-92 (State Vet. Inst., Bratislava, Czechoslovakia) Virulence of L. monocytogenes was closely correlated with catalase activity in cells. Significant correlation also existed between virulence and the activities of glucose and lactic acid dehydrogenases and GOT. I.R.Sargent

611. RHODANESE-CATALYSED REDUCTION OF THIOSULPHATE BY REDUCED LIPOID ACID. M.Villarejo and J.Westley: J. biol. Chem., 1963, 238, PC1185-1186 (Dept. Biochem.. Univ. Chicago, Ill., U.S.A.) Cryst. ox liver rhodanese catalyses reduction of S₂O₃²⁻ to SH⁻ and SO₃²⁻. NaBH₄ or Na dithionite functions as substrate for the enzymic reaction. But in the range of physiol. accessible oxidation-reduction potentials only reduced lipoate and lipoamide are reactive. The enzyme does not utilise NADH₂, NADPH₂, cysteine, reduced glutathione, or formaldehyde for reduction of S₂O₃²⁻.

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The reaction with lipoate or lipoamide is stereosp. The cryst. enzyme contains no bound lipoic acid.

J.N.Ashley

612. DESULPHURATION OF THIOUREA BY SALIVA. T.H.Shepard, A.E.Lorincz and S.M.Gartler: Proc. Soc. exp. Biol., N.Y.. 1963. 112. 38-42 (Dept. Anat. Pediatrics, Med. Coll., Univ. Florida, Gainesville, Fla., U.S.A.) There is an enzyme system in saliva which is capable of desulphuration of thiourea which is stable after 15 min. at 70°. inactivated by 100° in a min.. and destroyed by TCA at a final concn. of 4%. Its activity is slightly lost after dialysis and lyophilisation. It is dependent on the presence of thiocyanate and ascorbic acid and its behaviour is temp, and pH dependent. The activity of saliva of various mammalian spp. has shown that it is not possessed by all. There was no correlation between the presence of this enzyme system and the ability of people to taste phenylthiocarbamide. Many S containing substances such as propylthiouracil, thiosulphate and reduced glutathione were potent inhibitors perhaps acting competitively with thiourea.

D.N.Wheatley

The ratio of the prealbumin-albumin complex to globulins was 0.47 in this group and 0.59 in ducklings receiving 0.05% choline chloride in the diet. In ducklings receiving a protein deficient diet the prealbumin to globulin ratio increased. Of the 8 amino acids tested tryptophan, methionine and leucine increased the pre-albumin-albumin ratio. (French) MAPfc*

618. TRANSAMIDINASE ACTIVITIES IN VITRO OF TISSUES FROM VARIOUS MAMMALS AND FROM RAT-FED PROTEIN-FREE, CREATINE-SUPPLEMENTED AND NORMAL DIETS. J.F.Van Pilsum, B.Olsen, D.Taylor, T.Rozycki and J.C.Pierce: Arch. Biochem.. 1963, 100. 520-524 (Dept. Physiol. Chem., Univ. Minnesota Med. Sch., Minneapolis, Minn., U.S.A.). Spleen, skeletal muscle, heart muscle, lung, brain and testes had measurable transamidinase activities, although per unit wt. of tissue these were only a fraction of activities found in kidney and pancreas. In rats fed creatine-supplemented or protein-free diets only pancreas and kidney transamidinase levels fell. B.M.Stevens

619. EFFECT OF LYSINE AND GLYCINE UPON ARGININE REQUIREMENT OF GUINEA-PIGS. B.L.O'Dell and W.O.Regan: Proc. Soc. exp. Biol., N.Y.. 1963. 121. 336-337 (Dept. Agric. Chem., Univ. Missouri, Columbia, Mo., U.S.A.) The growth rate measured by average daily increase in wt. over 4 weeks in guinea pigs fed a diet of 30% casein is compared with diets supplemented with 2% lysine HCl and 2% glycine. TB¹⁰⁰ supplemented diets significantly reduced the growth rate. An addition of 0.5% arginine to the diet significantly increased the growth rate. D.N.Wheatley

620. COMPARATIVE EFFECTS OF PECTIN N.F. ADMINISTRATION ON THE CHOLESTEROL-FED RABBIT, GUINEA-PIG, HAMSTER AND RAT. A.F.Wells and B.H.Ershoff: Proc. Soc. exp. Biol., N.Y.. 1962, 111. 147-149 (Western Biol. Lab., Culver City, Calif., U.S.A.) Increase in plasma and liver cholesterol in the rat fed on 1% cholesterol counteracted by inclusion of citrus pectin, containing 10% methyl, in the diet. No significant effect was observed in rabbit, guinea-pig and hamster. Ian J M.M.Shapelfg

621. DIET AND CHOLESTEROLAEMIA: VII. EFFECT OF METHIONINE, ETHIONINE, AND β -FLUOROPHENYLALANINE. J.C.Seidel and A.E.Harper: J. lipid Res., 1963, 4, 75-80 (Dept. Biochem., Wisconsin, Madison, Wis., U.S.A.) Concn. 0.1% serum cholesterol in rats fed a diet containing cholic acid and hydrogenated coconut oil was significantly lower than those of rats supplemented with ethionine alone. The addition of methionine also very largely prevented the depression of growth caused by ethionine. Administration of β -fluorophenylalanine lowered the concn. of cholesterol in the serum but β -thiophenylalanine had little effect. J^

622. TURNOVER OF ADIPOSE TISSUE TRIGLYCERIDES [TG] MEASURED BY THE RATES OF SYNTHESIS AND RELEASE OF TRIGLYCERIDE-GLYCEROL. E. Shafrir: Biochim. biophys. Acta, 1963. 70. 19-24 (Dept. Biochem., Hebrew Univ., Jerusalem, Israel) Amounts of glycerol released by endogenous TCJ

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613. ADAPTATION OF THE EXOCRINE SECRETION OF RAT PANCREAS TO THE COMPOSITION OF THE DIET. A.Bep Abdeljilil, A.M.Visani and P.Desnuelle: Biochem. biophys. Res. Comm., 1963. 10, 112 (Inst. Chim. Biol. Fac. Sci., Marseille, France) Increased levels of amylase in pancreas homogenates and pancreatic juices from rats fed a starch-rich diet were apparent after 1 day and max. within 3-5 days. A similar effect on some pancreatic proteinases was shown when a casein rich diet was administered. B.Ketterer

614. EFFECT OF DILUTION OF THE DIET WITH AN INDIGESTIBLE FILLER ON FOOD INTAKE IN THE MOUSE. D.C.Dalton: Nature, Lond., 1963, 197. 909-910 (Dept. Agric., Univ. Leeds, England) Diln. of the diet of the mouse with indigestible cellulose filler is an effective means of lowering nutrient intake despite attempts by the animal to compensate for the lowered nutrient intake by increased food consumption. G.M.Lewis

615. COLORIMETRIC DETERMINATION OF LOW CONCENTRATIONS OF 2,2-DICHLOROVINYL DIMETHYL PHOSPHATE IN THE ATMOSPHERE. J.T.Hughes: Analyst, 1963, 88. 318-319 (Glasshouse Crops Res. Inst., Rustington, Littlehampton, England). I.A.B.S.

616. PROTEIN MALNUTRITION. J.B.Allison: Trans. N.Y. Acad. Sci., 1963. 25, 293 (Bureau Biol. Res., Rutgers State Univ., New Brunswick, N.J., U.S.A.) Review. The relationship of protein intake to the synthesis and catabolism of proteins is discussed with special reference to protein malnutrition. K.Brew

617. ELECTROPHORETIC SEPARATION OF SERUM PROTEINS OF DUCKLING DURING PROTEIN MALNUTRITION OR CHOLINE DEFICIENCY. J.M.Demers, R.Carbonneau and N.Platonow: C.R. Soc. Biol., Paris, 1962, 156. 1390-1394. There was a decrease in the albumin and prealbumin fraction of serum proteins of ducklings kept on a choline deficient diet for 21 days.

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in epididymal fat pads of fed rats were balanced by de novo glycerol synthesis. Approx. 1-7% of glyceride ester bonds were split and resynthesised/24 hr. indicating a $\frac{1}{2}$ day TG half life. Fatty acid [FA] release was lower. The ratio FA outflow:glycerol release increased on testing and decreased on refeeding or addition of glucose during incubation. During refeeding the surplus of Steyerol synthesised over glycerol released was utilised \approx external FA deposition. Glucose reduced FA outflow by promoting glycerol synthesis. With adrenaline glycerol please greatly outbalanced synthesis despite enhancement of synthesis but high glucose concn. raised esterification rates to equal lipolysis.

B.M.Stevens

623. BIOASSAY OF ESSENTIAL FATTY ACIDS [EFA]. COMPARISON OF EFFECTS OF TRIGLYCERIDES, METHYL AND ETHYL ESTERS. H.J.Thomasson and U.Gottenbos: Proc. Soc. exp. Biol., N.Y., 1962, 136, 261-262 (Unilever Res. Lab., Vlaardingen, Netherlands) Comparison of activities of fatty acids in EFA bioassay are correct only when the acids administered are in a comparable form such as esters and triglycerides. The latter was preferred because of causing low death rate and const. body wt. level in deficient animals.

M.M.Shapland

624. EFFECT OF CORN OIL FEEDING ON THE LIPIDS OF DOG BILE. U.K.Misra: Indian J. exp. Biol., 1963, 1, 87-90 (Vallabhbhai Patel Chest Inst., Delhi Univ., Delhi, India) The effect of dietary corn oil, an \approx 1% fat (40jfc wt./wt.), on dog bile lipids was studied. Using silicic acid column chromatography, bile lipids of tritium and test diet fed dogs have been fractionated into glycerides, free fatty acids, free cholesterol, mono- and diglycerides, cephalin, lecithin, sphingomyelin, lyssolecithin. On corn oil feeding, the amount of fatty acids, free cholesterol and monoglycerides increases, whereas that of phospholipids decreases.

625. EFFECT OF CHOLESTEROL-FAT FEEDING ON ACTIVITY OF RABBIT AORTA DEHYDROGENASE SYSTEMS. M.Rhova, T.Zemplenyi and Z.Lojda: Quart. J. w.p. Physiol., 1963, 48, 61-66 (Inst. C. H. C. Res. Prague-Kre, Prague, Czechoslovakia) Sucrose feeding to rabbits resulted in a decrease in hydrogenase activity in aortic tissue. Lactic acid decreases were seen in (X-glycerophosphate-, acid- and malic acid dehydrogenase activity).

626. INCORPORATION OF Cl^{14}C PALMITATE INTO SERUM TRIGLYCERIDES OF CHOLINE DEFICIENT RATS. B.Lombardi and M.C.Schotz: Proc. Path. exp. Biol., N.Y., 1963, 142, 400-401 (Dept. U.S.A. X Univ. Pittsburgh Med. Sch., Pittsburgh, Pa., U.S.A.) The accumulation of labelled palmitate in plasma triglycerides in rats fed on choline deficient diets was shown to be a different mechanism from that observed with hepatotoxic substances such as CCl_4 since there is no change in the liver to plasma triglycerides in the former case.

D.N.Wheatley

T.A.Andeison, R.E.Taylor, R.H.Diven, F.Hubbert jun. and W.H.Hale: J. anim. Sci., 1962, 21, 369-372 (Univ. Arizona, Tucson, Ariz., U.S.A.)

Samples were taken from different sites (dorsal, ventral and caudal lobes) of livers (cattle and sheep) having a wide range of vit. A levels. Samples were obtained by the aspiration technique and showed a confidence interval of $\pm 62\%$ of the estimated value when the observed vit. A was $< 30 \mu\text{g}/\text{g}$. of fresh tissue. For larger amounts (40-160 $\mu\text{g}/\text{g}$) the confidence interval did not exceed $\pm 21\%$ but widened again at still higher values.

A.G.Pollard

628. METABOLISM OF RETINA, m. ROLE OF NADPH₂ IN VISUAL CYCLE. S.Futterman: J. biol. Chem., 1963, 238, 1145-1150 (Howe Lab. Ophthalmol., Massachusetts Eye and Ear Inf., Boston, Mass., U.S.A.)

Aldehydes stimulate oxidation of C-1 of glucose in retina. Visual cell outer segment prep, metabolise glucose by glycolytic and hexose monophosphate oxidation routes; the latter is stim. by pyruvate and aldehydes. Retinal visual cell alcohol dehydrogenase can use NADPH₂ for reduction of retinene to vit. A. The quant. relationship between oxidation of C-1 of glucose and reduction of vit. A aldehyde to vit. A in dark-adapted visual cell outer segment prep, exposed to light shows that NADPH₂ is the main reducing agent for this aldehyde in the visual cycle.

629. EFFICIENCY OF ANTIBIOTICS IN SUPPLEMENTING THE GROWTH EFFECT OF 5-CAROTENE IN VITAMIN A-DEPLETED RATS. N.B.Guerrant: Proc. Soc. exp. Biol., N.Y., 1962, 111, 34-37 (Dept. Agric. and Biol. Chem., Pennsylvania State Univ., University Park, Pa., U.S.A.) Tetracyclines appear to be the most effective antibiotics in the stimm. of additional growth in rats receiving sub-optimum intake of vit. A.

M.M.Shapland

630. THIAMINASE ACTION: HAMMETT'S p- σ -TREATMENT. J.A.Mazrimas, Pill-Soo Song, L.L.Ingraham and R.D.Draper: Arch. Biochem., 1963, 100, 409-413 (Dept. Biochem., Univ. California, Davis, Calif., U.S.A.) Thiaminase was isolated from carp and reaction rates were studied as a function of the basicity of a series of substituted anilines. The rate increased as Hammett's σ const., which measures the availability of the electron pair on the N, became smaller until it reached 0. The rate then decreased with increasing neg. values of σ . Two possible explanations are offered.

B.M.Stevens

631. EFFECT OF PREVENTION OF COPROPHAGY ON THIAMINE-SPARING ACTION OF HYDROLYSED GLUCOSE CYCLOACETOACETATE [GCA] IN RATS. S.K.Meghal and M.C.Nath: Indian J. exp. Biol., 1963, 1, 107-108 (Dept. Biochem., Nagpur Univ., Nagpur, India) The thiamine-sparing action of hydrolysed glucose cycloacetoacetate is abolished when coprophagy is prevented. Rats when fed hydrolysed GCA along with their faeces record highest growth during 6 weeks of expt. period, and their thiamine contents in heart, liver and caecum are appreciably increased. The rats kept on thiamine-low diet (control) have been found to die due to thiamine deficiency during the expt. even though coprophagy is allowed while those fed their faeces along with thiamine-low diet do not show any increase in their body wt. This shows that thiamine synthesis depends upon the dietary constituents and coprophagy is essential in order to make available flora-synthesised thiamine.

VITAMINS

FOR THE LIVER BIOPSY TECHNIQUE
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632. EFFECT OF THIAZIDES ON THIAMINE EXCRETION AND ON PYRIDOXINE METABOLISM. S.J.Dubel and L.A.Soloff: Amer. J. med. Sci., 1963, 245, 58-62 (Div. Cardiology, Temple Univ. Med. Center, Philadelphia, Pa., U.S.A.) Thiazides do not increase the urinary excretion of thiamine or pyridoxine, as judged by the excretion of xanthurenic acid. E.E.Hobbiger
633. PANTOTHENIC ACID DEFICIENCY IN RATS. M.Hatano: J. Vitaminol., 1962, 8, 143-159 (Dept. Internal Med., Kyoto Univ., Sakyo, Kyoto, Japan) The effect of pantothenic acid deficiency on the histol. of various organs was investigated. Changes in the endocrine organs were evident and it is probable that through them become manifested the changes seen during expt. deficiency. G.C.Barr
634. MODE OF INTERACTION OF THE ISONICOTINOYL HYDRAZONE OF PYRIDOXAL PHOSPHATE WITH ASPARTATE-GLUTAMATE APOTRANSAMINASE. Y.M.Torchinsky: Biochem. biophys. Res. Comm., 1963, 10, 401 (Inst. Radiobiol. and Physico-Chem. Biol., Acad. Sci. of the U.S.S.R.. Moscow, U.S.S.R.) Data are given showing that the activation of aspartate-glutamate apotransaminase by the isonicotinoyl hydrazone of pyridoxal phosphate is due to the liberation of pyridoxal phosphate. B.Ketterer
635. SERINE TRANSHYDROXYMETHYLASE. PROPERTIES OF HOMOGENEOUS ENZYME PREPARATION AND NATURE OF ITS INTERACTION WITH SUBSTRATES AND PYRIDOXAL 5-PHOSPHATE. LaV.G.Schirch and M.Mason: J. biol. Chem., 1963, 238, 1032-1037 (Dept. Biol. Chem., Univ. Michigan, Ann Arbor, Mich., U.S.A.) The enzyme from rat liver is obtained more than 95% pure by starch gel electrophoresis and ultracentrifugation. The mol. wt. is 331000 ± 8000 . Reduction with NaBH₄ causes a shift of the 430 mji peak to 340 mji. Acid hydrolysis of the reduced enzyme gives G-pyridoxyllysine. Four mol. of pyridoxal phosphate are bound to each mol. of the enzyme by Schiff base formation to lysyl residues. The enzyme cleaves a-methyl-serine into N¹NIO-methylenetetrahydrofolate and D-alanine which shows the C-H bond on the (X-C of serine is not broken in the enzymic reaction. The spectrum of the enzyme is modified by addition of substrates because complexes with new absorption peaks are formed. J.N.Ashley
636. FREEDOM OF HYDROXYPROLINE-2-EPIMERASE FROM PYRIDOXAL PHOSPHATE. E.Adams: Biochem. biophys. Res. Comm., 1963, 10, 327 (Dept. Pharmacol., St. Louis Univ. Sch. Med., St. Louis, Mo., U.S.A.) An inducible hydroxyproline-2-epimerase from Pseudomonas striata gave no evidence of requiring pyridoxal phosphate as a cofactor. B.Ketterer
637. BIOTIN- AND ATP-DEPENDENT ACTIVATION OF PROPIONYL APOCARBOXYLASE. J.L.Foote, J.E. Christner and M.J.Coon: Biochim. biophys. Acta, 1963, 67, 676-678 (Dept. Biol. Chem., Med. Sch., Univ. Michigan, Ann Arbor, Mich., U.S.A.) At least 2 sol. enzyme fractions were required, the apoenzyme itself and an apoenzyme activating system. B.M.Stevens
638. BIOCHEMICAL FUNCTION OF BIOTIN. IV. BIO-SYNTHESIS OF BIOTIN. A.Lezius, E.Ringelmann and F.Lynen: Biochem. Z., 1963, 336, 510-525 (Max-Planck-Inst. Zellchemie, Munchen, Germany)

Achromobacter IV S was grown in a medium containing isovaleric acid to which [3-14C]cysteine or ¹⁴CO₂ were added. Biotin was isolated by first heating an acidified suspension (3% H₂SO₄) of bacteria, then separating biotin from amino acids and peptides on Dowex 50 and finally subjecting the avidin-biotin complex to gel filtration on Sephadex G25. The [3-14C] atom of cysteine was converted into the C-5 of biotin, whereas incubation with ¹⁴CO₂ led to the carbonyl (C-2) and the carboxyl group (C-10) becoming labelled. (German) L.Conn

639. BACTERIAL BIOTINIDASE. M.Koivusalo, C.Elorriaga, Y.Kaziro and S.Ochoa: J. biol. Chern., 1963, 238, 1038-1042 (Dept. Biochem., New York Univ. Sch. Med., N.Y., U.S.A.) Biotinidase is purified 700-fold from extracts of Streptococcus faecalis. The enzyme hydrolyses all biotin deriv. tested, and it is sp. for the biotin moiety of simple biotin esters and amides. The enzyme liberates equimol. amounts of biotin and lysine from biocytin. It is widely distributed. Besides liver and plasma, it is also present in kidney, heart, brain, spleen and intestine among animal tissues. It is also present in yeast and in Propionibacterium shermanii. There is little or no activity in Lactobacillus arabinosus 17-5 which utilises only free biotin.

J.N.Ashley

640. INCORPORATION OF PIMELIC ACID AS VUNIT IN THE BIOSYNTHESIS OF BIOTIN. H.L.Elford and L.D.Wright: Biochem. biophys. Res. Comm., 1963, 10, 373 (Dept. Biochem. and Graduate Sch. Nutr., Cornell Univ., Ithaca, N.Y., U.S.A.) Evidence is submitted that both carboxyl groups of pimelic acid participate in the biosynthesis of biotin and that only 1 mole of pimelic acid is involved in the biosynthesis of 1 mole of biotin. B.Ketterer

641. ENZYMIC CONVERSION OF TETRAHYDROPT¹⁴IP GLUTAMIC ACID [THPGA] TO CITROVORUM FA¹⁴ OF IN BACILLUS SUBTILIS. M.A.Netrawali, V.M. and A.Sreenivasan: Indian J. exp. Biol., 1963, 1, 70 (Cent. Food Technol. Res. Inst., Mysore, fr?) Optimum conditions for the enzymic synthesis of citrovorum factor [CF] from THPGA in whole cells of a strain of B. subtilis NRRL B644 have been studied. Max. synthesis of CF is observed when incubations are performed under anaerobic conditions at pH 7.2 for 2 hr. Increase in the amount of CF formed is observed on heating the incubated mixture in a water-bath for 30 min. P¹⁴Sap¹⁴ due to non-enzymic mechanism. Replacement of ¹⁴CF by pteroyl glutamic acid considerably lowers CF synthesis. Serine is a better Ci donor than formate. Ascorbic acid has a sp. function other than a reducing agent, and is not replaceable by homocysteine and glutathione (reduced) in the system. The system shows no requirement for ATP, DPN and Mg²⁺ as cofactors. Inclusion of Ci acceptors in the system inhibits CF synthesis.

642. ENZYMIC SYNTHESIS OF METHYL GROLFF^FTION METHIONINE. IV. ISOLATION, CHARACTER AND ROLE OF 5-METHYLtetrahydrofolate. R.Larrabee, S.Rosenthal, R.E.Cathou and J. Buchanan: J. biol. Chem., 1963, 238, 10 & 31 (Div. Biochem., Dept. Biol., M.I.T., Cambridge, Mass., U.S.A.) Synthesis de novo of methionine from 5,10-methylene tetrahydrofolate and homocysteine is studied with enzymes isolated from a mutant of E.coli 113-3 grown on vit. B₁₂ and limiting folic acid. 5-Methyltetrahydrofolate [5MTF], which is 1-dm-

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5'-deoxy-5-methyl-5,6-dihydrofolate. A. a major folate component of liver and serum. Isolated as an intermediate of these reactions. Although relatively stable to 0 at pH 8-7, it may be converted in presence of O into 5-methyl-5,6-dihydrofolate. It is formed by reaction of 5,10-methylene tetrahydrofolate with NADH₂ in presence of methylene tetrahydrofolate reductase, which is present in the *E. coli* mutant, but is absent from the methionine-requiring mutant 205-2. It is converted into methionine and tetrahydrofolic acid by an enzyme system consisting of NADH₂, *S. faecalis* S_{Mg f h} mocoysteine, and an enzyme that converts a deriv. of vit. B¹² as prosthetic group.

N.Ashley
^L PRODUCTION OF A VITAMIN B12 COMPOUND BY TETRAHYMENIDS. J.A.Erwin and G.G.Holz, jun.: J., Protozool., 1962, 9, 211-214 (Dept. Chem., Harvard Univ., Conn., U.S.A.) By means of micro-OrF assay paper chromatography, and paper electrophoresis it was shown that *Tetrahymena pyriformis* mating variety I, and 3 other tetrahymenids produce a heme compound. The compound produced by *T. pyriformis* was nutritionally active for *E. coli* and *Lactobacillus leichmannii* and inert for *Ochromonas malhamensis* and *Euglena gracilis*. It is present in 1 part in 30 million by dry wt. R.J.Walker

F.W. STRUCURE OF COBAMIDE-COENZYME. F.Wagner and P.Renz: Tetrahedron Letters, 1963, 4. StT²⁶⁷ (Lehrstuhl fur Biochem. Tech. Hochschule ^{lu} «gart. Germany) Letter. (German) I.A.B.S.

AMFFECT OF VIT AMIN B12 ON THE RATE OF AMMONIA OXIDATION BY NITRIFYING BACTERIA, R. Rewari and V.B.Sundara Rao: Indian J. Microbiol., 1962, 2f, 75-78 <Ind-Agric. Res. Inst., New Delhi, India) Three pure strains of nitrifying bacteria were isolated by enrichment culture medium. The oxidation of NH₃ to nitrite was significantly enhanced in the presence of vit. B12. G.M.Lewis

646 SEPARATION OF BOUND AND FREE VITAMIN B₁₂ C COLUMN. M.Kalei and BJ.Glass: (GasL Soc. - P. Biol., N.Y., 1962, 111, 270-274) Separation of free vit. B12 from that in normal gastric juice is obtained using Sephadex G-25. This method may be of value in the assay of Vit. B₁₂ binding capacity of biol. vit. B12 binders and factor materials from human and animal sources.

ISOLATION OF VITAMIN B12 BY RATS WITH JHENIC ACID DEFICIENCY. K.Ikuda, E.B. Hsu and B.F.Chow: Proc. Soc. exp. Biol. Med., 1962, 111, 300-304 (Dept. Biochem., Johns Hopkins Univ., Baltimore, Md., U.S.A.) Vit. B₁₂ content of rats exhibited an increased rate of survival. Large increase rate of survival. Absorption of [60Co]vit. B12 were not impaired.

M.M.Shapland
OF MUTATION AND AUXOTROPHY IN THE STUDY OF VITAMIN B12 BIOSYNTHESIS IN NOCARDIA RUGOSA. A-Marco and C.Spalla: G. Microbiol., 1961, 3, 237-248 ('Farmitalia', Milano, Italy) Intermediates in the biosynthesis of vit. B12 have been constructed from the unknown intermediates that accumulate in metabolically blocked strains. A common precursor for vit. B12 and ascorbic acid has been confirmed and is probably D-amino-acid. (ItaUan) G.N.Godson

649. HYDROXOCOBALAMIN: ITS EXAMINATION AND DETERMINATION IN PARENTERAL INJECTION SOLUTIONS BY PAPER CHROMATOGRAPHY. J.L.Martin and W.H.C.Shaw: Analyst, 1963, 88, 292-296 (Glaxo Labs. Ltd., Greenford, Middx., England). I.A.B.S.

650. PURIFICATION OF INTRINSIC FACTOR AND VITAMIN B12 BINDERS FROM HUMAN GASTRIC JUICE. R.GrSsbeck, K.Simons and I.Sinkkonen: Ann. Med. exp. Fenn., 1962, 40, Supp. 6. 1-24. With the aim of purifying intrinsic factor [IF], gastric juice was sat. with cyanocobalamin and fractionated using ion exchange celluloses and cross linked dextrans (Sephadex) and Pevikon electrophoresis. Bound radioactive vit. B12 was used as a guide to locate IF. Three protein-vit. B12 complexes S, I and R were found and fraction S was prep. in a high state of purity. Ultracentrifugal analysis of fraction S indicated an original mol. wt. of approx. 93000. IF activity was assayed throughout the whole purification procedure with a few explained exceptions. Clear cut activity was found only in the binding fractions S and I. The latter may be a digestion product of the former. The binder R and almost all the non-binding fractions lacked IF activity. G.Faulkner

651. TISSUE DISTRIBUTION AND STORAGE FORMS OF VITAMIN B12 INJECTED AND ORALLY ADMINISTERED TO THE DOG. C.Rosenblurru P.G.Reizenstein, E.P. Cronkite and H.T.Meriwether: Proc. Soc. exp. Biol., N.Y., 1963, 112, 262-266 (Merck Sharp and Dohme Res. Labs., Rahway, N.J., U.S.A.) Two mongrel dogs received concurrent administrations of both 57Ca and ⁵⁸Co labelled vit. B12, the former orally, the latter i.v. After 4 weeks the distribution of labelled vit. was studied in 50 different regions of the body. The ratio of the 2 isotopes was const, and therefore there was a common pool of vit. to which both types of vit. contributed regardless of mode of administration. It was also shown by reverse isotope diln. analysis of the liver that the vit. B12 was converted to the noncyano form. This and other chem. changes occurring during storage in the liver may account for there being a complex mode of excretion of vit. B12 products. D.N.Wheatley

652. ELECTRON SPIN RESONANCE STUDY OF COENZYME B12. H.P.C.Hogenkamp, H.A.Barker and H.S.Mason: Arch. Biochem., 1963, 100, 353-359 (Dept. Biochem., Univ. California, Berkeley, Calif., U.S.A.) Three different samples of coenzyme B12 showed no electron spin resonance spectra either in the cryst. state or in aq. soln., indicating that coenzyme B12 is diamagnetic. Electron spin resonance spectra of coenzyme B12 photolysed anaerobically were identical with the spectrum for vit. Bi2rt indicating a paramagnetic photolysis product containing bivalent Co. Exposure of the photolysis product or of vit. Bi2r to O₂ completely abolished the electron spin resonance spectra.

B.M. Stevens

653. BIOSYNTHESIS OF ASCORBIC ACID BY RATS FED A HIGH LEVEL OF DIETARY TYROSINE UNDER TOXIC AND ADAPTED CONDITIONS. S.Ghosh and B.C.Guha-Biochim. biophys. Acta, 1963, 69, 440-442 (Dept. App. Chem., Univ. Coll. Sci., Calcutta, India) Tyrosine toxicosis appeared to be related to reduced ascorbic acid synthesis by liver; ascorbic acid biosynthesis played a part in adaptation to a high tyrosine intake Prelim. comm. B.M. Stevens

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- 654. PERMEABILITY OF DERMAL CONNECTIVE TISSUE IN NORMAL AND SCORBUTIC GUINEA-PIGS.** J.Fabianek, A.Herp and W.Pigman: *Nature, Lond., 1963, 197, 906-907* (Dept. Biochem., New York Med. Coll., New York, U.S.A.) The permeability of dermal and s.c. tissue of normal and scorbutic guinea-pigs was increased by ascorbic acid to the same extent when estimated by the Duran-Reynal's spreading test or by a const. pressure infusion test. G.M.Lewis
- 655. DEVELOPMENTAL PATTERN OF ADRENAL ASCORBIC ACID IN THE RAT.** S.Levine and G.W. Lewis: *Science, 1963, 139, 118-119* (Dept. Psychiatry, Stanford Univ., Calif., U.S.A.) The maturational pattern of adrenal ascorbic acid in non-stressed newborn rats consists of high resting levels early in development, a marked decrease during a period between 8 and 12 days, and a subsequent return to high levels. The onset of the maturational pattern is accelerated by about 2 days by previous daily manipulation of the newborn rats. G.M.Lewis
- 656. SHORTENING THE INCUBATION PERIOD FOR THE DETERMINATION OF ASCORBIC ACID BY THE 2,4-DINITROPHENYLHYDRAZINE METHOD.** K.K.G.Nair, C.P.Tewari and P.S.Krishnan: *Indian J. Chem., 1963, 1, 131-134* (Div. Biochem., Lucknow Univ., Lucknow, India). L.A.B.S.
- 657. EFFECT OF TYROSINE AND SOME OF ITS METABOLITES ON THE BIOSYNTHESIS OF ASCORBIC ACID BY RAT LIVER TISSUES [IN VITRO].** S.Ghosh and B.C.Guha: *Biochim. biophys. Acta, 1963, 71, 213-214* (Dept. Applied Chem., Univ. Coll. Sci., Calcutta, India) *j*-Hydroxyphenylpyruvic acid and homogentisic acid inhibited ascorbate synthesis. Prelim, comm. B.M.Stevens
- 658. BACTERIAL ASCORBIC ACID OXIDASE.** W.A.Volk and J.L.Larsen: *Biochim. biophys. Acta, 1963, 67, 576-580* (Dept. Microbiol., Sch. Med., Univ. Virginia, Charlottesville, Va., U.S.A.) An Aerobacter aerogenes strain contained an enzyme which oxidised L-ascorbate and D-isoascorbate but not catechol, phenol, p-cresol, pyrogallol, cysteine, reduced glutathione, hydroquinone or *p*-phenylenediamine. 50*Jo CO* did not inhibit. The pH optimum was 6.3. Km for L-ascorbic acid was 2.36 x 10⁻² M. B.M.Stevens
- 659. EFFECT OF LIVER NECROSIS AND THYROTOXICOSIS ON THE SYNTHESIS OF L-ASCORBIC ACID BY RAT-LIVER MICROSOMES.** N.C.Ghosh and N.C.Kar: *Biochem. J., 1963, 87, 536* (Dept. Appl. Chem., Univ. Coll. Sci. Technol., Calcutta, India) The activity of the enzyme system catalysing the conversion of D-glucuronolactone and L-gulonolactone into L-ascorbic acid by rat liver microsomes is greatly decreased after the injn. of CCI4 and the administration of vit. B12 does not prevent the inhibn. of synthesis. The microsomal conv J-sion of L-gulonolactone into L-ascorbic acid is also significantly decreased in the liver tissues of rats given a necrogenic yeast diet free from vit. E. Supplementation of the necrogenic diet with DL-methionine and L-cystine completely restores the enzyme activity. The synthesis is, however, pyrophosphate-dependent. The administration of (X-tocopherol together with amino acids abolishes this requirement for pyrophosphate. The synthesis of L-ascorbic acid is markedly depressed in the liver microsomes of thyrotoxic rats. Supplementation with vit. B12 restores the synthesis partially.

- 660. SPECTROPHOTOMETRIC ASSAY OF ASCORBIC ACID OXIDASE.** M.F.Oberbacher and H.M.Vines: *Nature, Lond., 1963, 197, 1203-1204* (Florida Citrus Expt. Sta., Lake Alfred, Fla., U.S.A.) The activity of an ascorbic acid oxidase prep, from oranges was estimated quant. by spectrophotometric determination of the diminution of the ascorbic acid absorption peak at 265 fflr Results agreed well with the manometric assay method. G.M.Lewis
- 661. OPERATION OF ¹T_{EXOSE MONOPHOSPHATE OXIDATIVE PATHWAY OF GLUCOSE METABOLISM IN SCORBUTIC GUINEA-PIGS.}** S.Banerjee and W.K. Kawishwar: *Indian J. exp. Biol., 1963, 1, 105-107* (Dept. Physiol. and Biochem., Sardar Patel Med. COM Bikaner, India) Glucose 6-phosphate dehydrogenase and 6-phosphogluconic dehydrogenase activities have been determined by the triphenyl tetrazolium chloride reduction method in the tissues of normal, scorbutic and insulin-treated scorbutic guinea-pigs and in guinea-pigs after recovery from scurvy. The activities of both the enzymes increases in the brain and no changes are observed in the liver and kidney of the scorbutic animals. While insulin treatment of the scorbutic animals does not diminish enhanced activities of these enzymes in the brain, supplementation of the scorbutic animals with ascorbic acid brings back these activities to normal. *
- 662. RELATION OF TOCOPHEROL TO ENZYME SULPHYDRYL SITES.** L.M.Corwin and K.Schwarz: *Arch. Biochem., 1963, 100, 385-392* (Section Expt. Liver Diseases, LNE, Nat. Inst. of Arthritis Metab. Dis., Bethesda, Md., U.S.A.) Tocopherol affected neither cytochrome oxidase nor antimycin A sensitivity of a-tocopherol deficient rat liver homogenates. The decline in (X-ketoglutarate oxidation by such homogenates was prevented by glutathione and 2,3-dimercaptopropyl mercaptan. The decline in free SH with time was prevented by all reagents preventing oxidative decline. Tocopherol lowered the sensitivity of cell fraction (X-ketoglutarate oxidation to AsO₂ and Cd and prevented inhibn. of glutamate and p-hydroxybutyrate oxidation by *j*-hydroxymercuribenzoate. Protecting agents were required at the beginning of incubation; the presence of NAD extended the critical period for the addition of such agents. B.M.Stevens
- 663. CONVERSION OF TOCOPHEROLS IN ANIMALS.** C.Martius and E.Furer: *Biochem. Z., 1963, 336, 488* (Eidgenossische Tech. Hochschule, Zurich, Switzerland) OC-Tocopherol became converted to 2,5,6-trimethyl-3(farnesyl-farnesyl-geranyl-geranyl)-benzoquinone after a-tocopherol labelled with ¹⁴C and ³H had been inj. into chickens, rabbits, rats and earthworms. It is suggested that the vit. activity of a-tocopherol is not connected with its property of being an anti-oxidant. (German) L.
- 664. ACTION OF ARYLSULPHATASE ON VITAMIN DISULPHATE.** F.C.G.Hoskin and C.Von Eschen: *Biochim. biophys. Acta, 1963, 67, 669-671* (Dept. Neurol., Coll. Physn. and Surgn., Columbia Univ.t New York, U.S.A.) B.U.-steve

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- 665. INSULIN-LIKE ACTIVITY OF SERUM FROM NORMAL AND HYPOPHYSECTOMISED MONKEYS.** E.G.Bali

E.Knobil: Endocrinology, 1963, 72, 658-661 (Dept. Biol. Chem., Harvard Med. Sch., Boston, Mass., U.S.A.) Sera from hypophysectomised monkeys showed a lower insulin-like activity than that from normal monkeys, and also failed to show the increase in activity seen on diln. of serum from normal animals, ca* H.C.Jones

⁶⁶ PROPERTIES OF HEPATIC GLUTATHIONE-INSULIN TRANSDEHYDROGENASE. H.M.Katzen, F.Tietze and DeW.Stetten, jun.: J. biol. Chem., 1963, 238, 1006-1011 (Nat. Inst. Arthritis and Metabol. Dis., Bethesda, Md., U.S.A.) When the products obtained by reduction of the disulphide bonds of insulin are reoxidised by reduced glutathione in presence or absence of the trans-^N-Varogenase approx. 20 times as much insulin-like activity (as determined by the effect on metabolism of adipose tissue) is recovered in presence, as in absence, of shydrogenase. Approx. 5 times as much immunological activity corresponding to insulin is recovered when the enzyme is present. The results show that presence of glutathione-insulin transhydrogenase favours reconstitution of naturally occurring disulphide bonds of insulin.

J.N.Ashley

⁶⁷ APPARENT MOL. WT. OF INSULIN IN DILUTE ACID SOLUTION. P.D.Jeffrey and J.H.Coates: Nature, ^{nd.}, 1963, 197, 1104-1105 (Dept. Chem., Univ. of ^{elaide}, Australia) The apparent mol. wt. of insulin in acidic soln. was measured over a range of concn. of 0.8-0.02 g./100 ml. using the technique of sedimentation equilibrium. Values varied from 16000 at the highest concn. to 7500 at the lowest. The results are in stent with view that under these conditions insulin exists in a state of dynamic association, the dimer having mol. wt. of 6000. G.M.Lewis

⁶⁸ INSULIN. V. STRUCTURE OF THE GLYCYL CHAIN 2^F BONITO INSULIN II. A.Kotaki: J. Biochem., ^{kyo}, 1963, 53, 61-70 (Dept. Chem., Fac. Sci., ^{to}kyo Metropolitan Univ., Tokyo, Japan) Peptide fragments obtained by chymotryptic, peptic and acid hydrolyses were purified by paper electrophoresis and chromatography and analysed by paper chromatography. The Tyr-Cys linkage at positions 19-20 was Tinned by Witkop's N-bromosuccinimide method. The structure thus determined was H-Gly-Ileu-Glu-Glu-CySO₃H-(CySO₃H,Lys,Pro,His), CySO₃H. Asp[Leu]-Phe-Glu-Leu-Glu-Asp-Tyr-CySO₃H-Asp(NH₂)-OH. B.M.Stevens

⁶⁹ STIMULATION BY INSULIN OF INCORPORATION OF [³²P]PHOSPHATE AND CARBON-14 FROM ACETATE INTO LIPID AND PROTEIN OF ISOLATED RAT DIAPHRAGM. K.L.Manchester: Biochim. biophys. Acta, 1963, 70, 208-210 (Dept. Biochem., Univ. Cambridge, England). B.M.Stevens

⁷⁰ AMINO ACID INCORPORATION INTO PROTEIN OF DIABETIC RAT LIVER SLICES AFTER ACUTE INSULIN DEPRIVATION. A.Kraemer and M.E.Krahf: Proc. Soc. exp. Biol., N.Y., 1962, 111, 482-484 (Dept. Physiol., Univ. Chicago, 111, U.S.A.) Incorporation of [¹⁻¹⁴C]leucine into protein of liver slices decreased progressively up to 48 hr. after insulin withdrawal from all ^{an}-diabetic rats. Addition of both glucose and insulin to reaction medium stim. this incorporation at 24 hr. after insulin withdrawal from donor animals, addition of insulin or glucose alone had no effect on incorporation. M.M.Shapland

⁷¹ STIMULATION OF INSULIN SECRETION IN VITRO BY ATP. J.I.R-Candela, D.M-Hernandez and T.C-Cortazar: Nature, Lond., 1963, 197, 1304 (Inst. G.Maranon, Velazquez 138, Madrid, Spain)

10⁻³M ATP causes a significant increase in the release of insulin from fragments of rabbit pancreas in vitro. G.M.Lewis

⁷² SEPARATION OF 13I-LABELLED PROTEIN-BOUND INSULIN FROM 'FREE' INSULIN BY GEL-FILTRATION. V.Manipol and H.Spitz: Int. J. appl. Radiat., 1962, 13, 647-648 (Radioisotope Lab., Univ. Philippines, Manila, Philippines) A column method is described for separation of free and protein bound [¹³I]insulin. Sephadex G-75 was allowed to swell in 0.85% aq. NaCl for 24 hr. and was then packed into a column 11 mm. diam. by 65 cm. long. The serum sample was applied and eluted with 0.85% NaCl and the effluent collected and counted in 1 ml. samples. The separation obtained was distinct, quant. (95% recovery) and reproducible. The protein bound insulin was eluted at a peak at 10 ml. and free insulin at a peak at 40 ml. effluent. B.Payne

⁷³ SUBCELLULAR FRACTIONATION OF BOVINE PITUITARY GLANDS BY CENTRIFUGATION.

F.S.LaBella, R.J.Reiffenstein and G.Beaulieu: Arch. Biochem., 1963, 100, 399-408 (Dept. Pharmacol. Therapeutics, Univ. Manitoba Fac. Med., Winnipeg, Manitoba, Canada) Sucrose homogenates were

separated into nuclear, mitochondrial, light mitochondrial, microsomal and supernatant fractions which were characterised chem. and enzymically. All particulate fractions contained vasopressin and oxytocin but total hormone activity was greatest in the light mitochondrial fraction. Supernatant fraction contained up to 50% of total hormone but more oxytocin than vasopressin. Sol. hormone was dialysable. Density gradient centrifugation of combined light mitochondrial and microsomal fractions produced fractions with vasopressin oxytocin of 0.2-0.8. One of these subfractions appeared to be primarily neurosecretory material rich in hormone activity and protein but with negligible lipid. Granule fractions containing up to 10 units vasopressin plus 13 units oxytocin/mg. protein were isolated. B.M.Stevens

⁷⁴ PREPARATION OF SHEEP GROWTH HORMONE.

A.L.C.Wallace and K.A.Ferguson: J. Endocr., 1963, 26, 259-263 (C.S.I.R.O., Div. Animal Physiol., Ian Clunies Ross Animal Res. Lab., Prospect, N.S.W., Australia) A prep, free from contamination with other anterior pituitary hormones was obtained by chromatography of a buffer extract of sheep pituitary on DEAE cellulose. This prep. showed 2 components on electrophoresis and was equiv. in potency to purified ox growth hormone. G.F.Blane

⁷⁵ PURIFICATION OF HUMAN GROWTH HORMONE ON SEPHADEX G-200. R.A.Reisfeld, B.G.Hallows,

D.E.Williams, N.G.Brink and S.L.Stelman: Nature, Lond., 1963, 197, 1206-1207 (Merck Sharp and Dohme Res. Lab., Rahway, N.J., U.S.A.) Human growth hormone from acetone powders of pituitary glands may be further purified by fractionation on Sephadex G-200 to yield a growth hormone prep, of greatly increased sp. activity, free of serum proteins when assayed by immunol. techniques although not homogeneous as shown by disc electrophoresis and ultracentrifugation. A further fraction, contaminated by serum proteins, contained LH activity.

G.M.Lewis

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- 676. SEPARATION OF ACTH AND MSH FRACTIONS FROM PITUITARIES OF DIFFERENT SPECIES.** F.G.Sulman, Z.Ashair, B.Eckstein, N.Khazan and Y.Pfeifer: Proc. Soc. exp. Biol., N.Y., 1963, 112, 202-205 (Dept. Appl. Pharm., Sch. Pharmacy, Hebrew Univ., Jerusalem, Israel) Oxen, sheep and pig pituitaries were homogenised and the extract fractionated into melanophore stimulating and ACTH fractions. Their activity (ACTH, 0,-MSH and /3-MSH) was determined by their melanosis initiating effect on *Hyla* spp., their O.D. at 280 m/i, and their ascorbic acid T⁻ depleting effect on the adrenals respectively. The effects of ACTH and (X-MSH were similar and their O.D. alike; /3-MSH was different since it only caused melanosis. It is suggested that ACTH and (X-MSH have similar effects because their amino acid sequence to position 14 is identical. 1. D. N. Whea tley
- 677. SYNTHESIS AND BIOLOGICAL PROPERTIES OF L-ACETYL-8-LYSINE-VASOPRESSIN.** W.D.Cash and B.L.Smith: J. biol. Chem., 1963, 238, 994-997 (Dept. Biochem., Cornell Univ. Med. Coll., New York U.S.A.) The synthesis is described. Introduction of the acetyl group into the terminal amino group of 8-lysine-vasopressin markedly reduces the biol. activity, and the rat pressor and avian depressor effects are eliminated completely. The rat antidiuretic, rat oxytocic, and rabbit milk-ejecting activities are reduced to less than 0*5% of the corresponding activities of 8-lysine vasopressin. The acetylated hormone inhibits the rat pressor and avian depressor effects of the U.S.P. Posterior Pituitary, Reference Standard, but does not inhibit the antidiuretic, oxytocic, or milk-ejecting effects of the standard. J.N.Ashley
- 678. BIOLOGICAL AND CHROMATOGRAPHIC CHARACTERISATION OF A POLYPEPTIDE WITH PRESSOR AND OXYTOCIC ACTIVITIES ISOLATED FROM BOVINE PINEAL GLAND.** S.M.Mileu, S.Pavel and C.Neacsu: Endocrinology, 1963, 72, 563-566 (Inst. Endoc., Bucharest, Rumania) A polypeptide similar to arginine vasotocin with pressor and oxytocic activity has been isolated from the bovine pineal gland. H.C.Jones
- 679. INFLUENCE OF ARGinine VASOPRESSIN UPON THE PRODUCTION OF ADENOSINE 3|5'-MONOPHOSPHATE BY ADENYL CYCLASE FROM THE [DOG] KIDNEY.** W.A.Anderson, jun. and E.Brown: Biochim. biophys. Acta, 1963, 67, 674-676 (Dept. Biochem., Howard Univ. Coll. Med., Washington, D.C., U.S.A.) B.M.Stevens
- 680. INTRATHYROIDAL IODINE METABOLISM IN THE RAT. THE IODOTYROSINES.** L.G.Plaskett, C.F. Barnaby and G.I.Lloyd: Biochem. J., 1963, 87, 473-480 (Dept. Biochem., Univ. Edinburgh, Scotland) Estimations were made of the ¹¹¹I incorporated into monoiodotyrosine, di-iodotyrosine and iodothyronines in the rat thyroid gland at intervals from 1 min. to 24 hr. after injn. of [¹²⁵I]iodide. The radioactivity in the iodothyronines increased from less than 1% of the total radioactivity of the gland at 1 min. to about 20% at 24 hr. The ratio of labelled monoiodotyrosine to labelled di-iodotyrosine remained almost const. during this period. Administering NaI or thiouracil altered the value of this ratio but did not cause it to change with time. A possible revision of the current views on thyroid-hormone bio-synthesis is discussed. *

- 681. IN VITRO BIOSYNTHESIS OF THYROID HORMONE* FROM L-[3H]TYROSINE [BY THYROID SLICES].** J.Nunez, J.Mauchamp and J.Roche: Biochim. biophys. Acta, 1963, 71, 241-243 (Lab. Biochim. gén. et comparée, Coll. France, Paris, France) Prelim. comm. (French) . B.M.Stevens
- 682. PREPARATION OF TRITIATED PHENOLS. II. SYNTHESIS OF THYROID HORMONES LABELLED WITH 3H (DL-TYRQXINE AND IODO-3,5,3' DL-THYRO' NINE).** J.Nunez, CJacquemin and J.Roche: Int. J. appl. Radiat., 1962, 13, 611-616 (College de France, Paris, France) By means of a general tritiating method using ³H, thyroxine and 3,5,3'-triiodothyronin* were labelled in the OCJ positions of the side chain. ¹³¹I labelling of tritiated 3,5-diiodothyronine gives rise to double labelled thyroxine and triiodothyronine. (French) B.Payn⁶
- 683. BINDING OF THYROXINE TO HUMAN SERUM PROTEINS.** K.Levin and S.Linde: Scand. J. clin. Invest., 1963, 15, Supp. 69. 139-151 (Central Lab... Central Hosp., VSsteras, Sweden) The ratio between thyroxine bound to serum proteins and free thyroxine was consistent with the assumption that the binding is a simple reversible process, the apparent dissociation const. being about 200 IJM and the average total binding capacity for thyroxine 1-5 g./ml. serum = 1950 IJM. The main part of this was bound to the albumin. The dissociation const. for the binding between thyroxine and thyroxine-binding globulin or thyroxine-binding prealbumin were much smaller than for the binding to albumin. K.Jones
- 684. CONDITIONS FOR THE FORMATION OF AN IODINATED AND TRITIATED PROTEIN COMBINATION DURING THE DEIODINATION OF DOUBLY LABELLED (1311 AND 3H) THYROID HORMONES.** J.Roche, J.Nunez and CJacquemin: Biochim. biophys. Acta, 1963, 69, 271-283 (Lab. Biochim. gén. compare, Coll. France, Paris, France) DL-Thyroxine and 3,5,3'-triiodo-DL-thyronine, labelled OCJ with ¹³¹I, ³H or ³I with ¹³¹I. were deiodinated by mitochondrial salt extracts of slices or mitochondria and purified prep# of thyroxine deiodinase. ¹³¹I and a protein comply* [PX] containing ¹³¹I and ³H were the only labelled cW pounds produced. The ratio of the sp. activities of ¹³¹I and ³H isotopes in chromatographic areas containing residue DL-thyroxine or 3,5,3'-triiodo-DL-thyronine was identical with the blank after incubation with thyroXII⁵ deiodinase but not the other prep. The ¹³¹I concn. PX decreased during incubation in 2 stages. (French) B.M.Stevens
- 685. EFFECT OF THYROID HORMONE ON THE BACTERIOLYTIC ACTION OF [CRYSTALLINE EGG WHITE OR HOMOGENEOUS RAT KIDNEY] MURAMIDASE (LYSOZYME) IN VITRO.** G.Litwack: Biochim. biophys. Acta, 1963, 67, 501-504 (Biochem. Lab., Div. Cardiol., Philadelphia Gen. Hosp., Philadelphia, Pa., U.S.A.) B.M.Stevens
- 686. EFFECT OF D- AND L-TRIIODOTHYRONINE ON BILE ACID EXCRETION OF RATS.** T.H.Lin, R.Rubinstein and W.L.Holmes: J. lipid Res., 1963, 4, 63-67 (Biochem. Section, Res. and Development Div., A.I. Kline and French Labs., Philadelphia, Pa., U.S.A.) Treatment of rats with either D- or L-triiodothyro** caused a relative decrease of cholate and a relative increase of chenodeoxycholate as shown by gas-liquid chromatography studies. Relative increased lev.f. ? of bile acid component, suspected to be a metabolic

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chenodeoxycholic acid were also shown. Prelim, data indicated to indicate that intestinal absorption of cholesterol was poorer in D-triiodothyronine-treated rats than in control animals.

J.R.Sargent

687. EFFECTS OF THYROPROPIONIC ACID AND 3,3',5-TRIIODOTHYROPROPIONIC ACID ON OXYGEN CONSUMPTION, GOITRE PREVENTION AND CHOLESTEROL BIOSYNTHESIS IN RAT. C.H.Eades, jun. and N.R.Stasilli: *Endocrinology*, 1963, 72, 509-513 (Biochem. Dept., Warner Lambert Res. Inst., Morris Plains, N.J., U.S.A.) Rats fed on a diet containing small amounts of 3,3',5-triiodothyropropionic acid showed a lowering of serum cholesterol and an inhibn. in incorporation of [14c]acetate into liver cholesterol. Tyropropionic acid in large amounts only, inhib. the incorporation of acetate. No increase in O₂ consumption was seen in either case.

H.C. Jones

688. EFFECT OF THYROPROPIONIC ACID AND ITS IODINATED ANALOGUES ON INCORPORATION OF U-[14c]ACETATE INTO CHOLESTEROL BY RAT LIVER HOMOGENATES. C.H.Eades, jun. and G.E.Phillips: *Endocrinology*, 1963, 72, 514-517 (Biochem. Dept., Warner-Lambert Res. Inst., Morris Plains, N.J., U.S.A.) Tyropropionic acid and some of its iodinated analogues were found to inhibit the incorporation of acetate into non-saponifiable lipid fraction of rat liver homogenates. A tetra-iodinated compound stim. acetate incorporation.

H.C.Jones

689. EFFECT OF THYROID HORMONES ON OXYGEN CONSUMPTION OF ISOLATED HORSE LEUCOCYTES. W.Hamolsky, R.Michel, H.Camicero and J.Roche: *Biophys. Acta*, 1963, 69, 420-422 (Lab. de chim. et Comparée, Coll. France, Paris, France) Addition of L-triiodothyroacetic acid produced a ProraPt increase in O₂ consumption, L-thyroxine and triiodothyronine produced lesser and delayed increases. Prelim, comm.

B.M.Stevens

690. UBIQUINONE (COENZYME Q) AND THE REGULATION OF BASAL METABOLIC RATE BY THYROID HORMONES. S.Pedersen, J.R.Tata and L.Ernster: *Biophys. Acta*, 1963, 69, 407-409 (Wenner-Gren Inst. of Univ. Stockholm, Sweden) No change in one concn. in livers of thyrotoxic rats in acute increasing time when was increasing indicating that changes in ubiquinone concn. are adaptations rather than causes of, increased metabolic rate.

B.M.Stevens

691. INFLUENCE OF THYROXINE ON OXIDATIVE SPHORYLATION AND RELATED REACTIONS. R. Biochim. biophys. Acta. 1963, 69, 375-381 (Dept. Zool., Columbia Univ., New York.) The rate of ATP-[32P]inorg. phosphate transfer in submitochondrial particles was reduced by thyroxine. This inhibn. was doubled by adding the inhibitor after the particles. The increased inhibn. was associated with decreased P/O and loss of stimn. of substrate oxidation. Previously reported improvement in presence of thyroxine was largely due to particle ATPase. Stimn. of substrate oxidation was more pronounced at lower particle concentration. At 12° the stimn. was masked by the slow rate of phosphate transferring reactions unless DNP was present. Thyroxine increased the absorbancy of the suspensions.

B.M.Stevens

692. MAMMARY GLAND ENZYME SYSTEMS CONCERNED WITH SYNTHESIS OF MONOIODOTYROSINE. E.P.Reineke: *Proc. Soc. exp. Biol., N.Y.*, 1963, 112, 122-125 (Dept. Physiol. Pharmacol., State Univ.

Michigan, East Lansing, Mich., U.S.A.) A study has been made of the incorporation of 131I into homogenates of mammary glands of CFN strain rats. About 50% of the 131I incorporated was in the form of monoiodotyrosine after 6 hr. incubation. The effect of the inhibitors, heat, thiouracil and KSCN was to block monoiodotyrosine incorporation. Monoiodotyrosine production was catalysed by Cu especially with Mn present. The microsomal fraction from lactating mammary glands could form monoiodotyrosine without the addition of tyrosine as a substrate or metal catalysts but is bound here. Thus the mammary gland homogenates contain all the requirements for the formation of monoiodotyrosine and therefore it is a system which compares in many ways with the thyroid and salivary gland systems for concentrating and producing I-containing substances. It has not been proved that it is in fact the same system.

D.N.Wheatley

693. BRADYKININ ANTAGONISM FOLLOWING ORAL PROTEASE THERAPY. LInnerfield, R.E.Bundy and R.Hochberg: *Proc. Soc. exp. Biol., N.Y.*, 1963, 112, 295-297 (Dept. Biochem., Fairleigh Dickinson Univ., Teaneck, N.J., U.S.A.) It has been shown by hypotensive studies in dogs, smooth muscle contractions in rats and s.c. blueing responses in rabbits treated with bradykinin that orally introduced proteases had an antagonistic effect to bradykinin. They may not however be antagonistic to bradykinin but only to the inflammatory effects the latter produces.

D.N.Wheatley

694. EFFECT OF PHENYLALANINE AND ITS METABOLITES ON THE BRAIN 5HT LEVEL OF THE RAT. W.J.Culley, R.N.Saunders, E.T.Mertz and D.H.Jolly: *Proc. Soc. exp. Biol., N.Y.*, 1962, 111, 444-446 (Mental Retardation Res. Lab., Muscatatuck State Sch., Butlerville, Ind., U.S.A.) Rat brain 5HT was significantly reduced after supplementation of diet with phenylalanine and less so with phenylpyruvic acid. Phenylacetic acid and α -hydroxyphenylacetic had no effect.

M.M. Shapland

695. ISOLATION OF 1-METHYLMIDAZOLE-4-ACETIC ACID, A METABOLIC PRODUCT OF HISTAMINE FROM HUMAN URINE. E.A.Ham and R.W.Schayer: *Biochim. biophys. Acta*, 1963, 71, 208-209 (Merck Sharp and Dohme Res. Lab., Rahway, N.J., U.S.A.)

B.M.Stevens

696. PURIFICATION AND ELECTROPHORETIC PROPERTIES OF RELAXIN PREPARATIONS. E.H.Frieden: *Trans. N.Y. Acad. Sci.*, 1963, 25, 331 (Boston Dispensary and Dept. Biol. Chem., Tufts Univ. Sch. Med., U.S.A.) Relaxin of high sp. biol. activity was obtained by solvent partition in butanol-TCA-water systems but the material was found to be heterogeneous by starch gel electrophoresis. Relaxin prep. were fractionated on several ion exchangers and Sephadex G-50 and the distribution of biol. activity determined after electrophoresis on starch gel. The results indicate that relaxin activity is shared by a no. of substances with different mobilities at pH 8[±]2.

K.Brew

697. RELAXIN: STUDIES DEALING WITH ISOLATION, PURIFICATION AND CHARACTERISATION. H.Cohen: *Trans. N.Y. Acad. Sci.*, 1963, 25, 313 (Princeton Lab. Inc., Princeton, N.J., U.S.A.) A progress report

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of attempts to isolate and characterise pure relaxin is described. Material of high biol. activity but manifesting some electrophoretic heterogeneity was isolated and physicochem. studies indicate a mol. wt. of 8000-10000. The amino acid composition of the material was determined and indicates a high content of basic amino acids which is in accordance with the high isoelectric point of the substance. Prelim, results of an attempt to develop an immunol. assay for the hormone using the haemagglutination inhibn. procedure are presented. K.Brew

698. FORMATION OF STEROID SULPHATES BY EXTRACTS OF HUMAN ADRENALS. J.B.Adams: *Biochim. biophys. Acta.* 1963, 71, 243-245 (New South Wales State Cancer Council, Special Unit, Prince of Wales Hosp., Sydney, Australia) Cell free extracts formed steroid sulphates from adenosine 3'-phosphate 5'-phosphosulphate and oestrogens or androgens, but not corticosteroids. Prelim, comm. B.M.Stevens

699. INTERACTIONS OF STEROIDS WITH HUMAN PLASMA PROTEINS. W.R.Slaunwhite, jun., H.Rosenthal and A.A.Sandberg: *Arch. Biochem.*, 1963, 100, 486-492 (Roswell Park Mem. Inst., Buffalo, N.Y.. U.S.A.) The binding of oestrone, oestradiol, testosterone, progesterone, corticosterone and cortisol to plasma proteins was determined by equilibrium dialyses and, occasionally, by ultrafiltration at 5°. The solubilities and bindings of 18 steroids with serum albumin were also examined. Albumin was responsible for most binding of unconjugated steroids except for cortisol and corticosterone since it was the most abundant protein in plasma, binding was decreased at 25° but irregularly depending on the individual steroid. Corticosterone had 1 site on serum albumin with an association const. 30 times that of the other 20 sites. Evidence of competition was found only between corticosterone and cortisol and amongst a group of androgens. B.M.Stevens

700. EFFECT OF CORTISOL AND SALICYLATE UPON CONNECTIVE TISSUE. J.C.Houck: *Amer. J. Path.*, 1962, 41, 365-371 (Biochem. Lab., Children's Hosp., Washington, D.C., U.S.A.) The dermal chem. changes following the administration of cortisol (0⁰65 mg./day) or salicylates (25 mg. acetylsalicylate daily) were studied. Salicylate increased the concn. of galactosamine in the 0⁰5M saline sol. fraction of rat skin but was without affect upon the concn. of collagen or ground substance. Cortisol brought about a decrease in the concn. of ground substance and insol. collagen and an increase in the dermal concn. of a non-collagenous hexosamine poor scleroprotein. D.G.Scott

701. EFFECT OF DEOXYCORTICOSTERONE ON SOLUBLE BEEF HEART MITOCHONDRIAL ATPase. M.Blecher: *Proc. Soc. exp. Biol.*, N.Y., 1962, 111, 529-531 (Dept. Biochem., Sch. Med. and Den., Georgetown Univ., Washington, D.C., U.S.A.) Mitochondrial ATPase activity was decreased by over 35% in the presence of DOC as measured spectrophotometrically and by release of inorg. PO₄ from ATP. M.M.Shapland

702. MICROBIOLOGICAL OXIDATION OF REICHSTEIN'S COMPOUND S BY CUNNINGHAMELIA BLAKESLEEANA LENDNER. C.Spalla, A.Amici and M.Bianchi: *G.Microbiol.*, 1961, 9, 255-265 (Farmitalia Milano, Italy) *C. blakesleeana* transformed Reichstein's compound S into cortisol, cortisone, 14C-OH and 60-OH-compound S. Zn is required for the synthesis of

the enzymes that oxidise at the 6jS- and 14CC-positions and the state of growth and aeration of the medium affected the activity of these enzymes. It is suggested that there are 2 groups of enzymes, one for the 11p-oxidation and one for the 14a- and 6p-positions and these differ in structure and mechanism of action.

G.N.GodsoD

703. MECHANISM OF REGULATION BY CORTISONE OF METABOLISM OF LIVER PURINE AND RNA. P.Feigelson and M.Feigelson: *J. biol. Chem.*, 1963, 238, 1073-1077 (Dept. Biochem., Columbia Univ. Coll. Physic. Surg., New York, U.S.A.) Cortisone rapidly increases incorporation of [2-14c]glycine into acid-sol. adenine nucleotides as well as into rat liver RNA. Administration (i.p.) of various L- and D-amino acids, NH₄T, and glutamine into adrenalectomised rats also stimulates this absorption. Although cortisone increases the ATP level in liver, such alterations in ATP by themselves do not affect the rate of incorporation of precursor into protein or RNA. Probably increased deamination of amino acids, implicit in the gluconeogenic action of glucocorticoids, causes liberation of OC-amino N moieties that mediate the cortisone-inducco increases in hepatic purine biosynthetic rates. Cortisone also increases the amount of, and incorporation of [14c]orotic acid into, liver RNA. J.N.Ashley

704. PODOPHYLLIN AND COLCHICINE CHANGES IN THE VAGINAL MUCOSA OF THE VIRGINAL, &&*[†] AND OVARIECTOMISED RAT. COMPARATIVE STUDY. T.S.Kline: *Amer. J. Path.*, 1962, 41, 477-482 (Dept. Pathol., Michael Reese Hosp., Chicago, Ill., U.S.A.) D.G.Scott

705. INTERACTION OF OESTROGENS LABELLED WITH CARBON-14 WITH NICOTINAMIDE NUCLEOTIDE D* THE PRESENCE OF PEROXIDASE. P.H.Jellinck and L.Irwin: *Nature, Lond.*, 1963, 197, 1107-1108 (Cancer Res. Centre, Univ. Brit. Columbia, Vancouver, Canada) Horseradish peroxidase in the presence of NAD or NADP converts oestrone, and other phenolic oestrogens, into water-sol., ether-insol. compounds in relatively high yields. No reaction occurred under anaerobic conditions or in the presence of catalase, indicating that hydrogen peroxide is involved. The peroxidase of oestrogen-stimulated rat uteri did not form water-sol. products from oestrone. G.U.Lewis

706. PRESENCE OF OESTROGEN SULPHOKINASE IN CHICK EMBRYONIC CARTILAGE. J.B.Adams: *Nat.*, Lond., 1963, 197, 1007-1009 (New South Wales St. Cancer Council, Special Unit, Prince of Wales Hospt., Sydney, Australia) In a study of 35SO₄ metabolism in cartilage from chick embryos using chromatographic techniques, it was found that an enzyme which sulphates oestrogenic steroids was present in the condyles of femurs, tibias and sternum of 15-day old chick embryo. Cartilage from calf embryo and human chondrosarcoma was inactive. Oestrone, CL-oestradiol and oestriol were sulphated, while pregnan-30C.20a-diol, dehydroisoandrosterone, androsterone, testosterone and cortisone were not affected. G.M.Lewis

707. INHIBITION BY NADH₂ OF THE TRANSFORMATION OF PREGNENOLONE TO PROGESTERONE BY A ¹⁴C-Labeled ADRENAL PREPARATION. S.B.Koritz: *Arch. Biochem.*, 1963, 100, 349-352 (Biochem. Dept., Univ. Pittsburgh Sch. Med., Pittsburgh, Pa., U.S.A.) NADH₂ inhib. the transformation of pregnenolone to

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^corticoids in a supernatant fraction from an adrenal homone. NAD reversed the inhibn. Some other prop. of system are described. B.M.Stevens

708. COMPETITIVE INHIBITION OF CORTICOID SYNTHESIS BY OESTROGENS. K.W.McKerns: Biochim. biophys. Acta, 1963, 69, 425-427 (Dept. Obstet. Gynec., Coll. Med., Univ. Florida, Gainesville, U.S.A.) The competitive inhibn. by oestrogens J* the rate of added NADP reduction in adrenal homoneates was correlated with the competitive inhibn. of corticoid synthesis. Prelim, comm. B.M.Stevens

709. MODE OF CONJUGATION OF PREGNA-5-ENE, 3^β-DIOL AND PREGNA-5-ENE, 3^β,17^α,21-TRIOL-20-ONE IN MAN. IDENTIFICATION OF THE CORRESPONDING SULPHATE ESTERS. J.R.Pasqualini, P.Dutter and M.F.Jayle: Biochim. biophys. Acta, 1963, 69, 331-336 (Lab. Chim. biol. Fac. Méd., Paris, France) 270 mS. of 21-hydroxypregnénolone 300 mg. of 17^α,21-dihydroxypregnénolone were administered to a normal man and the forms found in blood and urine were examined. In both, 21-hydroxy-8nenolone was found only in the 3^βS, 21-disulphate form. 21-dihydroxypregnénolone was found in the 3^β-monosulphate form. Excretion of the former was more rapid than that of the latter. (French) B.M.Stevens

710. OESTROGENIC AND ANTI-OESTROGENIC EFFECTS OF SOME OESTROGEN DERIVATIVES IN VIVO AND IN VITRO. E.Hecker and G.Farhofer: Biochim. biophys. Acta, 1963, 71, 196-198 (Max-Planck Inst. Biochem., Munich, Germany) 3-Substituted and other oestrogenes were tested on the oestrogen dependent transhydrogenase of human placenta in vitro and by the Allen-Doisy test ^a vivo. (German) B.M.Stevens

711. ROLE OF 2-HYDROXYOESTRONE IN OESTROGEN METABOLISM. J.Fishman: J. clin. Endocrin., 1963, 207-210 (Sloan-Kettering Inst. for Cancer Res., New York, U.S.A.) The importance of 2-hydroxyoestrone as a product of the metabolism of oestradiol in man is discussed, and its substantial losses in the various stages of isolation from urine are estimated. K.Jones

712. KACEMIC PROGESTERONE. W.S.Johnson, J.F.W. Kna and W.S.Johnson: Tetrahedron Letters, 1963, 4, 193-196 (Dept. Chem., Stanford Univ., Calif., U.S.A.) A stereoselective total synthesis yields DL-progesterone indistinguishable for the natural hormone. I.A.B.S.

713. METABOLISM OF [4-¹⁴C]TESTOSTERONE IN NORMAL HUMAN ADRENAL HOMOGENATE. E.Chang, A.Mittelman and T.L.Dao: J. biol. Chem., 1963, 238, 915-917 (Roswell Park Mem. Inst., Buffalo, N.Y., U.S.A.) Androst-4-ene-3,17-dione, adrenosterone, 4-hydroxyandrost-4-ene-3,17-dione, and 11β-hydroxy-17^α-ene are isolated after incubation of [4-¹⁴C]testosterone with homogenised normal human adrenal gland. A named metabolite is the main conversion product. A highly polar metabolite is also isolated, compounds with reduced ring A are detected. J.N.Ashley

714. ALTERATION OF STEROID DEHYDROGENASE SYNTHESIS IN A MUTANT OF PSEUDOMONAS TESTOSTERONI. I.D.Teller and A.M.Bongiovanni: Nature, Lond., 1963, 197, 1112-1113 (Worthington Biochem. Corp., Freehold, N.J., U.S.A.) A culture of ^cPseudomonas stored for about 18 months in the presence

of testosterone, gave rise to a mutant which had lost the dehydrogenase active with testosterone, although androsterone activity remained intact. The mutant was also active against dehydroepiandrosterone. G.M.Lewis

715. AROMATISATION IN VIVO OF 30,170-BIS-ACETOXY-17^α-ETHYNYL-19-NOR-ANDROST-4-ENE (SC-11 800). P.K.Besch, D.J.Watson, N.Vorys and R.D.Barry: Biochim. biophys. Acta, 1963, 69, 417-418 (Dept. Obstet. Gynec., Ohio State Univ. Coll. Med., Columbus, Ohio, U.S.A.) The 3^β,17^α-bis-acetoxy group was removed and ring A aromatised to form 17^α-ethynyl oestradiol. Prelim, comm. B.M.Stevens

716. ISOLATION OF [¹⁴C]DEHYDROEPIANDROSTERONE [DHEA] FROM DOGS INFUSED WITH [4-¹⁴C]CHOLESTEROL BY THE SPERMATIC ARTERY. K.B.Eik-Nes and P.F.Hall: Proc. Soc. exp. Biol., N.Y., 1962, 111, 280-282 (Dept. Biol. Chem., Univ. Utah Coll. Med., Salt Lake City, U.S.A.) Isolation of [¹⁴C]DHEA from the spermatic vein blood after spermatic artery infusion of [¹⁴C]cholesterol lends additional support to the view that it is an intermediate in the synthesis of testicular androgens. M.M.Shapland

717. MEASUREMENT OF RATES OF SECRETION AND OF PERIPHERAL METABOLISM OF TWO INTERCONVERTIBLE COMPOUNDS; DEHYDROISOANDROSTERONE-DEHYDROISOANDROSTERONE SULPHATE. E.Gurpide, P.C. MacDonald, R.L.V.Wiele and S.Lieberman: J. din. Endocr., 1963, 23, 346-354 (Dept. Biochem., Coll. Physns. Surgn., Columbia Univ., New York, U.S.A.) K.Jones

718. STEROID METABOLISM. XV. RAPID DETERMINATION OF URINARY PREGNANEDIOL BY GAS CHROMATOGRAPHY [OF CRUDE URINE EXTRACTS]. H.H.Wotiz: Biochim. biophys. Acta, 1963, 69, 415-416 (Boston Univ. Sch. Med., Dept. Biochem., Boston, Mass., U.S.A.) Prelim, comm. B.M.Stevens

719. COLUMN CHROMATOGRAPHY OF 17-KETO-STEROIDS AFTER BISMUTHATE OXIDATION. G.Copinschi, A.Cornil and J.R.M.Franckson: Clin. chim. Acta, 1962, 7, 817-822 (Lab. Méd. Exp., Univ. Libre Bruxelles, Belgium) The 17-KS obtained by bismuthate oxidation of cortisone, cortisol, and tetrahydrocortisone were studied by column chromatography, using Dingemanse's method. V.M.Wootton

720. GAS-LIQUID CHROMATOGRAPHY IN QUANTITATIVE ANALYSIS OF URINARY 11-DEOXY-17-KETO-STEROIDS. M.A.Kirschner and M.B.Lipsett: J. clin. Endocrin., 1963, 23, 255-260 (Endocr. Branch, Natl. Cancer Inst., N.L.H., Bethesda, Md., U.S.A.) The ketosteroids were chromatographed on thin-layer silica gel, following hydrolysis of the urinary conjugates. After elution, the trimethylsilyl ethers were formed, separated and quantitated by gas-liquid chromatography. The method described is accurate, reproducible, rapid and simple. K.Jones

METABOLIC INHIBITORS AND CARCINOGENS

721. STRUCTURAL TRANSITIONS OF SOYABEAN TRYPSIN INHIBITOR. I. NATIVE PROTEIN IN WATER.

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R.F.Steiner and H.Edelhoch. II. DENATURED STATE IN UREA. H.Edelhoch and R.F.Steiner: J. biol.Chem.. 1963. 238. 925-930, 931-938 (Naval Med. Res. Inst.. Nat. Naval Med. Center, Bethesda, Md., U.S.A.)

I. Fluorescence polarisation. u.v. fluorescence, difference spectra, and optical rotation of soya bean trypsin inhibitor are studied. At acid pH there are small changes in difference spectra and optical rotation, and somewhat larger changes in fluorescence polarisation and intensity of fluorescence which suggest a minor structural change. Above pH 12 there is a time-dependent structural alteration.

II. There is only a relatively small change in the mol. shape of the inhibitor of 9M urea as shown by Q and polarisation of fluorescence measurements. Increasing concn. of urea up to 9M cause only a red shift in the difference spectrum and a uniform increase in fluorescence intensity. At high temp. or alk. pH there is a change to a largely unorganised structure. Denaturation follows first order kinetics for all methods of determination under a given set of conditions. The rate is probably determined by a single process between an initial and a final state.

J.N.Ashley

722. EFFECT OF DNP ON CARBON DIOXIDE FIXATION BY A THIOBACILLUS. D.P.Kelly and PJ.Syrett:

Nature. Lond.. 1963. 197, 1087-1089 (Dept. Bot.. Univ. Coll. London, England) T. thiorarus in the presence of Hg^{2+} fixed CO_2 when thiosulphate was added; sulphide was also rapidly oxidised but less CO_2 was fixed per mol. substrate oxidised, and the reaction was more sensitive to DNP. It is suggested that both oxidative and substrate phosphorylations are coupled to the oxidation of thiosulphate by Thiobacillus.

G.M.Lewis

723. THERMOSTABLE HAEMOLYTIC FACTOR IN SOYA-BEANS. Y.Birk. A.Bondi. B.Gestetner and I.Ishaaya:

Nature. Lond.. 1963, 197. 1089-1090 (Fac. Agric.. Hebrew Univ.. Rehovot, Israel) Soyabean saponin extract was prep. from ether-extracted soyabean flour, and separated by paper chromatography into 4 components. 3 of which were haemolytic and inhib. the proteolytic activity of Tribolium castaneum larval midgut enzyme and OC-chymotrypsin. The haemolytic activity was not affected by autoclaving the soyabean meal.

G.M.Lewis

724. INTERACTION OF CHLORAMBUCIL WITH CELL SURFACES. J.H.Linford. A.Froese and L.G.Israels:

Nature. Lond.. 1963, 197, 1068-1070 (Dept. Biochem.. Univ. Manitoba, Winnipeg, Canada) In the presence of r.b.c. or ascites cells, chlorambucil (sol. in benzene or ethyl acetate) is partially converted to its hydroxyl form (sol. in ethylacetate alone) or to a water-sol. form. All the added chlorambucil can be recovered from the extracellular phase as a mixture of these 3 components. A similar phenomenon occurs on addition of chlorambucil to r.b.c. ghosts. It is concluded that the chloro groups of chlorambucil are replaced by hydroxyl or other groups by reaction with the cell surface.

J.R.Sargent

725. METABOLIC DEFICIENCIES IN PROTOZOA INDUCED BY THALIDOMIDE. O.Frank. H.Baker, H.Ziffer, S.Aaronson, S.H.Hutner and C.M.Levey:

Science, 1963, 139, 110-111 (Seton Hall Coll. Med.. Jersey City, N.J., U.S.A.) Thalidomide at 2-6 mg./ml. inhib. growth of Euglena gracilis, Ochromonas malhamensis, O. danica and Tetrahymena pyriformis. The toxicity was not altered by purines, pyrimidines, amino acids or metals, but was counteracted by nicotinic acid, nicotinamide, NAD and vit. K1. The mechanism of

toxicity may be an interference with cellular oxidation. It is suggested that a protozoan test system may be useful in screening drugs.

G.M.Lewis*

726. SPINACH ENZYME FUNCTIONING TO REVERSE THE INHIBITION OF CYCLIC ELECTRON FLOW BY $\text{f}-\text{CHLOROPHENYL-L-1-DIMETHYLUREA}$ [CMU] AT HIGH CONCENTRATIONS. T.Asahi and A.T.Jageirdorf: Arch. Biochem.. 1963, 100, 531-541 (McCollum-Pratt Inst., Johns Hopkins Univ.. Baltimore, Md.. U.S.A.) Higher concn. of CMU were needed to inhibit cyclic electron flow in photosynthetic phosphorylation than were needed to inhibit O_2 evolution. The inhibition of cyclic electron flow usually occurred only with low concn. of broken aged chloroplasts and was reversed by adding back fairly large amounts of supernatant soln. after breaking the chloroplasts. The factor responsible for reversal was partially purified and appeared to be associated with diaphorase activity capable of oxidising NADH_2 and NADPH_2 . The higher CMU concn. is suggested to inhibit at a site on the reducing side of cytochrome c. the enzyme added back providing an alternative CMU resistant pathway for electron flow.

B.M.Stevens*

727. SEPARATION OF A TRIBOLIUM-PROTEASE INHIBITOR FROM SOYBEANS ON A CALCIUM PHOSPHATE COLUMN. Y.Birk. A.Gertler and S.Khalef: Biochim. biophys. Acta. 1963, 67, 326-328 (Fac. Agric., Hebrew Univ., Rehovoth, Israel) The Tribolium inhibitor was obtained free from trypsin inhibitor and amylase.

B.M.Stevens*

728. MODE OF ACTION OF 3-(4-CHLOROPHENYL) k , 1-DIMETHYLUREA [CMU] ON PHOTOSYNTHESIS [$\text{f}-\text{CHLORELLA PYRENOIDOSA}$]. G.Gingras, C.Lemasson and D.C.Fork: Biochim. biophys. Acta, 1963, 69, 438-440 (Lab. de Photosynthese du C.N.R.S., Gif-sur-Yvette, Seine et Oise, France) $5 \times 10^{-8}\text{M}$ - 10^{-10}M CMU inhib. the 'short A' light reaction acting on or close to the photochem. step; at higher concn. a rate limiting dark step was also affected. Prelim. comm.

B.M.Stevens*

729. INHIBITION OF SQUALENE AND CHOLESTEROL BIOSYNTHESIS BY HEPATOCATALASE (CAPERASH).

J.Caravaca, M.D.May and E.G.Dimond: Biochem. biophys. Res. Comm.. 1963. 10. 189 (Inst. Cardio-pulmonary Dis.. Scripps Clinic and Res. Fndn.. La Jolla, Calif.. U.S.A.) A dialysable substance in a hepatocatalase prep. was found to inhibit cholesterol formation. Inhib. occurred between mevalonic acid and squalene on the biosynthetic pathway.

K.Bitter*

730. EFFECT OF RAISED O_2 PRESSURE AND OF L-METHIONINE SULPHOXIMINE [MS] ON GLUTAMINE SYNTHETASE ACTIVITY [GSA] OF RAT BRAIN.

Z.S.Gershovich, A.A.Krichevskaya and J.Kolousek: J. Neurochem., 1963, 10, 79-82 (Biochem. Dept. State Univ.. Rostov-on-Don, U.S.S.R.) GSA fr. 7°C acetone powders was measured at pH 7 $^{\circ}\text{4}$ at 37°. Snosy were 40 μM hydroxylamine HCl, 100 μM glutamic acid, 40 μM MgCl_2 , 20 μM cysteine and 10 μM dibarium A. Incubation was performed either in a pressure chamber at 6 atm. pressure of O_2 or MS added to the reaction mixture. With O_2 pressure alone GSA was inhib. 35%-55%; with 0.3 and 1.7 mg. MS/ml. reaction mixture 16% and 4% respectively; and with MS under O_2 pressure 97% inhibition occurred, the effects being additive.

R.Wood*

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^{731.} EFFECT OF ETHIONINE ON METABOLITE STATUS OF RAT LIVER. H.Bartels and H.J.Hohorst: Biochim. biophys. Acta, 1963, 71, 214-216 (Physiol.-chem. Inst., Marburg/Lahn, Germany) The effect of Ethionine on energy metabolism was probably immediately due to ATP loss. Prelim, comm.

• (German) B.M.Stevens

^{732.} HYPERCHROMIC EFFECT OF ORGANIC DENATURING REAGENTS ON DNA. K.Kurihara, Y.Hachimori and K.Shibata: Biochim. biophys. Acta, 1963, 68, 434-445 (Tokugawa Inst. Biol. Res., Tokyo, Japan)

^{733.} N-Dimethylformamide and N-methylpyrrolidone proceed hyperchromic shifts in u.v. absorption of calf thymus and herring sperm DNA at room temp, and neutral or alk. pH. Formic, acetic and propionic acids caused a shift at acidic pH; isopropylamine and ethylamine caused a shift at alk. pH. Δ increments of absorbance at 260 m/i were 49-54% whereas heat produced 48-52% and inorg. acid or alkali 27-31%. Denaturation appeared to be partially reversible. Absorbancy-concn. curves of native DNA showed an abrupt absorbancy change over a narrow reagent concn. range. A slowly cooled heat denatured DNA showed a linear and gradual increase at low reagent concn. and an abrupt change at higher concn. A quickly cooled sample showed only the latter. B.M.Stevens

^{734.} SELECTIVE REACTION OF O-METHYLHYDROXYL AMINE WITH THE CYTIDINE NUCLEUS.

N.K.Kochetkov, E.I.Budowsky and R.P.Shibaeva: Biochim. biophys. Acta, 1963, 68, 493-496 (Inst. Chem. Natural Products, Acad. Sci., Moscow, U.S.S.R.) Prelim, comm. B.M.Stevens

^{735.} ACTION OF HOMOLOGUES AND ANALOGUES OF TRYPTOPHAN [TRY] COMPOUNDS ON TRYPTOPHAN BIOSYNTHESIS. F.Lingens: Hoppe-Seylers Z. physiol. Chem., 1963, 331, 56-63 (Chem. Inst.

^{736.} Biochem. Div. Univ., 74 Tübingen, Germany) Inhib. of indole formation, due to alkyl substitution in 1, 4 or 5 position of Try, or homo-Try, nor-Try analogues of Try, and a no. of substituted amino acids is discussed. (German) LCornish

^{737.} MICROANALYTICAL DETERMINATION OF ACETYL PYRIDINE-ADENINE-DINUCLEOTIDE[APAD] (WD ACETYL PYRIDINE-ADENINE-DINUCLEOTIDE-PHOSPHATE [APADP] IN BRAIN. H.Herken and J.Neuhoff: Hoppe-Seylers Z. physiol. Chem., 1963, 354, 85-94 (Pharm. Inst. Free Univ., Berlin-Dahlem, West Germany) A fluorimetric method was developed to investigate the neurol. symptoms following acetylpyridine poisoning. This permits the differentiation of NAD and NADP from APAD and APADP in 1 mg. of organ.

(German) I.Cornish

^{738.} ACTIVITY OF VARIOUS TRANSAMINASES ON OXYLAMINE. d-CYCLOSERINE AND dl-CYCLOCERINE. P.Oehme: Naturwissenschaften, 1963, 50, 21 (Inst. Pharmacol. Toxicol., Humboldt Univ., Berlin, Germany). (German) AJ.Wansbrough

^{739.} THE STRUCTURE OF 6-RHODOMYCINONE.

Brockmann and H.Brockmann, jun.: Naturwissenschaften, 1963, 50, 19 (Org. Chem. Inst., Univ. Göttingen, Germany). (German) AJ.Wansbrough

^{740.} INHIBITION OF HEXOKINASE BY DISULPHIDES.

Esbakken and L.Eldjarn: Biochem. J., 1963, 87, 525-529 (Inst. Clin. Biochem., Rikshospitalet, Univ.

Oslo, Norway) Disulphides inhibit glucose utilisation in various rat tissues in vitro, whereas the production of lactic acid from endogenous substrates is not inhib. Crude calf-brain hexokinase is inhib. by disulphides to a similar extent as is the utilisation of glucose in brain-tissue slices. Glucose and to a limited extent the ATP-Mg complex protect the isolated brain enzyme against the inhibn. The inhibn. is ascribed to mixed disulphide formation on essential -SH groups of hexokinase. •

^{741.} AMINOMALONATE AS AN ENZYME INHIBITOR.

M.Matthew and A.Neuberger: Biochem. J., 1963, 87, 601-612 (Dept. Chem. Path., St. Mary's Hosp. Med. Sch., London, England) Aminomalonate was a

powerful competitive inhibitor of 6-aminolacuvulate synthetase. This inhibn. was studied and compared with that exerted by some deriv. of aminomalonate and by other compounds. The effect of aminomalonate on serine hydroxymethyltransferase and enzymes requiring glycine as substrate or pyridoxal PO₄ as coenzyme was investigated. Pyridoxal PO₄ catalyses the condensation of aminomalonate with aldehydes under mild conditions to form ultimately (X-amino-p-hydroxy acids). •

^{742.} INHIBITION OF PROTEOLYTIC ACTIVITY BY ETHYL CARBAMATE [URETHANE]. A.M.Kaye and G.Temes: Biochim. biophys. Acta, 1963, 67, 435-440

(Dept. Expt. Biol., Weizmann Inst. Sci., Rehovoth, Israel) 20-150mM urethane inhib. the clotting of dil. sheep plasma. 8-60mM urethane inhib. the action of cryst. (X-chymotrypsin on N-acetyl-L-tyrosine ethyl ester. n-Propyl carbamate inhib. chymotrypsin activity to the same degree as urethane. B.M.Stevens

^{743.} INHIBITION BY PYRIMIDINES OF ASPARTATE TRANSCARBAMYLASE PARTIALLY PURIFIED FROM RAT LIVER. E.Bresnick: Biochim. biophys. Acta, 1963, 67, 425-434 (Dept. Biochem., Baylor Univ. Coll. Med., Houston, Tex., U.S.A.) The enzyme

was purified 56-fold by 30% satn. with (NH₄)₂SO₄, absorption and elution from Ca phosphate gel and fractionation on DEAEcellulose columns. The pH optimum was 9.2. Km was 5.3 x 10⁻³ M for aspartate and 2.5 x 10⁻⁴ M for carbamyl phosphate. Mercaptoethanol was necessary for stabilisation. Equiv. concn. of carbamyl-aspartate and inorg. phosphate were released. Ag, Hg, Cu and Cd inhib.; EDTA reversed. A crude supernatant prep. of rat liver was inhib. by β -hydroxymercuribenzoate. Uridine, cytidine and their nucleosides and nucleotides inhib. Deoxyribose deriv. inhib. more than ribose deriv. and thymidine was the best inhibitor of all. Thymidine and deoxycytidine inhib. were reversible and competitive when examined by the methods of Ackermann and Potter and Lineweaver and Burk. Inhibn. const. were 4.1 x 10⁻⁴ M and 7.0 x 10⁻⁴ M respectively. B.M.Stevens

^{744.} BIOLOGICAL ACTIVITY OF NICOTINYLALANINE.

ANALOGUE OF KYNURENINE. R.H.Decker, R.R.Brown and J.M.Price: J. biol. Chem., 1963, 238, 1049-1053 (Cancer Res. Div., Dept. Surg., Univ. Wisconsin Med. Sch., Madison, Wis., U.S.A.) Administration i.p. of

nicotinylalanine [γ -3-pyridyl- γ -oxo-a-aminobutyric acid] to rats causes a 4-fold increase in urinary N-methyl-nicotinamide. and incubation of nicotinylalanine with rat liver homogenate produces a linear increase in nicotinic acid with time. Nicotinylalanine is not a metabolite of tryptophan; it is an antimetabolite of kynurenine and inhibits kynureinase and kynureine hydroxylase in vitro. Inhibn. also occurs in vivo and this causes a sequential

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- block of the main route of kynurenine degradation. J.N.Ashley
- 743. HETEROGENEITY AND METACHROMASY OF SOME COMMERCIAL ANIONIC DYES.** C.Singh: Stain Technol., 1963, 38, 103-110 (Central Drug Res. Inst., Lucknow, India) The multicomponent character of some commercial anionic dyes has been demonstrated using paper chromatography. The metachromatic response of certain fractionated components of the dyes was ascertained by filter paper reactions between dye components and a no. of chromotropes. M.J.Bell
- 744. PANCREATIC HYPERSTROPHY AND CHICK GROWTH INHIBITION BY SOYBEAN FRACTIONS DEVOID OF TRYPSIN INHIBITOR.** H.C.Saxena, L.S.Jensen and J.McGinnis: Proc. Soc. exp. Biol. N.Y., 1963, 112, 101-105 (Dept. Poultry Sci., Washington St. Univ., Pullman, D.C., U.S.A.) Soybean brew flakes have been treated to extract the water sol. proteins not pptd. at pH 4⁴* but pptd. with sat. ammonium sulphate treatment after this. The protein pptd. then has no anti-trypsin activity and was a potent inhibitor of chick growth. The other fractions had high anti-trypsin activity and little growth inhibitory effect. In all cases where growth inhibn. occurred there was pancreatic hypertrophy suggesting that the action might be mediated through the pancreas. D.N.Wheatley
- 745. EFFECTS OF TWO QUATERNARY AMMONIUM COMPOUNDS ON CITRIC ACID AND STEROL SYNTHESIS IN ASPERGILLUS NIGER.** T.S.Raman and E.R.B.Shanmugam: J. gen. Microbiol., 1963, 31, 23-29 (Univ. Biochem. Lab., Madras, India) The action of cetyltrimethylammonium bromide (Cetrimide) and triclobisonium chloride (Triburon) on *A. niger* was examined. 1.28 mg. Triburon/ml. caused greater inhibn. of growth than 30 fig. Cetrimide per ml. 20 fig./ml. of Cetrimide inhib. citric acid accumulation but 160 fig. Triburon/ml. increased citric acid production and caused inhibn. at higher concn. Both compounds produced an initial increase in sterol concn. followed by a decrease at higher concn. K.Brew
- 746. HAEMAGGLUTINATION INHIBITOR IN EDIBLE BIRDS-NEST: ITS BIOLOGICAL AND PHYSICAL PROPERTIES.** F.Biddle and G.Belyavin: J. gen. Microbiol., 1963, 31, 31-34 (Bacteriol. Dept.. Univ. Coll. Hosp. Med. Sch., London, England) The degree of homogeneity and ability to neutralise infectivity of influenza virus of colocalia mucoid from edible birds-nest were investigated. Three compounds differing in mol. size and biol. activity and partially separable by preparative ultracentrifugation were contained in the crude material obtained by simple extraction. The slowest moving compound was lower in inhibitor activity than the others. K.Brew
- 747. INTERMEDIARY CARBOHYDRATE METABOLISM IN TRIATOMA INFESTANS (INSECTA; HEMIPTERA). II. THE METABOLISM OF [14C]GLUCOSE IN TRIATOMA INFESTANS NYMPHS AND THE EFFECT OF DDT.** M.Agosin, N.Scaramelli, M.L.Dinamarca and L.Aravena: Comp. Biochem. Physiol., 1963, 8, 311-320 (Dept. Parasit., Univ. Chile, Santiago, Chile) Reared nymphs of *T. infestans* were treated with DDT or DDE [2,2-bis(2-chlorophenyl)-1, 1-dichloroethylene] which were applied to the ventral abdomen by pipette. A day later 3*0 fil. of aq. [14C]glucose was inj. into the abdomen at a dose of 30 fig. glucose/g. wet wt.

Immediately after this the animals were placed in a respiratory set-up and the amount of labelled CO₂ produced determined. DDT has the effect of increasing the rate of incorporation of label from glucose into CO₂, glycogen and fatty acids (but not protein); DDE has no such effect. The pentose phosphate pathway is stim. by DDT, accounting for 22% of glucose oxidation in normal insects, and 77% in treated animals. DDE depresses this pathway. DDT also increases the total NADP present without affecting the ratio NADP/NADPH2.

M.S.LaveracK
748. STRUCTURAL REQUIREMENTS FOR PUROMYCIN INHIBITION OF PROTEIN SYNTHESIS. D.Nathans at* A.Neidle: Nature, Lond., 1963, 197, 1076-1077 (Rockefeller Inst., New York, U.S.A.) Inhibitory

effects of various analogues of puromycin were studied using a ribosomal amino acid incorporating system. Both the amino nucleoside and amino acid moieties of puromycin are required for inhibn. Amino nucleoside must be substituted at the 3'-position and amino acid must be of L-configuration. Aromatic amino acid deriv. are particularly potent. Analogues with a dipeptide chain are ineffective.

J.R.Sargei*,

749. INTERRUPTION OF POLIOVIRUS RNA SYNTHESIS BY β -FLUOROPHENYLALANINE AND PUROMYCIN. M.D.Scharff, M.M.Thorén, N.F.McElvain and L.Levintow: Biochem. biophys. Res. Comm., 1963, 10, 127 (Nat. Inst. Allergy and Infectious Dis., Bethesda, Md., U.S.A.) Puromycin and β -fluorophenylalanine inhib. RNA synthesis in a culture of *P. f. J.* virus made in strain S3 HeLa cells with actinomycin*cip.* in the medium. B.Ketterer

750. INHIBITION OF INCORPORATION OF LEUCINE INTO PROTEIN OF CELL-FREE SYSTEMS FROM RAT LIVER AND *E. COLI* BY CHLORTETRACYCLINE. T.J.Franklin: Biochem. J., 1963, 87, 449-453 (I.C.I Ltd., Pharm. Div., Alderley Park, Macclesfield, Cheshire, England) Chlortetracycline reduced incorporation of L-[14C]leucine into the microsomal ribosomal protein of cell-free systems from rat liver and *E. coli*. The rat-liver system was apparently less sensitive to chlortetracycline and to oxytetracycline and tetracycline than the *E. coli* prep. In both animal and bacterial systems chlortetracycline did not interfere with attachment of the amino acid to the transfer RNA but prevented the subsequent transfer of the amino acid to the particulate protein. The amino acid was largely retained on the transfer RNA. *

751. MODE OF ACTION OF ACTINOMYCINS. III. LINEAGE OF ACTINOMYCIN ON NUCLEIC ACIDS AND NUCLEOTIDES. W.Kersten and H.Kersten: Hoppe-Seylers Z. physiol. Chem., 1962, 300, 21-30 (Physiol. Chem. Inst. Univ., 44 Münster i. Westf., Germany) Actinomycin-complex formation was determined spectrophotometrically. The actinomycin-deoxy-guanosine complex was stable and thermolabile, but formaldehyde had a retarding effect on its formation, probably at the position being involved. Actinomycin-DNA complex stability is independent of Mg, formaldehyde and amino groups. (German) L'Ormanish

752. EFFECTS OF ACTINOMYCIN D ON MACROMOLECULE SYNTHESIS AND EARLY DEVELOPMENT IN SEA URCHIN EGGS. P.R.Gross and G.H.Cousineau: Biochem. biophys. Res. Comm., 1963, 10, 321 (Dept. Biol., Brown Univ., Providence, R.I., U.S.A.)

Actinomycin had no effect on RNA synthesis in the sea urchin egg for the first 4 hr. after fertilisation. Subsequently it inhib. [14C]uracil uptake, but inhib. neither ¹⁴C]alanine uptake nor cell division. B.Ketterer

⁷⁵ 3. POST-TREATMENT CROSS-LINKING OF DNA REACTED WITH POLYFUNCTIONAL ALKYLATING AGENTS. J.Doskocil and Z.Sormová: Biochim. biophys. Acta, 1963. 68, 313-316 (Inst. Org. Chem. and Biochem., Czechoslovak Acad. Sci., Praha, Czechoslovakia) Covalent intermol. bonds were Jwn to be formed when DNA treated with polyfunctional alkylating agents in dil. aq. soln. was subsequently con-ned to the solid state, the cross-linking occurring in ^{U₄} absence of any free alkylating agent. B.M.Stevens

H. INHIBITION OF ENTEROVIRUS RNA SYNTHESIS BY 2-((X-HYDROXYBENZYL)-BENZIMIDAZOLE [HBB]. H.J.Eggers and I.Jamm: Nature, Lond., 1963, 197, 1327-1328 (Rockefeller Inst., New York, U.S.A.) J?8./ml. actinomycin D reduced [3H]uridine uptake by [^]infected rhesus monkey kidney cells by 95%; the yield ^{bjC}xsackie virus in infected cells was not affected. J? at concn. 210/iM completely inhib. the production [^]infective RNA of virus but had no effect on the uptake ^{iM}Uridine into cellular RNA. The time course of virus-[^]Ucd RNA synthesis is similar to that of synthesis of [^]infective RNA, suggesting that RNA synthesis precedes ^{virus} Saturation by only a short time. G.M.Lewis

⁷⁵ 5. INFLUENCE OF CERTAIN ANTIMETABOLITES ON THE INCORPORATION OF OROTIC ACID INTO SEUDOURIDINE IN ANIMALS. J.Skoda and R.E.Hand-[^]humacher: Biochim. biophys. Acta, 1963. 68, 481-[#]83 (Dept. Pharmacol., Yale Univ. Sch. of Med., New Haven, Conn., U.S.A.) 6-Azauridine and, to [^]smaller extent, 5-fluorouracil and amethopterin [^][4-14C]orotic acid incorporation into urinary [^]Mouridine in normal and leukaemic mice and into ^{*u}<ouridylic acid of rat liver sol. RNA. B.M.Stevens

T NITROFURAN DERIVATIVE [3-AMINO-6-(2-(5-[£]JITRO-2-FURYL)VINYL)-1, 2,4-TRIAZINE HYDRO-^fFLORIDE]. A NEW INDUCING AGENT FOR PHAGE [^]VELOPMENT IN LYSOGENIC E. COLI [AND A ^SCIFIC INHIBITOR OF DNA SYNTHESIS IN E. COLI]. J. H.Endo, M.Ishizawa, T.Kamiya and M.Kuwano: [^]chim. biophys. Acta, 1963. 68, 502-505 (Div. [^]Inst# Cancer Res., Fac. Med., Univ. Kyushu, [^]uoka, Japan) Prelim, comm. B.M.Stevens

I. EXTRACTION op [3H]AMINOPTERIN WITH DIHYDROFOLIC REDUCTASE. R.Silber, F.M.Huennekens and B.W.Gabrio: Arch. Biochem., 1963, 100, 525-⁵³⁰ (Dept. Biochem., Univ. Washington, Seattle, Wash., U.S.A.) Inhib. of w.b.c. dihydrofolic reductase by 10-6-10-9M aminopterin, amethopterin and dichloroamethopterin was examined. [3H]Aminopterin was ^{highly} ¹⁰P^{re} enzyme-inhibitor [E-I] complexes ^{highly} ¹⁰P^{re} enzyme-inhibitor [E-I] complexes Dialysis of the w.b.c. E-I complex produced radioactivity and corresponding reappearance of enzyme activity, the liver E-I complex was not dissociated by dialysis. The w.b.c. E-I complex was readily dissociated by [^]Shraphy on DEAEcellulose using stepwise desorption. Reactivated enzyme appeared in the h.5/^{action} and inhibitor in the 0-15M fraction. Both ion?lexes were readily dissociated by (NH4)2SO4 ^{action}. Amounts of inhibitor bound in various

(NH4)2SO4 fractions indicated a turnover no. of 50-100 at pH 8.5 for the liver enzyme. B.M.Stevens

758. DETECTION OF TUMOUR-INHIBITING MANNITOL DERIVATIVES BY MEANS OF PAPER CHROMATOGRAPHY. I.Palyi: J. Chromatography, 1962. 9, 176-179 (Res. Inst. Oncopathol., Budapest, Hungary)

A system suitable for the separation of Degranol and Mannitol-Myleran by paper chromatography is described. Soln. of Degranol were more stable than those of Mannitol-Myleran. P.D.Dawkins

759. 6-AZURACIL INHIBITION OF E. COLI B AND ITS REVERSAL BY HADACIDIN. H.T.Shigeura: Arch. Biochem., 1963, 100, 472-477 (Merck Inst. for Therapeutic Res., Rahway, N.J., U.S.A.) Growth inhibn. by 6-azauracil was reversed by hadacidin (N-formyl hydroxyaminoacetate) but growth inhibn. by hadacidin was unaffected by 6-azauracil. The inhibitory activity of 6-azauracil in the presence of hadacidin was restored by addition of adenine, adenosine, deoxyadenosine or inosine. Several other purines and pyrimidines were inactive. Inhibn. due to 6-azauracil alone was enhanced by adenine. A 6-azauracil resistant strain was sensitive to hadacidin or 6-azauridine. Hadacidin did not reverse the inhibn. due to 6-azauridine. B.M.Stevens

760. INHIBITION OF CHLOROPHYLL SYNTHESIS BY 5-FLUOROURACIL AND 5-FLUORODEOXYURIDINE. D.van Noort and A.Wallace: Biochem. biophys. Res. Comm., 1963, 10, 109 (Dept. Plant Biochem., Univ. California, Los Angeles, Calif., U.S.A.) The synthesis of chlorophyll in regreening leaves of Fe-deficient bush bean was inhib. by both 5-fluorouracil and 5-fluorodeoxyuridine. This inhibn. could be reversed by simult. application of thymidine but not uridine. B.Ketterer

761. INCORPORATION OF 5-IODODEOXYURIDINE INTO DNA OF PLANT CELLS. H.H.Smith, B.H.Kugelman, S.L.Commerford and W.Szybalski: Proc. nat. Acad. Sci., Wash., 1963. 49, 451-457 (Brookhaven Nat. Lab., Upton, L.I., N.Y., U.S.A.) Incorporation of 5-iododeoxyuridine [5-IDU] into DNA of root tip chr. of Vicia faba was demonstrated by ³H radioautography of incorporated [3H]-5-IDU and incorporation of [131Q-5-IDU]. Following 24 hr. treatment with 5-IDU a new heavy DNA component was isolated by CsCl density gradient centrifugation. Degree of thymidine replacement by 5-IDU was about 22% and slightly higher (28%) if replacement was carried out in the presence of 5-fluorodeoxyuridine. J.R.Sargent

762. FATE OF 5-BROMODEOXYURIDINE [BUdR], 5-BROMODEOXYCYTIDINE [BCdR] AND 5-IODO-DEOXYCYTIDINE [ICdR] IN MAN. J.P.Kriss, Y.Maruyama, L.A.Tung, S.B.Bond and L.Revész: Cancer Res., 1963. 23, 260-268 (Dept. Med., Stanford Univ. Sch. Med., Stanford, Calif., U.S.A.; [82Br]BUdR disappeared rapidly from blood after i.v. injn. partly by degradation and liberation of Br". [82Br]BCdR disappeared equally rapidly being degraded to BUdR. bromouracil and Br". Bromocytosine was not found. 1 hr. after injn. of either approx. 60% of the 82Br was in intracellular or intraluminal sites. After i.a. or i.v. injn. [131I]ICdR was rapidly degraded to iododeoxyuridine [IUdR] iodouracil [IU] and I". Approx. 80% or more of the 131I appeared in urine within 72 hr. mostly as I" but with small amounts of ICdR, IUdR and IU. In 3 cases after injn. of [131I]ICdR into the internal carotid artery homolat. to a

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brain tumour scanning showed 1311 in the tumour region and diffusely distributed in the cerebral hemisphere. In 2 other cases given [131I]ICdR i.v. 131I was localised in an intracerebral metastasis and a hepatoma.

B.M. Stevens

763. MECHANISM OF RESISTANCE TO PYRIMIDINES IN STREPTOCOCCUS FAECALIS. I. UNUSUAL EFFECT OF 5-IODOURACIL AND 5-IODO-2'-DEOXYURIDINE. H.L.Gunther and W.H.Prusoff: J. biol. Chem., 1963, 238, 1091-1097 (Dept. Pharmacol., Yale Univ. Sch. Med., New Haven, Conn., U.S.A.) A mutant strain of S. faecalis is isolated that is resistant to the inhibn. of growth produced by 6-azathymine (7500-fold) or 6-aza-thymine 2'-deoxyribonucleoside (230-fold). The amounts of thymine and thymidine required by the mutant to attain half max. growth are increased 400-fold and 8-fold, respectively. Growth of the mutant is stim. 4-fold by addition of 5-iodouracil or 5-iodo-2'-deoxyuridine to media that contain suboptimal concn. of thymidine; no growth occurs in absence of the latter. The parent and mutant strains have similar nucleoside phosphorylase activities. The mutant utilises thymidine for synthesis of DNA thymine less efficiently.

J.N.Ashley

764. INCORPORATION OF 8-AZAGUANINE INTO SOLUBLE RNA OF BACILLUS CEREUS. D.H.Levin: J. biol. Chem., 1963, 238, 1098-1104 (Div. Biochem., Dept. Biol., M.I.T., Cambridge, Mass., U.S.A.) Incorporation of 8-azaguanine into RNA of B. cereus occurs-preferentially in the sol. RNA. A high proportion, greater than 40%, of guanine residues are replaced by azaguanine in the sol. RNA synthesised in presence of azaguanine. No other base is displaced. If the azaguanine residues are counted as guanine residues the base ratios of the sol. RNA are unaltered by the substitution. The sequential distribution of the azaguanine is identical with that of guanine in normal sol. RNA. The azaguanylate linkages in this abnormal sol. RNA are uniquely labile to mild acid. Treatment of the sol. RNA of this bacillus with RNase Ti shows that more than 75% of the total guanine residues of the unfractionated sol. RNA are located in consecutive sequences.

J.N.Ashley

765. INHIBITORY EFFECTS OF NUCLEOSIDES ON VEGETALISATION PROCESS IN SEA URCHIN EGGS. R.Lallier: Exp. Cell Res., 1963, 29, 119-127 (Centre Natl. de La Rech. Scient., Paris, France) Several purine and pyrimidine nucleosides tested inhib. the normal development of P. lividus eggs, the order of inhibitory activity being guanosine-adenosine-inosine-xanthosine-uridine. Adenine was more toxic than adenosine, its effect not being alleviated by uridine or hypoxanthine. Adenosine and inosine inhib. vegetalisation of sea urchin eggs by Li, and the phosphoric esters of adenosine counteracted the vegetalisation to some extent. The protecting action of adenosine and inosine is suggested to result from synthesis of energy-rich phosphate bonds from these nucleosides.

(French, English summary)

KJJones

766. INDUCTION OF NEOPLASMS IN PLANARIANS WITH CARCINOGENS. J.A.Foster: Cancer Res., 1963, 23, 300-303 (Stanford Univ. Sch. Med., Stanford, Calif., U.S.A.) 9*6 and 5% of Dugesia dorotocephala treated with 1,2-benzanthracene, 3'-methyl-4-dimethylaminoazobenzene and 3,4-benzopyrene respectively developed nodular growths which increased in size, became necrotic and eventually caused death. When benzanthracene treatment was followed by sectioning, 21% of the regenerating sections were affected.

In some animals highly basophilic nests of cells with increased nucleocytoplasmic ratios invaded the intestinal tract. Excessive pigmentation, giant cells and cells wth pigment globules occurred in the sub-epidermal layer under areas of epidermal hyperplasia. Numerous mitotic figures and pyknotic nuclei were apparent in hyperplasU intestinal tract and normal tissue separating channels ox. the tract was invaded and obliterated by the hyperplastif tissue.

B.M.Steve0

767. EXCITATION TRANSFER AND CARCINOGENESIS.

A.Pullman and H.Berthod: Biochim. biophys. Acta» 1963, 66, 277-279 (Inst. Biol. Phys.-Chim., 13 rue Pierre Curie, Paris, France) It is concluded that Birk's criterion does not distinguish between compounds which are active and those which are inactive as carcinogens.

B.MStEV«

768. DISTRIBUTION OF PROTEIN-BOUND DYE IN SUBCELLULAR FRACTIONS FROM RAT LIVER DURING ADMINISTRATION OF 3'-METHYL-4-DIMETHYL* AMINOAZOBENZENE[3'-Me-DAB]. T.Yamada. M.Matsumoto and H.Terayama: Exp. Cell Res., I⁹⁶⁵ 29, 153-161 (Dept. Biophys. Biochem., Fac. Sci.i Univ., Tokyo, Japan) In expt. with stomach tube administration of 3'-Me-DAB, and in feeding expt. ^ polar dye concn. per unit wt. of protein was higher in ^ supernatant fraction than in 2 microsomal subfractions ^ or insol. in deoxycholate. For the supernatant fraction, the binding max. appeared 1 week after the beginning feeding, while for the other subfractions, the max. occurred 2 weeks after the beginning. The results are discussed with respect to the tumour induction mecha

K.Jones

769. AUTORADIOGRAPHIC LOCALISATION OF PROTEIN-BOUND AMINOAZO DYES. P.E.Hughes: Exp. Cell Res., 1963, 29, 327-342 (Dept. Pathol., Univ. Melbourne, Australia) All parenchymali. duct and Kupffer cells of regenerating rat liver contain** bound dye, as studied autoradiographically. Protein-^ bound material did not influence DNA function, as tiP stabiliser, gene suppressor or binding to mitotic spin-^ protein. After 2 weeks feeding of the 3'-methyl-4-^ methylaminoazobenzene, islands of cells with increase mitotic activity and decreased dye-binding capacity, were noted, while the non-carcinogenic dye did not*, the effect.

KJ**

770. CHANGES IN CELLULAR DNA IN MOUSE SKIN FOLLOWING APPLICATION OF TUMOUR-PROMOTING AGENT. E.S.Meek: Exp. Cell Res., 1963, 29, 38*^{mu} 393 (Dept. Pathol., Univ. Bristol, England) »; painted with a tumour-promoting agent, the cell pr? liberation was accompanied by a slight increase in ^ f^{mu} with DNA complements greater than diploid but no *^{mu} reduction in the stem-line value, as shown by absorptions^ measurements of Feulgen-stained epithelial nuclei. *^{mu} result agreed with that expected in simple hyper^ s^{mu} des a normal tissue.

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771. PROTEIN-BOUND DYES IN THE SERUM AND OF RATS FED AMINOAZO DYES. J.Dijkstra and ^ Louw: Brit. J. Cancer, 1962, 16, 757-762 (Nat. binding Chem. Res. Lab., Pretoria, S. Africa) The binding

of 4-dimethylaminoazobenzene and various substitu^ analogues to serum proteins of Wistar rats was studie^ The azo-compounds were administered by stomach rub# Free dye in serum was low in first 10 hr., rose to a^ between 20 and 40 hr. then declined. The binding

{& serum paralleled that in the liver. The extent of binding of the dyes tested paralleled their carcinogenicity except for 2-methyl-4-dimethylaminoazobenzene which ^{w*}s weakly carcinogenic but strongly bound to liver proteins, though less strongly to serum proteins. D.Hamer

^{722.} PRECURSORS OF CARCINOGENIC HYDROCARBONS IN TOBACCO SMOKE. E.Gil-av and J.Shabtai: Nature, Lond., 1963, 197, 1065-1086 (Daniel Sieff Res. Inst., Weizmann Inst. Sci., Rehovoth, Israel) Data have been reviewed in support of the view that ^{*er}Penic compounds in tobacco undergo reactions during its combustion that lead to the formation of isoprene and ^{^otnatic} compounds, including the carcinogen. 3.4-^{be}nzopyrene. G.M.Lewis

^{723.} BURN TEMPERATURES OF CIGARETTE AND PIPE TOBACCOS. W.J.de Wet: S. Afr. J. agric. Sci., 1962, 5, 589-596 (Tobacco Res. Inst., Rustenburg, S. Africa). I.A.B.S.

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^{724.} IMMUNOLOGICAL DETERMINATION OF HUMAN CHORIONIC GONADOTROPHIN IN SERUM. D.R.Mishell, jun., L.Wide and C.A.Gemzell: J. clin. Endocr., 1963, 23, 125-131 (Dept. Obstet. Gynecol., Akademiska Sjukhuset, Uppsala, Sweden) The ^{haemagglutinin}, inhibn. reaction was used. Serum was treated with acetone and the HCG-containing fraction was washed with abs. alcohol and ether. The results obtained by this method were compatible with those by various assay techniques. K.Jones

DETERMINATION OF THE HALF LIFE TIME OF HUMAN PLASMA HAPTOGLOBIN. J.Moretti, J.Borel, W.Dobryszycka and M.-F.Jayle: Biochim. biophys., 1963, 69, 205-211 (Lab. Biochim., Fac. Méd., Paris, France) [131i]Haptoglobin was inj. into ^{humans} subjects and elimination followed for 11 days. ⁱ[L^h al* life appeared to be 4 days. Breakdown products form of small peptides appeared in the urine.

⁷²⁶ (French) B.M.Stevens

HAEMOGLOBIN-BINDING CAPACITY OF THE ^{^OMUCOID} FRACTION OF HUMAN SERUM. ^{^M.Dobryszycka:} Clin. chim. Acta, 1962, 7, 761-767 (Dept. Biochem., Fac. Pharm., Med. Sch., Poland) Concn. of seromucoid, total V, ^{^8}globin [Hp] and sulphosalicylic acid-sol. Hp [SS-Hp] determined in normal sera. Seromucoid derived from serum incubated with-Hb was separated by paper electrophoresis at pH 8.6. A significant decrease was found in the 0.2-seromucoid content. Hb-binding capacity of the cone, seromucoid was investigated. ^{not be}coid showed only a small part of the total Hb-binding capacity of serum. The lost Hp activity could be traced among proteins pptd. by sulphosalicylic acid. Determinations of SS-Hp were also made in some sera, and significant differences found. The ^{importance} of SS-Hp and its relation to the total Hp of serum are discussed. V.M.Wootton

VESTIGATION OF HUMAN SERUM PROTEINS AFTER AMMONIUM SULPHATE FRACTIONATION AT

VARYING CONCENTRATIONS AND pH. R.Bo*rrillon, R.Got and G.Lévy: Clin. chim. Acta, 1962, 7, 835-845 (Fac. Méd., Lab. Biochim. Med., Paris, France)

After (NH₄)₂SO₄ fractionation of human serum proteins in varying concn. and pH the soln. were separated by DEAE-cellulose chromatography and starch gel electrophoresis. Protein identification in each fraction was simult. effected by paper-, starch gel-, and immuno-electrophoresis. V.M. Wootton

^{778.} CHARACTERISTICS OF AN ACID-DISSOCIABLE HUMAN SERUM MACROGLOBULIN. E.D.Rees: Clin. chim. Acta, 1962, 7, 846-853 (Dept. Med., Univ. Kentucky, Lexington, Ky., U.S.A.) ^y-Globulin was prep, from serum containing abnormal amounts of ^{7S}, ^{13S}, ^{18S} and ^{26S} ^y-globulin components by (NH₄)₂SO₄. or by low ionic strength fractionation. In buffer, pH 4.2, all the heavier ^y-globulin components dissociated to ^{7S} units, except for a small amount of ^{19S} component which dissociated in mercaptoethanol. Only one-half of the total ^{7S} component present in acid buffer seemed able to aggregate: this amount of aggregation was complete at any pH above 7. Aggregation was also enhanced by increased concn. or decreased temp. It was not influenced by mercaptoethanol or a chelating agent, or by increased ionic strength. Acetylation of the free amino groups decreased the aggregation. V.M.Wootton

^{779.} HUMAN PLASMA GLYCOPROTEINS. I. METHOD FOR ISOLATING COHN'S FRACTION VI AND GLYCOPROTEIN DETERMINATION IN PATIENTS WITH RHEUMATOID ARTHRITIS. W.Btlrgi and V.Geeler: Z. Ges. exp. Med., 1963, 136, 419-431 (Pathol. Inst., Univ. Ztirich, Swtizerland) A rapid electrophoretic method for isolating the glycoproteins of fraction VI, mainly consisting of (Xi-acid glycoprotein, is described. This fraction was increased in the serum of most cases of rheumatoid arthritis. (German) P.F.Meyer

^{780.} DIFFERENCES BETWEEN THE NORMAL SERUM PROTEIN PATTERNS OF AMERICAN INDIAN, NEGRO AND CAUCASIAN SUBJECTS. G.C.Klein, M.M. Cummings and J.F.Hammarsten: Proc. Soc. exp. Biol. N.Y., 1962, 111, 298-300 (V.A. Hosp., Oklahoma City, Okla., U.S.A.) Indian and Negro protein patterns are similar in that they have a lower % of albumin and higher % of ⁸ and ^y-globulins than the Caucasian. Indian pattern differs from the other 2 by having an increased % of Oci- and decreased % of (X2-globulin).

M.M.Shapland

^{781.} A SIMPLE SCREENING TEST FOR WALDENSTROM'S MACROGLOBULINAEMIA. E.B.Thorling: Nature, Lond., 1963, 197, 605-606 (Cancer Chemotherapeutic Dept., Anti-Cancer Centre, Aarhus, Denmark) A test is described in which water flowed down a filter paper past a streak of serum for 75 min., after which the pattern produced was stained with Bromphenol Blue. A characteristic pattern was obtained with normal serum. Sera from cases of Waldenstrtm's macroglobulinaemia showed a well-defined deeply stained band at the site of application due to pptn. of the high mol. wt. proteins; this was prevented if cysteine was added to cause de-polymerisation. Other cases of neoplastic disease did not show this pattern. G.M.Lewis

^{782.} HUMAN LIPOPROTEINS: ROLE IN TRANSPORT OF THYROID HORMONES. E.Toro-Goyco and M.Cancioi Science, 1963, 139, 761-762 (V.A. Hosp., Sch. Med., Univ. Puerto Rico, San Juan, Puerto Rico)

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Lipoproteins from patients receiving therapeutic doses of 13*1 were isolated by density gradient techniques. Circulating thyroid hormones were bound mainly by the proteins of density greater than 1*23 g./ml., to a much less extent by OC-lipoproteins, and negligibly by δ -lipoproteins.

G.M.Lewis

783. ACID PHOSPHATASE IN SERUM: INCREASE IN ACUTE MYOCARDIAL INFARCTION. M.R.Schoenfeld: Science, 1963, 139, 51-52 (Med. Service, Lincoln Hosp., New York, U.S.A.) Significant rises in serum acid phenylphosphatase accompanied symptoms of acute transmural myocardial infarction and other thromboembolic diseases. It is suggested that the excess enzyme is released from platelets.

G.M.Lewis

784. SERUM TRANSAMINATION SYSTEM WITH PARTICULAR REFERENCE TO LIVER INJURY. L.Jaroszewicz and S.Niewiarowski: Bull. Acad. pol. Sci., 1963, 11, 61-64 (Dept. Physiol. Chem., Sch. Med., Bialystok, Poland) Colorimetric and chromatographic methods were used for transaminase activity determinations. Results were divergent. The colorimetric method was more adequate for quant. determination. Besides alanine and aspartate transaminases, there exists a system of other transaminases in human and dog serum. These enzymes participate in slow-rate transamination of 12 amino acids other than alanine and aspartic acid. The activities of these enzymes do not change significantly in the course of liver injury.

J.E.Hobbs

785. LIPOLYTIC ACTIVITY OF POST-HEPARIN PLASMA IN HYPERGLYCERIDAEMIA. D.S.Fredrickson, K.Ono and L.L.Davis: J. lipid Res., 1963, 4, 24-33 (Section on Mol. Dis., Lab. Metabolism, N.H.I., Bethesda, Md., U.S.A.) Post-heparin plasma lipolytic activity in the majority of patients with hyperglyceridaemia was equal to or greater than that found in normal subjects. Activity in patients with carbohydrate-induced hyperglyceridaemia was greater than in normal subjects, but in fat-induced γ -hyperglyceridaemia activity was abnormally low. Activity in both normal and hyperglyceridaemic subjects was uniformly dependent upon prior dietary fat intake.

J.R. Sargent

786. SIMPLIFIED METHOD FOR DETERMINATION OF SERUM ALKALINE PHOSPHATASE ACTIVITY. K.Roos: Scand. J. clin. Lab. Invest., 1963, 15, Supp. 69, 233-243 (Central Lab., Sahlgren's Hosp., Gothenburg, Sweden) A modified method, which does not require protein pptn. or any blank test, is described for the determination of a lk. phosphatase activity in serum. The results obtained with this method agreed well with those of others.

K.Jones

787. DETERMINATION OF γ -GLUTAMYL TRANSPEPTIDASE ACTIVITY IN HUMAN SERUM AND URINE. M.Otfowski and A.Szewczuk: Clin. chim. Acta, 1962, 7, 755-760 (Dept. Biochem. Oncol., Inst. Immun. Exp. Ther., Polish Acad. Sci., Wroclaw, Poland) A simple and improved method for the synthesis of γ -L-glutamyl-CX- and \bar{p} -naphthylamide is described. A procedure for determining γ -glutamyl transpeptidase activity, based on the colorimetric determination of $\bar{O}t$ -naphthylamine liberated from its γ -glutamyl deriv. is given. Synthesis of the substrates is simple. Both substrates can be used for the histochem. demonstration of the enzyme in tissue sections. γ -Glutamyl transpeptidase activity was very high in obstructive jaundice, cholangitis and liver cancer, while lower levels were found in viral hepatitis

and cirrhosis of the liver. The method may be of clinical use.

V.M.Wootton

788. LOW SERUM LACTIC DEHYDROGENASE ACTIVITY IN POST-HAEMORRHAGIC ANAEMIA. D.L.Mackler, J.J.Sampson and A.E.Lewis: Amer. J. med. Sci., 196* 245, 43-51 (Dept. Med., Mount Zion Hosp., San Francisco, Calif., U.S.A.) Haemorrhage causes a fall of serum lactic dehydrogenase activity, followed W^t rise. The rise is due to a release of the enzyme from tissues, e.g. the liver, followed by an increase of its synthesis.

E.E.Hobbiger

789. PRESENCE OF [127I]IODOTYROSINES IN EXTRACT¹ OF NORMAL HUMAN SERUM. S.C.Werner and L.Radichevich: Nature, Lond., 1963, 197, 877-878 (Dept. Med., Columbia Univ. Coll. Physn. Surgn., N.Y. York, U.S.A.) [131I]Diiodotyrosine [DIT] and mono iodotyrosine [MIT] of known sp. activity were added to normal serum and the [127QMIT and DIT estimated by isotope diln. or deriv. formation by dinitrophenylation[#] using paper chromatographic techniques. About one third of the extractable serum I appears to be present as iodo tyrosines, probably released from other compounds during the course of prep, for chromatography.

G.M.Lew

790. DYNAMICS OF PLASMA FREE FATTY ACID METABOLISM DURING EXERCISE. S.J.Friedberg, P.B.Sher. M.D.Bogdonoff and E.H.Estes: J. lipid Res., 1963, * 34-38 (Co-operative Lipid Lab. and Cardio-isotope A Unit, V.A. Hosp., Durham, N.C., U.S.A.) Frac[£] turnover rate and total turnover rates of plasma free ft^w acids were increased in human subjects during exercise. The concn. of free fatty acids in the plasma fell at the beginning of exercise, then rose to a level exceeding[^] of the resting state. Immediately after exercise a ft^w abrupt rise occurred, followed by a decline. It is inferred that exercise accelerates the efflux of plasma free fatf acids and, secondarily, increases mobilisation of free fatty acids from fat depots.

J.R. S[#]

791. QUANTITATIVE SEPARATION AND DETERMINATION OF BILIRUBIN AND CONJUGATED BILIRUBIN IN HUMAN SERUM. A.P.Weber and L.Schalm: Clin. chim. Acta, 1962, 7, 805-810 (Municipal Hosp^f Arnhem, Netherlands) In this simple method suitable for routine clinical chem. use, bilirubin and conjugated bilirubin are separated before quant. determ.[^] The serum must be protected from light. Serum is added[^] a soln. of ethyl acetate and lactic acid, followed by addition of CHCl₃ and then cone. diazo reagent. T^{**} mixture is gently shaken and then centrifuged to give[®] 2 crystal-clear layers. Should the serum contain only bilirubin, as in normal sera, the upper layer is colourless^{*} and the lower layer yellow. If the serum also contains conjugated bilirubin, the upper layer is coloured[®] For quant. determination of the conjugated bilirubin, the upper layer is transferred with a Pasteur pipette^{**} J 5 J #* which is tightly stoppered and kept in darkness for 1" room temp, and the extinction then measured. Reproducibility of the method is about 0-10 mg. pigment[†] 100 ml. serum. Small quantities of serum are^a adequate so neonatal blood can be examined.

V.M.Wootton

792. BLOOD AMMONIA IN LIVER DISEASE. J.St^{**1}: Ann. intern. Med., 1963, 58, 1-24 (Fac. Med., Strasbourg, France) Blood NH₃ at different venous levels varies in relation to circulatory conditions. Gastrointestinal haemorrhage, the regular rise in an

NH₃ reveals cirrhosis or extrahepatic block. The correlation between blood NH₃ and coma is analysed.

R.S.Toaks

793. PROPERTIES OF SERUM FRACTIONS DERIVED FROM WHEAL REACTIVE DIPHTHERIA ANTITOXIN. W.J.Kuhns: Proc. Soc. exp. Biol., N.Y., 1962, 111, 282-288 (Dept. Path., New York Univ. Sch. Med., New York, U.S.A.) Fractionation of wheal reactive diphtheria antitoxin serum produced a considerable loss of skin activity. Fractions retaining activity were mainly fixtures of y- and OC2-globulins and attempts at further separation produced a marked loss of activity particularly to components free of (X2-globulin). This supports the idea that a non-y-globulin component plays a role in the reactivity of reagins. M.M.Shapland

794. INFLUENCE OF A FAMILY DIET PATTERN HIGH IN LINOLEIC ACID ON SERUM CHOLESTEROL LEVEL: ONE YEAR STUDY. L.Swell, P.E.Schools, jun. and C.R.Treadwell: Proc. Soc. exp. Biol., N.Y., 1962, 111, 48-50 (V.A. Center, Martinsburg, W.Va., U.S.A.) A significant decrease in serum cholesterol was observed in clinically healthy subjects with elevated levels, after being placed on high linoleic acid diet. It is concluded that a dietary regimen for lowering cholesterol level is practical for long periods. M.M.Shapland

795. COLORIMETRIC DETERMINATION OF GLUCOSE IN 20 µl. OF BLOOD. D.M.Campbell and E.J.King: J. clin. Path., 1963, 16, 173-174 (Postgrad. Med. Sch., London, England) The Brown ultra-micro Cu action method was modified by pptg. proteins with J.tungstate and CUSO₄ to eliminate non-sugar reducing C₁₂haemines# The supernatant was then treated with alk. IM 4t and the amount of cuprous oxide formed determined by the colour produced with neocuproine.

796. AUTOMATIC DETERMINATION OF BLOOD CHOLESTEROL. J.Boy: J. clin. Path., 1963, 16, 178-180 (Civil Hosp., Rheims, France) The determination was based on Pearson's method, with slight modifications in the proportions of the reagents, using an automatic apparatus with a const. time for the reaction and mixing processes, and a const. temp. J.B.Derbyshire

797. GUANOSINE PHOSPHATE MANNOSE IN ERYTHROCYTES. G.C.Mills and C.A.Jones: Tex. Rep. Biol. Med., 1963, 21, 57-64 (Univ. Texas Med. Branch, Galveston, Tex., U.S.A.) GDP-mannose was isolated from normal r.b.c. and from r.b.c. of a glucose 6-dehydrogenase deficient individual following a drug-induced haemolytic attack. The isolated GDP-mannose was compared with a commercial prep, using paper chromatography and anion exchange techniques. The isolated and commercial compounds were subjected to mild acid hydrolysis to yield GDP and mannose. Results indicate that GDP-mannose is the primary component in the GDP hexose peak found by anion exchange analysis of blood filtrates of human r.b.c. A.J.Martin

798. SYNTHESIS OF HAEM IN NORMAL AND LEUKAEMIC LEUCOCYTES. T.R.Walters, T.J.Gribble and J.C.Schwartz: Nature, Lond., 1963, 197, 1213-1214 (Paediatrics, Stanford Univ. Sch. Med., Palo Alto, Calif., U.S.A.) Haem synthesis, as measured by uptake of ⁵⁹Fe, can be demonstrated in w.b.c. obtained from patients with acute leukaemia, but not in those from normal individuals or patients with chronic leukaemia. The difference may be due to the lymphoblasts or

myeloblasts present in the blood in acute leukaemia. G.M.Lewis

799. ABNORMAL Hb STUDIES IN TAIWAN ABORIGINES. R.Quentin Blackwell and J.Tung-hsiang Huang: Science, 1963, 139, 771 (Biochem. Dept., U.S. Naval Med. Res. Unit No. 2, Taipei, Taiwan) Examination of 655 blood samples from 3 aboriginal tribes in Taiwan by vertical starch gel electrophoresis at pH 9.0 revealed the presence of only the A Hb. G.M.Lewis

800. ERYTHROCYTE ACID PHOSPHOMONOESTERASE AND GLUCOSE 6-PHOSPHATE DEHYDROGENASE DEFICIENCY IN CAUCASIANS. F.A.Oski, N.T. Shahidi and L.K.Diamond: Science, 1963, 139, 409-410 (Children's Hosp. Med. Center, Harvard Med. Sch., Boston, Mass., U.S.A.) Caucasian patients with r.b.c. glucose 6-PO₄ dehydrogenase deficiency also have a deficiency in r.b.c. acid phosphomonoesterase. This latter deficiency is not present in Negroes with the glucose 6-PO₄ dehydrogenase deficiency. G.M.Lewis

801. ISOLATION OF THE 'SLOW' PROTEINS Y, XI AND X2 FOUND IN PREPARATIONS OF HUMAN Hb. G.Laurent, C.Marriq, D.Nahon, M.Charrel and Y.Derrien: C.R. Soc. Biol., Paris, 1962, 156, 1456-1461 (Lab. Chim. Biol., Fac. Méd., Marseille, France) The proteins XI, Xg and Y were isolated from an ethanol-CHCl₃ extract of haemolysed human r.b.c. by chromatography on Amberlite CG-50 columns. Paper electrophoresis of the fractions from the column showed that the proteins could be obtained in a pure form. (French) M.A.Price

802. IDENTIFICATION OF THE ERYTHROCYTE PROTEINS Y, XI AND X2 WITH HUMAN CARBONIC ANHYDRASES. G.Laurent, M.Charrel, M.Castay, D.Nahon, C.Marriq and Y.Derrien: C.R. Soc. Biol., Paris, 1962, 156, 1461-1464 (Lab. Chim. Biol., Fac. Méd., Marseille, France) An estimation of the sp. enzyme activity, absorption coeff. and Zn content of purified proteins Y, XI and X2 allowed the identification of these compounds with the carbonic anhydrases of Nyman, CA V, CA III and CA II respectively. Further evidence was obtained by electrophoresis and ultracentrifugation. A decreased enzyme activity of Y compared with CA V suggested that Y had undergone some denaturation during the purification procedure. (French) M.A.Price

803. N-METHYLMETANEPHRINE: EXCRETION BY JUVENILE PSYCHOTICS. T.L.Perry: Science, 1963, 139, 587-589 (Div. Chem., California, Inst. Technol., Pasadena, Calif., U.S.A.) Three out of 18 psychotic children excreted N-methylmetanephrine in the urine although levels of bufotenin⁺, 4-dimethoxyphenylethylamine, tryptamine and 5HT were normal. G.M.Lewis

804. PHENYLKETONURIA. II. EXCRETION OF N-ACETYL-L-PHENYLALANINE IN PHENYLKETONURIA. F.B.Goldstein: Biochii. biophys. Acta, 1963, 71, 204-206 (Res. Dept., Letchworth Village, New York State Dept. Mental Hyg., Thiells, N.Y., U.S.A.) B.M.Stevens

805. MEASUREMENT OF URINARY TETRAHYDROALDOSTERONE BY GAS-LIQUID PARTITION CHROMATOGRAPHY. H.F.Carr, jun. and H.H.Wotiz: Biochii. biophys. Acta, 1963, 71, 178-184 (Dept. Psychiatry, Boston Univ. Sch. Med., Boston, Mass., U.S.A.) A mean basal excretion of 46[±]7 fg./24 hr. was determined in 5 normal subjects on normal Na intake.

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Amounts increased on Na deprivation or ACTH administration. Two other, more mobile, components were observed, 1 of which was consistently increased by Na restriction. The chromatographic method was efficient, quick, accurate and reproducible.

B.M.Stevens

806. DETECTION AND DETERMINATION OF PETHIDINIC ACID IN URINE. S.L.Tomsett: *Acta pharmacol., Khb.*, 1962, 19, 368-370 (*Biochem. Labs., North Gen. Hosp., Edinburgh, Scotland*) Pethidinic acid, a major metabolite of pethidine in man, can be identified using paper chromatography.

R.S.Tonks

807. ELEVATED LEVELS OF LACTIC DEHYDROGENASE, GLUTAMIC-OXALOACETIC TRANSAMINASE, AND CATALASE IN INFECTED URINE. B.M.Brenner and V.E.Gilbert: *Amer. J. med. Sci.*, 1963, 245, 31-42 (*Dept. Med., Div. Infectious Dis., Univ. Pittsburgh Sch. Med., Pa., U.S.A.*) Normal urine possesses lactic dehydrogenase activity but is devoid of catalase or GOT activity. In human and expt. urinary tract infections the former is increased and the latter become detectable.

E.E.Hobbiger

808. ISOINTENSITY PATTERNS FROM RADIOACTIVE COLLOIDAL GOLD IN SEROUS CAVITIES. J.M.Morgan and R.Wigh: *Amer. J. Roentgenol.*, 1963, 89, 567-569 (*Dept. Radiol., Med. Coll. Georgia, Augusta, Ga., U.S.A.*) The distribution of radiation around a patient who has received an i.p. or intrapleural injn. of radioactive Au (50 to 150 pc) was plotted, and resembles the magnetic field of a bar magnet, being least intense at the head and feet.

D.E.Evans

809. IRON STORAGE IN HUMAN DISEASE. FRACTIONATION OF HEPATIC AND SPLENIC IRON INTO FERRITIN AND HAEMOSIDERIN WITH HISTOCHEMICAL CORRELATIONS. E.H.Morgan and M.N.I.Walters: *J. clin. Path.*, 1963, 16, 101-107 (*Univ. W. Australia Physiol. Dept., Perth, W. Australia*) Fe storage in the liver and spleen as ferritin or haemosiderin was measured chem. in 130 normal or diseased subjects, and compared with histochem. methods. In normal subjects, approx. 400 mg. Fe was stored in the liver and spleen, with increased or decreased storage in disease. When the tissue contained less than 500 fig./g. Fe, more was stored as ferritin than as haemosiderin, but for values greater than 1000 pg./g#, more was stored as haemosiderin. The histochem. results gave only an approx. estimate of Fe storage.

J.B.Derbyshire

810. TRYPTOPHAN-NICOTINIC ACID METABOLISM IN SUBJECTS RECENTLY OR LONG-SINCE RECOVERED FROM VIRAL HEPATITIS. M.Piazza and F.Tancredi: *Nature, Lond.*, 1963, 197, 903 (*Inst. Infectious Dis., 'Gesù d Maria', Univ. Naples Italy*) In about 60% of subjects recovered from viral hepatitis, clinical examination and many tests for liver function showed that some alteration of the tryptophan-nicotinic acid metabolism was still present, the lesion being principally connected with kynurenine oxidase activity.

G.M.Lewis

811. ORAL AND INTRAVENOUS ^{131}I -TRIOLEIN TESTS IN THE ASSESSMENT OF DISTURBED TRIGLYCERIDE METABOLISM. S.Wallach and H.L.Jones: *Amer. J. med. Sci.*, 1962, 244, 612-621 (*Dept. Med., U.S. Naval Hqsp., Chelsea, Mass., U.S.A.*) Data obtained with $[^{131}\text{I}]$ triolein suggest that in patients with coronary atherosclerosis, hypothyroidism, nephrosis and essential hypercholesterolaemia, both the production and degradation of triglycerides are increased.

E.E.Hobbiger

812. OBSERVATIONS ON HUMAN TISSUES AND TUMOUR PROTEINS. M.P.Tombs, D.Burston and N.F.Maclagan: *Brit. J. Cancer*, 1962, 16, 782-793 (*Westminster Med. Sch., London, England*) Human tissue extracts were investigated with a view to establishing the origin of the serum glycoprotein which are raised in cancer cases. Electrophoresis, immuno-electrophoresis and chromatography on DEAE-cellulose were used. The cytoplasmic proteins could be separated chromatographically into 5 main fractions and the characteristics of these fractions are described. Tumour however, were not particularly rich in acidic proteins as it was concluded that the increased circulating glycoprotein arises partly in the liver.

D.Harn*

813. γ -AMINOBUTYRIC ACID AND GLUTAMATE DECARBOXYLASE ACTIVITY [GDA] OF BRAIN TUMOURS. M.Wolleman and T.Dévényi: *J. Neur. chem.*, 1963, 10, 83-88 (*Inst. Biochem., Hungarian Acad. Sci., Budapest, Hungary*) 25 specimens of brain tumour distributed among 6 main types were analysed. No GABA could be detected in any of the tumours but it was conspicuous in normal brain. GDA $\frac{\text{GDA}}{\text{GDA}}$ 40-80% lower in tumours than normal tissue if pyridoxal phosphate was present in the reaction mixture. Omission of pyridoxal phosphate depressed normal tissue GDA $\frac{\text{GDA}}{\text{GDA}}$ but tumour GDA was depressed 80-100%. R.Woodm*ⁱ

814. SERUM GLUCOPROTEIN DISTRIBUTION IN PATIENTS WITH DIAGNOSED CANCER. D.Andriess*, J.A.P.Stroes and H.Hellendoorn: *Clin. chim. Acta*, 1962, 7, 823-827 (*Clin. Chem. Lab., Marine Hospt Overveen, Netherlands*) A new modification of KoiV and Gronwall's method for the staining of electrophoretically separated glucoproteins is given, including an elution procedure. The glucoprotein distribution $\frac{\text{GDA}}{\text{GDA}}$ sera from normal persons, patients with diagnosed but untreated cancer, and patients with diagnosed treated cancer was investigated. In several cases of cancer there were no significant changes in the distribution pattern of glucoproteins separated by paper electrophoresis, especially if the patients had not, or not recently, undergone X-ray or surgical treatment. Normal distribution were found in several sera from patients with proved malignant tumours which makes it doubtful whether $\frac{\text{GDA}}{\text{GDA}}$ protein paper electrophoresis is of greater clinical value in diagnosis of early stages of cancer. Abnormalities in the relative distribution or total amount of circulating glucoproteins may be due to treatment, so the possible influence of treatment on the results must be considered.

V.M.Wootton

815. STUDIES IN MAN ON GONADOTROPIN-RESPONSIVE FEMINISING ADRENAL CORTICAL NEOPLASIA. H.Dempsey and S.R.Hu1, jun.: *J. clin. Endocr.*, 1963, 23, 173-180 (*Div. M₁stab. Endocr., Dept. Med., Univ. Alabama Med. Center, Birmingham, Ala., U.S.A.*) Hormonal responsiveness and steroid hormone biosynthesis were studied in a patient with a feminising adrenal cortical tumour. The results suggested that the steroid biosynthetic pathways in this tumour closely resemble those usually found in normal ovarian tissue.

K.Jones

816. FURTHER STUDIES ON ORIGIN OF PREGNA Δ^{14} RC IN ADRENAL CARCINOMA. D.E.Fukushima, H.M. Bradlow, L.Hellman and T.F.Gallagher: *J. clin. Endocr.*, 1963, 23, 266-273 (*Sloan-Kettering Inst. Cancer Res., New York, U.S.A.*) Δ^{14} -Dihydroxy-A Δ^{14} -pregnene-20-one [DPO] appeared to be the major precursor of urinary pregnane-30,17,20-triol in a patient

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⁸¹ with adrenal carcinoma. The evidence indicated that compound(s) other than DPO contributed to A5-pregnane-17,20a-triol. K.Jones

^{817.} ISOLATION OF 5CC-ANDROSTAN- AND CRYSTAL-LINE 5j8-ANDROSTAN-[3<X ->j8-O SIDE)-D-GLUCO-PYRANOSURONIC ACID-17-ONE FROM URINE OF WOMAN WITH ADRENAL ADENOMA. H.E.Hadd and R.I.Dorfman: J. biol. Chem., 1963. 238. 907-912 (Worcester Found. Exp. Biol., Shrewsbury, Mass., U.S.A.) The 2 products named in the title are isolated by countercurrent distribution. J.N.Ashley

^{818.} METABOLISM OF 19-HYDROXYANDROST-4-ENE-3,17-DIONE AND TESTOSTERONE BY HUMAN ADRENAL TISSUE. L.L.Engel and A.Dimoline: I. Endocr., 1963, 26. 233-240 (J.C.Warren Labs., Huntington Mem. Hosp., Harvard Univ., Boston, Mass., U.S.A.) Adrenocortical tissue from patients with advanced metastatic breast cancer was incubated with known natural oestrogen precursors. Although there was some transformation of testosterone to 19-hydroxyandrost-4-en-3-one there was no evidence of aromatization. G.F.Blane

^{819.} SEPARATION OF OESTROGEN CONJUGATES FROM HUMAN URINE. R.Hahnel: Clin. chim. Acta. 1962, 7, 768-775 (Dept. Biochem., Royal Perth Hosp., Perth, W.Australia) A method is described for the separation of the 3 major oestrogens, oestrone, oestradiol-17 β , and oestriol, as their conjugates from pregnancy urine. The conjugates are removed from urine on a column of anion exchange resin Deacidite and subsequent quant. elution of the oestrogen conjugates. It is thought that this method could be used for concentrating oestrogen conjugates from urines with very low estrogen content. V.M.Wootton

^{820.} IN VIVO DEIODINATION OF LABELLED L-THYROXINE TO L-3,5,3'-TRIIODOTHYRONINE [T3] IN MUSE AND HUMAN PITUITARIES. R.Grinberg, E.M.Volpert and S.C.Werner: J. clin. Endocr., 1963, 140-142 (Roswell Park Mem. Inst., Buffalo, New York, U.S.A.) Four hr. after injection of L-[131I]thyroxine into and radiothyroidectomised mice, up to 70% of the radioactivity found in the pituitaries was in the form of T₃. In pituitaries of 2 patients undergoing pituitaryectomy, 5 and 10% of the radioactivity was present K.Jones

^{821.} CONJUGATED STEROIDS IN PLASMA. DC. ESTIMATION OF FREE AND CONJUGATED STEROIDS IN ADRENAL VENOUS BLOOD AND PERIPHERAL BLOOD. G.W.Oertel, E.Kaiser and W.Zimmermann: Hoppe-Seyler's Z. physiol. Chem., 1963. 331, 77-84 (Endocr. Dept., Inst. Hyg. Microbiol., Univ. Saarlandes, Homburg, Germany) Blood from a woman with carcinoma of the breast revealed besides the secretory products of the adrenal cortex, a number of Δ^5 -3 β -hydroxysteroids, especially dehydroepiandrosterone. The conjugates probably consist of sulphates and glucurides. The estimation requires a lengthy purification procedure, for which full expt. details are given. (German) I.Cornish

^{822.} NEW STAINING TECHNIQUE FOR KETOSTEROID CHROMATOGRAMS. E.Epstein and B.Zak: J. clin. Endocr., 1963, 23. 355-357 (Dept. Clin. Pathol., St. Joseph Mercy Hosp., Pontiac, Mich., U.S.A.) In this technique, 17-KS on paper chromatograms undergo

complete reaction when immersed for a prolonged period. An aq. 1*k*., *jm*-dinitrobenzene reagent is used as the reaction medium. K.Jones

^{823.} RING D-(K-KETOLS AS METABOLIC PRODUCTS OF OESTROGEN IN NONPREGNANT HUMAN. R.Hobkirk: J. clin. Endocr., 1963. 23, 279-285 (Univ. Med. Clin. Montreal Gen. Hosp., Montreal, Canada) The ring D-OC-ketolic fraction consisted of approx. equal amounts of 16(X-hydroxyoestrone and a 16-keigestradiol-17j β fraction perhaps containing some 16 β -hydroxyoestrone. Radioautographic studies showed that 16OC-hydroxyoestrone and the 16-ketoestradiol fraction arose from oestrone, perhaps via some common intermediate. K.Jones

^{824.} ELECTROPHORESIS OF SALIVA IN STARCH GEL. R.W.Shaw, R.G.Bozek and G.E.Connell: J. dent. Res., 1962. 41. 1322-1326 (Dept. Biochem., Univ. Alabama Med. Center, Birmingham, Ala., U.S.A.)

Proteins in parotid and extra-parotid saliva from 7 individuals were separated by electrophoresis on starch gel containing a high concn. of urea buffered at pH 3.9. At least 5 zones were detected in most saliva specimens and there were variations in the pattern between individuals.

R.J.Andlaw

^{825.} COMPOSITION OF NORMAL AND PATHOLOGICAL CUTANEOUS ELASTIN. J.G.Smith, jun., E.A.Davison and R.L.Hill: Nature, Lond., 1963. 197, 1108-1109 (Div. Dermatol., Dept. Med., Duke Univ. Med. Center, Durham, N.C., U.S.A.) Fibrous proteins isolated by hot alkali extraction of normal human skin and human skin involved with actinic elastosis and pseudoxanthoma elasticum have quite similar amino acid compositions, which are similar to those of elastins from other sources.

G.M.Lewis

^{826.} BRAIN LIPIDS IN TAY-SACHS DISEASE. II. SOLUBILITY PROPERTIES OF GANGLIOSIDES. III. INCORPORATION OF 3H2O INTO BRAIN LIPIDS. S.Gatt and E.R.Berman: J. Neurochem., 1963. 10. 65-72, 73-77 (Dept. Biochem., Hebrew Univ., Hadassah Med. Sch., Jerusalem, Israel) II. Only 10% of the gangliosides in 2:1 chloroform/methanol extracts of brain from Tay-Sachs patients could be partitioned into 0.1M aq. KCl. The remainder could however be partitioned into pure water. These 2 types of ganglioside had similar chem. compositions differing from those found in normal brain in having less sialic acid and more N-acetyl hexosamine. Expt. in which soln. of gangliosides in water or 0.1M KCl were shaken with chloroform/methanol extracts of brain showed that even normal gangliosides could be bound to excess lipids and remain in the lower phase and this is postulated as the basis for differential partitioning of the 2 Tay-Sachs gangliosides.

III. A 22-month old child suffering from Tay-Sachs disease was inj. 6 times with 3H2O during the week preceding death. The brain was frozen within 3 hr. of autopsy. The relative sp. radioactivities of various brain lipids were as follows: lecithins and cephalins each 1100 counts/min./pmole; ceramides, 390; sphingomyelin, 225; cerebrosides, 190; hexosamine-containing glycolipid, 180; ganglioside, 165; 165 cytoside, 95; and cholesterol, 22. The values for phospholipid and cholesterol confirm previous findings with normal brain.

R.Woodman

^{827.} LACTIC AND MALIC DEHYDROGENASES IN HUMAN SPERMATOZOA. E.Goldberg: Science, 1963. 139. 602-603 (Dept. Zool., North Dakota St. Univ., Fargo, N.Dak., U.S.A.) Human spermatozoa, representing a homogeneous population of post-mitotic cells, contain

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5 electrophoretically distinct lactic dehydrogenases and 2 malic dehydrogenases. This indicates that mol. heterogeneity of enzymes is characteristic of the individual cell and not a reflection of heterogeneity of cell types within a tissue.

G.M.Lewis

828. LACTATE DEHYDROGENASES IN HUMAN TESTES.

A.Blanco and W.H.Zinkham: *Science*, 1963, 139, 601-602 (Dept. Paediatrics, Johns Hopkins Hosp., Baltimore, Md., U.S.A.) A unique form of lactic dehydrogenase was observed in the starch gel electrophoretic patterns of adult human testes, which was present in sperm but not in prepubertal testes. Its electrophoretic mobility, heat stability, kinetic behaviour with NAD analogues and chromatographic characteristics on DEAE-cellulose were intermediate to those observed for lactic dehydrogenase isoenzymes 3 and 4.

G.M.Lewis

829. IMMUNOCHEMICAL BEHAVIOUR OF PROTEINS IN HUMAN SWEAT. M.Jirka and J.Masopust: *Biochim. biophys. Acta*, 1963, 71, 217-218 (Biochem. Dept., Res. Inst. Children Development, Fac. Pediatrics, Charles Univ., Prague, Czechoslovakia) Prelim. comm.

B.M. Stevens

830. ABNORMAL POLYSACCHARIDE-PROTEIN COMPLEX FROM AN AUTOPSY MATERIAL OF A NOVEL FAMILIAL METABOLIC DISORDER. N.Katsushima and Sen-Itiroh Hakomori: *J. Biochem.*, Tokyo, 1963, 53, 7-13 (Dept. Pediatrics, Tohoku Univ. Señ. Med., Sendai, Japan) Complexes isolated from the liver contained a large amount of glucose and smaller amounts of glucosamine and galactosamine and gave a blue 12 reaction. Digestion with peptide hydrolase reduced the 12 reaction. One fraction thus obtained was resistant to OC-amylase digestion.

B.M.Stevens

831. METABOLISM OF THE CHELATING AGENT DIETHYLENETRIAMINE PENTAACETIC ACID [DTPA] IN MAN. E.Stevens, B.Rosoff, M.Weiner and H.Spencer: *Proc. Soc. exp. Biol.*, N.Y., 1962, 111, 235-238 (Div. Neoplastic Dis., Montefiore Hosp., New York, U.S.A.) [¹⁴C]DTPA inj. i.v. is quant. excreted in the urine in 24 hr. 90-IOC^o of orally ingested DTPA passes unabsorbed through the intestine but presence of the chelate in the urine is evidence for absorption of small amounts.

M.M.Shapland

832. CEREBROSIDES FROM HUMAN AORTAS.

L.Hausheer and K.Bernhard: *Hoppe-Seylers Z. physiol. Chem.*, 1963, 331, 41-44 (Physiol.-Chem. Inst. Univ., Basle, Switzerland) The isolation, purification and identification of cerebrosides is described. They contain non-substituted sat. and unsat. fatty acids, glucose and galactose. A comparison of the glycolipids from normal and atherosclerotic aortas is also given.

(German) I.Comish

833. CONTRACTILE PROTEINS OF NORMAL AND FAILING HUMAN HEART. M.L.Nebel and R.J.Bing:

Arch. intern. Med., 1963, 111, 190-195 (Dept. Med., Wayne State Univ. Coll. Med., Detroit, Mich., U.S.A.)

The myosin of the failing human heart shows an increase in ATPase activity without change in viscosity. Prelim. studies suggest that heart failure is associated with (? caused by) changes in mol. shape and/or wt. of myosin.

E.E.Hobbiger

834. EFFECT OF THE ORAL ADMINISTRATION OF LEUCINE ON THE METABOLISM OF TRYPTOPHAN.

B.Belavady, S.G.Srikantia and C.Gopalan: *Biochem. J.*, 1963, 87, 652-655 (Nutr. Res. Lab., Tarnaka,

Hyderabad,* India) The effect of leucine on the urinary excretion of tryptophan, quinolinic acid, nicotinic acid, N-methylnicotinamide, the 6-pyridone of N-methyl-nicotinamide [NMN-6P], 5HIAA, indican and indolyl-acetic acid was studied in 6 normal subjects and 6 patients suffering from pellagra. Leucine brought about a significant increase in the excretion of quinolinic acid and a decrease in the excretion of tryptophan, NMN-6P and 5HIAA. Leucine had similar effects on the excretion of tryptophan, quinolinic acid and NMN-6P when a tryptophan load was given. However, with a nicotinamide load the decrease in urinary NMN-6P was considerably diminished.

835. DETECTION OF HYALURONIC ACID IN PLEURAL FLUIDS OF CASES WITH DIFFUSE PLEURAL MESOTHELIOMAS. J.S.Harrington, J.C.Wagner and M.Stern[†]: *Brit. J. exp. Path.*, 1963, 44, 81-83 (Pneumoconiosis Res. Unit, South African Inst. Med. Res., P.O. Box 100 Johannesburg, South Africa) Hyaluronic acid previously found in pleural mesotheliomas was identified by comparing chem. characteristics with those of a standard prep. and measured in samples from 6 proven cases: the concn. rose as the disease progressed and measurement is advocated as an aid in diagnosis of these tumours.

D.L.Gardine*

836. CHANGES IN DNA, COLLAGEN AND ASCORBIC ACID DURING THE DEVELOPMENT OF CARRAGEEN GRANULOMA. B.[‡]emuchalová and M.Chvapil: *Biochim. biophys. Acta*, 1963, 69, 565-567 (Dept. Expt. Biol. Inst. Ind. Hyg. and Occupational Dis., Prague, Czechoslovakia).

B.M.Stevei*

837. ACID PHOSPHATASE AND CATHEPTIC ACTIVITY IN RHEUMATOID SYNOVIAL TISSUE. M.Luscorn[†]: *Nature*, Lond., 1963, 197, 1010 (M.R.C. Rheumatol. Res. Unit, Manor Hosp., Combe Park, Bath, Wilts. England) In proliferating synovia 1 tissue from rheumatoid patients, the DNA and RNA content is more than twice that in normal synovia. Increased concn. of acid phosphatase and cathepsin were found in rheumatoid tissue; these enzymes may play some part in the erosion of cartilage which takes place in rheumatoid arthritis.

G.M.k

838. INFLUENCE OF AGE ON CONNECTIVE TISSUE. B.Clausen: *Lab. Invest.*, 1962, 11, 1340-1345 (Connective Tissue Res. Lab., Rigshospital, Dept. of Copenhagen Univ., Denmark) The hexuronic acid hydroxyproline ratio in aorta, myocardium and skin from human foetuses, children and adults, falls with increasing age, due to a decrease in ground substance acid rnucep polysaccharide.

A.M.M.

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(See also Microbiology)

839. RIBONUCLEOPROTEINS IN LEAVES INFECTED WITH TOBACCO MOSAIC VIRUS. P.M.Townsley: *Res. Sta., Canada*, Lond., 1963, 197, 1274-1276 (Res. Sta., Canada for Dept. Agric., Vancouver, Canada) A technique of electrophoresis of crude prep. of TMV virus in ?[†]ar g

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described. Using this technique, a single small sample can yield information on size of the virus particle, electrophoretic mobility, infectivity, concn. of virus Particle in the leaf, serol. activity and incorporation of fctopes into protein and RNA of the virus. J.R.Sargent

[^]0. PREPARATION AND PROPERTIES OF ARTIFICIAL ANTIGEN IMMUNOLOGICALLY RELATED TO TOBACCO MOSAIC VIRUS. F.A.Anderer: Biochim. biophys. Acta, 1963, 71, 246-248 (Max-Planck Inst. für Virusforschung, Tübingen, Germany) An Ag containing the C-terminal hexapeptide of TMV linked to a carrier protein produced an antiserum which pptd. and neutralised TMV, but the artificial Ag did not ppt. with anti-TMV serum. Prelim, comm. B.M.Stevens

^{**}1. SMALL RNA CONTAINING PSEUDOMONAS AERUGINOSA BACTERIOPHAGE. T.W.Feary, E.Fisher, Jun. and T.N.Fisher: Biochem. biophys. Res. Comm., 1963, 10, 359 (Dept. Microbiol. Ophthalmol., Tulane Univ. Sch. Med., New Orleans, La., U.S.A.) ^{?i}Pseudomonas bacteriophage designated ^f7s* has been isolated. Evidence is given that its nucleic acid component is RNA, not DNA. B.Ketterer

[^] SUBUNIT BASIS OF HEAD CONFIGURATIONAL CHANGES IN T2 BACTERIOPHAGE. D.J.Cummings: Biochim. biophys. Acta, 1963, 68, 472-480 (Nat. Inst. Neurol. Dis. and Blindness, Lab. Mol. Biol., Bethesda, Md., U.S.A.) Mol. wt. analyses of the 3d protein subunit revealed that monomers, dimers or trimers were obtained depending on the method of prep. The subunits yielded the same end group amino acids. Mol. wt. of the monomer was 42000 Daltons with ellipsoidal dimensions of 27[#]0 x 1[#]9 x 1[#]9 mji. A monomer-dimer transition occurred in the presence of Zn. Zn also markedly affected the transition between the fast and slow sedimentation forms of whole T2. A sliding subunit model of the head was formulated, which accounted for the differences in the 2 sedimentation forms. B.M.Stevens

[^]Km CONTROL OF PORPHYRIN BIOSYNTHESIS THROUGH S⁺GATIVE-FEEDBACK MECHANISM. STUDIES WITH REPARATIONS OF 6-AMINOLAEVULATE SYNTHETASE AND 6-AMINOLAEVULATE DEHYDRATASE FROM ^SHODOPSEUDOMONAS SPHEROIDES. B.F.Burnham and M-ascelles: Biochem. J., 1963, 87, 462-472 (Microbiology Unit, Dept. Biochem., Univ., Oxford, England) 6-Aminolaevulate synthetase, 6-aminolaevulate dehydratase and succinyl-CoA thiokinase have been purified by 10-, 70- and 170-fold respectively from extracts of ^Spheroides. 6-Aminolaevulate synthetase is inhib. by conpn. of haemin and by Hb and myoglobin. The inhibn. by haemin is not competitive with substrates or cofactors but is reversible by diln. Haemin inhibits porphyrin synthesis from glycine and 3-oxoglutarate by ¹⁴C-labelling. Pensions of ^R. sphaeroides but does not affect the conversion of 6-aminolaevulate into porphyrins. The characteristics of the inhibn. of 6-aminolaevulate synthetase and the results with whole cells suggest that one mechanism for the control of porphyrin biosynthesis in ^Spheroides may be through neg. feedback by haemin. •

[^] NUCLEIC ACID AND PROTEIN CONTENT DURING THE CYCLE OF PSEUDOMONAS FLUORESCENS. ⁵⁷ ANOMONAS METHANICA AND OF SPORING BACILLUS. A.C.R.Dean: Proc. roy. Soc. B, 1963, 157, 574, 586 ([^]ys. Chem. Lab., Univ., Oxford, England) The variations in the cell size and in the

RNA, DNA and protein content during the growth cycles of P. fluorescens, M. methanica and of a sporing bacillus which has some of the characteristics of B. coaculans are reported. The results are discussed in terms of those previously obtained with Bacterium lactis aerogenes.

G.M.Lewis

845. GENE CONTROLLED FACILITATED DIFFUSION AND ACTIVE TRANSPORT OF (X-THIOETHYLGLUCOPYRANOSIDE IN SACCHAROMYCES CEREVISIAE. H.Okada and H.O.Halvorson: Biochim. biophys. Acta, 1963, 71, 229-232 (Dept. Bacteriol., Univ. Wisconsin, Madison, Wis., U.S.A.) Prelim, comm.

B.M.Stevens

846. TEMPERATURE INDUCED CHANGES IN PHOSPHORUS METABOLISM IN SYNCHRONISED [PROTO-ZOA] TETRAHYMENA [PYRIFORMIS GL]. S.C.Chou and O.H.Scherbaum: Biochim. biophys. Acta, 1963, 71, 221-224 (Dept. Zool., Univ. California, Los Angeles, Calif., U.S.A.) Chromatographic patterns of TCA-sol. fractions showed striking changes. Prelim, comm.

B.M.Stevens

847. BIOCHEMICAL CHARACTERISATION OF CYSTEINE-REQUIRING MUTANTS OF SALMONELLA TYPHIMURIUM. J.Dreyfuss and K.J.Monty: J. biol. Chem., 1963, 238, 1019-1024 (McCollum-Pratt Inst.. Johns Hopkins Univ., Baltimore, Md., U.S.A.) These mutants representing damage to 14 discrete cistrons which map in 5 separate regions of the S.typhimurium linkage group, are analysed with respect to their metabolic aspects. Nine cistrons are considered to be structural genes for enzymes involved in formation of sulphide. Of the remaining 5 cistrons, 2 are connected with incorporation of sulphide into cysteine, and 3 may be concerned with permeability restrictions for inorg. ions. Adenosine 5'-phosphosulphate, 3'-phosphoadenosine 5'-phosphosulphate, SO₃²⁻, and S²⁻ are probably intermediates in incorporation of sulphate S into cysteine. The S of SO₃²⁻ are utilised via a reductive dismutation that gives SO₃²⁻ and S²⁻. Four enzymes appear to be involved between 3'-phosphoadenosine 5'-phosphosulphate and SO₃²⁻, 6 between SO₃²⁻ and S²⁻, and 3 in the dismutation of SO₃²⁻. J.N.Ashley

848. METABOLISM OF GLYCYL-L-LEUCINE IN E. COLI. N.Meisler and S.Simmonds: J. gen. Microbiol., 1963, 31, 109-123 (Dept. Biochem., Yale Univ., New Haven, Conn., U.S.A.) The metabolism of glycyl-L-leucine in an E. coli strain K-12 leucine auxotroph was investigated. Organisms sensitive to growth inhibn. by the peptide are produced by ageing in an acid-producing poorly buffered medium. Sensitive, aged organisms readily take up the peptide in the presence or absence of chloramphenicol, and whole cell prep. of these organisms do not rapidly hydrolyse glycylleucine, but cell free extracts have high enzymic activity. Young organisms have high enzymic activity in whole cell prep. Growth of slope organisms is inhibited by glycylleucine and whole cell and cell-free extracts of these organisms have low hydrolytic activity. K.Brew

849. TRICHOTHECINASE. I.Horváth and J.M.Varga: Acta microbiol. Acad. Sci. hung., 1962, 9, 117-121 (Dept. Microbiol., Res. Inst. Pharm. Ind., Budapest, Hungary) Trichothecinase, an inductive enzyme of Penicillium chrysogenum inactivates trichothecin and crotocin, by splitting their ester linkage. The 2 antibiotics serve both as inducer and substrate. DNP, Na₃N and nystatin have an inhibitory effect on the enzyme synthesis, glucose has none. S.Igali

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- 850. COMPARISON OF GROWTH AND PECTOLYTIC ENZYME PRODUCTION BY BACILLUS POLYMYXA.** C.W.Nagel and R.H.Vaughn: J. Bact., 1962. 83, 1-5 (Dept. Food Sci. Tech., Univ. California, Los Angeles, Calif.. U.S.A.)

The elaboration of the enzyme by *B. polymyxa* occurred during the log. phase and ceased when the stationary phase was reached. The sp. activity of the extracellular enzyme remained relatively const. until lysis occurred. The increased sp. activity of die intracellular enzyme may be explained if one assumes that the rate of secretion of the intracellular enzyme is dependent upon the concn. of the extracellular enzyme. The concn. of the intracellular pectolytic enzyme dropped markedly at the end of the log. growth phase; the enzyme was released into the medium during the stationary growth phase and subsequent lysis of the cells. The intra- and extra-cellular enzymes were shown to be similar or identical in that both were Ca dependent pectic acid transeliminases.

C.Toothill

- 851. EFFECT OF TYPE OF CARBOHYDRATE ON GROWTH AND PROTEIN SYNTHESIS BY TETRAHYMENA PYRIFORMIS.** H.Reynolds and J.B.Wragg: J. Protozool., 1962. 9, 214-222 (Human Nutr. Res. Div.. Agric. Res. Service, U.S.Dept. Agric., Washington, D.C., U.S.A.)

T. pyriformis multiplied more rapidly, developed larger cells, and achieved greater growth as measured by O.D., when dextrin rather than glucose was present in the media. In the presence of 0*3 mg./ml. amino acid N, glucose concn. of 0*1%-1Qf caused a proportional increase in growth; from 1"OP/o-3*OP/o, there was no effect; while above 3*0% the effect was inhibitory. With dextrin, max. growth paralleled carbohydrate concn. from 0-1-3QP/m. At raised N levels, the inhibitory concn. of glucose was lowered but growth in dextrin was not affected. At 1"Jo carbohydrate levels, the total cell protein/ml. of culture was 60% greater, protein per cell approx. bQP/o greater, and cells were 1*5-2*0 times larger in media containing dextrin than media with glucose. Growth as measured by O.D. in media with 0-3 mg./ml. N and 1 or 2% dextrin was not reduced by the presence of 1 or 2% glucose.

R.J.Walker

- 852. LOCALISATION OF ARGININE DIHYDROLASE SYSTEM^f IN STREPTOCOCCUS FAECIUM.**

W.Trentini and W.Chesbro: Biochim. biophys. Acta, 1963. 67, 511-513 (Dept. Microbiol., Univ. New Hampshire, Durham, N.H., U.S.A.) Neither arginine deiminase nor ornithine carbamoyltransferase was found in the membrane fraction of *S. faecium*.

" B.M.Stevens

- 853. LOCALISATION OF SOME PHOSPHATASES IN YEAST.** G.J.M.Tonino and E.P.Steyn-Parvé: Biochim. biophys. Acta. 1963, 67, 453-469 (Lab. Physiol. Chem., Univ., Utrecht, Netherlands)

Cells were fragmented by shaking with glass beads, protoplasts were disrupted hypotonically or isotonically. The non-sp. phosphatase with a pH optimum of 3-4 occurred only in the cell wall of commercial baker's yeast. The highly sp. a-glycerophosphatase was found entirely in the unstructured cytoplasm of a 17 hr. culture of *Saccharomyces carlsbergensis* No. 74 This strain contained only 1 non-sp. alk. phosphatase. In a 17 hr. culture approx. 70% was bound to particles sedimenting from 3000 £ to 100000 x £ and the remainder was sol. In a 24 hr. culture 70-85% of the enzyme was sol.

B.M.Stevens

- 854. ACID PHOSPHATASE OF YEAST. LOCALISATION AND SECRETION BY PROTOPLASTS.** W.L.McLellan,

jun. and J.O.Lampen: Biochim. biophys. Acta, 1963, 67, 324-326 (Inst. Microbiol., Rutgers, New Brunswick N.J. U.S.A.) B.M.Stevens

- 855. LOCATION OF ENZYMES IN AZOTOBACTER AGILIS.** S.A.Robrish and A.G.Marr: J. Bact., 1962. 83, 158-168 (Dept. Bact., Univ. California, Davis, Calif., U.S.A.)

If the cells of *A. agilis* are disrupted by osmotic shock, respiratory enzymes and the compound characteristic of cell wall and cytoplasmic membranes are recovered almost completely in large particles. Tb^e large particles obtained by osmotic shock were found by E.M. to consist of cell wall, cell membrane and an internal membrane, appearing as either vesicles or tubules in section. These envelopes are free of all the sol. cytoplasmic material and are essentially free of ribosomes. Small particles obtained by osmotic shock ^ are ribosomes; small particles obtained by sonic oscitf* tion consist of both ribosomes and amorphous material. Presumably fragments of the envelope. C.Tootu¹¹

- 856. ENZYMIC HYDRATION OF cis-9,10-EPOXYOCTA DECANOIC ACID BY CELL-FREE EXTRACTS OF GERMINATING FLAX RUST UREDOSPORES.**

G.R.Hartmann and D.S.Freer: Biochem. biophys. R^s Comm., 1963, 10, 366 (Dept. Agric. Biochem., North Dakota Univ., Fargo, N.Dak.. U.S.A.)

An enzyme from flax rust uredospores which catalyses tn^b hydra tion of cis-9,10-epoxyoctadecanoic acid to threo* 9,10-dihydroxyoctadecanoic acid has been identified a^c partially purified. B.Ketterf

- 857. y. 6-DIOXOVALERATE AMINOTRANSFERASE ACTIVITY IN RHODOPSEUDOMONAS SPHEROIDES.**

A.Neuberger and J.M.Turner: Biochim. biophys. AC^d, 1963, 67, 342-345 (Dept. Chem. Pathol., St. Mary Hosp. Med. Sch., London, England) The transaminase from *R. sphaeroides* was partially purified and substrate specificity and other prop. were examined. Prelim, comm.

B.M.Steven*

- 858. ACTIVATION OF ISOCITRATE LYASE AND TRIOSEPHOSPHATE DEHYDROGENASE IN AZOTOBACTER VINELANDE EXTRACTS.** I.R.Kennedy and M.J.Dilworth: Biochim. biophys. Acta. 1963, 67, 226-239 (Inst. Agric., Univ. Western Australia, Nedlands, Australia)

Isocitrate lyase was formed during growth of *A. vinelandii* on acetate. Requirements for Mg and cysteine were confirmed but EDTA P^{10v} n₁₁rf, more efficient than cysteine. The velocity was half n₁₁ at 8-6 x 10-5M threo-D_s-isocitrate. DL-isocitrate cO^{*} up to 8mM did not inhibit. Triosephosphate dehydrogenase was identified in (NH4)2SO4 fractions of crude extracts. EDTA again activated more efficiently than cysteine. Activations by cysteine and EDTA are con¹¹ cluded to be due to binding of inhibitory heavy nieg¹¹ in the assay medium. B.M.Steven

- 859. OXYGEN INHIBITION IN AZOTOBACTER VINE- LANDH. SOME ENZYMES CONCERNED IN ACETATE METABOLISM.** M.J.Dilworth and I.R.Kennedy: Biochim. biophys. Acta. 1963, 67, 240-253 (Inst. Agric., Univ. Western Australia, Nedlands, Australia)

Evidence is presented for the presence of phosphate X^{ans} acetylase and malatesynrJietaseinAuVinslaaa¹¹ M_{SVT} showed a requirement for thiol activation. EDTA s^{un} tuted for cysteine as an activator for acetate Wnasc¹¹ Exposure of crude cell-free extracts to 1 atm. O₂J^{or} & resulted in a loss of 45fo of acetate kinase activity

* Phosphate transacetylase activity. 32% of isocitrate kinase activity and 42% of malate synthetase activity.
B.M.Stevens

¹⁰ NEW ACIDIC COMPOUND FORMED DURING FERMENTATION OF GRAPE JUICE BY DIFFERENT YEASTS. B.Iñigo and F.Bravo-Abad: Rev. esp. Fisiol., 1962, 18, 163-170 (Dept. Ind. Fermentation, Madrid, Spain) 18 yeasts were examined and all were found to produce this substance except C. pulcherrima. The compound has a different Rf value from acids normally present in wines. Ir. absorption suggests that the substance has OH, CH₃, CH₂ and C=O groups,
te (Spanish) K.R.Rees

**. GLYCEROL FORMATION IN BAKERS' YEAST. H.Holzer, W.Bernhardt and S.Schneider: Biochem. 2- 1963, 336, 495-509 (Physiol. Chem. Inst., Univ. Freiburg i. Br., Germany) Under conditions of ¹⁴C steady state fermentation of glucose bakers' yeast was found to form 1 mol. ethanol and 0.2 mol. glycerol for each mol. of glucose used. No accumulation of glycerophosphate was observed. Yeast cells, in contrast to many animal cells, show no initial formation of glycerol because of the low level of d-glycerophosphate dehydrogenase activity present.

(German) L.Cohn
FREE AND BOUND INTRACELLULAR LACTIC ACID IN LACTOBACILLUS CASEI AND OTHER ORGANISMS. M.N.Camien, A.V.Fowler and M.S.Dunn: J. biol. Chem., 1963, 238, 1167-1174 (Chem. Lab., Univ. California, Los Angeles, Calif., U.S.A.) L. casei contains intracellular free L-lactic acid and D-lactic acid as a chem. bound constituent of insol. cellular material. Bound D-lactic acid is also present in Mycobacterium ranae and probably occurs in cells of other bacteria including higher animals. Labelled D-lactate appreciably incorporated into the bound D-lactic acid of V. casei. The relation of the results to occurrence of TTT-hydroxy acids as chem. bound cellular products of L. casei. J.N.Ashley

863. METABOLISM OF CITRATE BY PROTEUS VULGARIS. A.Kasamaki, S.Sasaki and S.Usami: J. Biochem., Tokyo 1963, 53, 89-94 (Dept. Bot., Fac. Sci., Hokkai Univ. Sapporo, Japan) Sonic extracts produced Slywyllic acid as the only keto acid from citrate by ¹⁴C-labeled aerobically or anaerobically. OKetoglutarate Qxi fated only when NADP was added. The extract contained citrate, isocitrate, succinate and NADPH₂. Isocitrate dehydrogenase was demonstrated. NADP accelerates citrate kinase. Malonate and cyanide inhibit the inhibition. NADPH₂ dehydrogenation and oxidation were inhibited by cyanide but the dehydrogenation was inhibited by promazine or benzoate. B.M.Stevens

864. INTERMEDIARY METABOLISM OF DIPLOCOCCUS GROWTH IN PHIL. U.S. II. ENZYMES OF A ACETATE FERMENTING SYSTEM. S.M.Klein and R.D.Sagers: J. Act., 1962, 83, 121-126 (Dept. Bact., Brigham Young Univ., Provo, Utah, U.S.A.) Glycine is cleaved to one carbon unit by cell free extracts of D. glycinophilus, the a-C being transferred to acetyl at the oxidation level of formaldehyde. Mitochondria ¹⁴C unit is condensed with a second glycine at the serine which is then deaminated to pyruvate; the latter compound reacting with ADP elding acetate, this being the main energy Action in the fermentation. The sp. activities

of the various enzyme systems are as follows (pM substrate acted upon/hr./mg. protein) serine aldolase 9-12; serine dehydrase 180; pyruvate oxidising and acyl generating system 98; phosphotransacetylase 96; acetokinase 3600. If coupled together these enzymes could account for the fermentation of glycine to acetate, CO₂ and NH₃ and could account for the conversion of 2-labelled glycine to doubly-labelled acetate as previously demonstrated.

C.Toothill

865. HYDROLYSIS OF CHOLINE-O-SULPHATE BY CELL-FREE EXTRACTS FROM PENICILLIUM. I.H.Segel and M.J.Johnson: Biochim. biophys. Acta, 1963, 69, 433-434 (Dept. Biochem., Univ. Wisconsin, Madison, Wis., U.S.A.) Prelim. comm. B.M.Stevens

866. OXIDATIVE PHOSPHORYLATION COUPLED WITH NITRATE RESPIRATION WITH CELL FREE EXTRACT OF PSEUDOMONAS DENITRIFICANS. T.Ohnishi: J. Biochem., Tokyo, 1963, 53, 71-79 (Biol. Inst., Fac. Sci., Nagoya Univ., Nagoya, Japan) A sonic extract from P. denitrificans showed ATP formation coupled with NO₃⁻ respiration. The ratio of the difference in the amount of ³²P incorporation into org. compounds with and without NaNO₃ to the amount of NO₃⁻ reduced [P/2e] was 0.25 with succinate as electron donor. When NADH₂ lactate or formate replaced succinate P/2e was lower. Effects of medium tonicity and Mg, ADP and inorg. phosphate concn. were examined. An apparent apyrase activity was found which responded like the phosphorylating activity to changes in the medium.

B.M.Stevens

867. UTILISATION OF PHENOL BY CERTAIN BACTERIA AS SOURCE OF CARBON. M.Raynaud and P.Daste: C.R. Soc. Biol., Paris, 1962, 156, 1489-1493 (Lab. Microbiol., Fac. Sci., Poitiers, France) Pseudomonas resinovorans was capable of utilising phenol as a source of carbon. The rate of growth in phenol was similar to that in glucose or succinic acid. Max. growth was obtained with concn. of phenol of 10⁻⁴ g./ml. At higher doses the phenol became toxic with death of the cells in concn. of 2 x 10⁻³ g./ml. Flavobacterium resinovorum was incapable of utilising phenol.

(French) M.A.Price

868. REDUCTION OF PHENAZINE-N-OXIDES BY MICROBIAL CELLS. Tchan Gi Bak and LYoshioka: J. Biochem., Tokyo, 1963, 53, 111-116 (Pharmaceut. Fac., Osaka Univ., Osaka, Japan) E. coli and other micro-organisms reduced phenazine 5,10-di-N-oxide to phenazine. The reduction was more rapid anaerobically than aerobically. Aerobically, H donors stimulated. E. coli cells also reduced hydroxy- and 2-methoxyphenazine di-N-oxides and phenazine 5-N-oxide. Effects of pH and several inhibitors were examined. B.M.Stevens

869. BIOCHEMICAL CHANGES DURING ACETATE DEPRIVATION AND REPLETION IN EUGLENA. JJ.Blum and D.E.Buetow: Exp. Cell Res., 1963, 29, 407-421 (Gerontol. Branch, Natl. Heart Inst., Natl. Inst. Hlth., Bethesda, Md., U.S.A.)

In a streptomycin-bleached strain of E. gracilis, the paramylon content decreased by 90% during the 13-day acetate starvation, the RNA by 55%, the protein by 45%, and the DNA by about 30%. The decrease in DNA is attributed to the failure of the starved cells to resynthesise DNA after their last division. Following the return of the starved cells to a complete medium, there was a lag period of growth, after which log. growth resumed with a

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normal generation time. The data suggested the operation of control mechanisms allowing the cells to utilise cytoplasmic components selectively for survival. K.Jones

870. CAROTENOID PRODUCTION BY STREPTOMYCIN-BLEACHED EUGLENA. R.B.Smillie and N.Rigopoulos: *J. Protozool.*, 1962, 9, 149-151 (Dept. Biol., Brookhaven Nat. Lab., Upton, N.Y., U.S.A.) Streptomycin-bleached *E. gracilis*, strain Z, was cultivated under conditions which yielded good growth rates and high cell densities. During cell division there was little production of carotenoid but after the cessation of cell division, the carotenoid content of the cells rapidly increased. During carotenoid synthesis the cell no. remained constant while the packed cell vol. decreased. R.J.Walker

871. PECTOLYTIC ACTIVITY OF MICRO-ORGANISMS ISOLATED FROM SPOILAGE OF CANNED JACK FRUIT [ARTOCARPUS INTEGRIFOLIA LINN.] G.Rangaswami and R.Swaminathan: *Indian J. Microbiol.*, 1962, 2, 45-50 (Microbiol. Lab., Dept. Agric., Annamalai Univ., Annamalainagar, Madras St., India) Spp. of *Aspergillus* and *Streptomyces* isolated from the spoilage of canned fruit produced protopectinase, polygalacturonase and pectin methyl esterase in culture. G.M.Lewis

872. METABOLISM OF ISOXANTHOPTERIN BY ALCALI-GENES FAECALIS. W.S.McNutt, jun.: *J. biol. Chem.*, 1963, 238, 1116-1121 (Dept. Pharmacol., Tufts Univ. Sch. Med., Boston, Mass., U.S.A.) *A. faecalis*, isolated in pure culture from soil, utilises the naturally occurring pteridine, iso-xanthopterin, as sole source of C and N. 7-Oxylumazine, tetraoxyppteridine, and xanthine-8-carboxylic acid are probably intermediates in metabolism of this pteridine. The enzymically catalysed ring contraction of tetraoxyppteridine to give xanthine-8-carboxylic acid involves cleavage of the bond between positions 7 and 8. C-6 of the tetraoxyppteridine becomes C-8 of the purine ring and C-7 of the pteridine appears as the carboxylic acid. Xanthine-8-carboxylic acid is not an effective precursor of riboflavin in *Eremothecium ashbyii*. J.N.Ashley

873. STRUCTURE OF AMIDOMYCIN AND VALINO-MYCIN [CYCLIC DEPSIPEPTIDES]. M.M.Shemyakin, E.I.Vinogradova, M.Yu.Feigina and N.A.Aldanova: *Tetrahedron Letters*, 1963, 6, 351-356 (Inst. Chem. Natural Products, U.S.S.R. Acad. Sci., Moscow, U.S.S.R.) Letter. I.A.B.S.

874. STRUCTURE OF ENNIATINS [FROM FUSARIUM STRAINS] AND RELATED ANTIBIOTICS. M.M.Shemyakin, Yu.A.Ovchinnikov, V.T.Ivanov and A.A.Kiryushkin: *Tetrahedron*, 1963, 19, 581-591 (Inst. Chem. Natural Prod., U.S.S.R. Acad. Sci., Moscow, U.S.S.R.) I.A.B.S.

875. BIOSYNTHESIS OF 7-CHLORO-6-DEMETHYL-TETRACYCLINE [BY STREPTOMYCES AUREOFACIENS ATCC 13900] IN PRESENCE OF AMINOPTERIN AND ETHIONINE. S.L.Neidleman, E.Bienstock and R.E. Bennett: *Biochim. biophys. Acta*, 1963, 71, 199-201 (Squibb Inst. for Med. Res., New Brunswick, N.J., U.S.A.) B.M.Stevens

876. BIOCHEMICAL STUDIES ON STREPTOMYCES AVREOFACIENS. II. IONIC INFLUENCES ON FORMATION OF CHLORTETRACYCLINE. MJárai and J.Kollár: IE. ROLE OF ORGANIC CHLORINE COMPOUNDS IN

BIOSYNTHESIS OF CHLORTETRACYCLINE. J.Kollár and MJárai: *Acta microbiol. Acad. Sci. hung.*, 1962, 9, 145-148, 149-156 (Microbiol. Labor. Dept. Antibiotics, Chinoim Pharm. Works, Budapest, Hungary)

II. The inhibitory effect of some S containing compounds (e.g. 2-mercaptopbenzthiazole at a concn. of Q'2mM) on the biochem. chlorination of *S. aureofaciens* could be reversed by Cu and Ag ions. In the presence of CuBr₂ &* formation of bromtetracycline was enhanced. These refl to a sp. metabolic role of Cu in biochem. halogenation,

III. Agitated culture of the organism was able to utilise the chlorine of chlorinated fatty acids for the formation of chlortetracycline. Bromide as well as sorn heterocyclic compounds inhib. this reaction. The utilisa^htion of org. and inorg. chloro compounds presumably have a common reaction pattern. S.Iga^h

877. SULPHYDRYL GROUPS ESSENTIAL FOR PENICILLINASE ACTIVITY OF AEROBACTER CLOACAE. J.T.Smith: *Nature*, Lond., 1963, 197, 900-901 (Pf Bacteriol., Guy's Hosp. Med. Sch., London, England) The penicillinase of *A. cloacae* was inhib. strongly by β -chloromercuribenzoate, less by N-ethylmaleimide and least by iodoacetamide. Reactivation of the enzyme with thiol compounds occurred most readily with 2"chlor-mercuribenzoate inhibn. The enzyme was resistant to oxidation with ferricyanide and (>)-iodosobenzoate. The data suggest that sulphhydryl groups are essential for activity of this penicillinase. G.M.Lew^{ew}

878. STUDIES IN BIOSYNTHESIS OF FUNGAL METABOLITES. V. UTILISATION OF SULPHUR-CONTAINING AMINO ACIDS AS PENICILLIN SIDE-CHAIN PRECURSORS. E.Albu and R.Thomas: *Biochem. J.*, 1963, 37, 648-652 (Squibb Inst. Med. Res., New Brunswick, N.J., U.S.A.) During investigations of the possible incorporation of amino acids as penicillin side-chain precursors by *Penicillium chrysogenum*, a new biol. active component was observed on bioautographic examination of the culture filtrate after methionine feeding expt. Apparently homologously related penicillins were similarly formed from ethionine, S-methyl cysteine and S-ethylcysteine. S-ethylcysteine was the most effective precursor and gave rise to a penicillin which was readily purified and shown to be the N-ethyl-D,L-α-acetyl deriv. of 6-aminopenicillanic acid. Consequently, methionine and its homologues appeared to be incorporated only after oxidative decarboxylation as in the formation of benzylpenicillin from phenylalanine. This was confirmed by demonstrating chromatographically the formation of the same series of penicillins by direct feeding of the corresponding intermediate mercapto-a⁺ mercaptotaurine.

879. BIOCHEMICAL STUDIES ON STREPTOLYSIN S FORMED IN PRESENCE OF YEAST RNA. I. PURIFICATION AND SOME PROPERTIES OF THE TOXIN. J.Koyama and F.Egami: *J. Biochem.*, Tokyo, 1963, 53, 147-154 (Dept. Biophys. Biochem., Fac. Sci. Univ., Tokyo, Japan) Streptolysin S was purified from supernatants of resting cell suspensions of *Streptococcus pyogenes* in a medium with oligoribonucleotides from RNase I core of yeast RNA. By successive zymography and DEAE-cellulose column chromatography toxin with 100000 haemolytic units/O.D. unit at 260 mji was reproducibly obtained. This prep. contained nucleotides and amino acids. B.M.Stevens

880. SELECTIVE PENETRATION OF AMMONIA AND ALKYLAMINES INTO STREPTOCOCCUS FAECALIS

AND THEIR EFFECT ON GLYCOLYSIS. M.Zarlengo and A.Abrams: *Biochim. biophys. Acta.* 1963, 71, 55-77 (Dept. Biochem., Univ. Colorado Sch. Med., Denver, Colo., U.S.A.) Selective penetration of free base into cells of *S. faecalis* suspended in NH₄Cl, Jethylamine chloride, dimethylamine chloride or triethylamine chloride soln. at pH 7.0 or below, measured by automatic continuous titration of H⁺. Appearance was practically instantaneous. Selective penetration of NH₃ was freely reversible and produced NH₄⁺ accumulation. An equation describing the relation between amine uptake and extracellular concn. of const. pH permitted estimation of intracellular pH and following free amine penetration. The intracellular pH of stationary phase cells was estimated at approx. 5.0. Retarded glycolysis in 'aged' cells was noted immediately following selective penetration of trimethyl or alkylamines at const. extracellular pH. K and Na restored glycolysis more slowly. K and Na elicited a efflux at const. extracellular pH from non-glycolysing cells. B.M.Stevens

INCORPORATION OF RADIOACTIVE PHOSPHORUS IN LEUCOCYTE DURING EXTRUSION OF PROTEIN INDUCED BY STAPHYLOCOCCAL LEUCOCIDIN. A.M.Woodin and A.A.Wieneke: *Biochem. J.*, 1963, 90, 480-487 (Dunn Sch. Path., Univ., Oxford, England) When polymorphonuclear w.b.c. are incubated with leucocidin there is a stimulated incorporation of ³²P into several nucleotides of the cell and also leucocidin other acid-sol. components. Treatment with leucocidin does not increase the permeability of the cell to orthophosphate and in the presence of ³²P does not increase the radioactivity of the orthophosphate of the ³²P inhibitors of glycolysis reduce the incorporation of tritiated lipids and nucleotides of the leucocidin-exposed cell but do not reduce the amount of protein denuded from the cell. The incorporation of [¹⁴C]-isotope into nucleotides and of [¹⁴C]acetate into lipids and proteins increased when ³²P was treated with leucocidin, but the rate of loss of ¹⁴C radioactivity from nucleotides in ³²P labelled with ³²P and transferred to a medium of leucocidin activity is decreased in the presence of leucocidin. It is suggested that the stimulated incorporation of ³²P into leucocidin-treated w.b.c. does not result from increased turnover of any compound of the cell but from direct utilisation at the cell surface of ³²P orthophosphate.

PENETRATION OF CALCIUM BY POLYMORPHONUCLEAR LEUCOCYTE TREATED WITH STAPHYLOCOCCAL LEUCOCIDIN AND ITS SIGNIFICANCE IN EXTRUSION OF PROTEIN. A.M.Woodin and A.A. Wieneke: *Biochem. J.*, 1963, 87, 487-495 (Dunn Sch. Path., Univ., Oxford, England) After treatment with leucocidin there is an accumulation of Ca in polymorphonuclear w.b.c. and a loss of Mg. The decrease in ⁴⁵K protein from ⁴⁵K granules of the leucocidin-treated cell is inhibited and becomes simultaneous to result from an increased availability of ⁴⁵K to some soluble components of the cytoplasm. When Ca is omitted from the medium the ⁴⁵K protein from ⁴⁵K granules of the leucocidin-treated cell is inhibited and becomes simultaneous to the release of protein can be induced by adding ⁴⁵K. If ⁴⁵K-free medium is used the amount released is increased. This decreased efficiency of Ca to ST is evident if certain nucleoside phosphates are present in the medium. The extrusion of protein from the

granules of the leucocidin-treated w.b.c. is accomplished by reactions that do not cause hydrolysis of ATP.

MORPHOLOGICAL CHANGES ASSOCIATED WITH EXTRUSION OF PROTEIN INDUCED IN POLYMORPHONUCLEAR LEUCOCYTE BY STAPHYLOCOCCAL LEUCOCIDIN. A.M.Woodin, J.E.French and V.T. Marchesi: *Biochem. J.*, 1963, 87, 567-571 (Dunn Sch. Path., Univ., Oxford, England) W.b.c. treated with leucocidin have been examined with the light-microscope and E.M. When Ca is present in the medium the cells lose their granules and vesicles can be seen in the cytoplasm and in the medium. Some of the vesicles are fused to the surface of the cell. In the absence of Ca the random brownian motion of the granules persists for at least 30 min. There is no degranulation and vesicles cannot be observed. When Ca is added to the leucocidin-treated cells after incubation in Ca-free medium the brownian motion stops, some of the granules disappear and vesicles can be seen in the cytoplasm. The sp. activities of some enzymes in the granules and the vesicles have been measured. It is suggested that the vesicles are produced from granules, some of which have discharged part of their contents. The conversion of the granules into vesicles may be simult. with the fusion of the granule and the cell surface. It is suggested that the release of protein from the vesicles follows rupture of the membrane at the site of fusion, or occurs by a permeability change at the site of fusion or by both processes.

IMMUNOLOGY OF TUBERCULOSIS. I. FRACTIONATION OF TUBERCULIN PARENT SUBSTANCE. H.Micke: Z. Immun.-Forsch., 1962, 124, 224-229 (Paiil-Ehrlich-Inst., Frankfurt a.M., Germany) Human tubercle bacilli were grown on a synthetic liquid medium and the culture fluid was then fractionated by paper electrophoresis. Four protein fractions were isolated, together with 2 carbohydrate fractions, various nucleic acid, lipid and enzyme components.

(German) D.P.Winstanley
PHYSICAL INVESTIGATIONS OF BEHAVIOUR OF BACTERIAL SURFACES. VI. CHEMICAL MODIFICATION OF SURFACE COMPONENTS. VII. RELATIONSHIP BETWEEN C-POTENTIAL AND SURFACE CHARGE AS INDICATED BY MICROELECTROPHORESIS AND SURFACE CONDUCTANCE MEASUREMENTS. G.J.Gittens and A.M.James. VIII. CAPSULAR MATERIAL OF STREPTOCOCCUS PYOGENES. M.J.Hill. A.M.James and W.R.Maxted: *Biochim. biophys. Acta*, 1963, 66, 237-249, 250-263, 264-274 (Dept. Chem., Chelsea Coll. Sci. and Technol., London, England)

VI. The electrophoretic mobility of suspensions of *Aerobacter aerogenes* cells after treatment with JD-toluene-sulphonylchloride, fluoro-2,4-dinitrobenzene, diazomethane, methanolic HCl, dicyclohexylcarbodiimide, N-ethyl-5-phenylisoxazolium-3'-sulphonate, ethylene and propylene oxides or ethyleneimine was determined at various pH. Ir. spectra were also determined. No adsorption of ions on to the basic surface matrix occurred. The mobility value was largely determined by the surface ionogenic groups, modified by gegenion association. Diazomethane and methanolic HCl were the most suitable reagents for carboxyl group modification on alcohol stable surfaces. Fluoro-2,4-dinitrobenzene and JD-toluene-sulphonyl chloride were most suitable for NH₂.

VII. The variation of C-potential of normal and ethyleneimine treated *A. aerogenes* cells, determined in different salt and buffer soln., demonstrated the importance of gegenion concn. The variation of surface con-

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ductance was determined at various ionic strengths. The surface conductance correction to the ζ -potential of cells was very important for ionogenic surfaces, particularly at low ionic strengths but was negligible for non-ionogenic surfaces. The surface charge of *Aerogenes* was unaffected by ion adsorption on to the basic matrix in contrast to the marked ion adsorption on to the unionised amino surface of the ethyleneimine treated cells at pH 10 \times 3.

Vm. Repeated washing in phosphate buffer did not affect the electrophoretic mobility of young 'matt' [M] cells but the mobility of young 'glossy' [G] cells was decreased to the value characteristic of old G cells. In a large no. of strains the mobility and the hyaluronic acid content increased to a max. at the end of the log. growth phase and decreased to the original values during the stationary phase. Variation with pH of the mobility of 24 hr. cells of M and G variants of a no. of different types confirmed the presence of NH₂ and carboxyl groups on the surface. The effects of hyaluronidase on the surface were also examined.

B.M.Stevens

886. 2-KETO-3-DEOXY-OCTONATE, CONSTITUENT OF CELL WALL LIPOPOLYSACCHARIDE PREPARATIONS OBTAINED FROM E. COLI. E.C.Heath and M.A.

Ghalambor: Biochem. biophys. Res. Comm., 1963, 10, 340 (Rockham Arthritis Res. Unit and Dept. Bacteriol., Univ. Michigan, Ann Arbor, Mich., U.S.A.)

A compound isolated from O \times 1N H₂SO₄ hydrolysates of lipopolysaccharide obtained from cell wall of *E. coli* has been characterised as 2-keto-3-deoxy-octonate.

B.Ketterer

887. OCCURRENCE OF CELL WALL CONSTITUENTS IN STABLE PROTEUS L FORMS. T.H.Morrison and C.Weibull: Acta path. microbiol. scand., 1962, 55, 475-482 (Central Bact. Lab., Stockholm, Sweden)

Diaminopimelic acid (DAP) and hexosamine levels were studied in 4 stable *Proteus* L form strains and in the small (0.3%) fraction of one strain. Paper chromatographic determinations revealed traces of DAP in strains L VI, L18 and LD52, and about 0.3% in strain L9. The former 3 strains also contained significantly less hexosamine than the fourth.

L.Friedmann

888. CELL WALLS OF PROPIONIBACTERIUM SPECIES: FRACTIONATION AND COMPOSITION. J.Allsop and E.Work: Biochem. J., 1963, 87, 512-519 (Twyford Lab., Twyford Abbey Road, London, England) Cell walls of *P. rubrum* and *P. peterssonii* prep. by conventional methods were very similar in composition. Walls were not digested by lysozyme except after treatment with hot formamide. Density-gradient centrifuging of *P. peterssonii* walls produced 2 homogeneous fractions; both contained mucopeptide components and carbohydrates (glucose and galactose) and one also had protein. Hot formamide extracted most of the carbohydrate and protein and left residues which, though not identical, both contained the mucopeptide amino acids D-glutamic acid, D-alanine, L-alanine, LL-diaminopimelic acid, glycine (in approx. equimolar amounts); also muramic acid, glucosamine and galactosamine. The only free end-amino groups belonged to glycine.

889. COMPARATIVE ACTION OF THREE LYSOZYMES OF DIFFERENT ORIGIN ON TWO GLYCOPEPTIDIC SUBSTRATES ISOLATED FROM MICROCOCCUS LYSODEIKTICUS. P.Jollès: Biochim. biophys. Acta, 1963, 69, 505-510 (Lab. Chim. biol., Fac. Sci., Univ. Paris, France) Two sol. purified glycopeptidic sub-

strates of lysozyme were isolated and analysed. Hen's egg white, duck's egg white and human milk lysozymes hydrolysed both. Duck's egg white lysozyme was the most active enzyme. Chromatographic expt. and amino acid analyses showed this enzyme had a higher content of basic amino acids than the other two.

(French)

B.M.Stevens

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890. BIOSYNTHESIS OF PYRIDINE RING OF NICOTINE FROM SUCCINATE AND ACETATE. T.Griffith and R.U.Byerrum: Biochem. biophys. Res. Comm., 1962, 10, 293 (Dept. Biochem., Michigan State Univ., & Lansing, Mich., U.S.A.) Evidence is submitted supporting a hypothesis that carbons 2 and 3 of the pyridine ring of nicotine are derived from the methylene carbons of succinate.

B.Ketterer

891. BIOGENESIS OF ALKALOIDS. I. INCORPORATE OF [14C]LABELLED COMPOUNDS IN RICININ.

U.Schiedt, G.Boeckh-Behrens and A.M.Delluva.

H. DEGRADATION OF BIOGENETICALLY LABELLED [14C]RICININ.

U.Schiedt and G.Boeckh-Behrens. IE. LYSINE AS PRECURSOR OF CONIINE. U.Schiedt and H.G.Hoss: Hoppe-Seylers Z. physiol. Chem., 1962, 330, 46-57, 58-73, 74-83 (Max-Planck-Institut für Biochem., Munich, Germany) I. Max. incorporation was shown by [14C]formate (2.6%) and min. by [MCMK] (0.1%). A new method for determination of ricinin is described; the min. plant requirement is 10 mg. and reproducible within \pm 10%.

11. A method for the chem. degradation, followed by isolation of the [14C]labelled products is described.

El. The determination of amino acids present in coniine containing plants is described. [14C]Lysine is rapidly incorporated in growing tissues and practical details for a new determination of coniine are also presented.

(German) L.Cornish

892. BIOSYNTHESIS OF NON-TRYPTOPHAN DERIVED PORTION OF AJMALINE AND RELATED ALKALOIDS. E.Leete and S.Ghosal: Tetrahedron Letters, 1962, 1179-1183 (Sch. Chem., Univ. Minnesota, Minneapolis, U.S.A.) Prelim. comm.

L.A.P.S.

893. ALKALOIDS OF VINCA MINOR L. STRUCTURE [QUEBRA CINEALIKE] OF VINCADINE AND VINCAMINOREINE. J.Mokrý, L.Komplík, L.Dúbravková and P.Sefcovic: Tetrahedron Letters, 1962, 25, 1185-1188 (Dept. Alkaloids, Inst. Chem., Slovak Acad. Sci., Bratislava, Czechoslovakia) Letter.

L.A.B.

894. SECURININE AND ALLOSECURININE [ALKALOID FROM SECURINEGA STJFFRUTICOSA]. I.Satoda, M.Murayama, J.Tsuji and E.Yoshii: Tetrahedron Letters, 1962, 25, 1199-1206 (Res. Lab., NiPPA Shinyaku Co., Kyoto, Japan) Letter.

KAI

895. BIOSYNTHESIS OF CHANOCLAVIN ERGOT ALKALOID. K.Mothes and K.Winkler: Tetrahedron Letters, 1962, 26, 12448-12448 (Institut für Biologie, Pflanzenbau und Deutschen Akad. der Wissenschaften zu Berlin, n.a.d. Saale, Germany) Letter.

* A#B.S

(German)

- "6. STRUCTURE OF SPORIDESMIN [ALKALOID WITH GLIOTOXIN-LIKE STRUCTURE]: CAUSATIVE AGENT OF FACIAL ECZEMA IN SHEEP. J.Fridrichsons and A.M.Mathieson: Tetrahedron Letters, 1962, 26, 1265-1268 (Div. Chem. Physics, C.S.L.R.O., Melbourne, Australia) Letter. L.A.B.S.
897. STRUCTURE OF TECOMANINE [ALKALOID FROM TECOMA STANS JUSS]. G.Jones, H.M.Jales and W.C.Wildman: Tetrahedron Letters, 1963, 6, 397-400 (Lab. Metabolism, Nat. Heart Inst., Bethesda, Md., U.S.A.) Letter. L.A.B.S.
898. TOMATID-5-EN-3 β -OL FROM SOLANUM DUL-CAMARA L. SYNTHESIS [OF THIS ALKALOID]. J.Schreiber and H.R.Schmid: Tetrahedron Letters, 1963, 6, 329-334 (Deutsche Akad. der Wissenschaften zu Berlin, Germany) Letter. (German) I.A.B.S.
- "9. HUNTERIAMINE, NEW ALKALOID WITH HYPOTENSIVE ACTIVITY FROM HUNTERIA EBURNEA P. \ddagger HON. U.Renner: Hoppe-Seylers Z. physiol. Chem., 1963, 331, 105-108 (Geigy AG, Basle, Switzerland) Chem. Paper. (German) L.Comish
900. NICOTINIC ACID CONTENT OF COFFEE. R.J.F.Smith: future, Lond., 1963, 197, 1321 (Lyons Lab., 1st Ammersmith Rd., London, England) The effects of roasting conditions on nicotinic acid content of coffee far outweigh the influence of cultural conditions on the content in raw beans. G.M.Lewis
901. ALKALOIDS OF SECURINEGA VIROSA PAX ET TAF. I. STRUCTURE OF VIROSECURININE. li¹kano. T.H.Yang and S.Terao: Tetrahedron, 1963, 609-619 (Fac. Pharmacy, Kyoto Univ., Japan). L.A.B.S.
902. LIMASPERMIN. M.Pinar, W.Von Philipsborn, W.¹ttCr^and H.Schmid: Helv. chim. Acta, 1962, 45, 21ⁿ²²^s (Oig.¹chem. Inst. Univ. Zürich, Switzerland) The constitution of the alkaloid limaspermin determined mainly on the evidence of spectra as methoxy-15-hydroxyaspidolimin. & O3 (German) A.D.Smith
- L¹STRUCTURE OF LUNARINE [ALKALOID FROM P¹TIA spp.]. P.Putier, J.LeMen, M.-M.Janot. L¹ndon¹ A.G.Brown and C.S.Wilson: Tetrahedron Far¹ 1963, 293-300 (Lab. Pharm. Galénique, * Pharm., Paris, France) Letter. L.A.B.S.
- CONSTRUCTION OF C/D RING SYSTEM PRESENT FOR hI¹ERPE¹NOID ALKALOIDS ATISINE AND GARRY-19RT¹* R.A.Bell and R.E.Ireland: Tetrahedron Letters, Ann¹ t²⁶⁹ 273 (Dept. Chem., Univ. Michigan, Arbor, Mich., U.S.A.) Letter. L.A.B.S.
- DITE¹NE ALKALOIDS: PARTIAL SYNTHESIS OF S₁, 3 IRROM ACONIUM HETEROPHYLLUM. L¹ucther and P.C.Parthasarathy: Tetrahedron GW¹ 1963, 44, 205-208 (Dept. Chem., Univ. r⁸¹a, Athens, Ga., U.S.A.) Letter. L.A.B.S.
- ERGOT-TYPE ALKALOIDS IN VEGETATIVE TISSUE OF RIVEA COR¹YMBOSA (L.) HALLF. W.A.Taber, R.A. Heacock and M.E.Mahon: Phytochemistry, 1963, 2, 93-101 (Prairie Reg. Lab., Nat. Res. Council Canada, Saskatoon, Sask. - Canada) Ergot alkaloids, ergine and isoergine, are present in leaves and stem, but not in the root of greenhouse-grown R. coiymbosa. The amount per plant increased with time, reaching max. of 0*027 and 0*012% dry wt. in the leaf and stem respectively after approx. 9 months' growth. B.H.Davies
- CLAVINE AND LYSERGIC ACID ALKALOIDS IN VARIETIES OF MORNING GLORY. W.A.Taber, L.C. Vining and R.A.Heacock: Phytochemistry, 1963, 2, 65-73 (Prairie Reg. Lab., Nat. Res. Council of Canada, Saskatoon, Sask., Canada) The seeds of a no. of commercially available varieties of Morning Glory (*Ipomoea* and *Convolvulus* sp.) have been found to contain clavine and lysergic acid alkaloids. Using thin-layer and paper chromatography, ergine, isoergine, ergometrine, ergometrinene, elymoclavine, penniclavine and chanodavine have been tentatively identified. Not all varieties of seed tested contained these alkaloids; one which contained a substantial amount also contained alkaloid in the leaves and stem of the mature plant. B.H.Davies
- KEY POINTS IN MASS SPECTRA OF ALKALOIDS. I¹AND n. G.Spiteller and M.Spiteller-Friedmann: Tetrahedron Letters, 1963, 3, 147-152, 153-158 (Inst. Org. Chem. der Univ. Wien, Austria) Letter. (German) L.A.B.S.
- CONFIGURATION OF CARBOMETHOXY GROUP IN VOBASINE, TABERNAEMONTAMINE AND DREG-AMINE [2-ACYLINDOLE ALKALOIDS]. M.P.Cava, S.K.Talapatra, J.A.Weisbach, B.Douglas and G.O. Dudek: Tetrahedron Letters, 1963, 2, 53-55 (Chem. Dept., Ohio State Univ., Columbus, Ohio, U.S.A.) Letter. L.A.B.S.
- ALKALOIDS OF AUSTRALIAN RUTACEAE: HALFORDIA SCLEROXYLA. I. STRUCTURE [OXAZOLE] OF N-METHYLHALFORDINIUM CHLORIDE. W.D.Crow and J.H.Hodgkin: Tetrahedron Letters, 1963, 2, 85-89 (Chem. Dept., Australian Nat. Univ., Canberra, A.C.T., Australia) Letter. L.A.B.S.
- STRUCTURE OF ISOPILOCEREINE [ALKALOID DERIVATIVE FROM LOPHOCEREUS SCHOTTII]. M.Tomita, T.Kikuchi, K.Bessho and Y.Inubushi: Tetrahedron Letters, 1963, 3, 127-130 (Fac. Pharm., Kyoto Univ., Japan) Letter. L.A.B.S.*
- CONVENIENT SEPARATION OF ALKALOID MIXTURES BY PARTITION CHROMATOGRAPHY, USING INDICATOR IN STATIONARY PHASE. K.S.Brown, jun. and S.M.Kupchan: J. Chromatography, 1962, 9, 71-80 (Dept. Chem. and Pharm. Chem., Univ. Wisconsin, Madison, Wis., U.S.A.) A method is described for the separation of the alkaloids of Buxus sempervirens L. on a Kieselguhr partition column with an indicator in the stationary phase. The separate bands are detected visually, collected and in many cases crystallised directly. Solvent systems are described for the separation of mixtures of bisbenzyl-isoquinoline alkaloids, indole alkaloids, veratrum ester alkaloids and a natural mixture of cevadine and veratridine. P.D.Dawkins
- MITRAPHYLLINE AND POSSIBLE EXISTENCE OF ITS OPTICAL ANTIPODE. N.Finch and W.L.Taylor: Tetrahedron Letters, 1963, 3, 167-168 (Res. Dept., CIBA Pharm. Co., Summit, N.J., U.S.A.) (-)-Mitraphylline may be obtained from ajmalicine, (+)-Mitraphylline probably does not exist in nature. After purification by thin-layer chromatography, measurements of optical rotation in dioxan revealed the presence only of

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- the (-)-form in a supposed sample of (+)-mitraphylline. I.A.B.S.
914. FREE RADICAL ADDITIONS TO SQUALENE. R.Breslow, E.Barrett and E.Mohacs: Tetrahedron Letters, 1962, 25, 1207-1211 (Dept. Chem., Columbia Univ., New York, U.S.A.) The cyclisation of squalene to a no. of other triterpenes probably involves free radical processes. I.A.B.S.
915. MASS SPECTROMETRY, TRITERPENOIDS: STRUCTURE ASSIGNMENT TO FRIEDELAN-Y-ONE (Y-AL) [FROM SIPHONODON AUSTRALE] AND DERIVATIVES. J.S.Shannon, C.G.Macdonald and J.L.Courtney: Tetrahedron Letters, 1963, 4, 173-179 (Div. Coal Res., C.S.I.R.O.. Chatswood, N.S.W., Australia) Letter. LA.B.S.
916. SYNTHESIS OF CADINANES, SYNTHETIC CORRELATION OF ABSOLUTE CONFIGURATION BETWEEN THE CADINANE SESQUITERPENES AND MONOTERPENES OF THE \wedge -MENTHANE SERIES. M.D.Soffer, G.E.Ghahay, O.Korman and M.B.Adams: Tetrahedron Letters, 1963, 6, 389-392 (Dept. Chem., Smith Coll., Northampton, Mass., U.S.A.) Letter. I.A.B.S.
917. HE ART WOOD CONSTITUENTS OF SCIADOPITYS VERTICILLATA SIEB. ET ZUCC. I. CONSTITUTION OF SCIADIN. M.Sumimoto: Tetrahedron, 1963, 19, 643-655 (Fac. Agric., Kagoshima Univ., Japan) Investigations on the constitution of sciadin, a new diterpenoid bitter principle, are reported, and the isolation of 4 new diterpenoid ester is described. I.A.B.S.
918. SESQUITERPENOID. III CONSTITUTION AND STEREOCHEMISTRY OF VALDIVIOLIDE. FUEGIN, WINTERIN AND FUTRONOLIDE [ISOLATED FROM DRIMYS SPECIES]. H.H.Appel, R.P.M.Bond and K.H.Overton: Tetrahedron, 1963, 19, 635-641 (Univ. Tecnica Federico Santa Maria, Valparaiso, Chile). LA.B.S.
919. LONGICYCLENE, FIRST TETRACYCLIC SESQUITERPENE [FROM PINUS LONGIFOLIA. ROXB.]. U.Ramdas Nayak and S.Dev: Tetrahedron Letters, 1963, 4, 243-246 (Nat. Chem. Lab., Poona, India) Letter. I.A.B.S.
920. NATURE OF SESQUITERPENIC HYDROCARBON CALARENE AND STRUCTURE OF J-GURJUNENE. J.Vrkoc, J.Krepinský, V.Herout and F.Sorm: Tetrahedron Letters, 1963, 4, 225-229 (Inst. Org. Chem. and Biochem., Acad. Sci., Prague, Czechoslovakia) Letter. LA.B.S.
921. NATURAL PRODUCTS [SESQUITERPENE LACTONES] FROM ACHILLEA LANULOSA. E.H.White and R.E.K.Winter: Tetrahedron Letters, 1963, 3, 137-140 (Dept. Chem., Johns Hopkins Univ., Baltimore, Md., U.S.A.) Letter. I.A.B.S.
922. CAROTENOID PIGMENTS OF NEMATODE-TRAPPING HYPHOMYCETE ARTHROBOTRYS OLIGOSPORA (FRES.). L.R.G.Valadon and R.C.Cooke: Phytochemistry, 1963, 2, 103-105 (Dept. Bot., Royal Holloway Coll., Univ. London, Englefield Green, Surrey, England) β -Carotene is the major carotenoid of A. oligospora; γ -carotene, torulene and neurosporoxanthin are also present. It is suggested that

the pigment characteristics of the nematophagous series may be an aid in elucidating their taxonomic affinities.

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923. CAROTENOID PIGMENTS OF PROTOMYCES INUNDATUS DANGEARD. L.R.G.Valadon: Phytochemistry, 1963, 2, 71-73 (Dept. Bot., Royal Holloway Coll., Univ. London, Englefield Green, Surrey, England) P. inundatus contains a-, β - and γ -carotene, with β -carotene predominating. It is suggested that if carotenoid contents of fungi are to be used as a taxonomic tool, absorption spectra of the total extracts give only limited information; one must know all the carotenoids present using a well defined medium under strict cultural conditions. B.H.Davi#

924. STEREOCHEMISTRY OF PANAXADIOL. S.Shibata*, O.Tanaka, M.Nagai and T.Ishii: Tetrahedron Letter 1962, 26, 1239-1242 (Fac. Pharm. Sci., Univ. Tokyo, Japan) Panaxadiol, a sapogenin of Ginseng roots (Panax ginseng C,A, Mey), is the first example of naturally occurring β -C/D 13 (X-H tetracyclic triterpenoid). I.A.B.S.

925. CARDIAC GLYCOSIDES [USCHARIDIN, CALO" TROPIN, CALOTOXIN, USCHARIN AND VARUS-CHARIN] OF CALOTROPIS PROCERA. D.H.G.Croft, R.F.Curtis, C.H.Hassall and T.L.Jones: Tetrahedron Letters, 1963, 2, 63-67 (Dept. Chem., Univ. Coll. Swansea, Wales) Letter. I.A.B.*

926. CONSTITUTION OF ANTIARIGENIN AND ANTIOSIDE. C.Juslen, W.Wehrli and T.Reichstein: Helv. chim. Acta. 1962, 45, 2285-2296 (Inst. Org. Chem., Univ. Basel, Switzerland) The conversion of β -antiarin to tetra-O-acetyl-antiroside demonstrated the structural relationship between the 2 compounds. The side is des-aldehyde-12-O-acetyl-j8-antiarin. The relationship between di-O-acetyl-antiogenin and di-ogenin was shown by chem. transformation, thus proving the structure of the steroid nucleus and the distribution of all O-atoms. The Q-is-configuration on C3 and C5 demonstrated by formation of a cyclic sulphite. (German) A.V.Sf

927. SAPONINS OF SPIROSTANOL SERIES. K. CONSTITUTION OF DIGITONINS. R.Tschesche and G.Wulff: Tetrahedron, 1963, 19, 621-634 (Org. Chem. Inst. Univ.. Bonn. Germany). I.A.B.*

928. [STRUCTURE OF] CYANOMACLURIN. P.Madhava Nair and K.Venkataraman: Tetrahedron Letters, 1963, 5, 317-320 (Nat. Chem. Lab., Poona, India) Letter. A.f. \$, LA.*

929. STRUCTURE [IRIDOID] OF ASPERULOSIDE. L.H.Briggs, B.F.Cain, P.W.Le Quesne and J.N.S. hoolerty: Tetrahedron Letters, 1963, 2, 69-74 (Dept. Chem., Univ. Auckland, New Zealand) Letter. I.A.B.*

930. CHEMICAL CONSTITUENTS OF AUSTRALIAN FLINDERSIA spp. XVI. CONSTITUENTS OF W.S.D. of FLINDERSIA LAEVICARPA C.T.WHITE AND FRANCIS. G.J.W.Breen, E.Ritchie and W.C.Taylor: Aust. J. Chem.. 1962, 15, 819-823 (Dept. Org. Chem., Univ. Sydney, Australia) Light petroleum, β -carotene and methanol extraction of the milled wood of F. laevicarpa, and subsequent chem. treatment yielded skimmianine, hesperidin, β -sitosterol, and two alcohols. These were identified as 1,5-diphenylpentan-3-ol and (~) threo-1,5-diphenylpentan-1,3-diol using i.r., chem. degradation and synthesis. D.G.-U. ^

^{931.} TISSUE HYDROXY-CINNAMIC ACIDS AND SOIL MOISTURE STRESS. W.A.Gortner: Nature, Lond., 1963, 197, 1316-1317 (Pineapple Res. Inst. of Hawaii, Honolulu, Hawaii) Evidence is presented at the amounts of hydroxy-cinnamic acid deriv. present in Pineapple stem tissue is inversely related to the soil moisture content. As these compounds are involved in metabolism of IAA, this observation has implications in connection with growth effects and flowering that may be influenced by moisture stress. G.M.Lewis

^{932.} PLANT POLYPHENOLS. K. GLYCOSIDIC PATTERN OF ANTHOCYANIN PIGMENTS. J.B.Harborne: Phytochemistry, 1963, 2, 85-97 (John Innes Inst., Bayford, Hertford, England) The anthocyanins of colour varieties of *Lathyrus odoratus* and *Streptocarpus* have been identified, and the sugars of some 40 other anthocyanins determined. Twenty-two new anthocyanins have been isolated, including the first representatives of the following glycosidic classes: 3-rhamnosides, 3-(xylosylgalactosides), 3-glucoside-3-rhamnosides, 5-glucoside-3-sophorosides, 5-phloroside-7-glucosides and 5-glucoside-3-sambubiosides. Each of the 22 unusual disaccharides sophorose and sequestrin occurred combined in the anthocyanins of Plant genera. Structures previously proposed for pigments of *Matthiola incana* flowers and of red cabbage have been revised. This work brings the no. of known classes of anthocyanins to 17. B.H.Davies

^{933.} TOBACCO POLYPHENOLS. I. BIOSYNTHESIS OF GLUCOSIDES AND O-GLUCOSE ESTERS OF 2'-HYDROXYCINNAMIC ACIDS. V.C.Runeckles and J.Woolrich: Phytochemistry, 1963, 2, 1-6 (Imp. Tobacco Co. of Canada Ltd., Montreal, Quebec, Canada) Leaf discs of *Nicotiana tabacum* var. Delcrest metabolise 2'-coumaric acid and ferulic acid with the formation of the corresponding glucose esters and O- β -D-glucosides. In 40 hr. more glucoside accumulates than glucose ester, when either acid is supplied. B.H.Davies

^{934.} COMMON ACIDIC CONSTITUENT OF WESTERN AUSTRALIAN RUTACEAE. A.M.Duffield, P.R.Jefferies and P.H.Lucich: Aust. J. Chem., 1962, 15, 812-818 (Dept. of Pt. Chem., Univ. Western Australia, Nedlands, Australia) Ether extraction and subsequent chem. treatment of dried tissue of *Philothea hasselli* and *Eriostemon spp.* yielded eriostoinic acid, C₂₀H₂₄O₅. Its structure has been elucidated using u.v., i.r., and chem. techniques, and shown to contain a benzodipyran skeleton. D.G.Upshall

^{935.} (10-PENTADECENYL)RESORCINOL FROM *VILLEA PYRAMIDALIS*. J.L.Occolowitz and A.S. te Stroet: Aust. J. Chem., 1962, 15, 858-861 (Defence Research Labs., Dept. Supply, Maribymong, Victoria, Australia) Light petroleum extract of pods of *Villea pyramidalis* (family Protoaceae) and subsequent removal of solvent yielded a red, sticky material. U.v., i.r. and analysis indicated its major constituent to be (10-penta-decenyloxy)resorcinol. D.G.Upshall

^{936.} ROLE OF PHENOLASES IN FORMATION OF QUINOID FUNGAL METABOLIC PRODUCTS OF ASPERGILLUS FUMIGATUS FRES. AND PENICILLIUM SPINULOSUM THOM. E.Kilster and B.T.Little: Biochim. biophys. Acta, 1963, 67, 288-294 (Dept. Ind. Microbiol., Univ. Coll., Dublin, Ireland) Colorimetric tests with a range of phenolic substrates showed that endo-cellular laccases with same specificity were responsible for fumigatin and spinulosin formation. A para-

phenolase mechanism is proposed. Exo-cellular laccases were found only in strains producing fumigatin and these enzymes were responsible for the Bavendamm reaction. The intensity of this reaction was not quant. related to the gross phenolase activity or to the formation of fumigatin. B.M.Stevens

^{937.} STRUCTURE OF MUNETONE [ISOFLAVONE FROM MUNDLEA SUBEROSA]. C.S.Barnes, J.L.Occolowitz, N.L.Datta, P.Madhavan Nair, P.S.Riadke and K.Venkataraman: Tetrahedron Letters, 1963, 5, 281-288 (C.S.I.R.O.. Chem. Res. Lab., Melbourne, Australia) Letter. LA.B.S.

^{938.} SYNTHESIS OF PRATENSEIN. 5,7,3'-TRIHYDROXY-4'-METHOXYISOFLAVONE [FROM TRIFOLIUM PRATENSE]. E.Wong: Tetrahedron Letters, 1963, 3, 159-161 (Plant Chem. Div., D.S.I.R.t Palmerston North, New Zealand) Letter. LA.B.S.

^{939.} CITRUS FLAVONOID COMPLEX: CHEMICAL FRACTIONATION AND BIOLOGICAL ACTIVITY. L.Freedman and AJ.Merritt: Science, 1963, 139, 344-345 (Product Development Lab., U.S.Vitamin and Pharm. Corp., Yonkers, New York, U.S.A.) A study was made of the anti-inflammatory activity of the fractionated components of a citrus flavonoid complex. Several highly active components, distinct from hesperidin and naringin, were isolated and tested for their ability to inhibit increase of capillary permeability in guinea-pig. G.M.Lewis

^{940.} ISOLATION OF CITRONIN FROM PEEL OF ARGENTINE ORANGES [NARANJA DULCE]. CITRUS SINENSIS. Linn. A.Rahman and A.A.Khan: Rec. Trav. Chim. Pays-Bas, 1962, 81, 102-106 (Dept. Quimica, Universidad del Sur, Bahia Blanca, Argentina) The isolation of citronin from oranges is described and its structure established as a 7-rhamnoglucoside of 5,7-dihydroxy-2'-methoxyflavanone. The chem. prop. of this compound and some of its deriv. are described and discussed. G.C.Barr

^{941.} ISOTHIOCYANATE-PRODUCING GLUCOSIDES IN SPECIES OF CAPPARIDACEAE. A.Kjaer and H.Thomsen: Phytochemistry, 1963, 2, 29-32 (Oig.-Chem. Dept., Royal Vet. and Agr. Coll., Copenhagen, Denmark) A series of 38 botanically authenticated spp. of Capparidaceae have been analysed by paper chromatography for their content of isothiocyanate-producing glucosides. The distribution pattern indicates the predominance within the family of glucocapparin and glucodeomin. The taxonomic significance and possible biogenesis of the glucosides are discussed. B.H.Davies

^{942.} GLUCOSIDES OF COUMARINIC AND J2-COUMARIC ACIDS IN TONKA BEAN. F.A.Haskins and H.J.Gorz: Science, 1963, 139, 496-497 (Dept. Agronomy, Univ. Nebraska, Lincoln, Neb., U.S.A.) jS-Glucosides of coumarinic and jD-coumaric acids were detected in extracts of cotyledons, exocarps, and seedling leaves of *Dipteryx odorata* Willd. The presence of L-glucosidase having specificity for the cis glucoside suggests that, as in sweet-clover, coumarin is synthesised through the conversion of L-coumaryl glucoside to coumarinyl glucoside, which hydrolyses to coumarinic acid; on spontaneous lactonisation, this produces coumarin. G.M.Lewis

^{943.} STRUCTURE OF BRUCEOL. A.N.Duffield, P.R. Jefferies, E.N.Maslen and A.L.M.Rae: Tetrahedron, 1963, 19, 593-607 (Dept. Chem. and Physics, Univ.

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Western Australia, Nedlands, Australia) A novel coumarin, bruceol, has been isolated from Eriostemon brucei F.Muell. Prelim. chem. studies have been made and the complete structure determined by X-ray crystallography of a monobromo deriv. LA.B.S.

944. TETRAHYDROFRANKLINONE. P.M.Brown, J.S. Burton and R.Stevens: Tetrahedron Letters, 1963, 5, 289-291 (Brewing Ind. Res. Fndn., Nutfield, England) Franklinone is a ketone based on a phloroglucinol nucleus and found in the essential oil of Acradenia f. franklinii (Kippist). It is closely related in structure to a degradation product of the hop p-acid, colupulone. I.A.B.S.

945. COMPONENTS OF HEARTWOOD OF DALBERGIA LATIFOLIA ROXB. M.M.Rao and T.R.Seshadri: Tetrahedron Letters, 1963, 4, 211-215 (Dept. Chem., Univ. Delhi, India) The new compounds isolated are all related to dalbergin, a 4-phenyl coumarin deriv. LA.B.S.

946. BETACYANINS AND THEIR DISTRIBUTION. T.J.Mabry, A.Taylor and B.L.Turner: Phytochemistry, 1963, 2, 61-64 (Dept. Bot. and Plant Res. Inst., Univ. Texas, Austin, Tex., U.S.A.) Thirty-eight spp. including 13 previously uninvestigated genera, in 10 families usually grouped in the Centrospermae were surveyed by electrophoresis and chromatography for the presence of betacyanin and anthocyanin pigments. Betacyanins were observed in all 38 spp. but no anthocyanins were detected. B.H.Davies

947. PREPARATION OF ANTHOCYANIDINS AND THEIR GLYCOSIDES FROM RELATED FLAVONOIDS. H.G.Krishnamurty, V.Krishnamoorthy and T.R.Seshadri: Phytochemistry, 1963, 2, 47-60 (Dept. Chem., Univ. Delhi, Delhi, India) Improvements in the method of reductive acetylation of flavonols provide pure samples of anthocyanidins, the examples studied being cyanidin and its O-pentamethyl and O-5, 7, 3', 4'-tetramethyl deriv. The method can also be used for the conversion of the flavonol glycosides into anthocyanins; the prep. of cyanidin and pelargonidin-3-rhamnoglycosides are described. 3-Hydroxyflavanones undergo isomeric change into V-base acetates on heating at 150-155° with acetic anhydride soln. and a base catalyst, and these undergo conversion into anthocyanidins. This mechanism is supported by expt. evidence, and the biogenetic significance of this new transformation is discussed. B.H.Davies

948. PHLEBIARUBRONE, BASIDIOMYCETE PIGMENT RELATED TO POLYPORIC ACID. T.C.McMorris and M.Anchel: Tetrahedron Letters, 1963, 5, 335-337 (New York Bot. Garden, New York, U.S.A.) The bright red pigment phlebiarubrone produced by Phlebia strigosa is shown to be the *g*-terphenyl deriv., 3, 6-diphenyl-4, 5-methylene dioxy-1, 2-benzoquinone. LA.B.S.

949. INCORPORATION OF [¹⁵N]HYDROXYLAMINE INTO PROTEINS OF WHEAT SEEDLINGS. W.L.Kretovich, A.A.Bundel and N.V.Borovikova: Life Sci., 1963, No.3, 184-189 (A.N.Bach Inst. Biochem., Acad. Sci., Moscow, U.S.S.R.) N of hydroxylamine as the hydrochloride or the oxime could enter into the reactions of protein synthesis in wheat seedlings. It is suggested that in plants hydroxylamine is an intermediate in the reduction of nitrate to ammonia. K.Jones

950. BIOCHEMICAL TESTS INDICATIVE OF REACTION OF CASTOR BEAN TO BOTRYTIS. C.A.Thomas and

R.G.Orellana: Science, 1963, 139, 334-335 (U.S. Agric. Res. Service, Beltsville, Md., U.S.A.) Peptides acid cellulolytic enzymes caused browning and maceration of capsules of varieties of castor bean susceptible to Botrytis, but not in resistant varieties. Resistance to the hydrolytic enzymes was correlated with both a low content of flavonols and related compounds and the presence of oxidised compounds in injured tissue which inactivated enzymes. GM.

951. PHOSPHORUS LEVELS OF NORMAL AND CONDITIONED TOBACCO CALLUS TISSUE. M.J.Merrett: Biochim. biophys. Acta, 1963, 69, 405-406 (Dept. Biol. Sci., Bradford Inst. Technol., England) Conditioned tissues possessed a higher level of P compared with normal tissue although acid-sol. org. P was not increased. B.M.Stevens

952. SYNTHESIS OF ENZYMES DURING GERMINATION OF FUNGUS SPORES. D.Gottlieb and P.G.Caltriden: Nature, Lond., 1963, 197, 916-917 (Dept. Plant Pathol., Univ. Illinois, Urbana, Ill., U.S.A.) Resting spores of Ustilago zaeae have a very low O₂ consumption and several enzymes necessary for glucose metabolism are undetectable. With increasing period of incubation in & Jo molasses, O₂ uptake and incorporation of [¹⁴C]phenylalanine into protein increased steadily. At the time of development of the germ tube, all the enzymes of the hexose-monophosphate shunt and citric acid cycle were present or had increased significantly concn. It is concluded that morphol. manifestation of development appears long after physiol. mechanisms & to operate. G.M.

953. PURIFICATION OF FACTORS INDUCING CELL DIVISION EXTRACTED FROM PLUM FRUITLETS. D.S.Letham: Life Sci., 1963, No.3, 152-157 (Fiji Res. Div., Dept. Sci. Indust. Res., Auckland, New Zealand) Two fractions with cell division-promoting activity were extracted from plum fruitlet. One factor (Ai) seemed to be an N⁶-substituted adenine, as shown by its u.v. spectra. The second factor, identified as myoinositol, promoted cell division only in the presence of K.Jones

954. ARGININOSUCCINIC ACID IN GERMINATING SEEDS OF Vicia faba L. J.T.Barber and D.Boulter: Nature, Lond., 1963, 197, 1112 (Hartley Bot. Lab., Univ. Liverpool, England) Arginine, arginosuccinic citrulline and ornithine have been determined in ungerminated seeds and 6- and 14-day-old seedlings of V. faba. Vacuum-infiltration of [¹⁴C]arginine in 10-day-old cotyledon showed that arginosuccinic acid and proline were the first amino acids to be labelled later, ornithine, citrulline, glutamic and aspartic acids and finally alanine and γ -amino butyric acid became labelled. GM.

955. UREA SYNTHESIS IN YOUNG BARLEY ROOTS BY MEANS OF THE ORNITHINE CYCLE. H.Kating: Biochem. Z., 1963, 336, 489-494 (Pharm. Inst., Bonn, Germany) Roots, 2 to 4 days old, from young varieties of summer barley were placed in a nutrient medium containing NaH₁₄CO₃ and ammonium sulphate. After 2 to 4 hr. radioactively labelled citrulline, arginine and urea were detected. The presence of ornithine carbamylase, arginase and urease was shown. (German) 14C

956. COLORIMETRIC ESTIMATION OF 4-HYDROXYPIECOLINIC ACID, 4-AMINOPIECOLINIC ACID

- PIPECOLINIC ACID IN PLANT EXTRACTS BY MEANS OF NINHYDRIN. W.Schenk: Biochem. Z.. 1963, 336. 557-563 (Inst. Allgemeine Bot., Univ. Halle/Saale, Germany) Powdered material from *Strophanthus* J.Sindeus was extracted with aq. ethanol and separated from nitrogenous substances on a Dowex 50 column.
- ¹Aminopipecolinic. 4-hydroxypipecolinic and piperujinic acid were eluted with 3N NH₄OH and separated by Paper chromatography. Spots were cut out and treated with 0.2% ninhydrin in 90% acetic acid at 100°. (German) L.Cohn
- * PREPARATIVE DEMONSTRATION OF RED CELL WALL PIGMENT OF SPHAGNUM MAGELLANICUM. H.Rudolph: Ber. dtsch. bot. Ges.. 1963. 76, 72-73 (Bot. Inst. Christian-Albrechts-Univ., Kiel, Germany) Prelim, comm.
- ifco (German) H.(3pik)
- ¹ CONVERSION OF 3-INDOLEACETALDOXIME [IAOx] TO 3-INDOLEACETONITRILE [IAN] BY PLANTS. S.Mahadevan: Arch. Biochem.. 1963. 100, 557-558 (JDept. Biochem.. Indian Inst. Sci., Bangalore, India) leaves and mycelia of *Aspergillus niger* (Mulder), *Penicillium chrysogenum* (51-20F3), *Fusarium oxysporum*, *Cubense* and *Gibberella fujikuroi* converted IAOx to and IAA. Prelim, comm. B.M.Stevens
- INHIBITION OF NITRATE ASSIMILATION BY AMMONIUM IN CHLORELLA. P.J.Syrett and I.Morris: chim. biophys. Acta, 1963, 67, 566-575 (Bot. J. Pl., Univ. Coll., London, England) *C. vulgaris* J. Completely ceased to assimilate NO₃⁻ on addition of id J. NO₃⁻ assimilation recommended when the NH₄⁺ disappeared. NH₄⁺ did not inhibit NO₃⁻ reduction by Peking C source and hence unable to assimilate NH₄⁺. Chlorella nitrate reductase was sp. for NAD⁺, the glutamic dehydrogenase was sp. for NADP. addition inhib. NO₃⁻ assimilation completely, but only partially inhib. NO₂⁻ assimilation. B.M.Stevens
- fcn B.M.Stevens
- MECHANISM OF NITRITE REDUCTION IN CHLOROPLASTS. M.Losada, A.Paneque, J.M.Ramirez and F.del Campo: Biochem. biophys. Res. Comm., 1963, 10, 298 (Section Bioquímica y Fisiol. Celular, Centro de Investigaciones Biol., C.S.I.C., Madrid, Spain) Washed spinach chloroplast fragments will not photoreduce of NO₂⁻ in the presence of xin and a thermolabile substance from chloroplast presumably nitrite reductase. B.Ketterer
- LOW TEMPERATURE SPECTRA OF CHLOROPLAST FRAGMENTS. W.L.Butler and J.E.Baker: Biochim. Biophys. Acta, 1963, 66, 206-211 (Instrumentation Lab. Market Quality Res. Div., Agric. Marketing Beltsville, Md., U.S.A.) Absorption and fluorescence excitation spectra of fragments, obtained by oscillation and differential centrifugation, were at -196°. Several chlorophyll pigments including the one absorbing near 705 mp were resolved. No separation of pigments was achieved by differential centrifugation. The smallest fragments, in a 173000 x g, contained chlorophyll pigments in the same intact chloroplasts and fluorescence excitation showed that energy transfer between the pigments to the same degree. B.M.Stevens
- PROPERTIES OF AQUEOUS EXTRACTS OF CHLOROPLASTS WITH ABSORBANCY MAXIMUM AT 740 mji. Ghorion: Biochim. biophys. Acta. 1963. 66, 212-217 du Phytotron, Gif-sur-Yvette, Seine-et-Oise.

France) The absorption spectrum of a detergent-buffer extract of tobacco chloroplasts showed a bathochromic shift on treatment with aq. alcohol or acetone. The max. moved from 668 mji to 740 mp owing to crystn. of chlorophyll mol. on chloroplast protein particles. The solvent acted on the whole protein-pigment complex. The aggregation of chlorophyll was in the range of 10⁹ mol./particle. (French) B.M.Stevens

963. EMERSON EFFECT IN ISOLATED CHLOROPLASTS. P.M.Bishop and C.P.Whittingham: Nature. Lond., 1963, 197, 1225-1226 (Dept. Bot., Queen Mary Coll., London, England) The O₂ production resulting from flash illumination was measured in spinach chloroplast fragments illuminated with low intensity continuous light. The O₂ yield depended markedly on wavelength and there appeared to be 2 pigment systems, one absorbing at 675 and 700 mji and one at 651 and 675 mp. The data indicate the existence of a long-lived photosynthetic intermediate. G.M.Lewis

964. CHLOROPLAST STORAGE WITH RETENTION OF PHOTOSYNTHETIC ACTIVITIES. W.C.Duane and D.W.Krogmann: Biochim. biophys. Acta, 1963. 71, 195-196 (Dept. Chem., Wayne State Univ., Detroit, Mich.. U.S.A.) B.M.Stevens

965. SOLVENT-INDUCED CHANGES IN ABSORBANCY OF ISOLATED CHLOROPLAST FRAGMENTS. J.Aghion, E.Porcile and J.A.Lippincott: Nature. Lond., 1963. 197, 1110-1112 (Lab. du Phytotron, Centre N*tl. de la Recherche Sci., Gif-sur-Yvette (Seine-et-Oise). France) Treatment of *Nicotiana tabacum* chloroplasts with 65% methanol or 52% ethanol at pH 8.5 causes the formation of a substance absorbing at 740 mji. It was found that chlorophyll remains bound to the chloroplast structure at higher alcohol concn. than are required to produce the 740 mp absorbancy max. 75% methanol causes a reversible bleaching of chlorophyll. These changes may be due to enzymic processes as they are prevented by boiling, very low temp., or by addition of Cl₁Cl₂. A decrease in size of the chloroplast fragments accompanying the formation of the 740 mji absorbancy max. is consistent with crystn. of the chlorophyll mol. G.M.Lewis

966. EFFECT OF LIGHT INTENSITY ON FAR RED INHIBITION OF CHLOROPHYLL FLUORESCENCE IN VIVO. W.L.Butler: Biochim. biophys. Acta, 1963. 66, 275-276 (Instrumentation Res. Lab., Market Quality Res. Div., Agric. Marketing Service, Beltsville, Md., U.S.A.) B.M.Stevens

967. EFFECT OF ULTRAVIOLET LIGHT ON PHOTOPHORYLATION AND HILL REACTION. N.Shavit and M.Avron: Biochim. biophys. Acta. 1963. 66, 187-195 (Biochem. Section. Weizmann Inst. Sci., Rehovoth, Israel) Photophosphorylation and more especially Hill reaction activity of Swiss chard chloroplasts or chloroplast fragments were reduced by short X.u.v. irradiation. Ascorbate prevented the reduction especially for Hill reaction activity. SH containing compounds could not replace ascorbate. Chloroplast prep. with no Hill reaction activity but high photophosphorylative activity could be prep. Irradiation was shown to destroy chloroplast plastoquinone. The activity of irradiated chloroplasts was stim. by plastoquinone addition but non-irradiated chloroplasts were similarly stim. B.M.Stevens

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- 968. PHOTO-INDUCED ELECTRON PARAMAGNETIC RESONANCE IN MUTANT PHOTOSYNTHETIC SPECIES LACKING CAROTENOIDS OR CHLOROPHYLL.** G.M.Androes, M.F.Singleton, J.Biggins and M.Calvin: *Biochim. biophys. Acta.* 1963, 66, 180-187 (Lawrence Rad. Lab., Univ. California, Berkeley, Calif., U.S.A.) The association of the photo-induced electron paramagnetic resonance signal in photosynthetic tissue with the necessity for the presence of chlorophyll was demonstrated with a variety of mutant organisms. B.M.Stevens
- 969. DYNAMIC ROLE OF TRIPLET STATES IN PHOTOSYNTHESES.** G.W.Robinson: *Proc. nat. Acad. Sci., Wash.*, 1963, 49, 521-529 (Gates and Crellin Lab. Chem., California Inst. Technol., Pasadena, Calif., U.S.A.) The possible significance of triplet state quenching, triplet energy transfer, triplet-triplet annihilation, and triplet energy multiplication in photosynthesis is discussed. J.R.Sargent
- 970. EVIDENCE FOR OCCURRENCE OF CYCLIC PHOSPHORYLATION IN VIVO.** G.Forti and B.Parisi: *Biochim. biophys. Acta*, 1963, 71, 1-6 (Nat. Res. Council for Redox Studies in Plants, Lab. Plant Physiol., Inst. Plant Sci., Univ., Milano, Italy) The ATP level in leaves was increased many times on illumination in the presence of β -chlorophenylidimethylurea [CMU] although CMU completely inhibits O₂ evolution and CO₂ fixation. The light effect in the presence of CMU was observed under strictly anaerobic conditions as well as in air and was very rapid. B.M.Stevens
- 971. FUNCTION OF CYTOCHROME*i* IN PHOTOSYNTHETIC ELECTRON TRANSPORT.** G.Forti, M.L. Bertolé and B.Parisi: *Biochem. biophys. Res. Comm.*, 1963, 10, 384 (Inst. di Science Bot., Università di Milano, Italy) Expt. are described showing that H₂O is the terminal electron donor in cytochrome *f* reduction and that this reduction is accompanied by the formation of one mole of ATP per electron pair transferred. Doubt is cast on the view that NADP is reduced by the same light reaction responsible for the oxidation of cytochrome *U*. B.Ketterer
- 972. ELECTRON-TRANSPORT SYSTEM IN PHOTOSYNTHESIS OF GREEN PLANTS ANALYSED BY SENSITIVE FLASH PHOTOMETRY.** H.T.Witt, A.Mittler and B.Rumberg: *Nature, Lond.*, 1963, 197, 987-991 (Max-Volmer Inst., Phys.-chem. Inst. der Technischen, Univ., Berlin, Germany) A reaction scheme for the electron transport system in photosynthesis is presented based on short-time absorption changes as measured by sensitive flash photometry. The scheme includes coupling of 2 light-reactions. NADP or similar substances are reduced by transfer of electrons from water through at least 8 reaction cycles including an unknown Y, activated chlorophyll *a*, plastoquinone, an unknown E, cytochrome, activated chlorophyll *jil*, an unknown Z and ferredoxin. J.R.Sargent
- 973. INTRACELLULAR DISTRIBUTION OF THE EARLY PRODUCTS OF PHOTOSYNTHESIS.** C.R.Stocking, G.R.Williams and A.Ongun: *Biochem. biophys. Res. Comm.*, 1963, 10, 416 (Univ. California, Davis, Calif., U.S.A.) Chloroplasts were isolated non-aqueously to prevent leaching. After 5 sec. of photosynthesis about 7V% of newly formed carbon compounds are in the chloroplasts while after 60 sec. of photosynthesis this level has dropped to 50%. B.Ketterer

GENERAL BIOCHEMISTRY

- 974. EVIDENCE OF AN EXTRATERRESTRIAL ORIGIN FOR SOME ORGANIC CONSTITUENTS OF METEORITES** M.H.Briggs: *Nature, Lond.*, 1963, 197, 1290 (Jet Propulsion Lab., California Inst. Technol., Pasadena, Calif., U.S.A.) The isotopic composition of the H, C and S of org. matter extracted from 3 carbonaceous chondrites indicated an extraterrestrial origin for this material. G.M.Lewis
- 975. MODEL SYSTEM FOR TRANSCELLULAR ACTIVE TRANSPORT.** D.S.Parsons: *Nature, Lond.*, 1963, 197, 1303-1304 (Dept. Biochem., Univ. Oxford, England). G.M.Lewis
- 976. CHEMICAL REACTION ACCELERATED TRANSPORT OF MOLECULES THROUGH MEMBRANES.** J.H.Wang: *J. theor. Biol.*, 1963, 4, 175-178 (Dept. Chem., Yale Univ., Conn., U.S.A.) The diffusion of mol. through membranes is often accelerated if the membrane contains mol. which combine rapidly and reversibly with the diffusing spp. The example of O₂ transport through a membrane containing Hb is examined mathematically > a treatment which accounts for all data in previous reports. G.F.Bla&^e
- 977. PROPERTIES OF MITOCHONDRIAL PREPARATIONS FROM THE SMALL-INTESTINAL MUCOSA OF THE GUINEA-PIG.** H.S.A.Sherratt and G.Hoflscher: *Biochim. biophys. Acta*, 1963, 69, 403-405 (Dept. Med. Biochem. Pharmacol., Med. Sch., Univ. Birmingham, England) A variety of substrates w# oxidised and good P/O ratios were obtained. B.M.Stevens
- 978. DEPENDENCE OF MONOAMINE OXIDASE ACTIVITY AND PEROXIDATIVE CONVERSIONS ON MITOCHONDRIAL STRUCTURE.** H.Aebi, F.Stocker and M.Eberhardt: *Biochem. Z.*, 1963, 336, 526-544 (Med.-cn^g Inst., Univ. Bern, Switzerland) Mitochondria ^U dog or rabbit kidney and rat liver were used to study & combined action of MAO and catalase. In these expk the peroxidative conversion of [14c]formate to ^ 9 L^p found to give theoretical yields of O₂, NH₃ and MCTM prep. of freeze dried and lysed mitochondria. Mitoy, chondria not subjected to swelling showed only 10-2W. die activity of lysed mitochondria. If swelling of mito chondria was inhib. by ATP and serum albumin, ty^t Triton X-100 caused no appreciable change in MAO activity. (German) k^cnn
- 979. FREE FATTY ACIDS IN CARROT-TISSUE PREPARATIONS AND THEIR EFFECT ON ISOLATED CARROT MITOCHONDRIA.** L.Dalgarno and L.M.Birt: *Biochem. J.*, 1963, 87, 586-596 (Russell Grimwade Sch., Univ. Melbourne, Victoria, Australia) The t^y B^p amounts of fatty acids, both free and combined, P[^]fe carrottissue homogenates and mitochondrial prep. estimated by gas chromatography. and the influence no. of these acids on mitochondrial prop. determine is concluded that the amounts of free fatty acids gen in the homogenate during the isolation of the partic sufficient to depress the activity of various oxidases (notably the succinate-oxidase system) and to uncoupl oxidation and phosphorylation. The protective effect of serum albumin, added during the disruption of the tissue is ascribed to its ability to bind fatty acids.

980. CHEMICAL PROPERTIES OF BRAIN MITOCHONDRIA. S.Lövtrup and L.Svennerholm: *Exp. Cell Res.*, 1963, 29, 298-313 (Inst. Neurobiol., Univ. GSteborg, Sweden) Chem. prop. of isolated brain mitochondria studied, and it is concluded that brain mitochondria are very similar to those from other tissues. They have the ability to oxidise fatty and amino acids, resembling muscle mitochondria. However, dissimilarities existed, many of them possibly being on the physico-chem level. K.Jones

981. MECHANISM OF RESPIRATORY CONTROL. I. ACTION OF DINTTROPHENOL ON GLYCOLYSIS OF PEAS. R.Bianchetti and E.Marré: *G. Biochim.*, 1962, 11, 162-174 (Inst. di Scienze Bot., Univ. Milan, Italy) The effect of DNP on respiration, fermentation, content of nucleotide labile P, levels of free and phosphorylated carbohydrates, alcohol, acetaldehyde and pyruvate was studied in segments of pea internodes. DNP increased O₂ consumption from 0.97 to 1.27 and was accompanied by large decrease in labile P (as ATP). DNP also increased amounts of pyruvate, aldehyde and alcohol, but phosphorylated and free effect fell. Expt. confirm the view that the primary and DNP is to uncouple phosphorylation in mitochondria which leads to a decline in ATP and an increase in ADP. B.Payne

982. DIFFERENTIAL EFFECTS OF ROTENONE AND ENZYME ON MITOCHONDRIAL ELECTRON AND ENERGY TRANSFER. L.Ernster, G.Dallner and G.F. (Winnherg) J. biol. Chem., 1963, 238, 1124-1131 The effects of rotenone on respiration, phosphorylation, reactions of rat liver mitochondria are compared with those of Amytal. Rotenone inhibits aerobic Uccin NAD-linked substrates but not that of NAD A? Jnhib. is not relieved by DNP, nor by added cytochrome f, but is overcome by added vit. B₆. Rotenone also inhibits endergonic reduction of acetoacetate by succinate, but not the dismutative reduction of acetoacetate by pyruvate plus malate. Inhibition of extramitochondrial NADH2 is also inhib. by rotenone. He, but only partially in presence of added cytochrome f. NADH2 oxidase activity of submitochondrial particles is also highly sensitive to rotenone. Amytal, rotenone does not affect the mitochondrial membrane as far as PO₄-ATP exchange, and the resting as well as the DNP-induced ATPase reaction. Rotenone does not decrease the P:O ratio with succinate as substrate. Rotenone appears to block NAD-flavin-linked electron transport more specifically than does Amytal. Rotenone also differs from Amytal because it is firmly bound to mitochondria and to submitochondrial particles. J.N.Ashley

983. ELECTRON TRANSFER SYSTEM. LI. ISOLATION AND CHARACTERISATION OF D(-)-j8-HYDROXYBUTYRIC APODEHYDROGENASE FROM OX HEART MITOCHONDRIA. I.Sekuzu, P.Jurtshuk, jun. and D.E.Green: J. biol. Chem., 1963, 238, 975-982 F. A. T. Y. M. Res. Univ. Wisconsin, Madison, Wis. j8-hydroxybutyric apodehydrogenase is isolated by lecithin with cholate and (NH₄)₂SO₄ and by iso-lation with a thiol as a substrate. Requirement for unsat. in IV O/VU concn. of a thiol is needed for max. IM b Asp f enzyme. The activity is inhib. by Cd²⁺ (in presence of 2,3-dimercaptopropanol), on enzymic oxidation of j8-hydroxybutyrate may involvement of vicinal dithiols. The active

D(-)-j8-hydroxybutyric dehydrogenase of mitochondria is probably a lecithinoprotein complex with a dithiol functional group. J.N.Ashley

984. COMPARATIVE STUDY OF ELECTRON TRANSPORT IN MICROSOMES. D.Garfinkel: *Comp. Biochem. Physiol.*, 1963, 8, 367-379 (Johnson Res. Found., Univ. Pennsylvania, Philadelphia, Pa., U.S.A.) Microsomes from the same (or analogous) organs in different spp. resemble each other more closely than microsomes from different organs of a single sp. This has been shown for the following group of organisms; *Rattus*, *Oryctolagus*, *Rana*, *Gallus*, *Carpoides*, *Pseudemys*, *Homarus*, and embryonic pig. In any sp. cytochrome Jbs is almost always richest in microsomes from the liver, followed by kidney, lung, intestinal mucosa, testes and adrenals. Mammals show more activity than (in order), birds, reptiles, fish, amphibia and Crustacea. Information is given on flavin, CO-binding pigment and total haem and enzymic activity of NADH2-cytochrome f reductase, NADH2-cytochrome b5 reductase, and NADPH₂ cytochrome f reductase. M.S.Laverack

985. OXIDATIVE PHOSPHORYLATION AND RESPIRATORY CONTROL IN DIGITONIN FRAGMENTS OF OX HEART MITOCHONDRIA. D.W.Haas and W.B. Elliott: *J. biol. Chem.*, 1963, 238, 1132-1136 (Dept. Biochem., Univ. Buffalo Sch. Med., N.Y., U.S.A.)

The prep., with digitonin, of large batches of mitochondrial fragments which effect oxidative phosphorylation when /3-hydroxybutyrate, NADH2, or succinate is the substrate, is described. The respiratory pigments that function during electron transport in these fragments are the same as those in intact mitochondria. The relative concn. of these pigments in these fragments are similar to those in the intact system, but the abs. concn. show a 3-fold increase in the cytochrome content of the fragments and a 2-fold increase in flavoprotein over that in intact mitochondria. The fragments show respiratory control ratios of 3-4 with j8-hydroxybutyrate and NADH2 when ADP is the phosphate acceptor, and ratios of 1-2 with succinate in presence of Amytal. J.N.Ashley

986. EVALUATION OF GLYCOLYTIC AND CITRIC ACID CYCLES IN HOMOGENATES OF DYSTROPHIC MOUSE MUSCLE. G.L.Mayers and N.Epstein: *Proc. Soc. exp. Biol.*, N.Y., 1962, 111, 450-452 (Dept. Ped., New York Hosp., Cornell Med. Cen., New York, U.S.A.) The glycolytic cycle, as measured by lactic acid production, and the citric acid cycle, measured by O₂ consumption, appeared to operate as efficiently in homogenates from dystrophic mouse muscle as in those from normal muscle. M.M.Shapland

987. EFFECT OF THE LIVER ON THE EXTRACELLULAR REDOX QUOTIENT LACTATE/PYRUVATE. EXPERIMENTS WITH ISOLATED PERFUSED RAT LIVER. H.Schimassek: *Biochem. Z.* 1963, 336, 468-473 (Physiol.-Chem. Inst., Univ. Marburg/Lahn, Germany) The ratio lactate/pyruvate remained const. in the isolated perfused liver even though the substrate levels rose in the perfusion medium and liver as a result of a lactate flux of 20 pmole/g. liver/hr. This ratio was 10 and identical with that observed in vivo. (German) L.Cohn

988. OXIDATION OF SUCCINATE AND THE CONTROL OF THE CITRIC ACID CYCLE IN THE MITOCHONDRIA OF GUINEA-PIG LIVER, MAMMARY GLAND AND KIDNEY. E.A.Jones and H.Gutfreund: *Biochem. J.*

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1963. 87, 639-648 (N.I.R.D., Shinfield, Nr. Reading, Berks., England) The rate of oxidation of succinate by respiring liver mitochondria phosphorylating ADP to ATP is only half that of broken or uncoupled mitochondria. It was concluded that in these particles phosphorylation is the rate-determining step during the coupled oxidation of succinate. The addition of oxaloacetate to liver mitochondria oxidising succinate and synthesising ATP caused only a limited inhibn. of the oxidation of succinate, whereas the same concn. of oxaloacetate ($1^{*}7\text{mM}$) completely inhib. the oxidation of succinate when the synthesis of ATP was uncoupled by the addition of DNP. This and other results pointed to the conclusion that ATP was utilised during the metabolism of oxaloacetate by mitochondria. This energy requirement appears to be limited to the local removal of oxaloacetate from the vicinity of the succinate-oxidase system. The total amount of oxaloacetate metabolised by liver mitochondria is remarkably independent of a variety of conditions. Mammary-gland mitochondria metabolise oxaloacetate more slowly than do liver mitochondria, and in this system the rate of removal of oxaloacetate appeared to be the rate-determining factor in the oxidation of succinate under a variety of conditions.

989. DISTRIBUTION OF LYSOSOMAL ENZYMES IN ANIMAL TISSUES. S.Shibko, K.A.Caldwell, P.L. Sawant and A.L.Tappel: J. cell. comp. Physiol., 1963. 61, 85-92 (Dept. Food Sci. Technol., Univ. California, Davis, Calif., U.S.A.) Distribution and activity of β -galactosidase, cathepsin, RNase, α -glucuronidase, acid phosphatase and aryl sulphatase in muscle, liver and spleen tissue of 8 spp., representing the main phyla of the animal kingdom was studied. Spp. differences are discussed. G.M.Lewis

990. IN VITRO EFFECT OF ASPARTIC ACID ON SOME AMINO ACIDS AND ON THE RESPIRATION OF CEREBRAL TISSUE. U.Bonomi and L.T.Tenconi: G. Biochim., 1962, 11, 146-156 (Lab. Direzione Centrale Med., Milano, Italy) The O₂ uptake of rat cerebral cortex slices and homogenates was studied in presence of glucose and aspartate. It was found that aspartate alone only partly inhib. uptake in cerebral slices, but with addition of glucose O₂ uptake was increased. In both these reactions glutamate was synthesised. Glutamine synthesis was increased by presence of aspartate and glucose, but γ -aminobutyrate synthesis increased only in presence of glutamate. Variations in endocellular amino acids did not always follow a similar pattern to those of the supernatant. Comparison of data of slices and supernatant indicated that glutamic-aspartic transaminase is at least in part located at the periphery of the cell, and in this position may condition the ratio of glutamate and aspartate during absorption, and thus the energy metabolism of the brain. B.Payne

991. RELAXING FACTOR SYSTEM OF HEART MUSCLE. H.Abe, M.Takauji, H.Takahashi and T.Nagai: Biochim. biophys. Acta. 1963, 71, 7-14 (Physiol. Inst. Med. Hochsch. Sapporo, Japan) Relaxing activity of micro somes was very low but crude extracts or a microsome-cofactor system inhib. cardiac myofibrillar ATPase. Relaxing factor system activity was lower in heart than in skeletal muscle although prop. were similar. A protein-free relaxing substance was obtained by eluting a cellulose column with adsorbed microsomes with an ATP soln. containing cofactor. The prop. resembled those of skeletal muscle relaxing substance. Ouabain had no

effect on relaxing factor system, relaxing substance or myofibrillar ATPase. Heart myofibrillar ATPase was $I^{*}5$ inhib. by relaxing factor systems of heart or skeletal muscle or by EDTA than the myofibrillar ATPase of skeletal muscle. Uterine muscle, liver and brain had no relaxing factor system. (German) B.M.Stevel*

992. ROLE OF THE PHOSPHORYLASE ENZYMES IN CARDIAC CONTRACTION: A PROPOSED THEORY THE RHYTHMICAL PRODUCTION OF ENERGY IN THE HEART. N.Haugaard: Nature. Lond. 1963. 197, I 1072-1074 (Dept. Pharmacol., Sch. Med.. Univ. Pennsylvania, Philadelphia, Pa., U.S.A.) It is proposed that AMP, produced during any stage of heart contraction cycle, causes an increase in phosphorylase & activity. This results in increased glycolysis bringing phosphorylation of ADP, and through the action of myokinase, disappearance of AMP. Thus a discontinuous rhythmic formation of high energy phosphate bonds occur. J.R.Sarg

993. EFFECT OF LEUCINE-ISOLEUCINE AND VALINE ANTAGONISM AND COMPARISON WITH THE EFFECT OF ETHIONINE ON RAT LIVER REGENERATION. P.D.Spolter and A.E.Harper: Arch. Biochem., 1963, 100, 369-377 (Dept. Biochem., Univ. Wisconsin, Madison, Wis., U.S.A.) Less liver tissue, protein DNA were regenerated in 4 days after partial hepatectomy in rats fed a high leucine diet than in controls fed the leucine diet plus isoleucine and valine ad lib. The regeneration was, however, similarly depressed in pair fed controls. Rats on the high leucine diet regenerate more RNA and had more liver RNA 2 and 4 days after partial hepatectomy than pair fed controls receiving leucine and valine as well. The RNA content returned to normal 10 days after operation. In males ethionine interfered with liver protein. DNA and RNA regeneration more than would be expected from its depression of food intake. B.M.Stevens

994. METABOLISM OF THE TRANSPLANTED DOG KIDNEY. P.Nathan, E.C.Foulkes, L.S.Wilchens, B.F.Miller: Proc. Soc. exp. Biol., N.Y. 1963, IV 207-210 (May Inst. Med. Res., Cincinnati Jetet Cincinnati, Ohio, U.S.A.) Slices from second kidney transplant in advanced state of rejection. Take up O₂ within normal limits. Results were interpreted as indicating that cytotoxic actions are not a major factor in transplant rejection. M.M.Shapiro

995. CHEMICAL COMPOSITION AND TERMINOLOGY OF SPECIALISED ORGANELLES (MELANOSOMES AND MELANIN GRANULES) IN MAMMALIAN MELANO-CYTES. M.Seiji, T.B.Fitzpatrick, R.T.Simpson and M.S.C.Birbeck: Nature, Lond., 1963, 197, 1082-1084 (Dept. Dermatol., Harvard Med. Sch., Boston, Mass., U.S.A.) Three stages in the development of melanin granules are defined. Sucrose density analysis of homogenates of mouse melanomas as used separate mitochondria and melanosomes, which show marked chem. and enzymic differences. Melanosomes are distinctive subcellular particles with unique distribution in cytoplasm of melanin-forming cells; they have a specialised metabolic pathway in which tyrosine is converted to melanin but are otherwise biol. inert. G.M.Lewis

996. PARTIAL KINETIC ANALYSIS OF THE CHIMERIC LUMINESCENCE OF PHENAZINE METHOSULPHATE. R.H.Steele and B.S.Breckinridge: Biochem. biophys.

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^as. Comm., 1963, 10, 396 (Dept. Biochem., Tulane Univ., New Orleans, La., U.S.A.) B.Ketterer

7 - CHEMILUMINESCENCE OF PHENAZINE METHO-SULPHATE IN THE PRESENCE OF HYDROGEN PEROXIDE INDUCED BY REDUCTANTS INCLUDING REDUCED NICOTINAMIDE ADENINE DINUCLEOTIDE AND ASCORBIC ACID. C.Chayet, R.H.Steele and B.S. Eckinridge: Biochem. biophys. Res. Comm., 1963, 1°. 390 (Dept. Biochem., Tulane Univ., New Orleans, U.S.A.) The kinetics of the above chemiluminescence are discussed and the participation of a ^{-mi}quinone intermediate proposed. B.Ketterer

*⁸i, EFFECT OF WASHING PROCEDURES ON THE
5JOSPHATE METABOLISM OF EHRLICH ASCITES-
TUMOUR CELLS. J.O.Laws and L.H.Stickland:
Biochem. J., 1963, 87, 520-525 (Dept. Expt. Path.
E & Cancer Res., Med. Sch., Leeds, England)
20⁸ ~~in ascites tumour~~ cells after incubation in N2 at
Cont. a high content of inorg. phosphate and a low
showt of ATP*. In the unv*ashed condition such cells
to a! ^ a high rate of resynthesis of ATP when restored
in air and (b) a rate of disappearance of inorg. phosphate
in air presence of glucose which is up to 3 times as great
on th as *N2. Washing of the cells has a harmful effect
and (b) Processes: (a) ATP resynthesis is slowed by 80#,>
presence the rates of disappearance of inorg. phosphate in
presence of glucose are equal in air and in N2. *

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[^]EATHOGENESIS OF URAEMIA, vn. INFLUENCE
FROM TYRAMINE ON THE FORMATION OF ACETOIN
HEART PYRUVIC ACID IN THE RAT BRAIN. LIVER.
HEART AND ILEUM. F.Bigler, H.ThOlen and H.Staub:
Helv. Physiol. pharmacol. Acta. 1962. 20. 368-372
(Med. Universitätsklinik Basel, Switzerland) The
hypothesis that the increased acetoin levels in blood and
c.s.f. of renal and hepatic patients are caused by endo-
genous amino acids was examined. 10 " 2M pyruvate increased
tenis ^v ^{in vitro} synthesis of acetoin from pyruvate by homo-
[^]nythet- ^{k_{ra:n*}} liver and ileum, and decreased the
utylein ^U heart muscle. The concen. of acetoin and
toe C₆" 8lycol is lower in the rabbit cerebrum than in
re oelium and the brain stem.

DQO or SURFACE STRUCTURE OF ERYTHROCYTES FROM
 G. f. ANIMAL SOURCES. G.V.F.Seaman and
 (*W. bruck: Arch. Biochem.. 1963. 100. 493-502
 *al. "P., chem. Inst. der Univ. KÖln, K61n-Linden-
 troj. h. term. any). Proteolytic enzymes reduced the
 W. ^{IC} _{IC} ^{mobil} itics of human and chimpanzee
 la. * hum decreases depending on the enzyme specificity.
 5. ^{witw?} k.c. the reductions were semiquant. corre-
 "acetylated neuraminic acid containing mucoids. With
 other animal r.b.c. proteolytic enzymes produced small
 decreases or no change in mobility; with chicken r.b.c.
 mobility was increased. Treatment of r.b.c. with
 neuraminidase reduced the electrokinetic charge markedly
 In all cases. The sialic acid on the surface of chicken
 r.b.c. was predominantly N-acetylneuraminic acid while
 that from horse r.b.c. was mainly N-glycolyneuraminic
 acid. Successive treatments with neuraminidase, papain
 and trypsin revealed marked differences between r.b.c.
 from different spp.

OXIDATIVE INACTIVATION OF ENZYMES.
M.S.Melzer,^r and S.I.Epstein: Arch. Biochem., 1963,
100, 436-440 (Dept. Chem., Tufts Univ., Medford,

Mass., U.S.A.) RNase lost very little activity after treatment with 55000 mol. H₂O₂/mol. at pH 5*00. Using a modified Kunitz method, the slope with H₂O₂ was - 0-072 ± 0-014 whereas the control slope was - 0-086 ± 0-016. With 3-aminotriazole [3-AT] and H₂O₂ the slope was -0-080 ± 0-016. Denaturation of the enzyme is suggested to be a necessary first step for complete inactivation by H₂O₂. 3-AT was unreactive with 12 amino acids but did react with the oxidised forms of cystine and cysteine. 3-AT also reacted strongly with basic haemin alone or in the presence of H₂O₂, histidine or acetate. A mechanism for catalase inactivation by 3-AT and H₂O₂ is suggested. B.M.Stevens

1002. 1,2-DIHYDRO-1, 2-DIHYDROXYBENZENE AND SEVERAL OTHER SUBSTANCES IN THE METABOLISM OF BENZENE. T.Sato, T.Fukuyama, T.Suzuki and H.Yoshikawa: J. Biochem., Tokyo, 1963, 53, 23-27 (Dept. Nutr. Biochem., Inst. Public Health, Tokyo, Japan) Paper chromatographic and electrophoretic prop, and colour reactions of *trans*- and *cis*-benzeneglycol were examined. On incubation with liver supernatant, phenylsulphate and catechol sulphate were produced, the *trans*-isomer producing more catechol sulphate than the *cis*-isomer. Urine of rabbits dosed with benzene contained a substance which behaved as *trans*-benzeneglycol chromatographically and electrophoretically and also a substance which yielded JiaBfi-benzeneglycol after treatment with *p*-glucuronidase. A compound which appeared to be the precursor of phenylmercapturic acid was also demonstrated in the urine by paper chromatography.

B M Stevens

1003. EFFECT OF EXPERIMENTAL TUBERCULOSIS ON CHOLESTEROL AND ASCORBIC ACID CONTENT OF GUINEA-PIG ADRENALS. V.N.Singh, T.A.Venkitasubramanian and R.Viswanathan: Indian J. exp. Biol., 1963, 1, 79-81 (Vallabhbhai Patel Chest Inst., Delhi Univ., India) Expt. tuberculosis induces a decrease in the cholesterol content and an increase in the ascorbic acid content of the guinea-pig adrenals. *

1004. FLUORESCENT LIGHTING IN BIOLOGICAL RESEARCH. R.Scott and H.C.Bennet-Clark: Nature, Lond., 1963, 197, 1321-1322 (Dept. Dairying, Univ. Reading, Berks., England) The radiation from fluorescent lights may have mutagenic and other deleterious effects on biol. material. G.M.Lewis

1005. CARBON ISOTOPE EFFECT IN THE DECARBOXYLATION OF THE ANISOYLOXY RADICAL. T.H.Bates and J.C.Bevington: Nature, Lond., 1963. 197, 1294-1295
(Dept. Chem., Univ. Birmingham, England) Prelim.
comm. G.M.Lewis

1006. MECHANISM OF BLOOD CORPUSCLE SETTLING.
VH. CHEMISTRY OF PROINHIBITORS. F.H.Kayser,
 G.Nass and G.Ruhenstroth-Bauer: Hoppe-Seylers Z.
 physiol. Chem., 1963, 331, 95-104 (Max-Planck-
 Inst. Biochem., Munich, Germany) Proinhibitor
 concn. is independent of fat ingestion, and on heat inacti-
 vation, normal sera is not affected by removal of (X2-
 and p-lipoproteins. Proinhibitor was shown to occur in
 0Ci- but not in the 0,2" or p-lipoproteins.

**1007. METABOLIC PRODUCTS FROM LABELLED
ETHANOL. IV. DISAPPEARANCE OF ETHANE-
CARBON FROM MORPHOLOGICAL FRACTIONS AND
LIPIDS OF RAT TISSUES. H.-M.HSKKINEN, T.NIKKARI
and E.KULONEN. V. NOTE ON THE EFFECT OF**

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GLUTAMINE ON THE INCORPORATION OF ETHANOL CARBON. H.-M.H2kkinen and E.Kulonen: Arch. int. Pharmacodyn.. 1963. 142. 74-85. 86-89 (Res. Labs.. State Alcohol Monopoly (Alko). Helsinki. Finland) IV. Rates of turnover of ^{14}C are studied in rat liver, brain, plasma, r.b.c. and liver lipid fractions after ingestion of [^{14}C]ethanol. Half-lives found are: liver lipids 50 hr., plasma 40 hr., r.b.c. 117 hr., whole brain homogenate 168 hr., brain cytoplasm 84 hr., and brain mitochondria 630 hr. In brain incorporation is highest in the micro-somes.

V. 2 hr. after ingestion of [^{14}C]ethanol total recoverable ^{14}C from whole liver, brain, and blood is reduced by simult. oral administration of L-glutamine 2 g./kg. ^{14}C in non-volatile residues is not affected. S.E.Smith

1008. MECHANISM OF BIOLOGICAL N-DEALKYLATION. H.Keberle, W.Riess, K.Schmid and K.Hoffmann: Arch. int. Pharmacodyn.. 1963. 142. 125-140 (Ciba Res. Labs.. Basel. Switzerland)

The metabolism of orally administered D- and L- N-methylglutethimide is studied in dogs. The 2 optical isomers are each excreted as 2 glucuronides. One of each pair undergoes N-demethylation. the nature of which is discussed.

(German) S.E. Smith

1009. STEREOSPECIFIC METABOLISM OF OPTICAL ISOMERS OF a-PHENYL, (X-ETHYLGUTARIMIDE (DORIDEN) [GLUTETHIMIDE]. H.Keberle, W.Riess and K.Hoffmann: Arch. int. Pharmacodyn.. 1963. 142, 117-124 (Ciba Res. Labs.. Basel. Switzerland)

The metabolism of orally administered glutethimide is studied in dogs. The results show that the (+) and (-) optical Isomers are metabolised differently, the former being hydroxylated in the glutarimide ring, the latter hydroxylated in the ethyl side chain. All the metabolites are conjugated to a great extent.

(German) S.E. Smith

1010. NON SPECIFICITY OF BASIC AMINO ACIDS AND AMINES OF THE TISSUES OF THE SNAIL (HELIX POMATIA. L.). J.Cardot, J.Ripplinger and M.Lonchamp: C.R. Soc. Biol.. Paris. 1962. 156,

1433-1435 (Lab. Zool.. Fac. Sci.. Besancon. France)

Separation of extracts of heart and nervous tissue of Hg^{2+} by paper and column chromatography showed the presence of die basic amino acids ornithine, lysine, arginine and histidine and several amines. The amino acids were without effect on the snail heart. The amines accelerated the snail heart. They were found in both heart and nervous tissue. They did not include histamine, tyramine, dopamine and 5HT. It is concluded that they are not cardioaccelerator transmitters. (French) M.A.Price

1011. CHEMICAL COMPOSITION OF MARTESIA

FRAGILIS. V.V.Srinivasan and S.Krishnaswamy: Life Sci.. 1963. No. 3. 149-151 (Zool. Res. Lab.. Univ. Madras. S. India) The contents of water. N. protein. lipids. ash and glycogen of wood-boring pholads. M. fragilis. are reported. K.Jone-

1012. EFFECTS OF OCTACOSANOL ON CHICK COMB GROWTH. E.Levin: Proc. Soc. exp. Biol., N.Y.. 1963. 112. 331-334 (VioBin Corp.. Monticello. 111, U.S.A.) The C28 straight chain sat. alcohol octacosanol was found in wheat germ oil. This expt. study confirms and extends its action on the combs of White Leghorn chicks in that it significantly increases comb growths a direct relationship between dose and response was not found.

D.N.Wheatley

1013. ELECTROPHORETIC STUDIES OF RED CELL HAEMOLYSATES SUPPLEMENTED WITH PHOSPHORYLATED CARBOHYDRATE INTERMEDIATES. Y.Sugita and A.Chanutin: Proc. Soc. exp. Biol., NJ.. 1963, 112. 72-75 (Biochem. Lab.. Univ. Virginia Med. Sch.. Charlottesville, Va.. U.S.A.) The

electrophoretic behaviour of 3 different fractions of huff^{H} blood stored for a month at 4° was followed after the bW^{I} haemolysate was treated with various substances containing phosphate groupings. It was found that the fraction designated B could be neatly increased by the addition of 2,3-diphosphoglycerat J and of ATP and with this increase the fractions f and A were reduced. Smaller increases were found with ADP and 3-phosphoglyceric acid. The addition of fructose 1,6-diphosphate introduced a new electrophoretic component. The explanation might lie in the reversibility of the binding of phosphoric esters with proteins.

D.N.

Wheatley

1014. RECIPROCAL ACTION OF THE DIFFUSION FACTOR OLIGO-N-METHYL-MORPHOLINIUM-PROPYLENE OXIDE [OMP] WITH ANIONIC POLYSACCHARIDES. E.Buddecke: Hoppe-Seylers Z. physiol. Chem.. 1962, 330, 84-95 (Physiol.-Chem. Inst. Univ.. Tübingen. Germany)

OMP has no enzymic prop., releases no reducing end groups, forms ppt. with polysaccharides ADU lowers the viscosity of chondroitin sulphate protein SO^{A} . It also influences the metachromic p-band of Toluidin Blue soln.

(German)

LConisn

1015. POSSIBLE FUNCTIONS OF CHAINS OF CATALYSTS

H. RJ.P.Williams: J. theoret. Biol.. 1962. 3. 209-229 (Wadham College. Oxford. England) The oxidap phosphorylation system is considered in detail. Function of the chain of catalysts involved is discussed placing special emphasis upon the ordering in space of the catalysts and their substrates.

G.F.B**

METHODS

1016. BIOSYNTHESIS OF CHLOROGENIC ACID AND RELATED CONJUGATES OF HYDROXYCINNAMIC ACIDS. CHROMATOGRAPHIC SEPARATION AND CHARACTERISATION. K.R.Hanson and M.Zucke*: J. biol. Chem.. 1963, 238. 1105-1115 (Dept. Biochem.. Connecticut Agric. Exp. Station. New & Conn.. U.S.A.) A system for partition chromatography on SiO_2 gel is used for quant. separation of COP mixtures of phenolic conjugates (compounds related to chlorogenic acid [3-O-caffeoylequinic acid]). A solvent gradient of 10% cyclohexane- CHCl_3 (by vol.) \$ 30% \text{jerf}\$ butyl alcohol- CHCl_3 (by vol.) is used. TDF of the peak effluent vol. for any 2 compounds resolve independent of the gradient applied and of the length of the column under specified conditions. The methods

a prelim. short SiO_2 gel column fractionation step is applied to potato tuber cortex and pulp tissue, to tissue slices that have been kept in water, and to tissue cultured in soln. containing L-phenylalanine and 4- Fe^{2+} acid. Eighteen components are resolved and characterized by various methods. Culture of the tissue markedly stimulates phenolic biosynthesis and causes accumulation of 3-O-B-coumaroylquinic acid, with previously known conjugates of $\text{L}-\text{coumaric}$ and caffeic acid with

acid. and also conjugates of these hydroxycinnamic acids with glucose. Chlorogenic acid, the main phenolic component and a previously unknown conjugate of caffeoic acid and quinic acid are present in both cultured and treated tissue. The role of phenylalanine in phenolic synthesis and of 3-O-*β*-coumaroylquinic acid in biosynthesis of chlorogenic acid are discussed. J.N.Ashley

1017. PREVENTION OF EXCESSIVE FOAMING.

R.C.R.Barreto: *J. Chromatography*, 1962, 9, 121 (Central Lab. Tuberculosis and Inst. Phthisiol. and Pneumology, Rio de Janeiro, Brazil) Notes.

1018. USE OF 5-DIMETHYL-2,4-OX AZOLIDINE-DIONE FOR DETERMINATION OF INTRACELLULAR pH. W.Thomason: *Scand. J. clin. Lab. Invest.*, 1963, 15, 55-51 (Dept. Clin. Chem., Rigshospitalet, Copenhagen, Denmark). P.D.Dawkins K.Jones

1019. QUANTITATIVE INFRA-RED ANALYSIS FOR «ULPHONATE AND SULPHATE ESTERS AND NOTE ON ALKYLATION OF NUCLEOSIDE ANALOGUES. E.R.Katritzky, R.G.Shepherd and A.J.Waring: *Rec. av. Chim. Pays-Bas*, 1962, 81, 443-450 (Chem. Univ. Cambridge, England) It is shown that intronate esters can be determined quant. by extraction and measurement of peak heights in the i.r. by observing the rate of disappearance of ethyl methanesulphonate by this method, the rate of ethylation under physiol. conditions was observed for 9-ethylguanine and several other methylated purines and pyrimidines.

1020. APPLICATION OF THE ARCHIBALD ULTRACENTRIFUGAL METHOD FOR STUDY OF DILUTE POLYSYRENE-PYRIMER SOLUTIONS. I. THEORY AND SOME SUMMARY DATA ON THE SYSTEM POLYSTYRENE-METHYL ETHYLKETONE. H.Fujita, H.Inagaki, T.Kotakai and H.Utiyama: *J. phys. Chem.*, 1962, 66, 4-10 (Kyoto Univ., Japan) The theory for the Archibald ultracentrifugal method for polydispersed systems¹, solutes has been improved and extended. It the determination of the wt.-average mol. wt. and scattering second virial coefficient of a given system²,³ or sedimentation expt. performed under conditions appropriate to the Archibald method. The validity of the equations have been verified expt. G.C.Barr

1021. SPECTROPHOTOMETRIC DETERMINATION OF CAFFEINE IN COFFEE AND TEA PRODUCTS, WITH SPECIAL REFERENCE TO COFFEE AND CHICORY MIXTURES. R.F.Smith and D.L.Rees: *Analyst*, 1963, 88, 310-313 (Labs., J.Lyons and Co. Ltd., London, England). L.A.B.S.

1022. MICROAPPARATUS FOR ABSORPTION OF ETHYLENE [IN TOTAL AMOUNTS AS LOW AS A FRACTION OF A MICROLITRE] AND ITS USE IN DETERMINATION OF ETHYLENE IN EXHALED GASES FROM HUMAN SUBJECTS. G.Ram Chandra and M.Specker: *Biochim. biophys. Acta*, 1963, 69, 423-425 (Dept. Plant Sci., Univ. Alberta, Edmonton, Canada) Prelim, comm. B.M.Stevens

1023. PROBES FOR SAMPLING GROUND-WATER FOR GAS ANALYSIS. A.J.Rutter and J.R.Webster: *J. Ecol.* 1962, 50, 615-618 (Imperial Coll., London, England). J.H.Tallis

1024. IMPROVED ELECTRON MICROSCOPIC AUTORADIOGRAPHY. TECHNIQUE FOR PRODUCING THIN FILMS

AND ITS APPLICATION TO [3H]THYMIDINE-LABELLED MAIZE NUCLEI. J.K.Koehler, K.M.Bhle-thaler and A.Frey-Wyssling: *J. cell. Biol.*, 1963, 16, 73-80 (Dept. Physics, New Mexico Highlands Univ., Las Vegas, N.Mex., U.S.A.) A method for producing uniformly thin layers of photographic emulsion over tracer-labelled cell sections is described. Carbon-coated specimens on E.M. grids are placed on a glass disc previously coated with a drop of the emulsion at 45° and centrifuged at 10000 r.p.m. in an M.S.E. basket-type centrifuge. The dry, cooled discs are developed for 7-14 days in Kodak D19b diluted 1:1. The method is illustrated using root tips of 3-5 day old maize seedlings terminally exposed to a soln. containing 10 f.c./ml. [³H]-thymidine for 24 hr. The finest cell structures may be observed and no digestion of gelatin is required.

P.Barrow

1025. LIQUID SCINTILLATION COUNTING OF SOLUTIONS CONTAINING CAROTENOIDS AND CHLOROPHYLLS. E.A.Shneour, S.Aronoff and M.R.Kirk: *Int. J. appl. Radiat.*, 1962, 13, 623-627 (Lawrence Radiat. Lab., Univ. California, Berkeley, Calif., U.S.A.)

Direct bleaching with chlorine has overcome the self-absorption in liquid scintillation counting of soln. containing ³H- or ¹⁴C-labelled carotenoids or chlorophylls, and restored most of the counting efficiency. B.Payne

1026. STORAGE OF STANDARDISED RADIOACTIVE SOLUTIONS. J.H.Harley, N.A.Hallden and I.M.Fisenne: *Nature*, Lond., 1963, 197, 1230 (U.S. Atomic Energy Commission, Hlth. and Safety Lab., New York, U.S.A.) Expt. on the storage of ¹³⁷Cs, ¹⁴⁴Ce, ⁹⁵Zr, ¹³¹I, ¹⁴⁰Ba and ¹⁰⁶Ru in polythene ampoules showed that the nuclide may be kept in soln. by addition of the appropriate acid or carrier; Ru adsorbs on polythene and at least 25% remains on the walls. G.M.Lewis

1027. IODINATION OF TRIPHENYLMETHANE DYE-STUFFS. G.Hillman and E.Kuhlmann: *Hoppe-Seylers Z. physiol. Chem.*, 1963, 331, 109-113 (Chem. Lab. Med., Univ. Klin., Ttbingen, Germany). (German) I.Cornish

1028. RAPID METHOD FOR DETERMINING SULPHATE IN WATER EXTRACTS OF SOILS. A.Massoumi and A.H. Cornfield: *Analyst*, 1963, 88, 321-322 (Chem. Dept., Imperial Coll. Sci. and Technol., London, England). L.A.B.S.

1029. METHOD FOR RAPID DETERMINATION OF ALCOHOL IN BODY FLUIDS. R.M.Maboa: *Analyst*, 1963, 88, 320-321 (Dept. Physiol., Hannah Dairy Res. Inst., Ayr, Scotland). L.A.B.S.

1030. DETERMINATION OF TOTAL SULPHUR DIOXIDE CONTENT OF CIDERS. L.F.Burroughs and A.H.Sparks: *Analyst*, 1963, 88, 304-309 (Res. Sta., Long Ashton, Bristol, England). L.A.B.S.

1031. ISOTOPIC METHOD FOR ENZYMIC ESTIMATION OF OXALOACETATE. G.L.Sfller and O.Wieland: *Biochem. Z.*, 1963, 336, 447-454 (H Med. Univ. Munchen, Germany) Oxaloacetate was extracted from rat liver, rapidly frozen after removal from the animal, by homogenising it in ice-cold 6% HClO₄. Assays were done on a neutralised soln. in the presence of [1-14C]-acetyl-CoA and citrate condensing enzyme isolated from pig heart. [1-14C]citric acid was ptd. at pH 5 by the addition of AgNO₃ and its radioactivity determined in a flow or liquid scintillation counter. Rat liver was found to contain 5×10^{-9} mole oxaloacetate/g. wet wt.

(German)

L.Cohn

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1032. DETERMINATION OF POLYOXYETHYLENE GLYCOL IN NON-IONIC DETERGENTS. P.H.Elworthy: J. Pharm., Lond., 1963, 15, 216-217 (Roy. Coll. Sci. Technol., Glasgow, Scotland) A letter. The method described was applied to commercial detergents. J.M.Whitmarsh
1033. DETERMINATION OF SMALL AMOUNTS OF LONG CHAIN ALIPHATIC AMINES IN AQUEOUS SOLUTION. H. SOMH OBSERVATIONS ON THE COBALT THIO-CYANATE METHOD. M.W.Desai and T.K.S.Murphy: Indian J. Chem., 1963, 1, 106-108 (Chem. Eng. Div. Atomic Energy Establishment, Trombay, Bombay, India). L.A.B.S.
1034. H₂O₂ AND FeSO₄ USED TO DETECT PHOSPHATE ESTERS WHICH ARE DIFFICULT TO HYDROLYSE. P.Venker and G.Schmidt: J. Chromatography, 1962, 9, 121-122 (Inst. Angewandte Isotopenforschung der Inst. Biol. Deutschen Akad. Wissenschaften Berlin, Berlin-Buch, Germany) Note. (German) P.D.Dawkins
1035. ASSAY OF INTRINSIC FACTOR WITH ANTI-INTRINSIC FACTOR SERUM IN VITRO. J.Abel, W.Bouma and H.O.Nieweg: Biochim. biophys. Acta, 1963, 71, 227-229 (Div. Haematol., Dept. Med., State Univ., Groningen, Netherlands) The method provided a more sp. method for detecting intrinsic factor than previously described methods. Prelim, comm. B.M.Stevens
1036. RELAXIN ASSAY METHODS. B.G.Steinert: Trans. N.Y. Acad. Sci., 1963, 25, 307 (Warner-Lambert Res. inst., Morris Plains, N.J., U.S.A.) The guinea-pig pubic symphysis palpitation method and mouse pubic ligament method are compared as assay procedures for relaxin. The former method is prone to subjective variation and the latter offers greater precision, speed and objectivity as well as having comparable sensitivity and specificity. K.Brew
1037. SEPARATION OF BETAINE AND CHOLINE ON ION-EXCHANGERS. A.Niemann: J. Chromatography, 1962, 9, 117-118 (Landw. Forschungsanstalt Btlnthof, Hanover, Germany) Notes. (German) P.D.Dawkins
1038. SEPARATION OF HOMOLOGOUS SERIES OF 2,4-DINITROPHENYLOSAZONES BY COLUMN PARTITION CHROMATOGRAPHY. D.P.Schwartz: J. Chromatography, 1962, 9, 187-194 (Dairy Products Lab., Eastern Utilization Res. and Development Div., Agric. Res. Service, U.S. Dept. Agric., Washington, D.C., U.S.A.) Ethanolamine-benzene systems have been used for the separation of the 2,4-dinitrophenylosazones of CX-keto-aldehydes, 2,3-diketones and glyoxal on celite partition columns. P.D.Dawkins
1039. SIMPLE SYSTEM FOR THE CREATION OF A CONCENTRATION GRADIENT IN THE MOBILE PHASE. J.C.Hauton: J. Chromatography, 1962, 9, 257-260 (H8p. Timone, Marseille, France). (F. French) P.D.Dawkins
1040. PAPER ELECTROPHORESIS THROUGH DIALYSING BARRIERS. R.C.R.Barreto and A.M.Cutrim: J. Chromatography, 1962, 9, 173-175 (Central Lab. Tuberculosis and Inst. Phthisiol. and Pneumol., Univ. Brazil, Rio de Janeiro, Brazil) A method is described for separating low mol. wt. electrically charged compounds from proteins by electrophoresis on paper strips with collodion bridges inserted on either side of the starting

line. Low mol. wt. compounds proceed freely through the collodion semi-permeable membrane whereas the displacement of proteins is barred, thus alleviating the necessity of deproteinising biol. fluids before electro* phoresis. P.D.Dawta*

1041. ISOLATION AND IDENTIFICATION OF ISO-Nicotinic ACID HYDRAZIDE [INH] AND ITS META-BOLIC PRODUCTS. R.C.R.Barreto and S.O.Sabino: J. Chromatography, 1962, 9, 180-186 (Inst. Phthf* and Pneumol., Univ. Brazil, Rio de Janeiro, Brazil) Combined paper electrophoresis and paper chromatography in 2-dimensional separations are described for jp study of acid metabolites of INH. Better separations of the non-acid metabolites are obtained by means of 2-dimensional paper chromatography on unbuffered Paper A sequential procedure for the localisation of INH and some of its deriv. on paper chromatograms is devised. P.D.W

1042. WICK SYSTEMS IN CIRCULAR PAPER <CHRC GRAPHY. T.Medwick, R.G.Johl and N.Adler: J. Chromatography, 1962, 9, 118-120 (Chem. Di- Merck and Co. Inc., Rahway, NJ., U.S.A.) Note. P.D.Dawkins

1043. CENTRIFUGAL CHROMATOGRAPHY. IV. SIMPLE DISTRIBUTOR FOR CENTRIFUGAL CHROMATOGRAPHY. M.Pavli&k, J.Rosmus and Z.Deyl: J. ChromatograP^ 1962, 9, 92-95 (Automation Dept., Tech. Univ., Prague, Czechoslovakia) A simple distributor or mobile phase for centrifugal paper chromatography is described which enables the mobile phase to be changed rapidly and lends itself to gradient elution paper chromatography. P.D.Dawkins

1044. RAPID PAPER CHROMATOGRAPHIC FRACTIONATION OF COMPLEX MIXTURES OF WATER-SOLUBLE SUBSTANCES. H.T.Gordon, W.W.Thornburg and L.N. Werum: J. Chromatography, 1962, 9, 44-59 & ept. Entomol. Parasitol., Univ. California, Berkeley, U.S.A.) Three alcohol-pyridine-water-acetic BP solvents are described for a rapid preliminary fractionation of crude biol. extracts by paper chromatography. The primary system contains isopropanol. For substances with very high Rf values in this system isopropanol is replaced by isobutanol and for those with very low Rf values by methanol. Rf values of a large no. of org. and inorg. compounds in the 3 systems are tabulated. P.D.Dawkins

1045. PAPER CHROMATOGRAPHIC SEPARATION CYCLIC OLIGOMERIC PEPTIDES OF CAPROLACTAM. K.Czerepko: J. Chromatography, 1962, 9, l''-203 (Irrst. Allgemeine Chenu und Inst. physiol. Cherru Med. Akad., Bialystok, Poland) The cyclic oligomers of Caprolactam have been separated on filter paper impregnated with thymol as stationary phase and developed with a sat. aq. soln. of thymol. The Parent lactam and its cyclic amides were detected with J^dim bismuth iodide. (German) P.D.Dawkins

1046. FRAME FOR PHOTOGRAPHIC PROCESSING-MS AUTORADIOGRAMS OF PAPER CHROMATOGRAMS AND ELECTROPHOREGRAMS. O.Horesovsky, J.Dubal and I.M.Hais: J. Chromatography, 1962, 9, 260-261 (Res. Inst. Pharm. Biochem., Prague, Czechoslovakia) Notes. P.D.Dawkins

1047. AUTOMATIC COUNTER FOR RADIOACTIVE CHROMATOGRAMS ON PAPER STRIPS. J. t. J. Chromatography, 1962, 9, 96-105 (Lab. Clin.)

Nucleaire, Val-Benoit, Liège, Belgium) An apparatus is described which moves chromatographic paper strips successively under the counter tube. An endless strip of cellulose acetate carries up to 15 bands of ^{32}P or ^{35}S arranged on 5 tracks or 3 bands of ^{50}Cr and ^{35}S arranged on 3 tracks. After scanning one track the counter tube moves sideways to the next track. Radioactivity is registered on a graphic recorder.

(French) P.D.Dawkins
1048. GAS-FLOW COUNTING OF CARBON-14 COMPOUNDS: AN IMPROVED TECHNIQUE. H.J.Perkins and M.D MacDonald: Science, 1962, 138, 1259-1260 (Canada Agric. Res. Sta., Lethbridge, Alberta, Canada) Reproducibility in counting by a gas-flow method of samples of ^{14}C -labelled compounds is much improved by spraying the lower surface of the planchet with an 'antistatic' agent in aerosol form. G.M.Lewis

1049. VALIDITY OF RESULTS OBTAINED WHEN A STREAM-SPLITTING DEVICE IS USED BEFORE GAS-LIQUID CHROMATOGRAPHY DETECTOR. A.Karmen, J.C.Caffrey and R.L.Bowman: J. lipid Res., 1963, 4, 8-11 (Lab. Technical Development, N.I.H., Bethesda, Md., U.S.A.) When effluent gases are divided into 2 streams of a given ratio the components in the gas stream are divided in the same ratio. Thus mixtures may be divided into 2 separate streams which may be assayed in radiation and mass detectors.

1050. PREPARATIVE SCALE GAS CHROMATOGRAPHY. M.V. Vreede: Chromatography, 1962, 9, 116-117 (Molab- Org. Chem., State Univ. Ghent, Belgium) P.D.Dawkins

1051. VOLMAN COLLECTOR FOR GAS CHROMATOGRAPHY. R.Teranishi, J.W.Corse, J.C.Day and W.G. Jennings: J. Chromatography, 1962, 9, 244-245 (Western Reg. Res. Lab., Albany, Calif., and Univ. California, Davis, Calif., U.S.A.) Notes. P.D.Dawkins

1052. IMPROVED SAMPLING VALVE FOR GAS CHROMATOGRAPHY. D.J.McEwen: J. Chromatography, 1962, 9, 266-269 (Res. Labs., General Motors Corp., Warren, Mich., U.S.A.) Notes. P.D.Dawkins

1053. GAS CHROMATOGRAPHY FRACTION COLLECTOR AND TRANSFER SYSTEM. C.M.Drew and J.H.Johnson: J. Chromatography, 1962, 9, 264-266 (Res. Dept., U.S. Naval Ordinance Test Station, China Lake, Calif., U.S.A.) Notes. P.D.Dawkins

1054. CHANGES OCCURRING WITH THE IMMOBILE LIQUID PHASE IN GAS-LIQUID CHROMATOGRAPHY. II. EFFECT ON RETENTION VOLUMES. R.A.Keller and G.H.Stewart: J. Chromatography, 1962, 9, 1-12 (Dept. Chem., Univ. Arizona, Tucson, Ariz., U.S.A.) Chemical and physical changes which occur in the immobile liquid phase of gas chromatographic columns during conditioning and use are discussed. P.D.Dawkins

1055. THIN LAYER CHROMATOGRAPHY OF BILE ACIDS. P.Eneroöd: J. lipid Res., 1963, 4, 11-16 (Dept. Chem., Karolinska Inst., Stockholm, Sweden) Solvent systems suitable for thin-layer chromatographic separation of 40 different bile acids are described. The influence of substituents and chain length on the separation factors in different solvent systems has been examined. J.R.Sargent

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- 1056. PHOTOELECTRIC MEASUREMENT OF SMALL FLUCTUATING RETARDATIONS IN WEAKLY BIREFRINGENT, LIGHT-SCATTERING BIOLOGICAL OBJECTS. I. REVOLVING TILTED COMPENSATOR METHOD.** R.D.Allen and L.L.Rebhun: *Ex p. Cell. Res.*, 1963, 29, 583-592 (Dept. Biol., Princeton Univ., Princeton, N.J., U.S.A.) A photoelectric method is described for the analysis of birefringence in light-scattering biol. subjects. The sensitivity and range of the method could be varied easily, the smallest detectable retardation being about 10^{-8} radian (0.1 Å). Birefringence fluctuations with a period of the order of 1 sec. could be analysed. K.Jones
- 1057. FUNCTIONAL ANALYSIS OF CHEMICAL SYSTEMS IN VIVO USING LOGICAL CIRCUIT EQUIVALENT. n. THE IDEA OF A MOLECULAR AUTOMATON.** M. Sugita: *J. theoret. Biol.*, 1963, 4, 179-192 (Hitotsubashi Univ., Tokyo, Japan) The author's earlier theory of cellular control mechanisms is here revised and extended and the application of digital analysis discussed. The concept of a mol. automaton is introduced, the logical nature of which is equivalent in the terms of electronics to a switching circuit having input, output, and a time delay. G.F.Blane
- 1058. PLOTTING KINETIC DATA TO DETERMINE REACTION ORDER AND SPECIFIC RATE CONSTANTS.** G.M.Mullet and C.R.Noddings: *Science*, 1962, 138, 1346 (Chem. Eng. Lab., Dow Chem. Co., Midland, Mich., U.S.A.) The Pessen method for obtaining from kinetic expt. both order of reaction and rate const. by means of single straight-line graphs has been combined with the concept of unit time to permit handling of data over the range of 0 to 99% conversion or reaction. C.M.Lewis
- 1059. UNCERTAINTIES INHERENT IN DETERMINATION OF EFFICIENCY OF COLLISION BETWEEN VIRUS PARTICLES AND CELLS.** A.G.Ogston: *Biochim. biophys. Acta*, 1963, 66, 279-281 (Dept. Phys. Biochem., John Curtin Sch. Med. Res., Australian Nat. Univ., Canberra, A.C.T., Australia) Even in the most favourable case of collision with small spherical objects, the collision efficiency can be measured only if it is considerably less than 10^{-3} . B.M.Stevens
- 1060. PATHOLOGY OF EFFECT OF LASER BEAM ON SKIN.** L.Goldman, D.J.Blaney, D.J.Kindel, jun., D. Richfield and E.K.Franke: *Nature*, Lond., 1963, 197, 912-914 (Dept. Dermatol., Univ. Cincinnati, Ohio, U.S.A.) Prelim. investigations with a light-weight type solid laser with a ruby crystal showed that superficial destructive lesions may be produced in the skin of man. The more intense the colouring of the skin, the deeper the reaction. Deep necrotic lesions were produced in black pigmented regions of the rabbit ear. G.M.Lewis
- 1061. ACTION SPECTRA FOR ULTRAVIOLET LIGHT INACTIVATION OF SYSTEMS CONTAINING 5-BROMOURACIL SUBSTITUTED DNA. I. E. COLI 15 T'A'U.** R.Boyce and R.Setlow. II. BACTERIOPHAGE T4. R.Setlow and R.Boyce: *Biochim. biophys. Acta*, 1963, 68, 446-454, 455-461 (Biol. Div., Oak Ridge Nat. Lab., Oak Ridge, Tenn., U.S.A.) I. 22% of the thymine was substituted by 5-bromouracil with no loss in viability. U.v. sensitivity of substituted cells was greater than that of normal cells at all X between 230-0 m μ and 313*0 m μ by a factor depending on the X . 5-Bromouracil absorption was not sufficient to account quant. for the X dependence

of the sensitivity of substituted cells.

II. Phage with an estimated SO^*Jo of thymine replaced by bromouracil were inactivated by light in the range 230-0-313*1 m μ Li Sensitivity of substituted phage was greater than that of normal phage by a factor of approx 4 at 240-0-290*0 m μ /x. The factor increased to 7 at 230*0 m μ and to 88 at 313*1 m μ . The long X dependence of the sensitivity was largely accounted for by the greater u.v. absorbancy of bromouracil as compared with thymine. B.M.Stevens

- 1062. AUTORADIOGRAPHIC INVESTIGATION ON INCORPORATION OF [3H]AMINO ACIDS INTO THE CYTOPLASMIC NUCLEUS DURING POST-MITOTIC, PRESYNTHETIC PHASE AND DNA DUPLICATION PHASE [S-PHASE]. OF NORMAL AND X-IRRADIATED MICE.** K.Gerbaud, W.Maurer and J.Brtlikner: *Biochim. biophys. Acta*, 1963, 68, 462-471 (Inst. Med. Isotopenforschung, Univ. Koln, Germany) With nuclei of the same cell type incorporation/unit cell vol. was nearly constant. After simult. application of [14C]thymidine, nuclei in the S-phase were additionally labelled by ^{35}S -tracers, permitting differentiation of nuclei synthesising DNA from those not synthesising DNA. In epithelial cells of the jejunum crypts, [3H]leucine or [3H]tyrosine incorporation/unit nuclear vol. was const. throughout the generation cycle excepting mitosis. Whole body irradiation with doses up to 800 r had no effect on [3H]leucine or [3H]tyrosine incorporation into nuclei of epithelial cells of liver and jejunum crypts within the first 2 hr.

- (German) B.M.Stevens
1063. ULTIMATE MAXIMUM VALUES OF RBE [RADICAL BIOLOGICAL EFFECT] OF FAST NEUTRONS AND GAMMA RAYS FOR CHROMOSOME ABERRATIONS. G.J.Neary, J.R.K.Savage, H.J.Evans and J.Whittle: *Int. J. rad. Biol.*, 1963, 6, 127-136 (M.R.C., Radiobiol. Research Unit, Harwell, Didcot, Berks., England) Chr. radiations in *Tradescantia* microspores produced by short and long exposures were examined. At low doses or long exposure times the RBE of the fast neutrons was high, approaching in the limit values of the order of 100. B.M.Stevens

- 1064. KINETICS FOR TWO-BREAK CHROMOSOME CHANGES.** S.Wolff: *J. theoret. Biol.*, 1962, 3, 314-314 (Biol. Div., Oak Ridge Nat. Lab., Tenn., U.S.A.) Data from a variety of biol. systems were examined and found to be compatible with an equation formulated to describe the theoretically expected kinetics for chrom. chr. exchanges. G.F.Blane

- 1065. DIFFERENTIAL INHIBITIONS OF SYNTHESIS OF SOLUBLE AND PARTICULATE RNA.** E.Wainfan, L.R. Mandel and E.Borek: *Biochem. biophys. Res. Commun.*, 1963, 10, 315 (Dept. Biochem., Coll. Phys. and Exptl. Columbia Univ., New York, N.Y., U.S.A.) are reported showing that u.v. irradiation of *Escherichia coli* mutant damages sol. RNA synthesis and particulate RNA synthesis differently. B.Ketterer

- 1066. DNA SYNTHESIS IN X-IRRADIATED CULTURES INFECTED WITH POLYOMA VIRUS.** J.Minowada and G.E.Moore: *Exp. Cell Res.*, 1963, 29, 31-35 (Roswell Park Mem. Inst., Buffalo, N.Y., U.S.A.) The X-irradiated (10000 r or 2000 r on 1 or 2 days before virus inoculation) mouse-embryo cultures supported virus multiplication with typical and rapid cytopathic effects, the growth rate of the virus being higher than that in non-irradiated ones. It is suggested that increased DNA synthesis obtained in the X-irradiated cultures represents mainly newly synthesised viral DNA. K.J.

- ^{1067.} GROWTH AND NUCLEIC ACID SYNTHESIS IN NORMAL AND ULTRAVIOLET IRRADIATED CELLS OF VIBRIO CHOLERAE. N.K.Kapoor, P.Sagar and S.C. Agarwala: Indian J. exp. Biol., 1963, 1, 84-87
 Central Drug. Res. Inst., Lucknow, India) Chloramphenicol has been shown to significantly inhibit DNA synthesis and to some extent RNA synthesis in normal cells of *V. cholerae*. In the case of u.v. irradiated cells, chloramphenicol completely prevents the recovery of RNA synthesis from the effects of irradiation and inhibits RNA synthesis almost to the same extent as in the normal cells. The incorporation of [14C]adenine, specifically taken up by the nucleic acids, is also inhibited by chloramphenicol in both normal and irradiated cells. *in vivo*, chloramphenicol prevents the abrupt decline in the case of irradiated cultures during the later stages of growth, presumably due to lysis. *
- ^{1068.} LOW-TEMPERATURE REVERSAL OF ULTRAVIOLET PHOTOCHEMICAL REACTION PRODUCT OF 2'-V⁴XYURIDINE. W.H.Prusoff: Biochim. biophys. Acta, 1963, 68, 302-310 (Dept. Pharmacol., Yale Univ. Sch. Med., New Haven, Conn., U.S.A.) U.v. irradiation of frozen or liquid 2'-deoxyuridine soln. decreased absorbancy. Storage at -2(f resulted in reappearance of 20% of the original absorbancy within 5 hr. and/or 70% within 71 hr. Little or no absorbancy increase occurred at room temp., 5° or 7(f. Uracil, but not thymine, thymidine, 5-fluoro-2'-deoxyuridine, 5-bromo-2'-deoxyuridine or 5-iodo-2'-deoxyuridine, behaved similarly. 100- and 1000-fold increases in acid-AirS³ generation at room temp, and 5° respectively. S² added before or after irradiation prevented reversion. Irradiation of deoxyuridine in [³H]water and

- ^{1069.} EFFECT OF OXYGEN AND N-ETHYLMALEIMIDE ON INACTIVATION OF RNase BY Y-IRRADIATION. J. Bridges: Biochim. biophys. Acta, 1963, 67, 331-335 (Isotope Res. Div., Wantage Res. Lab., Wantage, Berks., England). B.M.Stevens

- ^{1070.} INCORPORATION OF [³H]THYMIDINE IN DNA IN MOUSE TISSUES AND ITS RADIATION EFFECTS. K.F.Garder and F.Devik: Int. J. rad. Biol., 1963, 6, 157-172 (Hlth. Phys. Dept., Inst. for Atomenergi, Kjeller pr. Illestrfm, Norway) Mice received 200 ²⁰ ^μc or 5 ⁵ ^μc pHthymidine or 4 ⁴ ^μc [14C]thymidine. Weight activity and degree of labelling in autoradiographs were determined in 7 tissues at intervals up to 120 days. Cellular death due to radiation occurred in mice receiving 200 ^μc and possibly also in those receiving 5 ^μc. In several tissues thymidine incorporation did not decrease proportionately to the amount available. JK , B.M. Stevens

- ^{1071.} VISCOSITY OF SINGLE-STRANDED DNA AFTER IRRADIATION IN THE NATIVE STATE. U.Hagen: ¹⁹⁶³ ¹⁹⁷ ^{10⁴-1005} (Radiol. Inst. Freiberg/Breisgau, Germany) The T₁ of single-stranded DNA and the hydrogen bonds between strands have nearly the same radiosensitivity to X-rays. If about 37% about 30000 r. After separation of the single-stranded DNA, the T₁ drops to 50% after 500 r. If DNA is irradiated, the loss in T₁ is small. Sensitivity of the single nucleotide chain might be in? ²et vol. in the coiled single-strand DNA than that in the stiff double helix. G.M.Lewis

- ^{1072.} X-RAY INDUCED RADICALS IN WHOLE BACTERIOPHAGE AND PHAGE NUCLEIC ACID. A.Müller: Int. J. rad. Biol., 1963, 6, 137-142 (Inst. für Strahlenbiol., Kemforschungszentrum Karlsruhe, Germany) The electron spin resonance [ESR] absorption of DNA, extracted from purified *E. coli* T2 bacteriophage and irradiated in vacuo at various temp., showed pronounced hyperfine structure when measured in vacuo at room temp. When DNA received increased X-ray doses in vacuo at room temp., satn. of radical concn. occurred at a few hundred kr. The initial energy expenditure measured at room temp., after irradiation at various temp., was 8-30 e-V/radical induced. The e.s.r. of whole phage irradiated in vacuo at various temp., was, at room temp., equal to the absorption of phage DNA plus that of a similar quantity of protein; similarly, dependence of radical concn. on dose was the sum of contributions from DNA and protein.

B.M.Stevens

- ^{1073.} DEHYDROPEPTIDE PRODUCTION IN RADIOLYSIS OF SOLID PEPTIDES: A RADIOLYTIC SYNTHESIS OF PYRAZINE DERIVATIVES FROM CYCLIC DIPEPTIDES. M.K.-English and W.M.Garrison: Nature, Lond., 1963, 197, 895-896 (Lawrence Radiation Lab., Univ. California, Berkeley, Calif., U.S.A.) Evidence is presented for the formation of pyrazine deriv. through γ -radiolysis of solid glycine-, alanine- and glycylalanine-anhydrides, followed by dissolution in alkali.

G.M.Lewis

- ^{1074.} SYNTHESIS OF ORGANIC COMPOUNDS BY HIGH-ENERGY ELECTRONS. J.Oró: Nature, Lond., 1963, 197, 971-974 (Lawrence Radiation Lab., Univ. California, Berkeley, Calif., U.S.A.) Irradiation of gaseous methane-ammonia-water mixtures with 5 meV electrons from a linear accelerator causes formation of org. compounds among which amino acids, hydroxy acids and their corresponding amides and nitriles predominate. Irradiation of methane-ammonia-water mixtures in the solid state results in a similar pattern of org. compounds.

J.R.Sargent

- ^{1075.} CATHEPSIN C AND ULTRAVIOLET MEDIATED INHIBITION OF MITOCHONDRIAL REACTIONS. R.E. Beyer: Exp. Cell Res., 1963, 29, 212-219 (Inst. Enzyme Res., Univ. Wisconsin, Madison, Wis., U.S.A.) The relation between u.v. inactivation of mitochondrial DNP-activated ATPase and cathepsin C activity contained in the prep, was studied. The data are interpreted to indicate that far-u.v. action of lysosomal cathepsin C acting upon mitochondrial protein is probably not the basis of previously noted inactivation of mitochondrial enzyme systems following* u.v. irradiation. K.Jones

- ^{1076.} EFFECT OF ULTRAVIOLET IRRADIATION [AT 254 m/i] OF E. COLI STRAIN B ON SUCROSE-GRADIENT-SEDIMENTATION PATTERN OF ITS CELL-FREE EXTRACT. A.ROisch, A. Edelman and J.A.Cohen: Biochim. biophys. Acta, 1963, 68, 271-277 (Med. Biol. Lab., Nat. Defence Res. Org. TNO, Rijswijk, Netherlands) Extracts of fully 32P-labelled cells sedimented in 3 peaks of 50 S, 30 S and 4 S in a sucrose gradient between 5 and 20% Tn pH 7-4, 0.05 M tris (hydroxymethyl)-aminomethane buffer with 10⁴ M ^{mg#} in the swinging-bucket rotor No.25 of the Spinco model-L ultracentrifuge. Extracts of cells exposed to 32P⁴ for 5 min. had all their ³²P between 4 and 30 S. U.v. irradiation had no effect. If 20 min. with 32POJ3 followed the 5 min., 32P appeared in 30 S and 50 S fractions. This was altered by 200 erg/mm² u.v. irradiation; in wild type 4 S material accumulated while in the u.v. sensitive mutant 20 S material also accumulated.

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Chloramphenicol caused 20 S accumulation in both. 400 crg/mm.2 u.v. irradiation produced 20 S accumulation in wi Id type. BM Stevens

1077. RECOVERY OF OXIDATIVE PHOSPHORYLATION IN RAT LIVER MITOCHONDRIA AFTER WHOLE BODY IRRADIATION. J.C.Hall, A.L.Goldstein and B.P.Sonnenblick: *J. biol. Chem.*, 1963, 238, 1127-1140 (Newark Coll. Arts and Sci., Rutgers State Univ. N.J., U.S.A.) Rat liver mitochondrial protein decreases to 1b% of the control value after exposure to a single acute dose (840 r) of whole body irradiation for 6 hr. and returns to normal within 24 hr. The no. of mitochondria decreases to some extent during the first 3 hr. and then recovers; irradiated mitochondria vary greatly in size and fragility. Consumption of O₂ varies markedly after irradiation. It is higher with all substrates 6 hr. after irradiation and returns to normal in 24 hr. The rate of synthesis of ATP decreases by 20% after irradiation for 1 hr. and remains at this level for 12 hr. In most cases it returns to normal after 24 hr. and in every case after 48 hr. P:O ratios are decreased by 25% after irradiation for 3 hr. and remain so for 12 hr. Control levels are attained within 24 to 48 hr.

J.N.Ashley

1078. BIOCHEMICAL STUDIES ON IRRADIATED PROTOZOA. I. EFFECT OF METABOLITES ON RESPIRATION OF X-IRRADIATED TETRAHYMENA PYRIFORMIS. J.S.Roth: *J. Protozool.*, 1962, 9, 142-146 (Inst. Cell. Biol., Univ. Connecticut, Storrs, Conn., U.S.A.)

Cells of *T. pyriformis* suspended in 0.07 M phosphate buffer, pH 7.4, failed to show a decrease in O₂ consumption when irradiated with 600000 r; while lower doses appeared to stimulate O₂ uptake slightly. Irradiation in water with increasing doses led to a reduction in the O₂ consumption. This fall in respiration was prevented by the addition of pyruvate or acetate. Pyruvate stim. the respiration of irradiated cells particularly at 10 and 60 min. post-irradiation. Lactate was less effective than pyruvate in increasing the O₂ uptake of irradiated cells while thiocetic acid had little effect. The growth lag of *T. pyriformis* increased proportionately with increasing radiation, no cells surviving 600000 r. The lag period or subsequent growth rates were unaffected by the presence of metabolites during irradiation.

R.J.Walker

1079. BIOCHEMICAL AND MORPHOLOGICAL STUDIES OF RADIATION INJURY IN TISSUE CULTURE: COMPARISON WITH CELLULAR INJURY IN ANTIGEN-ANTIBODY REACTIONS. H.Hayashi, A.Tokuda, T.Ono and Y.Takaba: *Brit. J. exp. Path.*, 1963, 44, 1-10 (Dept. Path., Kumamoto Univ. Med. Sch., Kumamoto, Japan) Monocytes from rabbits' peritoneal sacs were cultured in chamber which allowed sampling of culture fluid and visual observation. Irradiation by X-rays released an inactive sulphhydryl protease. Later release of non-sulphhydryl protease occurred simult. with morphol. changes in cytoplasm and mitochondria.

D.L.Gardner

1080. VARIATIONS IN BLOOD CONTENT OF STRONTIUM-90/YTTRIUM-90 OF MICE INJECTED AFTER 200 r WHOLE BODY X-RAY DOSE. B.Holmberg, M.Dahlstrom and E.Wallgren: *Int. J. rad. Biol.*, 1963, 6, 181-186 (Cancer Res. Div. Radiumhemmet, Stockholm, Sweden) Male albino mice received 4 J.C.⁹⁰Sr i.p. at various times after irradiation. The ⁹⁰Sr/⁹⁰Y content of whole blood was estimated at various intervals after injn. The values of ⁹⁰Sr obtained agreed with a theoretical equation expressing the overall state

of isotope in blood after i.p. injn. The const. for inflow and outflow of isotope in the blood were increased in irradiated animals as compared with non-irradiated controls. The injury to isotope transport routes to and from the blood system thus indicated was demonstrable 5 min* after irradiation. B.M.Stevens

1081. CHANGES IN EXCRETION OF SODIUM BY SALIVA AFER WHOLE-BODy IRRADIATION IN RATS. J.Ondráckova, M.Rakovic and V.Gregora: *Nature*, Lond. 1963, 197, 915 (Inst. Biophys., Med. Fac., Charles Univ., Prague, Czechoslovakia) Rats were inj. i.p. with ²²Na and irradiated with 1000 r X-rays. There is * significant increase of 22Na concn. in saliva of irradiated rats after 72 and 96 hr. compared with controls.

G.M.Lewis

1082. EFFECT OF GAMMA IRRADIATION IN PIGS FED LOW VITAMIN A RATIONS. T.N.Meacham, T.J.Cunha, G.E.Combs, H.D.Wallace, A.C.Warnick, Shirley and C.F.Simpson: *Proc. Soc. exp. Biol.*, N.Y., 1962, 111, 30-34 (Dept. Anim. Sci., Univ. Florida, Agr. Expt. Stn., Gainesville, Fla., U.S.A.) Vit. A deficiency had no effect on the survival period of pigs exposed to lethal γ -radiation (350 r). M.M.Shaplan

1083. RECOVERY OF CENTRAL NERVOUS SYSTEM FUNCTIONS IMPAIRED BY LETHAL HEAD X-IRRADIATION. V.Nair, H.Sugano and L.J.Roth: *Proc. Soc. exp. Biol.*, N.Y., 1963, 112, 273-277 (Dept. Pathol., Univ. Chicago, Ill., U.S.A.) Male Sprague-Dawley rats were given 10000 r to the head only. response to a 150 mA, 0.2 sec. duration electrical stimulus was measured daily after irradiation. There was a loss of hind limb tonic extension observed in control animals. The response recovered progressively until death. The report presented evidence that recovery from injury to the c.n.s. occurs in spite of the animals becoming moribund. D.N.Whitfield

1084. SUCCESSIVE CHANGES IN SKIN EPITHELIUM OF YOUNG AXOLOTL (SIREDON MEXICANUM) AFER ROENTGEN IRRADIATION. V.V.Bnmst: Amer. J. Roentgenol., 1963, 89, 624-647 (Lab. Radiobiol., Roswell Park Mem. Inst., Buffalo, N.Y., U.S.A.) dose of 250 to 9000 r was given to the head of the animal, *S. mexicanum*, and animals were killed at intervals for histol. examination. Definite changes were observed following a dose of 500 r and occurred sooner after irradiation as the dose was increased. Regeneration of the epidermis occurred in 40 to 50 days if the animal survived long (doses up to 3000 r). The outer surface of the epithelium became very uneven and fissured and contained more pigment, many giant cells and more melanophores than that of the control animals. D.E.Evans

1085. IMPACT OF IONISING RADIATIONS ON EMBRYO AND FOETUS. R.Rugh: Amer. J. Roentgenol., 1963, 89, 182-190 (Dept. Radiol., Coll. Phys. and Surg., Columbia Univ., N.Y., U.S.A.) A review. D.E.Evans

1086. DEVELOPMENT OF X - IRRADIATED AND N¹⁰O¹⁷ IRRADIATED MOUSE OOCYTES TRANSPLANTED X-IRRADIATED RECIPIENT FEMALES. L.E.Glass, Teh Ping Lin: *J. cell. comp. Physiol.*, 1963, 60 (Dept. Anat., Sch. Med., Univ. California, Francisco, Calif., U.S.A.) Unfertilised oocytes agouti C3H mice exposed to 250 r X-irradiation were much less successful than non-irradiated eggs in implantation.

^{^n} and development in recipient Cal A? induced to ^{^ulate} by hormone injn. Irradiation of the recipients ^{^e}taces their pregnancies. It appeared that death of irradiated oocytes was primarily due to oocyte injury and ^{^t} irradiation in vitro was less damaging than in vivo, [^] petition for uterine sites between native and donor SSs was observed.

G M Lewis

¹⁰⁸ J. RADIATION DAMAGE IN MUSCLE CELL MEMBRANES AND REGULATION OF CELL METABOLISM. A.Portela, J.C.Perez, P.Stewart, M.Hines and V. ^{^d y}: Exp. Cell Res., 1963, 29, 527-543 (Dept. ^{^nat}- Emory Univ., Atlanta, Ga., U.S.A.) In frog ^{^ated} muscles, high doses (100000 r) of X-irradiation and ^{^led} prolonged relaxation time, more rapid fatigue, ^{^t} increased ATP and glycogen content, but increased [^] and Na effluxes, Na influx and O₂ consumption. ^{^tch} latency and rise time were not changed. Mg-^{act} ^{^d} activity of homogenates or mitochondria! suspensions decreased immediately after irradiation, ^{^increased} with time more rapidly than in controls. ^{^tch} interpreted to support the hypothesis that irradiation results in membrane damage, both in the sarco-syn* membrane and in the mitochondrial structure.

^{108.8} RADIATION DOSE-RESPONSE CHARACTERISTICS OF LEUCOCYTES IN MOUSE. W.W.Smith, I.M.Alderman, C.A.Schneider and J.Comfield: Proc. Soc. exp. ^{^1} N.Y., 1962, 111, 182-186 (Nat. Cancer Inst., Bethesda, Md., U.S.A.) Differences of the days¹ of 50 rad were detected by lymphocyte counts 1-4 days after [^] sublethal irradiation and 100 rad by granulocyte counts 3, 4 days after 98-100 lethal doses. [^] nor injn. Crimtoxin did not improve the accuracy of dose distribution after 3 days.

M.M.Shapland

¹⁰ [^]VARIATIONS IN SURVIVAL TIME AFTER WHOLE-BODY IRRAIDATION AT TWO TIMES OF DAY. D.J. Pizzarello, R.L.Witcofski and E.A.Lyons: Science, 1963, 139, 349 (Dept. Radiol., Bowman Gray Sch. of Med., Winston-Salem, N.C., U.S.A.) Rats irradiated [^] 100 r whole-body X-irradiation survived more ¹³ days when irradiated in the morning, but only [^] if irradiated at night.

CM.Lewis

¹⁰⁹⁰ CHRONIC GAMMA RADIATION AFFECTS DISTRIBUTION OF RADIAL INCREMENT IN PINUS RIGIDA 1963 - G.M.Woodwell and L.N.Miller: Science, 1963, 139, 222-223 (Biol. Dept., Brookhaven Natl. Lab., U.S.A.) Exposure of pitch pine ⁵ r/day chronic ionising radiation at rates between 1 and ^{*ien} X for several yr. causes reduction of radial increment throughout the stem, the reduction being most pronounced near the base of the tree.

CM.Lewis

¹⁰⁹¹ OP ^{^C} VERY FROM RADIATION-INDUCED DELAY IN GAMETES OF ARBACIA PUNCTULATA 1963 - P. McColla: Science, 1962, 138, 1341-1342 (Radiol. Physics Div., Argonne Nat. Lab., Argonne, Ill., U.S.A.) Recovery of A. punctulata sperm from ev. egg. Recovery of the egg is prevented by removal of the unfertilised egg is not necessarily the same as in the zygote.

CM.Lewis

¹⁰⁹² EFFECTS OF RADIOPROTECTIVE AGENTS ON FOOT DEFORMITIES AND GAIT DEFECTS IN PRE-NATALLY X-IRRADIATED RAT. B.H.Ershoff,

C.W.Steers, jun. and L.Kmger: Proc. Soc. exp. Biol., N.Y., 1962, 111, 391-394 (Western Biol. Labs., Culver City, Calif., U.S.A.) Radioprotective agents largely prevented the occurrence of foot deformities and defective gait, and partially prevented the development of abnormal cerebral hemispheres in the young of rats exposed to a single dose of 150 r X-irradiation.

M.M.Shapland

¹⁰⁹³ PROTECTIVE EFFECT OF OLIVE OIL AGAINST X-RAY IRRADIATION OF HAMSTERS. W.Lohmann, W.F. Denny, W.H.Perkins and A.J.Moss, jun.: Int. J. rad. Biol., 1963, 6, 195 (Dept. Radiol., Univ. Arkansas, Little Rock, Ark., U.S.A.) Injn. of oil did not alter the effect of 800 r X-irradiation on the incorporation of [14c]thymidine into DNA. Prelim. comm. B.M.Stevens

¹⁰⁹⁴ RADIOPROTECTION BY SULPHUR IN COMPOUND CHI₃S₈. A. Van de Vorst and J.Duchesne: Int. J. rad.piol., 1963, 6, 191-193 (Inst. d'Astrophys. de l'Univ. de Liège, Cointe-Sclessin, Belgium) Resistance of CHI₃S₈ to X-rays was estimated from changes produced in the quadruple resonance line of ¹²⁷I. (French) B.M.Stevens

¹⁰⁹⁵ RADIOPROTECTIVE ACTION OF DIMETHYL SULPHOXIDE. C. Van der Meer, P.W.Valkenburg and M.Remmelts: Int. J. rad. Biol., 1963, 6, 151-155 (Med. Biol. Lab., Nat. Def. Res. Org., TNO, Rijswijk, Z.H., Netherlands) Protection against a lethal dose of X-rays was somewhat better in CBA/Rij mice than in C57BL/Rij mice. At protective doses the O₂ tension in the spleen was markedly reduced especially in the CBA/Rij mice. I.p. injn. of dimethyl sulphoxide caused an abrupt rise in b.p. lasting a few min. B.M.Stevens

¹⁰⁹⁶ RADIOPROTECTIVE EFFECTS OF COMBINED HYPOXIA AND β -AMINOETHYL ISOTHIURONIUM BROMIDE HYDROBROMIDE IN [X-IRRADIATED] MICE. L.M.Zatz: Int. J. rad. Biol., 1963, 6, 105-115 (Dept. Radiobiol., Stanford Univ. Sch. Med., Palo Alto, Calif., U.S.A.) No evidence of significant therapeutic synergism was found. A relative increase in the no. of deaths 3-6 days after irradiation in the protected mice is suggested to indicate that the protective agents had a selective action on modes of death. B.M.Stevens

¹⁰⁹⁷ DISTRIBUTION AND CHEMICAL FORMS OF RADIATION PROTECTIVE AGENT (S-(2-AMINOETHYL) THIURONIUM BROMIDE HYDROBROMIDE IN MAMMARY TUMOUR-BEARING MICE. B.Shapiro, E.E. Schwartz and CKollmann: Cancer Res., 1963, 23, 223-228 (Res. Lab., Dept. Radiol., Southern Div., Einstein Med. Center, Philadelphia, Pa., U.S.A.)

^o C57BL/6J mice bearing a s.c. transplanted mammary adenocarcinoma received either 140 or 280 mg./kg. [35s]2-mercaptoethylguanidine [MEG] or 140 mg./kg. [35s]bis(2-guanidoethyl) disulphide [GED] i.p. After 20 min. the tumour had taken up less agent than most vital organs except brain. More GED appeared in tumour in animals receiving GED than in those receiving MEG. The tumour contained the same ³⁵S compounds as normal tissues. Distribution of protective agent was also examined 120 min. after GED injn. Tumour-bearing animals appeared to have difficulty in excreting the protective agents. Optimum conditions for protecting normal tissue but not tumour are suggested to be injn. of large doses of MEG 20 min. before irradiation.

B.M.Stevens

¹⁰⁹⁸ CHEMICAL PROTECTION FOR INCORPORATION OF ³²P INTO NUCLEIC ACIDS OF LYMPHATIC CELLS

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AGAINST Y-IRRADIATION. LHonjo, Y.-T.Tchoe, Y.Takamori and M.Akaboshi: Nature, Lond., 1963, 197, 914-915 (Dept. Biol., Fac. Sci., Univ., Osaka, Japan) The incorporation of ^{32}P into RNA and DNA is impaired in rabbit lymphatic cells *in vivo* after Y" irradiation. Cysteamine exerts some protective effect if present during radiation, whereas S, 2-aminoethylisothiuronium-Br-HBr does not, and has a noxious effect on the cells.
G.M.Lewis

1099. PROTECTION OF TISSUE CULTURE CELLS AGAINST IONISING RADIATION. III. INFLUENCE OF ANOXIA ON RADIOPROTECTION OF TISSUE CULTURE CELLS BY CYSTEAMINE. AJ.Vergroesen, L. Budke and O.Vos: Int. J. rad. Biol., 1963, 6, 117-126 (Med. Biol. Lab. RVO-TNO, Lange Kleiweg 139, Rijswijk, Z.H., Netherlands) 4 mM and 16 mM cysteamine soln. gave dqse reduction factors [DRF] of 1.9 and 3*3 respectively while anoxia gave a DRF of 2*6 on X-irradiation. Puck's pjdting technique was used. 4 mM and 16 mM cysteamine soln. under anoxic conditions gave DRF of 3 and 3.95, respectively. When conditions were arranged to give intensive contact between air and a thin layer of cysteamine soln., chem. measurements indicated that the cysteinine was oxidised rather quickly. Under such conditions the protective action of cysteamine was that expected of the Residual concn. of cysteamine present during irradiation^
B.M.Stevens

1100. TEMPORARY RADIO^TABILTY IN EXTRACELLULAR BACTERIOPHAGES AFTER TRAPPING OF MOLECULES OF CYSTEINE CYSTEAMINE GROUP. G.Hotz: Int. J. rad. Biol., 1963, 6, 143-149 (Inst. ftr Strahlenbiol., Kemforschungszentrum Karlsruhe, Germany)

Some phages of the 10 strains tested acquired temporary radioresistance if incubated in nutrient broth containing 0.5 M cysteine or cysteamine before X-irradiation in an anoxic medium in which the SH concn. was reduced below that required for protection. O₂ removed the acquired protection but treatment with N-ethylmaleimide did not affect the acquired protection.
B.M.Stevens

1101. EFFICIENCY OF TETRACYCLINE IN REMOVING RADIOSTRONTIUM FROM RATS. H.Smith: Int. J. rad. Biol., 1963, 6, 197-198 (U.K.A.E.A., Annan, Scotland) Tetracycline did not increase the rate of removal of Sr from bone.
B.M.Stevens

1102. RADIOACTIVITY IN LARGE MARINE PLANKTON AS FUNCTION OF SURFACE AREA. C.Osterberg, L. Small and L.Hubbard: Nature, Lond., 1963, 197, 883-884 (Dept. Oceanography, Oregon State Univ., Corvallis, Ore., U.S.A.) The concn. of the radio-nuclides ^{40}K , ^{65}Zn , ^{95}Nb , $^{103-106}\text{Ru}$, ^{95}Zr , ^{51}Cr and ^{141}Ce was not dependent on the surface area of euphausids and copepods of varying size. In the tunicate *Salpa*, the highest radioactivity was found in the digestive tract.
G.M.Lewis

1103. RADIOIODINE IN MILK OF COWS CONSUMING STORED FEED AND OF COWS ON PASTURE. B.Kaw, C.P.Straub and LR.Jones: Science, 1962, 138, 133* 1335 (Robert A.Taft Sanitary Eng. Center, U.S. Publ. Hlth. Serv., Cincinnati, Ohio, U.S.A.) ^{131}I was measured in mi lk 2 months after termination of the Russian nuclear test series in 1961 and found to be $270/\text{^131I}$ per 1. milk in cows at pasture. This concn. decreased with a half-life of 7 ± 1 days. No ^{131}I was found in sheltered cows that consumed stored feed. G.M.Lewis

1104. STRONTIUM-90 AND CALCIUM IN MILK OF MINIATURE SWINE. R.O.McClellan and L.K.Bustad: Int. J. rad. Biol., 1963, 6, 173-180 (Biol. Lab., Hanford Lab., G.E.C., Richland, Wash., U.S.A.) The mean $^{90}\text{Sr}/\text{Ca}$ of the milk of 9 young adult primiparous swine fed 25 or 125 mcg of ^{90}Sr daily was 0*10 that of diet. The mean $^{90}\text{Sr}/\text{Ca}$ of plasma was 0*23 that of diet and the mean $^{90}\text{Sr}/\text{Ca}$ of milk was 0*38 that of plasma. With increasing time after parturition the ^{90}Sr content of the milk increased from 1^ to more than 3% of the ^{90}Sr ingested each day. The Ca content of the milk also increased with time after parturition but the $^{90}\text{Sr}/\text{Ca}$ of the milk increased relative to the $^{90}\text{Sr}/\text{Ca}$ of the diet.
B.M.Steve

1105. DETERMINATION OF ^{90}Sr AND ^{228}Th IN BIOLOGICAL MATERIALS. F.W.Bruenger, D.R.American and B.Stover: Health Physics, 1963, 9, 232-236* Anat., Univ. Utah, Salt Lake City, Utah, V⁸⁵A¹³³ Details are given of a method for the separation of ^{90}Sr and ^{228}Th from biol. specimens, in particular, dog faeces. The ^{90}Sr technique is a modification of the nitrate pptn. method for separation from Ca. T^{228}Th determinations require two pptn. with H_2O_2 , first at pH 4 and then at pH 9, followed by pptn. with eerie m-nitrobenzoate and treatment on an ion exchange column* ck
MSLavera

IMMUNITY TO INFECTION

^{Uo} _x ⁶- ASSAY OF INTERFERON PRODUCED IN RHESUS MONKEY AND CALF KIDNEY TISSUE CULTURES USING BOVINE ENTEROVIRUS M6 AS CHALLENGE ^{Re}_sellers and M.Fitzpatrick: Brit. J. exp. Path., ^A 62, 43, 674-684 (Wellcome Res. Lab., Beckenham, ^{nt}_{En}?land ^A) Bovine enterovirus was the most sensitive to interferon of a series of viruses tested in tissue culture. A sensitive method of assay was developed using tu_{hes.} D.L.Gardner

¹ 1(?) . THE STRUCTURE, FUNCTION, AND SIGNIFICANCE OF THE IMMUNE GLOBULINS. E.C.Franklin:
^ Sang., Basel, 1962, 7, 1-8 (Dept. Med., New
te -sk UIUv Sch Medtf N#Y#t U.S.A-> Editorial
view. 36 ref. R.MacAndrew

1108 ^EFFECT OF OPSQNINS ON INTRACELLULAR SUR-
FVAL OF BACTERIA. CRJenkin: Brit. J. exp. Path.,
1953, 44, 47-57 (Dept. Microbiol., Univ. Adelaide,
South Australia) Using Salmonella typhimurium
~~strains, Phagocytosis of bacteria by mouse peritoneal
macropages was measured by clearance studies with
bacteria absent a isotonically labelled. When serum opsonins were
absent bacteria were phagocytosed but continued to sur-~~
Vive a ^{and} f multiply intracellularly. D.L.Gardner

1109 **IM-XING¹** DETECTION OF 'CELL-FIXED' HAEM-AGGLUTINATING ANTIBODIES TO TUBERCULIN PURIFIED PROTEIN DERIVATIVE IN HUMANS. S.O. Freedman, R.Turcotte, A.J.Fish and A.H.Sehon: J. Immunol., 1963, 90, 52-59 (McGill Univ. Clin., Montreal, Que., Canada) Extracts of peripheral blood w.b.c. of all adults tested contained IgM agglg. Ab to PPD. Subjects with pos. tuberculin skf^{em} tests had significantly higher titres of these 'cell-fix'd' Ab than did tuberculin neg. subjects. The 'cell-fix'd' Ab are probably adsorbed from the serum of the w.b.c. donor. Serum titres were in general higher than those obtained with leucocyte extracts. N.RXing

(German) D.P.Winstanley

111. CHROME TYPHOID VACCINE. E.E.Vella: J. Hyg., Lond., 1963, 61, 43-51 (D. Bruce Lab., E. Everleigh, Marlborough, Wilts., England). A typhoid vaccine was prep. by treating *Salmonella typhi* with 1% formalin and 0.02% chrome alum. Aggl. tests showed that the formalin-chromate treatment preserved the Vi-Ag of the organism, and sufficient V-antigenicity was confirmed. The typhoid antigen was produced by the vaccine in rabbits, the rabbit sera gave passive protection to mice against *S. typhi*, and the vaccine produced active im-

munity in mice. The Vi-antigenicity and immunogenicity of the vaccine were retained on storage at 4°, but were lost at 41°.

1112. MORPHOLOGICAL AND IMMUNOHISTOCHEMICAL STUDIES OF THE PATHOGENESIS OF INFECTION AND ANTIBODY FORMATION SUBSEQUENT TO VACCINATION OF MACACA VIRUS WITH AN ATTENUATED STRAIN OF PASTURELLA TULARENSIS. I. INTRACUTANEOUS VACCINATION. M.H.McGavran, John D. White, • H.T.Eigelsbach and R.W.Kerpsack. II. AEROGENIC VACCINATION. John D. White, M.H.McGavran, P.A.Prickett, J.T.Tullis and H.T.Eigelsbach: Amer. J. Path., 1962, 41, 259-267, 405-409 (U.S. Army Chem. Corps., Fort Detrick, Frederick, Md., U.S.A.)

I. Monkeys were vacc. by i.d. injn. with 1×10^5 viable cells of a live vaccine of *P. tularensis* (LVS). LVS multiplied at the local site for 2 weeks and gave rise to lymphatic and haematogenous spread. They were found in the tracheobronchial lymph nodes between the 14th and 28th day. By the 90th day all sites were sterile. Cells containing Ab to LVS were found in regional lymph nodes and spleen 3 to 5 days after inocn. and at the inocn. site on the 14th day.

II. Monkeys were exposed to an aerosol of a live vaccine strain of *P. tularensis* (LVS). The average dose of viable cells received was 270000. LVS initiated a monocytic inflammatory response in the respiratory bronchiole that resolved by the 14th day. A min. and transient inflammatory response occurred in the lymph nodes and spleen. By the 90th day all sites were sterile. Plasma cells containing Y" globulin were found in the tracheobronchial lodes and the spleen on the 5th day and in the lung, and peri-bronchial lymphoid tissue by the 7th day. D.G.Scott

1113. COMPARISON OF BORDETELLA PERTUSSIS CELLS AND FREUND'S ADJUVANT WITH RESPECT TO THEIR ANTIBODY INDUCING AND ANAPHYLACTOGENIC PROPERTIES. J.Munoz: J. Immunol., 1963, 90, 132-139 (Rocky Mountain Lab., Hamilton, Mont., U.S.A.) Susceptibility to fatal anaphylactic shock in mice was equally enhanced when one injn. of 1 mg. of egg albumin was mixed with Freund's adjuvant or with 2 billion Bordetella pertussis cells. The mice which received egg albumin in Freund's adjuvant produced 10 to 100 times more Ab than those which received an equiv. amount of Ag mixed with B. pertussis. No direct correlation between the Ab titre of individual mice and their susceptibility to fatal anaphylaxis was observed whether Ag was given alone, with adjuvant or with pertussis. N .R.Iing

1114. CROSS-IMMUNISATION OF GUINEA-PIGS WITH PRODUCTS OF BRUCELLAES ABORTUS, MELITENSIS AND SUIS. J.Keppie, K.Witt and H.Smith: Brit. J. exp. Path., 1963, 44, 84-87 (Microbiol. Res. Estab.,

Porton, Wilts., England) Crude cell wall prep, and culture filtrates from attenuated *B. abortus* and virulent *B. meUtenis* and *B. suis* were used to immunise guinea-pigs. Protection was provided against all 3 spp. although *B. suis* Ag was most promising. D.L.Gardner

1115. LYSINE DEFICIENCY AND HOST RESISTANCE TO ANTHRAX. I.Gray: J. exp. Med., 1963, 117, 497-508
(U.S.Army Unit, Fort Detrick, Frederick, Md., U.S.A.)
Rats died within 2 days of inocn. with *B. anthracis* spores when they were fed a diet in which casein was replaced by gluten. When lysine was added to the gluten diet to bring die total concn. to that of the control diet resistance improved only slightly. Decreased ability of the RE system to

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break down the organism is considered as a major factor of the decreased resistance of the lysine-deficient rats to anthrax.

H E.H.

Jones

1116. EPIDEMIOLOGICAL ANALYSIS OF TETANUS VACCINATION IN HUNGARY. L.Kubinyi, O.Rudnai and G.Baisy: *Acta microbiol. Acad. Sci. hung.*, 1962, 9, 133-143 (State Inst. Hyg., Budapest, Hungary) As a result of active immunisation against tetanus in Hungary the general morbidity has decreased to one half-one tenth, dependent on the age, compared with the corresponding prevaccn. levels. At present the majority of cases occur in older patients. The case fatality of tetanus has not changed: the standardised average is 43°. Jo. S.Igali

1117. THE REITER STRAIN OF TREPONEMA PALLIDUM. ORIGIN, CULTIVATION, AND USE IN IMMUNISATION OF RABBITS. A.H.Christiansen: *Acta path. microbiol. scand.*, 1963, 57, 81-86 (Treponematoses Dept., Statens Seruminst., Copenhagen, Denmark) Immunisation with lyophilised Reiter-treponemes caused a marked production of at least 2 types of Ab, antilipid and antipolysaccharide. However, the antilipid Ab disappeared quickly, whereas the antipolysaccharide were detectable over a longer period. I.Friedmann

1118. INTERACTION OF RICKETTSIAE AND PHAGOCYTIC HOST CELLS, in. OPSONISING ANTIBODIES IN HUMAN SUBJECTS INFECTED WITH VIRULENT OR ATTENUATED RICKETTSIA PROWAZEKII OR INOCULATED WITH KILLED EPIDEMIC TYPHUS VACCINE. C.L.Wissemann, jun., J.R. Gauld and J.G.Wood: *J. Immunol.*, 1963, 90, 127-131 (Dept. Microbiol., Univ. Maryland Med. Sch., Baltimore, Md., U.S.A.)

Although an injn. of conventionally killed epidemic typhus vaccine appeared to cause more rapid appearance of Ab, the titres attained were low and usually did not increase further. Serum from all groups enhanced phagocytosis of R. mooseri, but for the most part these Ab occurred in lower titres than the Ab involved in the opsonisation of R. prowazekii. N.R.Iing

1119. CHARACTERISTICS OF LIPID-ADSORBED VIRUS VACCINES. J.S.Youngner and V.Alexrod: *J. Immunol.*, 1963, 90, 1-11 (Dept. Microbiol., Sch. Med., Pittsburgh, Pa., U.S.A.) Hexadecylamine-adsorbed vaccine elicited an acute inflammatory response with predominantly polymorphs. Spp. differences in response to lipid-adsorbed vaccine were encountered; marked adjuvant action occurred in guinea-pigs and mice but not in rabbits and chickens. The influence of route of inocn., suspending medium and loading of lipid with Ag on Ab response were determined. A series of water-insol. lipids with different polar groups and side-chains were tested for adjuvant activity. N.R.Iing

1120. A SIMPLE RAPID METHOD FOR PRODUCTION OF VIRAL ANTIBODIES IN MICE. S.Berkovich: *Proc. Soc.exp. Biol.*, N.Y., 1962, 111, 127-129 (Res. Div. Infect. Dis., Children's Hosp. Med. Center, Boston, Mass., U.S.A.) Virtually similar titres of Ab were produced in serum and ascitic fluid in mice inj. with viral Ag followed by Ehrlich ascites tumour cells.

M.M.Shapland

1121. IMMUNOGENICITY OF INACTIVATED VACCINIA VIRUS. A.V.Ramanarao: *J. Path. Bact.*, 1962, 84, 367-377 (I.N.H.S., Asvini\ Colaba, Bombay, India) The efficiency of i.m. vaccines consisting of virus inacti-

vated by acetylethyleneimine [AEI] or formaldehyde [HCHO] was compared with i.d. living virus in the rabbit by measuring neutralising Ab response and the resistant of skin to i.d. challenge 17 weeks later with living virus*. All agents produce a basal immunity, that of the living virus being highest, that of HCHO-inactivated virus being more effective than that of AEI inactivated virus. Necrosis of skin did not follow i.d. challenge in rabbits immunised with live virus. Absence of necrosis was not correlated with level of neutralising Ab. D.MuU>

1122. CLINICAL REACTION OF NIGERIAN CHILDREN TO MEASLES VACCINE WITH AND WITHOUT Y-GLOBULIN. D.Morley, S.L.Katz and S.Krugman: *J. Hyg. Lond.*, 1963, 61, 135-141 (Wesley Guild Hosp., Ilesha, W. Nigeria) Enders 'B' liquid or lyophilised measles vaccine was given to 146 Nigerian children, a further 378 children received vaccine plus Y-globulin. The vaccine alone produced fairly severe reactions, but the children who received vaccine and y-globulin had only minor reactions. LB-Derbystu^

1123. EFFICACY OF MEASLES VACCINE. J.Hartfield and D.Morley: *J. Hyg. Lond.*, 1963, 61, 143-147 (Wesley Guild Hosp., Ilesha, W. Nigeria) 1000 Nigerian children, aged between 6 months and 120 also received y-globulin. Controls received Y-globulin plus inert material. In an outbreak in a village measles occurred in 19 out of 27 controls, 2 of whom died, but not in 26 vacc. children. 80 cases of measles were seen in vacc. children in an out-patient clinic, and 192 cases in controls, of whom 11 were to have died. J.B.Derbyshu^

1124. AN ANAMNESTIC ANTIBODY INCREASE IN FERRETS CROSS-INFECTED WITH INFLUENZA A2-VIRUS AFTER MYXOVIRUSES NOT BELONGING TO THE GROUP. A.Harboe: *Acta path. microbiol. scand.*, 1962, 55, 425-436 (Virus Dept., Nat. Inst. Publ., Oslo, Norway) In cross-infected ferrets influenza A2-virus provoked an anamnestic Ab titre increase to different influenza B-strains, to influenza C and Sendai virus in the haemagglut. inhibn. test. Usually this increase was about 2-fold. A table illustrating various degree* antigenic relationship between myxovirus strains is presented. I.Friedmann

1125. CHROMATOGRAPHIC PROOF OF THE HETERogeneity OF ANTIBODIES AGAINST PSEUDO-RABIES VIRUS. A*R.Neurath, A.Zuffa and CALtaner-Z. Immun.-Foisch., 1962, 124, 156-163 (Oncol. Res. Inst. Bratislava, Czechoslovakia) Antisera prep. *Sainst were submitted to DEAE-cellulose chromatography and SDS-phoresis. Ab were distributed among the resulting protein fractions. (German) D.P.Wins*

1126. POLIOMYELITIS NEUTRALISING ANTIBODIES IN MOTHERS AND THEIR NEWBORN INFANTS. A.Alice-vogt and H.J.Otte: Z. Immun.-Foisch., 1962, 197-205 (Hyg. Inst., Univ. Munster, Germany) A series of 195 mothers, 81% had adequate titres of neutralising Ab against poliovirus types I, II and III. In 8 cases the Ab were transmitted to the infant, but 7 mothers had type II Ab and 13 type III Ab which the infants lacked. 17 of the infants had Ab (11 to TyP^ in titres up to 16) which could not be demonstrated in their mothers. (German) D.P.Winstanley

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- ¹¹²? PASSIVE TRANSFER OF IMMUNITY TO BLUE TONGUE VMJS FROM VACCINATED MATERNAL MICE TO THEIR OFFSPRING. S.Svehag and J.R.Gornam: Res. vet. Sci., 1963, 4, 109-113 (Washington State Univ. Dept. Vet. Sci., Pullman, Wash., U.S.A.)
 Mice were immunised during pregnancy with blue tongue virus, and some were allowed to nurse their young whilst some of the baby mice suckled foster dams. Neutralising Ab was passed to the offspring only by lacteal transfer. J⁺ Passive immunity increased during the first 12 days J⁺.Mrth and was lost after weaning. No detectable passive immunity was obtained by the offspring of ? that ate fed blue tongue virus-infected mouse brain.

J.B.Derbyshire

- DISCUSSION**
Distribution of Adenovirus antibodies in normal children. C.W.Potter and W.I.H.Shedden: J Hyg, Lond., 1963, 61, 155-160 (Sheffield Univ. W. / ? ; 1 Dept sh e f f e l d, England) Adenovirus ^ pausing Ab was measured in 42 specimens of maternal and cord serum, and on 197 sera from children up to 14 years. Ab to types 1 and 3 was found in approx. half the fetal and cord samples, with higher titres in the cord and active Ab appeared early in life. Ab to types 1, 2 and 5 was found more frequently than Ab to types 3, 6 and 7. It was concluded that infection with types 1, 2 and 4 endemic in Sheffield. J.B.Derbyshire

J.B.Derbyshire

1129. COMPLEMENT-FIXATION TITRES AGAINST THE SPECIES-SPECIFIC TRACHOMA ANTIGEN IN SERA OF TRACHOMA PATIENTS. A.L.Terzin, M.R.Fornazaric S.,^a P.^b Brltascvic: J. Hyg. Lond., 1963, 61, 31-42 elcjjii^c Fac, Sarajevo, Yugoslavia) 3 semi-purified in Q^d ry body suspensions of trachoma virus were used and a^e te sts^f on Bedsonia-neg. sera from trachoma patients, ^feri^g against Psittacosis-pos. sera. A saline-formol Ag was either either a buffered-sucrose-K glutamate [SKG] - Ag or an SKG-formol Ag. The SKG-formol Ag best species-specific reactions, and it was not ant-i-complementary. However, it contained a group-sp. component which reacted with psittacosis-pos. sera, so that it only detected trachoma CF Ab specifically in Bedsonia^h sera. The species-specific component was the same as in the Ig sera. J.B.Derbyshire

J.B.Derbyshire

- ¹⁷⁴ ANTIBODY RESPONSE TO BACTERIOPHAGE 0 X M's 5? NON-MAMMALIAN VERTEBRATES. J.W.Uhr, Bior^{IT} elstein and E.CFranklin: Proc. Soc. exp. Wv^o ^ Y - »¹⁹⁶². HI. 13-15 (Dept. Med., New York ftved j" s £ h. Med., N.Y., U^A.A.) A change was ob- Uni? ^{le} sedimentation prop. of Ab produced during auon. M.M.Shapland

M.M.Shapland

1131. S₁^M ^OTEIN PATTERNS IN EXPERIMENTAL
 ^Qc ^t^l^o E>OMYCOSIS. R.H.Diven and R*E.Reed:
 * ^H₂A²⁻ exp. Biol., N.Y., 1962, 111, 503-505 (Dept.
 Path., Univ. Arizona, Tucson, Ariz., U.S.A.)
 .-otal serum. Protein and α_1 L₂ and β_2 -globulins increased sig-
 nificantly w^th development of disease, whereas albumin
 decreased after the onset. The increase in globulins began
 about the 5th day and decrease in albumin about the 7th
 day after ^ocn.

MJ^I.Shapland

- IMMUNITY IN EXPERIMENTAL CRYPTOCOCCOSIS.**

~~infection~~ - ~~ays aft~~ FUCU ui an tissues ui miccicu ~~llllle ll l w~~
~~if or noocn~~ M^ost mice then gained control of the
so that tissues were usually sterile in 3 to 6

months. Survivors challenged up to 4 months after infection lived longer than controls. Pretreatment with bacterial endotoxin also protected against cryptococcal challenge, but the infection could not be limited until circulating Ab could be demonstrated in these hosts. There was increased cellular infiltration in the brains of specifically protected and endotoxin protected mice 1 to 2 weeks after challenge. Control of the infection could not be correlated with this enhanced cellular response, but only with the presence of Ab. H.E.J.H.Jones

- 1133. TOXOPLASMA PRECIPITINOGENS AND THEIR CORRESPONDING ANTIBODIES BY DIFFUSION-IN-GEL METHODS.** O.Strannegård: Brit. J. exp. Path., 1962, 43, 600-613 (Dept. Bacteriol., Univ. Gothenburg, Sweden) The nature and prop. of toxoplasma pptg. Ab were studied in adult and congenital human toxoplasmosis and in expt. rabbit infections, using gel diffusion techniques and electrophoresis. D.L.Gardner

- 1134. ANTIBODIES OF TOXOPLASMA GONDII. D.G. Fleck: J. Hyg. Lond., 1963, 61, 53-61 (Publ. Hlth. Lab., Swansea, Wales)** The serum litre in the dye test for toxoplasma Ab was inversely proportional to the no. of organisms in the Ag. Peritoneal exudates, harvested from mice more than 3 days after the injn. of large no. of organisms, contained Ab. Certain chemicals, mainly detergents, modified the staining of the organisms in a similar way to a pos. dye test reaction. High speed centrifugation of toxoplasma extracts demonstrated CF Ag of low and high density. The light Ag gave pptn. in agar double diffusion expt., but did not inhibit dye test Ab, whereas the heavy Ag did so.

J.B.Derbyshire

- 1135. DETECTION OF CIRCUMOVAL PRECIPITINS BY THE FLUORESCENT ANTIBODY [FA] TECHNIQUE. A.R. De Sala, R. Meméndez- Corrada and R. Rodriguez- Molina: Proc. Soc. exp. Biol., N.Y., 1962, 111, 212-215
(Gen. Med. Res. Lab., V.A. Hosp., San Juan, Puerto Rico) Serol. diagnosis of schistosomiasis was made by FA technique applied to circumoval ppt.**

M.M.Shapland

HYPERSensitivity

- 1136. PROTEOLYTIC MECHANISM IN RECURRENCE OF ARTHUS-TYPE INFLAMMATION BY THIOL COMPOUNDS.** H.Hayashi, H.Miyoshi, R.Nitta and K.Udaka, Brit. J. exp. Path., 1962, 43, 564-573 (Dept. Path., Kumamoto Univ. Med. Sch., Kumamoto, Japan)
 An Arthus reaction was induced in rabbits by i.d. injn. of bovine serum. Healing lesions were reactivated by local injn. of reduced glutathione. The response was associated with increased protease activity in euglobulin prep, from local skin. A pos. but less severe response occurred with cysteine but not with other reducing agents.

D.L.Gardner

1137. CUTANEOUS ANAPHYLAXIS IN THE GUINEA-PIG AND ITS RELATIVE INSUSCEPTIBILITY TO AN ANTI-HBTAMINE. J.P.Craig and D.L.Wilhelm: J. Immunol., 1963, 90, 43-51 (Lister Inst. Prev. Med., London, England) Whereas triprolidine caused a 500-5000-fold suppression of the permeability response to i.d. injn. of histamine it was never capable of suppressing the anaphylactic response more than 10-fold. The findings

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indicate that histamine plays little or nor role in the events leading to the increase in capillary permeability or cutaneous anaphylaxis, regardless of its presumed role in other manifestations of immediate hypersensitivity.

N.R.Ling

1138. PASSIVE ANAPHYLAXIS IN VITRO. V. DESENSITISATION OF SENSITISED TISSUES. P.Liacopoulos: *J. Physiol., Paris*, 1962, 54, 599-618 (Centre de Rech. Allergiques, Hôp. Broussais, 96 rue Didot, Paris, France) The reversibility of the sensitisation process by the desensitisation of isolated tissues previously sensitised either actively or passively both *in vivo* and *in vitro*, has been demonstrated. Incubation of sensitised organs with non-sp. V-globulins of the rabbit, guinea-pig or horse, regularly produced complete desensitisation. Prolonged washing, or incubation in a medium sat. with CO₂ produced at least a partial desensitisation.

(French)

A.Angel

1139. ROLE OF MASTOCYTES IN THE ANAPHYLATOID REACTION PROVOKED BY DEXTRAN. L.Kato and B.Cozsy: *J. Physiol., Paris*, 1962, 54, 619-624 (Inst. Microbiol. and Hyg., Univ., Montreal, Que., Canada) Compound 48/80 provoked local mast cell disruption in the skin of the rat when inj. i.d., and disruption of nearly all the mastocytes when inj. i.v. Dextran 0*79 mg./100 g.-30 mg./100 g. induced increased capillary permeability and intense oedema formation without mast cell disruption. It is suggested, therefore, that liberation of loose binding histamine and 5HT from the mast cells is not involved in the dextran-induced acute inflammatory reaction.

(French)

A.Angel

1140. SOURCE AND TIME OF RELEASE OF HISTAMINE-DESTROYING FACTOR (HISTAMINASE) DURING ANAPHYLACTIC SHOCK IN RATS. G.B.Logan: *Proc. Soc. exp. Biol., N.Y.*, 1962, 111, 171-174 (Sect. Ped., Mayo Clin. and Fdn., Rochester, Minn., U.S.A.)

Histamine released from the intestinal tract of rats was consistently detected in blood drawn 6-13 min. after onset of anaphylactic shock and less so in that drawn prior to 6 min.

M.M.S

hap

land

1141. ACTIVATION BY IRRITANTS OF SLOW-CONTRACTING SUBSTANCES AND THEIR RELATION TO VASCULAR CHANGES OF INFLAMMATION IN RAT. W.G.Sp3ctor and D.A.Willoughby: *J. Path. Bact.*, 1962, 84, 391-403 (Dept. Morbid Anat., Univ. Coll.

Hosp. Med. Sch., London, England) Exudates induced in rats by intrapleural injn. of turpentine contained material causing a slow contraction of plain muscle. The activity was max. at 2-3 hr., was virtually absent after 24 hr. and closely paralleled the alterations in ability of exudates to increase vascular permeability. Rat plasma acquired similar prop. within 3 min. of addition of turpentine. The activity could be separated into 2 fractions on Sephadex columns. One resembled a slow reacting substance of guinea-pig origin. The other resembled bradykinin in some respects and was closely associated with permeability-increasing activity.

D.Murray

1142. TUBERCULIN HYPERSENSITIVITY: STUDIES WITH RADIOACTIVE ANTIGEN AND MONONUCLEAR CELLS. K.Kay and W.O.Rieke: *Science*, 1963, 139, 487-490 (Dept. Anat., Univ. Washington, Seattle, Wash., U.S.A.) [131]PPD was taken up *in vitro* by lymphocytes and neutrophils of guinea-pig sensitive to tuberculin more frequently than by the cells from non-sensitive ones. Passive transfer of tuberculin hypersensitivity by PHlymphocytes indicated that significant no. of

radioactive cells migrated to the site where the skin ^{aS} tested with PPD only when the test was made immedia^ly after transfusion; they are therefore not required in large no. at the site for a reaction to develop.

G.M.Lewis

1143. IN VITRO CELL MIGRATION AS A MODEL FOR DELAYED HYPERSENSITIVITY. M.George and JH^a Vaughan: *Proc. Soc. exp. Biol., N.Y.*, 1962, 111-514-521 (Dept. Microbiol., Sch. Med. and Dent.,^a Rochester, N.Y., U.S.A.) The ability of Ag to In^a cell migration in tissue culture was confirmed with PJ^a toneal exudate cells for tuberculin hypersensitivity; reaction also occurred in the delayed hypersensitivity that developed after immunisation with a protein Ag & Freund's adjuvant.

M.M.Shapla^{no}

1144. IN VITRO PRODUCTION OF ANTIBODY BY D^a? LAYERED PHASE CORNEAL LIMBAL LYMPHOID FOCT. H.M.I.Leibowitz and JJ.Parks: *J. exp. Med.*, 1963, 117, 197-212 (Wilmer Ophthal. Inst., Johns Hopkins Hosp., Baltimore, Md., U.S.A.) A biphasic allerg^a reaction occurred in the cornea of a rabbit eye inj. with sol. protein Ag. The early stage, with diffuse cloud^a of the cornea was due to delayed hypersensitivity ^a he was accompanied by infiltration of the periphery of t&^a reaction by mononuclear cells. The later response C^a I sely phenomenon) was Ab-dependent and accompan^a by infiltration by plasma cells. The eye appeared n^a for a few days between the 2 reactions. Explants of & first stage mononuclear infiltrate were maintained xn culture. Later the fluid surrounding the cells contain^a sp. humoral Ab, indicating that the cells present i^a delayed reaction were capable of later production O^a.

H.E.H.^o5

1145. E.M. STUDY OF DELAYED SENSITIVITY T RITIN IN GUINEA-PIGS. B.Goldberg, F.S.Kantor^a B.Benacerraf: *Brit. J. exp. Path.*, 1962, 43, 621-631 (Dept. Path., New York Univ. Sch. Med., N.Y..) Ferritin and picryl guinea-pig albumin were used to produce delayed hypersensitivity in guinea-pig skin. Ferritin was found only in macrophages, which were characteristic cells of the reaction. Ferritin clearance and cellular uptake from skin appeared independent of any immune mechanism.

D.L.Gardn⁶

1146. INACTIVATION OF THE SKIN-SENSITISING^a P, ANTIBODIES OF HUMAN ALLERGY BY THIOLS. Leddy, G.L.Freeman, A.Luz and R.H.Todd: *Proc. Soc. exp. Biol., N.Y.*, 1962, 111, 7-12 (DePf Int. munochem., W.Reed Army Inst. Res., Washington, D.C., U.S.A.) Exposure of sera from patients with atopie allergy to sulphhydryl compounds resulted in inactivation of their skin-sensitising activity. M.M-Shap^a

1147. SPECIFICITY OF ALLERGIC REACTIONS. y_c\$ RESPONSIVENESS TO SIMPLE CHEMICALS. y_c&% and S.B.Salvin: *J. exp. Med.*, 1963, 117, 40J^a (Nat. Inst. Allergy and Infectious Dis., Rocky Moun^a Lab., Hamilton, Mont., U.S.A.) Feeding adult guinea-pigs with dinitrochlorobenzene [DCB] produced^a sp. unresponsiveness to contact with the hapten. When mycobacteria were incorporated into the sensitising emulsion the state of unresponsiveness to the dinitrophen^a [DNP] group was less apparent. Animals fed DCD^a & be normally immunized with the hapten and P^a's prier if they were sensitised with a conjugate suc^a hen egg albumin. If the carrier were an homologous protein (guinea-pig serum) they showed diminished^a compared with non-tolerant controls. Sensitisa^a

^{for} ^{g.v.l ci before or after feeding of DCB did not affect}
^{^responsiveness to DNP. Circulating Ab to the DNP}
^{exhi-had no effect on these relations, which could be}
^{just explained by assuming that when fed DCB an in vivo con-}
^{tracte is formed with a somatic protein which determines}
^{the basic specificity of the tolerance.} H.E.Hjones

¹¹¹⁴ IDENTIFICATION OF A SIMPLE CHEMICAL COMPOUND (CHLOROGENIC ACID) AS AN ALLERGEN IN PLANT MATERIALS CAUSING HUMAN ATOPIC DISUSE. S.O.Freedman, A.L.Siddiqi, J.H.Krupey and ^{^H.Sehon:} Amer. J. med. Sci., 1962, 244, 548-555
^{McGill Univ., Montreal Gen. Hosp., Montreal, Que.}
^{bear Canada)} Chlorogenic acid, a constituent of coffee in castor beans and oranges produced a skin reaction in subjects who were allergic to them. E.E.Hobbiger

¹¹⁴⁹: SPONTANEOUS CANINE HYPERSENSITIVITY TO ^{^WEED. CHARACTERISATION OF THE SERUM}
^{Ax⁺ TRANSFERRING SKIN, BRONCHIAL AND}
^{NAPHYLACTIC SENSITIVITY.} R.Pattison, J.J.Pru-
^{sky and W.W.Y.Chang: J. Immunol., 1933, 90,}
^{42 (Alle U.S.A.)} The active fraction was a &A globulin. Blood histamine release in sensitised challenged dogs showed correlations with naphylactic symptoms and with pathol. changes at Postmortem. The demonstration that Ab of canine serum which transfer skin sensitivity, respiratory symptoms and anaphylaxis all exist in the same fraction suggests that the same Ab mediate all 3 hypersensitivity reactions. N.R.Ling

TISSUE ANTIGENS (EXCLUDING TUMOURS)

¹¹⁵⁰ ACTIONATION OF HUMAN BLOOD GROUP BODIES BY GEL FILTRATION. J.Killander and ^{Supragnan: Scand. J. clin. Lab. Invest., 1963, 15,}
^{M.W.169-138 (Dept. Clin. Chem., Univ. Hosp.,}
^{types of Sweden)} Blood group Ab of 7 S and 19 S anti-A^{*} tested by gel filtration. Sera containing ^{U.g^+ t-B, anti-M, anti-Le, anti-D, anti-D + C,}
^{^A being anti-e} anti-e and anti-K were studied, the ^{i-iblps classified into either 7 S or 19 S types. The} ^{light of existence of a *W At type is discussed in the} C. data obtained from a serum containing anti-D + K.Jones

¹¹⁵¹. ^{20 A S? S REGULATION OF HUMAN Ab-GROUP SPERMATO-}
^{ULUTINATION WITH IMMUNE ANTI-A RABBIT}
^{Fo⁺- R.Popivanov and V.H.Vulchanov: Z. Immun.-}
^{Scj., 1962, 124, 206-210 (Inst. Microbiol., Acad.}
^{Rising, Sweden)} Antisera were prep. by im-
^{ly aggl. Jp** w¹ spermatozoa from Group A men;}
^{after 1 h and o spermatozoa almost as strongly as A,}
^{denatured aggl. Oipton with the fotme P-anti-A activity}
^{seen. Sperma tozoa from AB men treated with this}
^{in the U.S. ated into 2 layers on centrifugation. Those}
^{in the lower layer were not aggl. by anti-A, those in the}
^{upper layer were. These results suggest that segregation of}
^{the spermatozoa are formed in equal no.} D.P.Winstanley

^{1152. COMMON ANTIGENS BETWEEN CATTLE AND HORSES AND BETWEEN MEN AND HORSES DEMONSTRATED BY THE IMMUNE HAEMOLYSIS TEST.}
^{D.O.Schmid and L.Erhard: Z. Immun.-Forsch., 1962,}
^{124, 149-155 (Inst. Blutgruppenforschung Tierzuchtforsch. e.V., Mtinchen, Germany)} Human anti-A serum contained haemolysins against blood group factor C of the horse. A serum produced by immunising horses with r.b.c. from other horses contained a haemolysin against the Z factor of cattle. (German) D.P.Winstanley

^{1153. Rh SPECIFICITY OF HETERO-ANTIBODIES FROM GUINEA-PIGS IMMUNISED WITH EXTRACTS OF HUMAN Rh POSITIVE AND NEGATIVE ERYTHROCYTES.I. AND II.} A.Majsky, M.Kreckova, R.Zikova and M.Poslusna: Z. Immun.-Forsch., 1962, 124, 115-119, 120-123 (Inst. Haematol., Prague, Czechoslovakia) I. Extracts prep. by the method of Levine et al. failed to produce anti-D Ab.
^{II. An extract prep. from D-pos. r.b.c. heated at 56° for 1 hr. stimulated complete anti-D Ag in 4 out of 5 guinea-pigs. Extracts from D-neg. cells had no effect. The complete Ab was not identical with human complete anti-D for they aggl. r.b.c. coated with incomplete anti-D.} (German) D.P.Winstanley

^{1154. OCCURRENCE OF RHEUMATOID FACTOR AND OTHER ABNORMALITIES IN FAMILIES OF PATIENTS WITH AGAMMAGLOBULINAEMIA.} H.Fudenberg, J.L. German HI and H.G.Kunkel: Arthritis and Rheumatism, 1932, 5, 565-588 (Rockefeller Inst., New York, N.Y., U.S.A.) D.G.Scott

^{1155. REACTIVITY OF RHEUMATOID ARTHRITIS SERA WITH ALTERED AND AGGREGATED HUMAN Y-GLOBULIN.} I.Oreskes, J.M.Singer and CM.Plotz: J. Immunol., 1963, 90, 107-115 (Dept. Med., Mount Sinai Hosp., New York, N.Y., U.S.A.) Commercial pools (14) of human y-globulin varied widely in their reactivity. When heated at 63° for 10 min. reactivity of the prep. increased to about the same level in all cases. Purified 7 S Y-globulin, when denatured under conditions which avoided aggregation, was also reactive. It is concluded that reactivity of pooled y-globulin for rheumatoid factor is primarily due to denaturation. N.R.Ling

^{1156. IMMUNOELECTROPHORESIS OF SERUM CONTAMINATION OF PERFUSED ORGANS.} R.Depieds, G.Cartouzou, S.Lissitzky, H.Gignoux and D.Gignoux: C.R. Soc. Biol., Paris, 1962, 156, 1450-1454 (Lab. Parasitol., Fac. Med., Marseille, France) Rabbit organs which had been washed by prolonged perfusion contained blood proteins. The lines of pptn. obtained after immuno-electrophoresis of liver, kidney and tongue extracts against cock anti-rabbit serum were due to direct reactions between the contaminating serum proteins and Ab of the immunoserum. The kidneys showed the greatest contamination with blood proteins. (French) M.A.Price

^{1157. a-2-MYELOMA. FALLIBILITY OF ARBITRARY CLASSIFICATIONS OF PROTEINS.} S.E.Ritzman, R.H. Thurm and W.C.Levin: Tex. Rep. Biol. Med., 1963, 21, 74-92 (Univ. Texas Med. Branch, Galveston, Tex., U.S.A.) A case of X-2-myeloma with typical clinical pattern, X-ray findings and bone marrow features is described. The multiple myeloma protein revealed several unusual features; on paper electrophoresis it migrated as a homogeneous (X-2-globulin fraction; on ultracentrifugation it revealed the presence of 2 intermediate

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fractions; immunol. it belonged to the y type myeloma protein; ppm. at 56° qualified it as a pyroglobulin. It is suggested that classification of myeloma proteins be based upon their immunol. prop. A.J.Martin

1158. ANTIBODIES TO GENETIC TYPES OF YGLOBULIN AFTER MULTIPLE TRANSFUSIONS. J.C.Allen and H.G.Kunkel: *Science*, 1963, 139, 418-419 (Rockefeller Inst., New York, N.Y., U.S.A.) 71% of the sera from a group of children who had received multiple transfusions contained anti-Gm agglutinins, each highly sp. for a single Gm factor. It was concluded that these Ab resulted from the introduction of foreign y globulin through multiple transfusions. G.M.Lewis

1159. IMMUNOLOGICAL COMPARISON OF IMMUNOGLOBULINS FROM HUMAN BLOOD SERUM, URINE, AND MILK, USING DIFFUSION-IN-GEL METHODS. L.A.Hanson and I.Berggard: *Clin. chim. Acta*, 1962, 7, 828-834 (Dept. Bact., Univ., Gothenburg, Sweden)

Normal serum and urine contained 2 or 3 low mol. wt. Y-globulins (YL"globulins) which were antigenically deficient compared to 7 S Y-globulin. 2 serum YL" globulins gave interference reactions with 2 corresponding urine VT-globulins. One of the YL"-globulins gave a reaction of interference with a milk immunoglobulin. The other YL"globulin gave a reaction of partial interference with another milk immunoglobulin, and was antigenically deficient compared to this protein. In comparative immuno-electrophoretic studies, reactions of interference were obtained between one Bence-Jones protein and 2 urine y-globulin ppt., and between another Bence-Jones protein and a third urine YL" globulin ppt. V.M.Wootton

1160. IMMUNOELECTROPHORETIC CHARACTERISATION OF PROTEOLYTIC ENZYMES. V.Raunio and O. Gabriel: *Nature*, Lond., 1963, 197, 1012-1013 (Pediat. Metabol. Branch, Nat. Inst. Arthritis and Metabol. Diseases, Bethesda, Md., U.S.A.) Pptn. lines were produced on a nr>scope slide by immuno-electrophoretic analysis of human urinary macromol. components and serum Ab produced in rabbits. After exhaustive washing, the slide was placed in buffer against an agar slide that had been exposed to Hb soln. After incubation in a moist chamber for 1 hr., the slides were fixed and stained with amido black to reveal the area of enzymic activity as a clear zone against a dark background. G.M.Lewis

1161. PROPERTIES OF ANTHEUCOCYTIC SERUM. A.E.Stuart: *Brit. J. exp. Path.*, 1962, 43, 614-620 (Dept. Path., Univ., Edinburgh, Scotland) Rabbit anti-guinea-pig leucocyte sera, which inhib. motility and phagocytosis, contained haemolysin, Forssman Ab and Ab against muscle, liver, kidney and spleen. The most sensitive detection of these complex, overlapping Ab was by tanned r.b.c. haemaggl. D.L.Gardner

1162. IMMUNOCHEMICAL IDENTIFICATION OF SALIVARY PROTEINS. H.R.Stoffer, F.W.Kraus and A.C. Holmes: *Proc. Soc. exp. Biol.*, N.Y., 1962, 111, 467-471 (V.A. Hosp., Birmingham, Ala., U.S.A.) 7 proteins in whole saliva and parotid secretion were immunochemically similar to plasma proteins by ring-pptn., micro-immuno-electrophoresis and micro-double-diffusion methods employing sp. antisera. M.M.Shapland

1163. IMMUNOLOGICAL AND ELECTROPHORETIC ANALYSIS OF RAT LIVER MITOCHONDRIA AND OTHER

CELLULAR FRACTIONS. V. D'Amelio, V.Mutolo and A.Barbarino: *Exp. Cell Res.*, 1963, 29, 1-16 (Lab. Comp. Anat., Univ., Palermo, Italy) Rat liver mitochondria were composed of at least 12 components, either anodic or cathodic, their immuno-electrophoretic pattern being different from that of the microsomes and of the cell sap. The microsomes exhibited at least 7 components and the cell sap 14. When mitochondria were treated with deoxycholate, some Ag were progressively brought into soln., while others were firmly bound to the mitochondrial membranes. K Jones

1164. HEPATIC ANTIGENS IN THE BLOOD OF RATS WITH TOXIC LIVER DAMAGE. E.Espinosa and I.Insunza: *Proc. Soc. exp. Biol.*, N.Y., 1962, 174-177 (Univ. Chile, Escuela Med., Lab. Fisiopatol., Santiago, Chile) Liver Ag of O_t, j8 and y-globulin electrophoretic mobilities were detected in rat sera following induced acute hepatic damage. M.M.Shapland

1165. NEPHRITIS AND LUNG HAEMORRHAGE. R.L.De Gowin, Y.Oda and R.H.Evans: *Arch. intern. Med.*, 1963, 111, 16-22 (Dept. Int. Med., Univ. Chicago, 111, U.S.A.) Lyophilised and pulverised dog's lung was inj. into Flemish Giant rabbits daily for 3 weeks. Dogs inj. i.v. with the serum of these rabbits developed lung lesions and nephritis which were not duplicated by inj. of normal rabbit serum. E.E.Hobbiger

1166. E.M. LOCALISATION OF NEPHROTOXIC SERUM IN RABBIT GLOMERULI WITH FERRITIN CONJUGATED ANTIBODY. R.B.Arhelger, J.A.Gronvall, O.B.Carr and J.G.Brunson: *Lab. Invest.*, 1963, 12, 33-37 (Pathol. Dept., Mississippi Med. Center, Jackson, Miss., U.S.A.) Rabbits were given i.v. chicken anti-rabbit kidney serum to produce glomerulonephritis. 12 hr. later kidney blocks were flooded with ferritin-conjugated Ab to chicken a-globulin for 3 min. and prep, for E.M. Ferritin was located mainly in the glomerular basement membrane. Control procedures were neg. A.M.Mackay

1167. NEPHROTOXIC SERUM NEPHRITIS IN NEWBORN RATS. D.K.Hammer, JJ.Vazquez and F.J.Dixon: *Lab. Invest.*, 1963, 12, 8-15 (Div. Expt. Pathol., Scripps Clin. and Res. Fdn., La Jolla, Calif., U.S.A.) Anti-rat kidney serum was inj. into newborn rats to produce acute glomerulonephritis and proteinuria. The serum a-globulin and rat C^f were localised by fluorescence microscopy to mature glomeruli of the inner cortex. These glomeruli showed progressive damage but the peripheral ones escaped injury. The disease was self-limited due to the production of new normal nephrons from the latter zone. A.M.Mackay

1168. EFFECT OF INJECTING HETEROLOGOUS GLOMERULAR BASEMENT MEMBRANE PREPARATIONS IN PREGNANT SHEEP. R.W.Stebly: *Proc. soc. Exp. Biol.*, N.Y., 1963, 112, 15-18 (Dept. Obstet. and Gynecol., Univ. Chicago, 111, U.S.A.) 3 pregnant sheep were used to study the effect of heterologous glomerular basement membrane prep, which are known to cause fatal glomerulonephritis. All 3 developed the fetal nephritis but all the foetal or newborn lambs were normal even when suckled on the mother's colostrum. D.N.Wheatley

1169. LOCALISATION OF ACROSOMAL ANTICENICITY IN GUINEA-PIG TESTES. R.E.Mancini, O.W.Davidson*, O.Vilar, M.Nemirovsky and D.C.Bueno: *Proc. Soc. exp. Biol.*, N.Y., 1962, 111, 435-438 (Inst. Anat.,

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Fac.de Med., Buenos Aires, Argentina) Homologous guinea-pig testes antisera were shown by immunofluorescence to contain Ab directed against the acrosome of the spermatid and the head of the sperm. Sp. localisation occurred in the testis of sensitised as well as unsensitised animals.

M.M.Shapland

1170. HIGH CONCENTRATION OF ANTIBODIES TO GROWTH HORMONE OBTAINED BY NEW PROCEDURE. J.Morat6-Manaro: Endocrinology, 1963, 72, 667-668 (Lab. Endocr. Res., Pasteur Hosp., Montevideo, Uruguay) A high titre of Ab using small amounts of human growth hormone was obtained by the immunity granuloma technique in rabbits. Good titres of anti-thyroid Ab were also obtained.

H.C.Jones

1171. ACUTE INHIBITION OF THYROID FUNCTION IN THE RAT PRODUCED BY RABBIT ANTIBODY TO BEEF THYROTROPIC HORMONE. S.Reichlin and R.L.Boshans: Proc.Soc.exp.Biol., N.Y., 1962, 111, 139-140 (Endocrinol. Dept. Med., Sch. Med. and Dent., Rochester, N.Y., U.S.A.) Inj. of rabbit anti-beef TSH produced acute inhibn. of 131I released from the thyroid.

M.M.Shapland

1172. E.M. STUDY OF HASHIMOTO THYROIDITIS. W.J. Irvine and A.R.Muir: Quant. J. exp. Physiol., 1963, 48, 13-26 (Dept. Therapeutics, Royal Infirmary, Edinburgh, Scotland) E.M. of thyroid tissue from patients with Hashimoto's thyroiditis showed that the basement membrane was more or less continuous. Contact was observed between the invading lymphocytes and the epithelial cells of the gland.

H.C.Jones

1173. AN IMMUNE CHROMATOGRAPHIC METHOD FOR ASSAY IN SERUM OF ANTIBODIES TO GLUCAGON AND INSULIN. Y.Kologlu, L.L.Wiesel, V.Positano and G.E.Anderson: Proc. Soc. exp. Biol., N.Y., 1963, 112, 518-523 (Dept. Med., Brooklyn Hosp., New York City, N.Y., U.S.A.) Non-flocculating and non-PPtg. Ab were measured quant. by a chromatographic technique. Glucagon and insulin did not produce Ab which gave cross-reactions in this system.

D.N.Wheatley

1174. INSULIN-BINDING ANTIBODIES IN RELATION TO INSULIN THERAPY. J.N.Harris-Jones, H.Miller and G.Owen: J. clin. Path., 1963, 16, 120-123 (Llanelli Hosp., Llanelli, Carmarthenshire, Wales) Insulin-binding Ab was detected by incubating [1S]finsulin with serum samples, and subjecting the sera to zone electrophoresis or immunoelectrophoresis with autoradiography. Ab was detected in the majority of 50 subjects receiving iigulin, 2nd in expt. animal sera. Binding occurred in the p- and a~lobulins.

J.B.Derbyshire

1175. EFFECTS OF 6-MERCAPTOPURINE [6-MP] ON SUSCEPTIBILITY OF GUINEA-PIGS TO EXPERIMENTAL ALLERGIC ENCEPHALOMYELITIS. J.D.Thomson and K.W.Austin: Proc. Soc. exp. Biol., N.Y., 1962, 111, J21-23 (Dept. Physiol., Coll. Med., State Univ., Iowa, U.S.A.) No significant difference was found between incidence of paralysis in guinea-pigs inj. with both homologous bragg in complete Freund adjuvant and **, and animals given Ag alone.

M.M.Shapland

1176. ENHANCEMENT OF EXPERIMENTAL ALLERGIC ENCEPHALOMYELITIS BY ADRENALECTOMY. E.Levine, E.J.Wenk, T.N.Muldoon and S.G.Cohen: Proc. Soc. exp. Biol., N.Y., 1962, 111, 383-385 (Dept. Path., St. Francis Hosp., Jersey City, N.J., U.S.A.) Adrenalectomy or adrenal enucleation increased incidence and severity of expt. allergic encephalomyelitis. This effect was reversed by cortisone.

M.M.Shapland

.1177. LYMPHATIC DISSEMINATION OF ENCEPHALITIC EMULSION AND ITS RELATION TO PREVENTION OF ALLERGIC ENCEPHALOMYELITIS [EAE] BY LYMPHODECTOMY. S.Levine and E.J.Wenk: Proc. Soc. exp. Biol., N.Y., 1962, 111, 385-387 (Dept. Path., St. Francis Hosp., Jersey City, N.J., U.S.A.) It was not possible to prevent EAE in rats by removal of popliteal and inguinal lymph nodes before foot pad injn. of homologous brain emulsion because of dissemination in superficial and retroperitoneal nodes.

Spread of emulsion was more restricted after flanking injn. and so EAE was prevented by bilat. excision of axillary, inguinal and elbow nodes.

M.M.Shapland

1178. AN IN VITRO GLIOTOXIC EFFECT OF SERUM FROM ANIMALS WITH EXPERIMENTAL ALLERGIC ENCEPHALOMYELITIS [EAE]. O.Berg and B.Kallen: Acta path. microbiol. scand., 1962, 54, 425-433 (Dept. Neurol., Univ., Lund, Sweden) Seras of

guinea-pigs and rabbits with EAE contained a factor which was selectively toxic for glial cells cultured in vitro from neonatal rat brain tissue. There was no correlation between the gliotoxic factor and the clinical status of the animals. It has not been demonstrated in sera of rats with EAE.

I.Friedmann

1179. SERA OF ANIMALS WITH EXPERIMENTAL ALLERGIC ENCEPHALOMYELITIS AND PATIENTS WITH MULTIPLE SCLEROSIS USING IMMUNE PRECIPITATION IN AGAR GEL AND IMMUNO-ELECTROPHORESIS.

O*Berg and SJ.Dencker: Acta path. microbiol. scand. 1962, 54, 434-438 (Dept. Neurol., Univ., Lund, Sweden) Ab against c.n.s. tissue were found in sera from animals with expt. allergic encephalomyelitis. Immuno-electrophoretically the nervous tissue Ag migrated like a J₁protein. No Ab to human brain tissue were found in sera from 4 patients with multiple sclerosis.

I.Friedmann

1180. SPHINGOLIPID ANTIBODIES IN SERA OF ANIMALS AND PATIENTS WITH C.N.S. LESIONS. M.Yokoyama, E.G.Trams and R.O.Brady: Proc. Soc. exp. Biol., N.Y., 1962, 111, 350-352 (Lab. Neurochem., Nat. Inst. Neurol. Dis. and Blindness, Bethesda, Md., U.S.A.) Anti-asialoganglioside Ab were detected in the sera of animals and patients with viral encephalitis having brain damage, in 5 out of 14 patients with Tay-Sachs disease and 3 out of 14 schizophrenic patients. Anti-ganglioside Ab were found in the sera of 8 of 42 patients with multi. pié sclerosis, all 8 patients possessing the homozygous hr (c) blood group Ag.

M.M.Shapland

1181. EXPERIMENTAL PRODUCTION OF MUSCULAR DYSTROPHY-LIKE LESIONS IN RABBITS AND GUINEA-PIGS BY AUTO-IMMUNE PROCESS. C.Tal and E.Libani: Brit. J. exp. Path., 1962, 43, 525-529 (Dept. Nervous Dis., Hadassah Med. Sch., Jerusalem, Israel)

Guinea-pigs and rabbits were given homologous or heterologous muscle homogenates with Freund's adjuvants. Histopathol. changes found in skeletal muscles up to 1 yr. later were similar to those of muscular dystrophy in man.

D.L.Gardner

1182. VENOM OF THE BULGARIAN SAND VIPER IE. AUTO-ANTIBODIES TO THE VENOM OF VIPERA AMMODYTES AND COMMON ANTIGENS IN ITS VENOM AND SERUM. M.Gomtor and S.Nedjalkov: Z. Immun.-Forsch., 1962, 124, 211-218 (Res. Inst. Epidemiol., Sofia, Bulgaria) The serum of the Bulgarian sand viper contained auto-Ab to its venom demonstrable by the Ouchterlony technique. The serum of the snake was also toxic, but this toxin was destroyed in 30 min. at 58° and had nothing to do with the venom.

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The serum and venom had certain non-toxic Ag in common. The snake is recommended as a laboratory animal for research on autoimmunity. (German) D.P.Winstanley

1183. SKIN HOMOGRAFT SURVIVAL IN CHRONIC RENAL INSUFFICIENCY. A.B.Morrison, K.Maness and R.Tawes: Arch. Path., Chicago, 1963, 75, 139-143 (Dept. Path., Univ. Med. Center, Rochester, N.Y., U.S.A.) Chronic renal insufficiency was induced in adult Sprague-Dawley rats by 2 stage partial nephrectomy. Between 6 and 9 months later, when serum inorg. PO₄ and blood urea showed established renal insufficiency, hybrid homografts of skin were placed on control and expt. rats. Survival time of the grafts was significantly prolonged in rats with renal insufficiency. This was correlated with the blood urea but not with serum P. The reasons for prolonged survival time is given as possibly adrenal hypertrophy. R.Mitchell

1184. COMPLETE SPERMATOGENESIS IN INTRATESTICULAR HOMOTRANSPLANTS OF FOETAL AND NEONATAL TESTES IN THE RAT. C.D.Turner and H.Asakawa: Proc. Soc. exp. Biol., N.Y., 1963, 112, 132-135 (Dept. Biol., Duquesne Univ., Pittsburgh, Pa., U.S.A.) Testis transplants were performed from neonatal or 15-16 day foetal Sprague-Dawley rats into either the tunica albuginea or the renal capsule of adult c^o rats. Transplants were rejected in 29% of animals within 3 weeks. The remaining 71% of the grafts developed into testis tissue with maturation through all stages of spermatogenesis. The incidence of 'takes' in the grafts to kidney was similar, but the testis did not produce histol. normal sperms. This suggests that the cryptorchid environment prevents complete spermatogenesis in testis grafts. D.N.Wheatley

1185. ANAESTHETIC ASPECTS OF RENAL HOMOTRANSPLANTATION IN MAN. L.D.Vandam, J.H.Harrison, J.E.Murray and J.P.Merrill: Anesthesiology, 1962, 23, 783-792 (Div. Anesthesia, Dept. Surg. and Med., P.B.Brigham Hosp., Boston, Mass., U.S.A.) An account is given of 17 renal transplants between identical twins. The problems presented by both donor and recipient are discussed. The chief problem to be solved is tissue-immune response. A. A. Zimmerman

1186. SKIN COMPATIBILITY OF DIFFERENT CBA SUB-LINES SEPARATED FROM EACH OTHER IN THE COURSE OF A VARYING NUMBER OF GENERATIONS. O.E.A.Inder: Transplantation, 1963, 1, 58-60 (Inst. Tumour Biol., Karolinska Inst., Stockholm, Sweden) Tissue compatibility was tested between sublines of CBA mice by observing the fate of skin grafts. No homograft reactions occurred between mice of sublines separated for 8 or less generations. Between sublines separated by 10 or more generations, occasional grafts showed evidence of reactions and some were rejected. J.R.Anderson

1187. HISTOCOMPATIBILITY ASSOCIATED WITH X CHROMOSOME IN MICE. D.W.Bailey: Transplantation, 1963, 1, 70-74 (Cancer Res. Inst., Univ. California Med. Center, San Francisco, Calif., U.S.A.) Skin grafts were exchanged between F₁ hybrids of 2 inbred strains of mice (the expt. was designed to detect X-ray mutations at the histocompatibility loci, and the fathers of the hybrids had received X-irradiation). Some of the grafts between reciprocal hybrids were rejected, and the more rapid rejection of selected second-set skin grafts of hybrid and parental strains supported the conclusion that tissue incompatibility resulted from transplantation Ag determined by factors carried by the reciprocal X chr. Difference in host reactivity determined by genes

on the X chr. is considered a less likely possibility.

J.R.Anderson

1188. KOTOPIC LABELLING OF CORNEAL STROMAL CELLS PRIOR TO TRANSPLANTATION. F.M.Polack: Transplantation, 1963, 1, 83-96 (Dept. Ophthalmol., Coll. Phys. and Surg., Columbia Univ., New York, N.Y., U.S.A.) The cells of the central part of the rabbit's cornea were destroyed by freezing, and regeneration was studied histol. for up to 100 days. Labelling of proliferating cells was accomplished by injn. of [³H]thymidine into the ant. chamber, and was observed by autoradiography sections. Following epithelial desquamation, transparency returned and regeneration of epithelial and stromal cells was virtually complete in 6 weeks. To obtain optimal and uniform labelling throughout the damaged area, several injn. of [³H]thymidine were required within 8 days after freezing. Good radioautographs were obtained up to 12-13 months later.

J.R.Anderson

1189. EVOCATION AND PERSISTENCE OF TRANSPLANTATION IMMUNITY IN RATS. D.Steinmuller and L.J.Weiner: Transplantation, 1963, 1, 97-106 (WistarInst., Philadelphia, Pa., U.S.A.) The rate of development, strength and duration of homograft immunity was determined in Lewis rats following orthotopic skin grafting or injn., by various routes, of spleen cells or dissociated epidermal cells of BN rats. Immunity was assessed by estimating the proportion of viable epithelium in skin homografts of 6 days duration. Immunity induced by skin grafts persisted for over 200 days. Injn. of spleen cells induced less prolonged immunity, the duration depending on the dosage. The i.p. route was the most effective, i.v. and i.d. less so, and s.c. ineffective in the dosage employed. Dissociated epidermal cells were less effective than spleen cells.

J.R.Anderson

1190. EFFECT OF SPLENIC HOMOGENATES ON HOMOLOGOUS CELLS IN VITRO. W.Rosenau and H.D.Moon: Lab. Invest., 1962, 11, 1260-1265 (Pathol. Dept., California Univ. Med. Sch., San Francisco, Calif., U.S.A.) Highly inbred mice were sensitised to homologous cells by i.p. and intrasplenic injn. Splenic lymphocyte suspensions were added to homologous tissue culture cells, which they destroyed. At the same time the sensitised lymphocytes underwent cytolysis. Splenic homogenates of both control and sensitised mice were cytolytic to a similar degree.

A.M.Mackay

1191. PATTERN OF REJECTION IN RAT SKIN HOMOGRAFTS AND ITS RELATION TO VASCULAR NETWORK. B.H.Waksman: Lab. Invest., 1963, 12, 46-57 (Neurol. Res. Lab., Massachusetts Gen. Hosp., Boston, Mass., U.S.A.) Histol. studies of rat skin homografts showed the earliest change to be accumulation of mononuclear cells within and just without the venous channels of the graft. Later these cells destroyed epithelium and blood vessels. Vessel obstruction and destruction led to ischaemic death of the graft. The vascular pattern of grafted site affected the relative importance of different elements in the sequence of changes.

A.M.Mackay

1192. CHANGES IN PLASMA PROTEINS OF MICE DURING REJECTION OF SKIN HOMO- AND HETEROGRAFT. E.E.Peacock, jun. and W.P.Biggers: Proc. Soc. exp. Biol., N.Y., 1962, 111, 131-133 (Dept. Surg., Univ. North Carolina Sch. Med., Chapel Hill., N.C., U.S.) Application of a single hetero- or homograft caused an increase in α_2 globulin levels. Excision of graft before necrosis caused the level to return to normal

M.M.Shapland

1193. CROSS CIRCULATION IN NORMAL AND INTOXICATED PARABIONTS. R.T.Binhammer and J.K.Hull: Proc. Soc. exp. Biol., N.Y., 1962, 111, 134-139 (Dept. Anat., Univ. Cincinnati Coll. Med., Cincinnati, Ohio, U.S.A.) Up to 30 days after union there was no statistical difference in the r.b.c. and plasma transfer times of normal parabiotic rats. Intoxicated pairs exhibited a slowing of overall cross circulation with faster plasma transfer time than that for r.b.c. M.M.Shapland

1194. PASSIVE TRANSFER OF TRANSPLANTATION IMMUNITY. HI. INBRED GUINEA-PIGS. L.S.Najarian and J.D.Feldman: J. exp. Med., 1963, 117, 449-456 (Div. Expt. Path., Scripps Clin., La Jolla, Calif., U.S.A.) Transplantation immunity was passively transferred in inbred guinea-pigs with pHlthyridine-labelled lymphoid cells sensitised to homologous tissues. Autoradiographs of the homologous skin graft sites undergoing rejection contained few or no labelled cells. Passive transfer of transplantation immunity was also accomplished with sensitised cells enclosed in cell-impenetrable chambers. When tuberculin sensitivity was passively transferred labelled cells were readily found at the challenge site. The homograft reaction and delayed sensitivity of tuberculin type are dependent on different immunol. mechanisms within the same spp. H.E.Jones

1195. ACQUIRED TYPE OF REFRACTORINESS TO GRAFT-VERSUS-HOST REACTION IN ADULT Fi HYBRID MICE. M.Fox and J.Choward: Transplantation, 1963, 1, 2-14 (Dept. Surg. Sci., Univ. Med. Sch., Edinburgh, Scotland) Adult (C57BL x CBA) Fi hybrid mice inj. with adult mice spleen cells of either Parental strain showed depression of graft-versus-host reaction following injn. of spleen cells of the other parental strain. Injn. of C57BL cells into the hybrids also resulted in refractoriness following a 2nd injn. of C57BL cells. The spleens of C57BL -> (C57BL x CBA)Fi chimaeras were almost completely occupied by C57BL cells, which retained anti-host activity and probably reacted against subsequently inj. CBA cells. Only a small proportion of 'Plein cells of CBA -> (C57BL x CBA)Fi chimaeras were of CBA type, and these were considered likely to retain anti-host reactivity; subsequently inj. CBA cells incased in the spleen more than those of the 1st injn. and a graft-v-host reaction ensured. J.R.Anderson

1196. TRANSPLANTATION OF ANTIBODY PRODUCING CELLS OR THEIR PRECURSORS BY PARABIOSIS. L.W. McDonald: Life Sci., 1963, No.1, 36-43 (Cancer Res. Inst., New England Deaconess Hosp., Boston, Mass., U.S.A.) Expt. results are presented for the transplantation of an immunol. conditioned cell by parabiosis, as studied with rats. The transplantation of such $^{35}\text{Ce}^{\text{U}}$ appeared not to be related to X-irradiation of the immunised member of die pair. K.Jones

1197. T⁴rj, OF HISTOCOMPATIBILITY FOR ALLOGEN-EIC GRAFTS. M.Matsukura, A.L.Mery, J.LJVnjel and G.Mathieu: Transplantation, 1963, 1, 61-64 (Hop. Saint-Louis, Paris, France) This test, previously applied unsuccessfully between inbred strains of mice, Pec³?* to homografting an animal with skin from a proskin⁴ recipient and following graft rejection, with as "to". Prospective donors. The graft surviving longest considered likely to indicate the least incompatible Dr. direct evidence is advanced, from homograft and J. Upon rabbits, that the test may have some value, Possible use in homografting is discussed. J.R.Anderson

1198. LETHALITY OF A FORSSMAN ANTISERUM FOR MICE. L.S.Kind and J.Donch: Proc. Soc. exp. Biol., N.Y., 1962, 111, 241-242 (Dept. Microbiol., Univ. California Med. Center, San Francisco, Calif., U.S.A.) Mice could be killed by i.v. injn. of rabbit antiserum to boiled guinea-pig kidney. Evidence is presented that these deaths were due to Foissman Ab. M.M.Shapland

1199. ACTION OF FORSSMAN ANTISERUM ON BLOOD VESSELS OF SKIN IN GUINEA-PIGS. E.M.I.Berkinshaw-Smith, R.S.Morgan and G.P.Wright: Brit. J. exp. Path., 1962, 43, 665-673 (Dept. Path., Guy's Hosp. Med. Sch., London, England) The action of Forssman Ab, studied histol. and microscopically in the living animal, were mainly vasculonecrotic. Impaired blood flow apparently caused tissue damage, with lesions resembling the reversed passive Arthus phenomenon. D.L.Gardner

ANTIBODY FORMATION

1200. CELLULAR DISCRIMINATION BETWEEN INDIGENOUS AND FOREIGN MATTER. S.V.Boyden: J. theoret. Biol., 1962, 3, 123-131 (Dept. Expt. Path., Curtin Sch. Med. Res., Australian Nat. Univ., Canberra, Australia) A brief review of current knowledge concerning the mechanism by which cells, such as⁵w.b.c. are able to distinguish between 'indigenous' and 'foreign' macromolecules. The immunity reaction is given special consideration. Emphasis is laid on the possibility that 'recognition' by phagocytes and similar cells may be a Immorally mediated phenomenon. CF.Blane

1201. ANTIBODY FORMATION. IV. FORMATION OF RAPIDLY AND SLOWLY SEDIMENTING ANTIBODIES AND IMMUNOLOGICAL MEMORY TO BACTERIOPHAGE O X 174. J.W.Uhr and M.S.Finkelstein: J. exp. Med., 1963, 117, 457-477 (Med. Dept., New York Univ. Sch. Med., New York, N.Y., U.S.A.) Injn. of OX174 bacteriophage into guinea-pigs stim. 19 S Ab at first and 7 S later. At low dose levels the 19 S formation was dose-dependent. The amount of 19 S in the serum could double in 6 to 8 hr. suggesting tflat the amount produced per cell was increasing, in addition to proliferation of the Ab-producing cells. Following a single injn. 19 S synthesis ceased at 10 days after which 19 S disappeared from the circulation with a half life of appiox. 24 hr. A 2nd injn. on day 5 or 9 prolonged 19 S synthesis.[#] Synthesis was also prolonged by injn. of OX174 with endotoxin or by 400 r whole-body X-irradiation 24 hr. after the injn. into rabbits. The 7 S response was detected about 1 week after immunisation at rates independent of the dose, continued for months and led to an Ab response (immunol. memory) during which only 7 S was detected. H.E.HJones

1202. Y-GLOBULIN AND ANTIBODY FORMATION IN VITRO, n. PARALLEL OBSERVATIONS ON HISTOLOGICAL CHANGES AND ON ANTIBODY FORMATION IN THE WHITE AND RED PULP OF THE RABBIT SPLEEN DURING THE PRIMARY RESPONSE, WITH SPECIAL REFERENCE TO THE EFFECT OF ENDOTQXIN. H.L. Langevoort, R.M.Asafsky, E.B.Jacobson, T. de Vries and G.J.Thorbecke: J. Immunol., 1963, 90, 60-71 (Dept. Histol., Univ., Groningen, Netherlands) The 'red'*

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and 'white*' pulp of spleens of rabbits inj. with 10 mg. of BCG or 10 mg. of BCG + 10 μ g. of endotoxin were cultured separately. An increase in the no. of haemocytoblasts occurred in the 'white' pulp from 1 day after Ag injn. Ab formation in vitro occurred at the time of immature plasma cell proliferation (day 4 to 7) and was much more pronounced in the 'red*' than in the 'white' pulp. Most of the plasma cells were found on the border of the *red* and 'white' pulp. Endotoxin enhanced the reactions.

N.R.Jing

1203. FOETAL RESPONSE TO ANTIGENIC STIMULUS. I. PLASMA CELLULAR AND LYMPHOID REACTIONS IN THE HUMAN FOETUS TO INTRA-UTERINE INFECTION. A.M.Silverstein and R.J.Lukes : Lab. Invest., 1962, 11, 918-932 (Armed Forces List. Path., Washington, D.C., U.S.A.) That human foetuses are capable of immunol. response is suggested and discussed with particular reference to congenital syphilis and toxoplasmosis. Autopsy material from 19 cases was studied histol. and plasma cellular and lymphoid reactions assessed. Infected foetuses developed lymphoid tissue more rapidly than controls, the extent of lymphoid and plasma cell response being related to the severity of the disease.

A.M.Mackay

1204. PROPERTIES OF PHAGE-NEUTRALISING ANTIBODIES PRODUCED BY NEWBORN RABBITS. B.Pemis, I.Ghezzi and M.Turri: Nature, Lond., 1963, 197, 807-808 (Clin. Lavoro 'Luigi Devoto', Univ., Milano, Italy) Rabbits inj. within 24 hr. of birth with E.coli T2 bacteriophage in the foot pad produced sp. Ab within 4 to 5 days which was heat-labile, C-dependent and sedimented at 19[^], thus somewhat resembling properdin in the adult.

GM.Lewis

1205. DEVELOPMENT OF IMMUNE RESPONSE. AGGLUTININ RESPONSE TO SALMONELLA FLAGELLAR ANTIGENS IN NEWBORN RABBIT. JJ.Bellanti, D.V. Eitzman, J.B.Robbins and R.T.Smith: J. exp. Med., 1963, 117, 479-496 (Pediat. Dept., Univ. Florida Coll. Med., Gainesville, Fla., U.S.A.) Newborn rabbits were induced to form high titre flagellar agglutinins by the 7th to 10th day of life by injn. of large amount of Salmonella flagellar Ag. A y 1 macroglobulin Ab was first obtained and 77 S y 2 globulins did not appear until the 4th to 5th week of life. In adult animals the macroglobulin Ab was produced for only 3 to 5 days before the 7 S Ab appeared. The infant macroglobulin appeared to be identical with the adult macroglobulin Ab.

H.E.HJones

1206. IMMUNE RESPONSE IN COLD-ACCLIMATED MICE. R.RJ.Chaffee and CM.Martin: Proc. Soc. exp. Biol., N.Y., 1962, 111, 375-377 (Div. Life Sci., Univ. California, Riverside, Calif., U.S.A.) Neither acclimation at 4° nor de-acclimation at 25°, each of 4 weeks, resulted in significant change in the circulating Ab response to i.p. injn. of coliphage strain T2r⁺.

M.M.Shapland

1207. EFFECT OF VARIOUS EXPERIMENTAL PATHOPHYSIOLOGICAL CONDITIONS ON ANTIBODY PRODUCTION. I. INFLUENCE OF DIETS WITH DIFFERENT PROTEIN CONTENTS. L.Bertok and F.Kemenes. n. **METHIONINE DEFICIENCY.** L.Bertok, F.Kemenes and G.Simon: ZJmmun.-Forsch., 1962, 124, 270-279, 280-285 (Vet. Sch., Budapest, Hungary) Six groups of rats were kept on diets of equal caloric value but differing in protein (casein) content: 0, 5% 10% 20% (control), 40% and 80%. On the 23rd day all the rats were infected i.p. with virulent Leptospira ictero-

haemonchiae. They were killed at 56 days. The mean titres of Abrose from 1:1738 (no protein) to 1:6964 (40% protein), but fell off in the 80% protein group. Similar expt. were performed with rats fed on a methionine-deficient diet (glue instead of casein). They produced a mean Ab titre of 1:2528 (controls 1:7510, P< 0.01). Rats given ethionine produced very little Ab and half of them died.

(English) D.P.Winstanley

1208. EFFECT ON ANTIBODY PRODUCTION OF INJECTION OF AN α_2 -PROTEIN FRACTION. J.F.Mowbray: Nature, Lond., 1963, 197, 1019 (Med. Unit. St.Mary's Hosp., London, England) A fraction from serum chromatographed on DEAE cellulose and eluted with 0.5 M pH 5 acetate buffer prolonged the survival time of rat skin homografts and prevented an immune response in rabbits to human albumin or r.b.c. if inj. 1-2 hr. before the Ag.

G.M.Lewis

1209. EFFECT OF LARGE DOSES OF O2-GLYCOPROTEIN FRACTION ON SURVIVAL OF RAT SKIN HOMOGRAFTS. J.F.Mowbray: Transplantation, 1963, 1, 15-20 (M et al ^) St. Mary's Hosp., London, England) Survival of skin homografts between rats of 2 outbred albino strains from different sources was prolonged, in 20% of cases for over 8 months, by i.p. injn. of 25-100 mg. of an O,2" glycoprotein fraction of rat, human or bovine plasma, given within 1 hr. and 72 hr. after grafting. No prolongation resulted if the 1st injn. was given 4 hr. after grafting. In rabbits, the homologous plasma fraction was more effective than human or bovine. No effect was observed on the survival of second-set grafts in either spp. The phenomenon is believed to result from non-sp. suppression of the early stages of the immune response.

J.R.Anderson

1210. ACQUIRED TOLERANCE TO SKIN HOMOGRAFTS IN MICE. I. HISTOLOGICAL ANALYSIS OF LYMPHOID TISSUES BEFORE DURING AND AFTER LOSS OF TOLERANCE. B.F.Argyris: J. exp. Med., 1963, 117, 543-560 (Zool. Dept., Univ., Syracuse, N.Y., U.S.A.) Acquired tolerance to CBA skin homografts gave way to a chronic rejection after 2 months in many C3H mice neonatally inj. with CBA spleen cells. An immune response was observed histol. in the lymphoid tissues of many 4-month old tolerant mice. During graft rejection the immune response was limited to the lymph nodes but was also seen in the spleen after rejection of a 2nd graft by post-tolerant mice. These expt. suggest the development of a host-v.- graft reaction in seemingly tolerant CBH mice, and that tolerance is dependent on a critical balance between the immune potential of the host and the donor cells. As mice mature their immune potential may increase and the host-v#-graft reaction increase to the point where skin grafts are rejected.

H.E.HJones

1211. INDUCTION OF HOMOGRAFT TOLERANCE IN ADULT MICE BY SUBLETHAL X IRRADIATION AND INJECTION OF HOMOLOGOUS SPLEEN CELLS. A.Fefer and W.C.Davis: Transplantation, 1963, 1, 75-78 (Dept. Med., Stanford Univ., Palo Alto, Calif., U.S.A.) The conditions were investigated for inducing tolerance in DBA/2 mice to BALB/c skin grafts by prior whole-body X-irradiation and injn. of the recipients with BALB/c spleen cells. Graft survival was invariably prolonged, sometimes for over 7 months, by 300-400 r (200 r was ineffective), followed 24 hr. later by i.p. injn* of 1% to 100% of the cells obtained from a BALB/c mouse spleen. Injn. of spleen cells 1 hr. or 72 hr. after X-ray was ineffective. Grafts placed 6-17 days after injn.

showed prolonged survival; those placed concomitantly with the injn. were rejected normally. X-rays alone were without effect, and spleen-cell injn. alone hastened rejection. All attempts to induce tolerance across an H-2 difference failed.

J.R.Anderson

1212. LOSS OF PARTIAL TOLERANCE FOLLOWING SUBLETHAL IRRADIATION. W.H.Stone and R.D.Owen: *Transplantation*, 1963, 1, 107-115 (Div. Biol., California Inst. Technol., Pasadena, Calif., U.S.A.) Bi-weekly injn. of sheep r.b.c. were given to rats for 8 weeks, starting within 24 hr. of birth. At 10 weeks some of the rats received 600 r of total body X-irradiation. After further injn., the serum was tested for Ab to sheep r.b.c. Partial tolerance was induced by the early injn., particularly when measured by saline agglutinin titres, but tended to disappear spontaneously, particularly when tested by haemolysin titres. At 18-31 weeks the irradiated animals had developed higher Ab titres, particularly saline agglutinins, than those not irradiated. It is concluded that X-irradiation caused a loss of tolerance. 133 out of 171 rats died before completion of the expt.

J.R.Anderson

1213. DETERMINATION OF SPECIFIC IMMUNOLOGICAL TOLERANCE IN RADIATION CHIMERAS. D.W.Van Bekkum: *Transplantation*, 1963, 1, 39-57 (Radio-biol. Inst.T.N.O., Rijswijk (Z.H.) Netherlands)

'Complete*' chimaerism was produced in various mouse strain combinations by injn. of marrow cells into X-irradiated adults. Reactivity of the chimaeras* donor-strain cells was determined by injn. of spleen cells into newborn mice and examining for graft-vs-host reaction. Sp. tolerance of donor-strain cells for host tissue was rapidly lost on transfer to a new host of different antigenic constitution, sp. tolerance for the new host being developed. When large numbers of lymph node cells were transferred with the marrow cells, tolerance was maintained temporarily in the new host. The results are regarded as evidence against tolerance being an irreversible change and against its being attributable to elimination of clones.

J.R.Anderson

1214. INFLUENCE OF HOST'S SEX ON INDUCTION OF TOLERANCE OF HOMOLOGOUS TISSUES. D.B.Wilson: *Transplantation*, 1963, 1, 79-82 (Wistar Inst., Philadelphia, Pa., U.S.A.) Newborn rats of strongly ¹isto-incompatible strains (BN and Lewis) received an i.v. injn. of marrow cells, and 8-10 weeks later a skin graft, from ² of the other strain. A significantly higher proportion of ² then (¹ tolerated the grafts for over 50 %²ys. In similar expt. with strains of mice having H-2 compatibility, spleen cells were used to induce tolerance, and in some expt. F1 hybrid cells to avoid runt disease: no significant sex differences in induction of tolerance were observed.

J.R.Anderson

1215. MODIFICATION OF IRRADIATION EFFECTS THROUGH ACTIVELY ACQUIRED TOLERANCE TO HOMOLOGOUS BONE MARROW GRAFTS. D.H.Shaw and H.Vermund: *Proc. Soc. exp. Biol.*, N.Y., 1963, 112, 212-216 (Dept. Radiol., Univ. Wisconsin, Madison, Wis., U.S.A.) Pigeons (*Columba livia*) were made tolerant to skin grafts from hybrid *Clivia*¹ and *Coli*². Some were used as donors, some as hosts. Animals were X-irradiated with 2500 rad and inj. with 250 x 10⁶ bone marrow cells. The tolerance of the donor to the host to which its bone marrow was transplanted increased the survival time as compared with the control.

D.N. Wheatley

1216. ADOPTIVE TOLERANCE TRANSFER OF THE TOLERANT STATE. B.F.Argyris: *J. Immunol.*, 1963, 90, 29-34 (Dept. Embryol., Carnegie Inst. of Washington, Baltimore, Md., U.S.A.) Tolerance to skin homografts was induced in mice by i.v. neonatal injn. Lymphoid cells from these mice were transferred to lethally X-irradiated mice of both host and donor strain. The transferred lymphoid cells were mutually tolerant and the host and donor cells from the tolerant animal tolerated each other's type of skin grafts. The tolerance was due to a sp. inhibn. of the immunol. response.

N.R.ling

1217. USE OF ANTIGENIC TISSUE EXTRACTS TO WEAKEN IMMUNOLOGICAL REACTION AGAINST SKIN HOMOGRAFTS IN MICE. P.B.Medawar: *Transplantation*, 1963, 1, 21-38 (Nat.Inst.Med.Res., London, England) The effects of injn. of crude antigenic extracts of donor-strain lymphoid tissue upon the survival of subsequently applied skin grafts of A to C3H mice (strongly incompatible) and of C3H to CBA mice (weakly incompatible) was investigated. Paniculate A-strain Ag injn. i.p. or i.v. sensitised the C3H mice, whereas semi-sol. A Ag sensitised only when inj. i.p. Both 'semi-sol.' and paniculate C3H Ag, inj. i.p., i.v. or sub-dermally, prolonged C3H homograft survival in CBA mice. For both strain combinations, injn. of Ag acted synergistically with X-irradiation, a-methopterin or hyperimmune iso-Ab (but not with Typan Blue) in prolonging homograft survival.

J.R.Anderson

1218. REPRESSION OF DELAYED HYPERSENSITIVITY TO CONJUGATED SERUM ALBUMIN DURING IMMUNE PARALYSIS INDUCED IN GUINEA-PIG BY HETEROLOGOUS PROTEINS. T.Neveu, G.Biozzi, B.N.Halpern, A.Banellec and P.Liacopoulos: *Nature*, Lond., 1963, 197, 1023-1024 (Chair Méd., Expt. Coll. de France, Paris, France) Delayed hypersensitivity reactions to picrylated guinea-pig serum albumin produced in guinea-pigs were inhib. by injn. several days previously of large doses of human or bovine serum proteins, Y^globulins being particularly effective. This immune paralysis lasted only a few weeks. Complete suppression of delayed hypersensitivity was only produced when both systemic and local routes of injn. were used.

G.M.Lewis

1219. IMMUNOLOGICAL UNRESPONSIVENESS PRODUCED IN ADULT GUINEA-PIGS BY PARENTERAL INTRODUCTION OF MINUTE QUANTITIES OF HAPten OR PROTEIN ANTIGEN. J.R.Battisto and J.Miller: *Proc. Soc. exp. Biol.*, N.Y., 1962, 111, 111-115 (Dept. Microbiol., A. Einstein Coll. Med., Yeshiva Univ., New York, N.Y., U.S.A.) Injn. of micro amounts of picryl chloride or bovine Y-globulin into the mesenteric veins prior to sensitisation suppressed delayed hypersensitivity and Ab formation.

M.M.Shapland

1220. INTERFERENCE OF NEWBORN LYMPHOID CELLS WITH ESTABLISHMENT OF IMMUNOLOGICAL UNRESPONSIVENESS TO A PROTEIN ANTIGEN. M.W.Cohen and G.J.Thorbecke: *Proc. Soc. exp. Biol.*, N.Y., 1963, 112, 10-12 (Dept. Pathol., New York Univ. Med. Sctu., N.Y., U.S.A.) Injn. of neonatal thymus and spleen cell suspensions into neonatal mice 2-6 hr. after injn. of 10 mg. of bovine serum albumin resulted in immunol. responsiveness to Ag-challenge at 30-40 days of age. The majority of animals not receiving lymphoid cells at birth were unresponsive to the Ag at 30-40 days.

D.N.Wheatley

1221. ANTIBODY RESPONSE OF RATS DEPLETED OF LYMPHOCYTES BY CHRONIC DRAINAGE FROM THE

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THORACIC DUCT. D.D.McGregor and J.L.Gowans: *J. exp. Med.*, 1963, 117, 303-320 (Dunn Sch. Pathol., Univ., Oxford, England) Chronic lymph drainage from a thoracic duct fistula in rats reduced the lymph node wt. and small lymphocyte content. The primary immune response to tetanus toxoid or sheep r.b.c. was severely depressed or abolished in such animals. Immunol. reactivity could be supplied by injn. of small lymphocytes. The response of lymphocyte-depleted rats to a second injn. of tetanus toxoid was normal. H.E.H Jones

1222. SUPPRESSION OF ANTIBODY FORMING CAPACITY WITH THYMECTOMY IN THE MOUSE. B.W.Papermaster, A.P.Dalmasso, C.Martinez and R.A.Good: *Proc. Soc. exp. Biol.*, N.Y., 1962, 111, 41-43 (Ped. Res. Labs., Variety Club Heart Hosp., Minneapolis, Minn., U.S.A.) Antigenic stimn. with T2 bacteriophage was almost completely abolished by thymectomy performed within 24 hr. of birth. M.M.Shapland

1223. SUPPRESSION OF THE HOMOGRAFT REACTION BY THYMECTOMY IN THE MOUSE. A.P.Dalmasso, C.Martinez and R.A.Good: *Proc. Soc. exp. Biol.*, N.Y., 1962, 111, 143-146 (Dept. Physiol., Variety Club Heart Hosp., Univ. Minnesota Med. Sch., Minneapolis, Minn., U.S.A.) Thymectomy before 24 hr. after birth inhibits immunol. maturation sufficiently to permit acceptance of skin homografts of wide antigenic disparity. M.M.Shapland

1224. SUPPRESSION OF BLOOD GROUP AGGLUTINABILITY OF HUMAN ERYTHROCYTES BY CERTAIN BACTERIAL POLYSACCHARIDES. R.Ceppellini and M.Landy: *J. exp. Med.*, 1963, 117, 321-338 (Univ., Turin, Italy) R.b.c. coated with bacterial capsular polysaccharides were not aggl. by Ab to the blood group Ag. This could not be due to prevention of Ab uptake. Aggl. by Rh-incomplete Ab was restored to the original titre only after the polysaccharide-coated r.b.c. had been subjected to 10 alternate exposures to globulin and anti-globulin. Haemaggl. by Newcastle, mumps and influenza viruses was also suppressed. It is possible that the polysaccharide effect on immune aggl. can be explained as interference with lattice formation. H.E.H Jones

1225. IMMUNOLOGICAL PARALYSIS PRODUCED IN MICE BY KLEBSIELLA PNEUMONIAE TYPE 2 POLYSACCHARIDE. B.A.Batshon, H.Baer and M.F.Shaffer: *J. Immunol.*, 1963, 90, 121-126 (Dept. Microbiol., Tulane Univ. Sch. Med., New Orleans, La., U.S.A.) Mice inj. with varying amounts of Klebsiella pneumoniae type 2 polysaccharide were subsequently challenged with living homologous organisms after varying intervals of time. Of 3 prep. of polysaccharide one was essentially non-toxic and non-immunising, the other 2 were approx. equal in antigenicity. N R.Ling

1226. SPECIFIC IMMUNOLOGICAL UNRESPONSIVENESS TO SYNTHETIC POLYPEPTIDE ANTIGENS. M.Sela, S.Fuchs and M.Feldman: *Science*, 1963, 139, 342-343 (Weizmann Inst. Sci., Rehovoth, Israel) Immunol. unresponsiveness to 2 synthetic polypeptide Ag was produced in adult rabbits by treatment with 6-mercaptopurine, and in newborn animals by injn. of the Ag alone. A normal response to ovalbumin was shown by the "tolerant" animals. G.M.Lewis

1227. PROLONGED SURVIVAL OF HOMOGRAFTS IN MICE TREATED WITH EACA [6-AMINO-N-CAPROIC ACID]. R.W.Gillette, AJFindley and H.Conway:

Transplantation, 1963, 1, 116-117 (Dept. Surg. Cornell Med. Center, New York, N.Y., U.S.A.) Letter to editor. J.R.Andeison

1228. SUPPRESSION OF HOMOGRAFT RESPONSE BY PRE-TREATMENT WITH ANTITUMOUR AGENTS. S.R. Humphreys, J.P.Glynn and A.Goldin: *Transplantation*, 1963, 1, 65-69 (Lab. Chem. Pharmacol., Nat. Cancer Inst., N.I.H., Bethesda, Md., U.S.A.) The suppression of the homograft response in C57BL *a* mice by antitumour agents was assessed by giving the agents for 5 days and 24 hr. later injecting s.c. leukaemic (L 1210) spleen cells from (BALB/c X DBA/2J)Fi cfmice. Tumour growth was regarded as a measure of the effectiveness of suppression of the immune response. Of the agents tested, Mephelan and triethylene melamine were equally and the most effective, then, in decreasing order, Cytoxin, X-rays, 6-mercaptopurine and amethopterin.

J.R. Anderson

IMMUNOCHEMISTRY

1229. IMMUNOCHEMICAL STUDY OF RABBIT Y-GLOBULIN ALLOTYPEs. S.Leskowitz: *J. Immunol.*, 1963, 90, 98-106 (Dept. Bacteriol., Harvard Med. Sch Boston, Mass., U.S.A.) Rabbit Ab to purified y-globulin (inj. as an alum ppt. or in oil adjuvant) were shown by precipitin studies to be directed towards Ag determinants occurring on fragments I and II. Similar allotype sp. Ab could be produced in goats by immunisation with one type of rabbit y globulin and absorption with another type. Immunisation with sp. ppt., containing rabbit Ab in Freund adjuvant, produced an Ab sp. for human y-globulin in addition to the rabbit allotype-sp. Ab. N.R.Ling

1230. ELECTROPHORETIC DETERMINATION OF C-REACTIVE PROTEIN [CRP] WHICH APPEARS FOLLOWING SURGERY. M.Hornung and T.M.Morris: *Proc. Soc. exp. Biol.*, N.Y., 1962, 111, 25-30 (Dept. Microbiol., Tulane Univ. Sch. Med., New Orleans, La., U.S.A.) Electrophoretic examination of post-operative sera containing CRP showed a rise in a -globulin. $(\text{NH}_4)_2\text{SO}_4$ fractionation of CRP revealed no y -globulin.

M.M.Shapland

1231. RELATION OF IMMUNOLOGICAL AND ENZYMIC PROPERTIES TO STRUCTURAL MODIFICATIONS OF PEPSINOGEN. R.Amon and G.E.Perlmann: *J. biol. Chem.*, 1963, 238, 963-968 (Rockefeller Inst., New York 21, N.Y., U.S.A.) Pepsinogen and tyrosylated pepsinogen were antigenic, the latter stimulating production of larger amounts of Ab. Although pepsinogen, tyrosylated pepsinogen, and iodinated pepsinogen had some antigenic sites in common, the antisera reacted most strongly with their homologous Ag. Pepsin cross-ppt. with Ab to tyrosylated pepsinogen but not with antipepsinogen, which showed greater similarity of the conformation characteristics with the tyrosylated deriv. than between the enzyme and its zymogen. In the passive cutaneous anaphylaxis technique, pepsin reacted both with antipepsinogen and with Ab to tyrosylated pepsinogen. Iodinated pep'sinogen, although 80% inactivated, reacted fully with the Ab to pepsinogen, showing that the enzymic and antigen⁺ sites of the protein differ.

J.N.Ashley

1232. TWO MAJOR TYPES OF NORMAL 7 S Y-GLOBULIN. M.Mannik and H.G.Kunkel: *J. exp. Med.* 1963, 117, 213-230 (Rockefeller Inst. Med. Res., New York, N.Y., U.S.A.) Normal 7 S human y-globulin consisted of 2 antigenic groups of mol., corresponding to group 1 or group 2 multiple myeloma proteins and Bence-Jones proteins. The possible existence of a 3rd antigenic group constituting about 10% of the total normal Y-globulin is discussed. H E H Jones

1233. RECOVERY OF ANTIBODY COMBINING ACTIVITY BY INTERACTION OF DIFFERENT PEPTIDE CHAINS ISOLATED FROM PURIFIED HORSE ANTI-TOXINS.

F.Franek and R.S.Nezlin: *Folia Microbiol.*, 1963, 8, 128-130 (Dept. Immunol., Microbiol. Inst., Czechoslovak. Acad. Sci., Prague, Czechoslovakia) Ab specificity of horst antitoxins was determined by the H^{*} chain but the presence of L-chain was necessary for formation of a fully active combining site. L chains of one Ab could not be fully substituted for by L chains from an Ab of different specificity isolated from another individual.

J.R.Sargent

1234. PRECIPITIN REACTION BETWEEN NATURALLY OCCURRING HUMAN DEXTRAN-REACTING ANTIBODIES AND SICr TAGGED DEXTRAN. L.Jacobsson and R.Wikstr'Om: *Scand. J. clin. Lab. Invest.*, 1963, 15, Supp. 69, 114-120 (Dept. Clin. Chem., Royal Med. Sch., Umea, Sweden)

There were different types of naturally occurring human dextran-reacting Ab, the presence of which was most readily explained by the cross-reactivity of dextran. The use of [⁵¹Cr]dextran is suggested to be a convenient method in the study of dextran-reacting Ab.

KJones

1235. FLUORESCENT ANTIBODY STAINING. II. INHIBITION BY SUB-OPTIMALLY CONJUGATED ANTIBODY GLOBULINS. G.Goldstein, B.H.Spalding and W.B. Hunt, jun.: *Proc. Soc. exp. Biol.*, N.Y., 1962, 111, 416-421 (Dept. Microbiol., Univ. Virginia Sch. Med., Charlottesville, Va., U.S.A.) Max. brightness of sp. staining was only obtained after fractionation on DEAE-cellulose column to separate the optimally conjugated from the over- and under-conjugated globulins.

< M.M.Shapland

1236. COMPARISON OF FLUORESCEIN-LABELLED Y" GLOBULINS PURIFIED BY RIVANOL AND DEAE CHROMATOGRAPHY. L.H.Frommhagen and MJ.Martins: *J. Immunol.*, 1963, 90, 116-120 (Viral and Rickettsial Dis.Lab., California State Dept. Publ. Hlth., Berkeley, Calif., U.S.A.) Prep. of fluorescein-labelled y-globulins obtained by Rivanol [2-ethoxy 6, 9 diaminacrine-lactate] fractionation were comparable to DEAE Y" globulin in recovery of Ab and specificity of fluorescent staining. In some virus-cell systems (NH)aSO₄ pptd. globulins conjugated at low fluorescein-protein ratios &¹⁰d passed through Sephadex* were comparable. N.R.Iing

1237. THE APPLICATION OF IMMUNE E.M. TO THE DEMONSTRATION OF ANTIGENIC SITES IN BIOLOGICAL SYSTEM. J.F.Metzger and C.W.Smith: *Lab. Invest.*, 1962, 11, 902-911 (Inst. Path., Washington, D.C., U.S.A.) A.M.Mackay

1238. USE OF ANTIGEN CELLULOSE SUSPENSIONS FOR THE ISOLATION OF SPECIFIC ANTIBODIES. N.R. Gydal and R.R.Porter: *Biochim. biophys. Acta*, 1963, ^1, 185-187 (Dept. Immunol., St. Mary's Hosp. Med. Sch., London, England) A more detailed study of Pbell's method indicated that Ab could be prep. on a 10~200 mg. scale free of inactive protein. B.M.Stevens

1239. NON-IMMUNE GEL PRECIPITIN TESTS WITH AN ENZYME ANTIGEN. J.L.Niece and J.T.Barrett:

Nature, Lond., 1963, 197, 1021 (Dept. Microbiol., Sch. Med., Univ. Missouri, Columbia, Miss., U.S.A.)

Expt. with bovine carboxypeptidase A and its rabbit anti-serum revealed spurious precipitin bands in gel tests, one due to enzymic activity and one to a degradation product. It is concluded that in such systems, spurious bands may arise from the enzymic activity of an Ag functioning only as an enzyme, or conversely, the antigenic activity of an enzyme functioning only as an Ag.

CM.Lewis

1240. ELECTROPHORETIC AND IMMUNOLOGICAL CLASSIFICATION OF M-COMPONENTS IN SERUM. R.Bachmann and C.-B.Laurell: *Scand. J. clin. Lab. Invest.*, 1963, 15, Supp. 69, 11-24 (Dept. Clin. Chem., Gen. Hosp., MalmO, Sweden)

The prep. of rabbit antisera for immunol. classification of M-components and the criteria used for the classification of M-components are described. The paper electrophoretic distribution of the M-components of the different immunol. types is described. The prop. of the M-components are discussed, and it is concluded that all the components studied have immunoglobulin characteristics.

KJones

1241. IMMUNOELECTROPHORESIS ON CELLULOSE ACETATE. B.Laurent: *Scand. J. clin. Lab. Invest.*,

1963, 15, 98-101 (Dept. Clin. Chem., Univ. Hosp., Turku/Abo, Finland).

KJones

1242. SPECTROPHOTOMETRIC INVESTIGATIONS OF THE REACTION BETWEEN A HAEMOLYTIC VIRUS AND SPECIFIC HAEMOLYSIS-INHIBITING ANTIBODIES

USING THE VIRUS OF ATYPICAL FOWL-PEST [NEWCASTLE DISEASE VIRUS]. A.R.Neurath: *Z. Immun.-Forsch.*, 1962, 124, 164-172 (Res. Inst. Bioveta, Nitra, Czechoslovakia)

The action of a haemolytic virus in the presence of decreasing concn. of sp. antiserum was followed by spectrophotometric measurement of the Hb released. The method was capable of mathematical analysis.

(German) D.P.Winstanley

1243. QUALITATIVE DIFFERENCES IN THE MECHANISM OF COMPLEMENT FIXATION. F.Peetoom, K.W.Pondman, M. van der Hart and JJ. van Loghem: *Nature, Lond.*, 1963, 197, 911 (Dept. Immunochem., Central Lab., Netherlands Red Cross Blood Transf. Serv., Plesmanlaan 125, Amsterdam, Netherlands)

An anti-C^f serum was obtained by immunising rabbits with egg albumen/anti-egg albumen ppt. with bound human C. Sensitised Lewis cells removed anti-C'3a and anti-C'4, whereas r.b.c. sensitised with incomplete cold Ab exhausted anti-C'4 only in vivo; sensitised r.b.c. from patients with cold-type haemolytic anaemia absorbed neither.

G.M.Lewis

1244. PREPARATION OF COMPLEMENT REAGENTS BY MEANS OF GEL FILTRATION. K.-E.Fjellstrom: *Acta path. microbiol. scand.*, 1962, 54, 439-448 (Dept.

Clin. Chem., Univ. Hosp., Uppsala, Sweden)

A new method for the prep. of reagents R1 and R2 for C^f titration is described. Gel filtration by means of Sephadex G25 and an elution buffer of low ionic strength and pH were used to ppt. C^f 1 in the euglobulin fraction, leaving C^f 2 in the supernatant pseudoglobulin fraction. In this way the time necessary for prep. could be reduced an hr. The reagents obtained fulfilled the criteria for adequate R1 and R2.

L.Friedmann

IMMUNOLOGY AND EXPERIMENTAL PATHOLOGY

1245. MEASUREMENTS OF COMPLEMENT BY AGGLUTINATION OF HUMAN R.B.C. REACTING IN IMMUNE-ADHERENCE. K.Nishioka: *J. Immunol.*, 1963, 90, 86-97 (Lab. Microbiol., Hughes Med. Inst., Miami, Fla., U.S.A.) Measurements of immune adherence haemagglutination were made in 7 Ag-Ab systems: hen albumin, bovine serum albumin, bacteriophage T2, Brucella abortus, Salmonella typhosa, S. enteritidis and sheep r.b.c., using 1-0 ml. of reaction mixture containing 2×10^7 human r.b.c. The same reaction mixture required 100 to 200 times as much serum to induce immune haemolysis. At least 4 components of C were required. N.R.Ling

EXPERIMENTAL ONCOLOGY

1246. ULTRASTRUCTURAL ALTERATIONS IN HAMSTER CHEEK POUCH EPITHELIUM IN RESPONSE TO CARCINOGEN. M.A.Istgarten, J.T.Albright and P.Goldhaber: *Arch. oral Biol.*, 1963, 8, 145-165 (Dept. Oral Histopathol., Harvard Sch. Dent. Med., Boston, Mass., U.S.A.) 7,12-Dimethylbenzanthracene applications produced a marked disturbance in the intercellular relationship of epithelial cells. Widening of the intercellular spaces occurred on the 2nd day. Similar changes which may facilitate the penetration of a carcinogen to the stratum germinativum and the underlying connective tissue occurred when non-carcinogenic xylene was applied. The most striking feature of the tumour cells was a peculiar clumping of tonofibrils on the periphery of the cytoplasm, with depletion of the tonofibrils in the rest of the cytoplasm. *

1247. EFFECT OF CASTRATION AND OF ADDITIONAL HORMONAL TREATMENTS ON THE INDUCTION OF CERVICAL AND VULVAL TUMOURS IN MICE. A. Glucksman and CP.Cheney: *Brit. J. Cancer*, 1962, 16, 634-652 (Strangeways Res. Lab., Cambridge, England) ? C3H and Strong A mice were painted intravaginally with a 1% acetone so ln. of DMBA, once weekly. Ovariectomy increased the incidence of mucoepidermoid carcinomas of cervix. Treatment of castrate mice with progesterone increased the adenocarcinomatous content of the tumours, whereas stilboestrol resulted in induction of squamous cell carcinomas only. In treated mice there was a papilloma incidence in the cervix of 31%, compared with 7% in intact mice. The vulval tumour yield was much higher in castrates than in intact animals. There were no significant differences in response between the 2 strains. D.Hamer

1248. INDUCTION OF MAMMARY CANCER IN RATS. E.Boyland and K.L.Sydnor: *Brit. J. Cancer*, 1962, 16, 731-739 (Chester Beatty Res. Inst., London, England) A soln. of 7,12-dimethylbenz-[a]-anthracene in arachis oil was fed to rats in 3 doses at fortnightly intervals. 5 strains of rat were used: Wistar, Sprague-Dawley, Chester Beatty, August and Marshall. Tumour incidence was very high (90-100%) in the first 4 strains but was zero in the case of the Marshall strain. Tumour development took longer in August strain but a similar high yield developed. 1 'Sty of uracil or thymine in diet reduced tumour induction. D.Hamer

1249. TRICYCLOQUINAZOLINE [TCQ] CARCINOGENESIS: INTERACTION OF CARCINOGEN WITH SKIN COMPONENTS. R.W.Baldwin, H.C.Palmer and M.W.Partridge: *Brit. J. Cancer*, 1962, 16, 740-748 (Cancer Res. Lab., Univ., Nottingham, England) TCQ

is an epidermal carcinogen for mouse skin. Skin extracts were hydrolysed and fractionated to determine location and binding of the carcinogen. Unlike hydrocarbon carcinogens there was no evidence of firm binding of TCQ to epidermal proteins at any stage during carcinogenesis nor to nucleic acid fractions. The carcinogen did not appear to be associated with any particular lipid fraction.

D.Hamer

1250. NEOPLASMS OF RAT URINARY BLADDER AND LIVER. R.Oyasu, D.A.Miller, J.H.McDonald and G.M. Hass: *Arch. Path.*, Chicago, 1963, 75, 184-190 (Presbyterian-St. Luke's Hosp. Div. Path., Chicago, Ill., U.S.A.) Charles River Wistar o rats approx. 6 weeks old were fed synthetic diets containing 0*06% 2-acetylaminofluorene (2-AAF). Two groups received also 1*6% and 3*2% indole. Rats receiving indole survived longer than those treated with 2-AAF alone. The incidence of bladder tumours was highest in 2-AAF/indole rats. With increase in indole ingestion, benign liver tumours became more common, but malignant liver neoplasms decreased in no. 2-AAF/Indole rat bladder tumours were correlated with the degree of liver damage. No tumours were found in rats fed indole without 2-AAF. R.Mitchell

1251. EFFECTS OF TUMOUR INITIATING AGENTS ON MOUSE SKIN SULPHYDRYL LEVELS. G.Calcutt and D. Doxey: *Brit. J. Cancer*, 1962, 16, 806-810 (Mount Vernon Hosp., Northwood, Middx., England) Strong A mice were given skin paintings with tumour initiating agents and, at intervals up to 24 hr. total-SH and TCA-Sol.-SH were determined in the skin. There was no general reaction pattern by which active initiators could be distinguished from related inactive compounds. D.Hamer

1252. SHORT-TERM TEST FOR CARCINOGENICITY. P.M.Peacock: *Brit. J. Cancer*, 1962, 17, 701-706 (Royal Beatson Mem. Hosp., Glasgow, Scotland) A range of polycyclic hydrocarbons (deriv. of pyrene and anthracene) were tested against embryonic skin, lung, stomach and urinary bladder homografts in BALB/c mice. Tumours were induced in more than one type of tissue by active compounds and only 16 weeks was necessary to obtain a reaction. The results obtained correlated well with the known carcinogenic prop. of the hydrocarbons examined. D.Hamer

1253. RELATION BETWEEN PSEUDOPREGNANCY AND THE CHEMICAL INDUCTION BY FOUR CARCINOGENS OF MAMMARY AND OVARIAN TUMOURS IN BALB/c MICE. C.Biancifiori and F.Cashcera: *Brit. J. Cancer*, 1962, 16, 722-730 (Univ. Study, Perugia, Italy) In BALB/c mice pseudopregnancy enhanced mammary carcinogenesis by hydrocarbons e.g. DMBA from 5% to 47%, benzopyrene from 0% to 35%. 1,2:5,6-dimethylbenzanthracene and methylcholanthrene, given orally in almond oil, induced granulosa cell tumours of the ovary in virgin and pseudopregnant mice. D.Hamer

1254. CHOLESTEROL AS A CARCINOGEN. L.Hieger: *Brit. J. Cancer*, 1962, 16, 716-721 (Chester Beatty Res. Inst. London, England) Strain differences in the susceptibility of mice to tumour induction by cholesterol were examined. The cholesterol was given by s.c. injn. of 0-02 ml. of 9% soln. in olive oil. Precautions were taken to

ensure that variation in results was not attributable to variation in the vehicle or to outside contamination with carcinogens. Strains Buffalo (16/50) and BRO (9/50) were particularly sensitive and the latter strain also developed sarcomas (4/35) from injn. of croton oil (0*4%) alone.

D.Hamer

1255. INFLUENCE OF CROTON OIL STIMULATION ON TUMOUR INITIATION BY URETHANE IN MICE. A.W. Pound and J.R.Bell: Brit. J. Cancer, 1962, 16, 690-695 (Pathol. Dept., Brisbane Hosp., Brisbane, Queensland, Australia) cf mice of the 'Hall*' strain were inj. with urethane at various intervals before a 20-week period of weekly paintings with croton oil in acetone. Some groups of mice also received croton oil paintings prior to urethane injn. Paintings with croton oil at 18, 24 or 48 hr. before urethane injn. increased the tumour yield, but paintings at shorter or longer periods before injn. had no measurable effect.

D.Hamer

1256. LUNG CARCINOGENESIS BY URETHANE IN NEW-BORN, SUCKLING, AND ADULT SWISS MICE. G.De Benedictis, G.Maiorano, L.Chiaco-Bianchi and L.Fiore-Donati: Brit. J. Cancer, 1962, 16, 686-689 (tost. Anat. Patol., Univ., Bari, Italy) Newborn mice inj. with a single dose of urethane developed lung tumours more rapidly and in higher yield than mice receiving urethane at a young adult age. Urethane given to lactating mothers induced lung tumours in a high % of offspring. Indirectly it was shown that urethane was passed on through the maternal milk.

D.Hamer

1257. A POSSIBLE TWO-STAGE MECHANISM IN RHABDOMYOSARCOMA INDUCTION IN RATS. N.Haran-Ghera, N.Trainin, L.Jiore-Donati and I.Berenblum: Brit. J. Cancer, 1962, 16, 653-664 (Dept. Expt. Biol., Weizmann Inst. Sci., Rehovoth, Israel) Albino rats of Wistar origin were used and effects of partial X-irradiation of body coupled with partial hepatectomy were studied. Many tumours were obtained, mainly sarcomas: 31/92 in rats having X-rays followed by hepatectomy, 21/92 when hepatectomy preceded X-irradiation, 26/96 with X-rays alone. 7/9 rhabdomosarcomas occurred in abdominal scars when X-rays followed hepatectomy, suggesting that X-rays acted as an initiating factor and wound healing as a promoting factor.

D.Hamer

1258. CANCER INDUCTION IN HAMSTERS BY HUMAN TYPE 12 ADENOVIRUS. EFFECT OF AGE AND OF VIRUS DOSE. Y.Yabe, J.J.Trentin and G.Taylor: Proc. Soc. exp. Biol., N.Y., 1962, 111, 343-344 (Div. Expt. Biol., Baylor Univ. Coll. Med., Houston, Tex., U.S.A.) The susceptibility of newborn hamsters to induction of sarcomas decreased rapidly with increasing age at the time of injn. For a given age at time of injn., the incidence of tumours induced was directly proportional to the inj. virus dose.

M.M.Shapland

1259. SEARCH FOR VIRUS IN HUMAN MALIGNANCIES. E. IN VIVO STUDIES. AJ.Girardi, M.R.Hilleman and R.E.Zwickley: Proc. Soc. exp. Biol., N.Y., 1962, 111, 84-93 (Div. Virus and Tiss. Cult. Res., Merck Inst. Therap. Res., West Point, Pa., U.S.A.) No statistically significant difference was found in tumour incidence of Swiss mice and hamsters inoc. with specimens crj^{yed} fr^m human malignant tissues when compared with ^ tr^s.

M.M.Shapland

1260. BIOLOGICAL AND PHYSICO-CHEMICAL FEATURES OF A BLASTOMOGENIC AGENT FROM HUMAN SARCO-

MATOUS TISSUE. A.LAgeenko: Folia Biol., Praha, 1963, 9, 27-33 (Hertzen State Oncol. Inst., Moscow, U.S.S.R.) The agent was inactivated by addition of *Vjo* formalin soln. and on irradiation with radioactive cobalt (125, 400 r). Activity was not influenced by u.v., and only partially affected by ether treatment. The material could be maintained in an active condition for up to 2 weeks in 50% glycerine at -14°. The agent was shown to be a nucleoprotein complex by enzyme degradation expt.

M.S.Laverack

1261. REACTION OF CERTAIN MOUSE AND HAMSTER TUMOUR TISSUE CULTURES TO POLYOMA VIRUS.

H.E.Pearson: Proc. Soc. exp. Biol., N.Y., 1962, 111, 332-334 (Dept. Publ. Hlth., Univ. S. California Sch. Med., Los Angeles, Calif., U.S.A.) Tumour cells were classified according to their reaction to polyoma virus. Group 1 cells had no morphological changes and virus only persisted a few weeks (murine RC carcinoma and HT6 fibrosarcoma); Group 2 cells had variable degrees of cytolysis and morphological changes and virus persisted several weeks (L2 and 1210 lymphomas); Group 3 cells had no morphological change with persistent virus (adenocarcinoma WT, Pearson); Group 4 cells had cytolysis with virus persisting for months (unclassified mouse tumour).

M.M.Shapland

1262. MALIGNANT NEOPLASMS INDUCED IN RATS BY EXTRACTS FROM HUMAN SARCOMATOUS TISSUE.

A.I.Ageenko: Folia Biol., Praha, 1963, 9, 20-26 (Hertzen State Oncol. Inst., Moscow, U.S.S.R.) Cell-free extracts from sarcomas taken from human patients were inj. i.p. into rats in two doses 21 days apart. Sarcomas were induced in the rats (11%) in various situations, with a latency of 17*2 months. Rats previously X-irradiated (200 or 150 r) were slightly more susceptible (14-8% developed tumours) and showed a shorter latency (14-7 months). Animals treated with 20-methylcholanthrene or DMBA in doses of 0*005 mg. s.c. showed a tumour incidence of 20*1% with a latency of 11*1 months. The tumour-inducing activity was heat labile at 90° for 40 min.

M.S.Laverack

1263. MECHANISM OF ACTION OF SHOPE RABBIT PAPILLOMA VIRUS. I. INDUCTION OF ARGINASE IN INFECTED CELLS. S.Rogers and M.Moore: J. exp. Med., 1963, 117, 521-542 (Univ. Tennessee Mem. Res. Center, Knoxville, Tenn., U.S.A.)

Evidence is presented showing that information of synthesis of arginase is derived from the virus and not from the rabbit. Domestic rabbit papillomas induced with purified virus derived from wild rabbit papillomas contained an Ag like a wild rabbit Ag, which was distinct from arginase, the protein coat of the virus, or the Vx-2 Ag. The presence of the wild rabbit Ag seemed to indicate integration of the virus DNA in the host genome of the wild rabbit.

H.E.H.Jones

1264. INDUCTION OF MALIGNANCY IN VITRO IN NEW-BORN HAMSTER KIDNEY TISSUE INFECTED WITH SIMIAN VACUOLATING VIRUS (SV40). A.S.Rabson and R.L.Kirchstein: Proc. Soc. exp. Biol., N.Y., 1962, in 323-328 (Nat. Cancer Inst., Nat. Inst. Hlth., Bethesda Md., U.S.A.)

Cell cultures of newborn hamster kidney infected with SV40 consisted of rapidly growing sheets of cells. Cell suspensions from these cultures inj. into newborn hamsters produced tumours as early as 17 days after injn. Tumours were mainly undifferentiated with areas of adenocarcinoma, sarcoma, and in one case, epidermoid carcinoma.

M.M.Shapland

1265. A DIETARY FACTOR INFLUENCING LYMPHOID TUMOUR OF THE CHICKEN. C.OlsOn, T.N.Fredrickson, S.Tekeli and H.R.Bird: Proc. Soc. exp. Biol., N.Y., 1962, 111, 44-47 (Dept. Vet. Sect., Univ. Wisconsin, Madison, Wis., U.S.A.) An increased incidence of lymphoid tumours in expt. exposed birds was observed after inclusion of one particular batch of cod-liver oil in the diet, but not with a 2nd batch.

M.M.Shapland

1266. EFFECT OF URETHANE ON PULMONARY TUMOURS PRODUCED BY METHYLCHOLANTHRENE. R.H.Rigdon: Tex. Rep. Biol. Med., 1963, 21, 65-73 (Dept. Path., Univ. Texas Med. Branch, Galveston, Tex., U.S.A.)

Pulmonary neoplasms in the duck resulting from the intratracheal injn. of methylcholanthrene were not influenced by the intratracheal injn. of urethane when the latter was given before, at the same time, or following the methylcholanthrene injn. Pulmonary tumours in ducks were greater when the methylcholanthrene was given to birds 35 days old than in those 101 days old. AJ.Martin

1267. EFFECT OF RNA FROM NORMAL BONE MARROW ON LEUKAEMIC MARROW IN VIVO, S. de Carvalho: Nature, Lond., 1963, 197, 1077-1080 (Lab. Haematol., Doctors' Hosp., Cleveland, Ohio, U.S.A.) Following intra-osseous instillation of normal marrow RNA to patients with leukaemia, a marked drop in the no. of leukaemic cells and marked increase in the no. of erythroblasts, myelocytes and megakaryocytes occurred in marrow, but not peripheral blood. This effect was transient. I.v. injn. of EDTA followed by normal marrow to leukaemic patients induced similar transient changes in peripheral blood. J.R.Sargent

1268. CHANGES IN SERUM PROTEINS DURING METHYL CELLULOSE INDUCED REGRESSION OF MURPHY-STURM LYMPHOSARCOMA. Z.Hruban, A.Lazar and A^lesers: Lab. Invest., 1963, 12, 25-32 (Pathol. Dept., Chicago Univ., 111, U.S.A.) For 38 days i.p. injn. of methyl cellulose were given to tumour-bearing rats starting before and after transplantation. Serum electrophoretic patterns were studied at intervals during tumour regression, when high levels of α -globulin, elevated β -globulin, but normal total protein were noted. This occurred despite the delayed immune response to tumour as evaluated by the appearance of splenic pyroninophilic cells and lymphocytes. A.M.Mackay

1269. INFECTION AND MALIGNANT TUMOURS. III. EFFECT ON TUMOURS OF PHAGE LYSATES OF HAEMOLYTIC STREPTOCOCCI. E.A.Christensen: Acta path. microbiol. scand., 1963, 57, 175-187 (Statens Serum Inst., Strept. Dept., Copenhagen, Denmark) Brown-Pearce carcinoma could be inhibited in young rabbits by lysates of haemolytic streptococci provided that: the doses were so large that they approached the toxic level; the injns. were distributed over 3 weeks starting between the 2nd and 8th day after transplantation. Lysates of haemolytic streptococci did not prolong the median survival time of mice with Ehrlich ascites carcinoma.

Uriedmann

1270. ATTEMPTED TUMOUR THERAPY COMPLICATED BY A VIROID ASSOCIATE OF THE TUMOUR. K.Lapis and A.J.S.Davies: Brit. J. Cancer, 1962, 16, 763-769 (Chester Beatty Res. Inst., London, England) The effects of Degranol or X-irradiation, both with or without bone marrow therapy, was tested on the survival of CBA mice carrying transplanted NK/Ly ascites tumours. Recovery was very low and from a study of the anaemia of

the mice it was concluded that the animals died before haematopoietic recovery, due to presence of a virus or virus-like entity in the tumour.

D.Hamer

1271. ANAEMIA ASSOCIATED WITH THE NK-LYMPHOMA IN MICE. A.J.S.Davies, A.M.Crassand K.Lapis: Brit. J. Cancer, 1962, 16, 770-781 (Chester Beatty Res. Inst., London, England) NK/Ly ascites cells, and serum or r.b.c. from tumour-bearing CBA mice induced anaemia on injn. into other CBA mice. This did not seem to be due to Ab reaction. It was concluded on the basis of filtration, deactivation and similar studies that the agent, designated NKLA, was viroid in nature. D.Hamer

1272. DINITROPHENOL INHIBITION OF PITUITARY ADENOMA FORMATION IN MICE FED PROPYL THIOURACIL. D.W.King, F.G.Bock and G.E.Moore: Proc. Soc. exp. Biol., N.Y., 1963, 112, 365-366 (Biol. Sm., Roswell Park Mem. Inst., Springville, N.Y., U.S.A.) Addition of 0.5 g. of 2,4-DNP/kg. of diet reduced the incidence of pituitary adenomata induced with propylthiouracil in C57BL mice. Tumours which formed in the diet supplemented group were not circumscribed adenomata.

D.N.Whcatley

1273. INFLUENCE OF TUMOUR FRACTIONS ON INCIDENCE OF SPONTANEOUS MAMMARY TUMOURS IN C3H/HeJ MICE. L.G.Nutini, J.E.Prince, A.G.Duarte, R.Juhasz and E.S.Cook: Proc. Soc. exp. Biol., N.Y., 1963, 112, 315-318 (Div. Exp. Med., Inst. DM Thomae, Cincinnati, Ohio, U.S.A.) The incidence of spontaneous turnouts in C3H, HeJ virgin mice was reduced by treatment of the young animals with one to 6 injns. of an alcohol-sol., protein-free extract from a transplantable tumour (dbrB adenocarcinoma in DBA/l mice) or spontaneous tumours (In these C3H mice). The treatment was probably most effective in the early stages if injn. i.p. but the effect of the 2 extracts given i.v. did not show any significant effect until some 225 days after the beginning of the expt.

D.N.Wheatley

1274. USE OF IMMUNOLOGICALLY COMPETENT CELLS IN THE TREATMENT OF CANCER: EXPERIMENTS WITH A TRANSPLANTABLE MOUSE TUMOUR. M.F-A. Woodruff and M.O.Symes: Brit. J. Cancer, 1962, 16, 707-715 (Dept. Surgical Sci., Univ., Edinburgh, Scotland) An A-strain mammary carcinoma was transplanted into A-strain mice. 5 days later groups of mice were subjected to various treatments, involving 400 r whole-body radiation plus injn. of allogeneic lymphoid cells from CBA mice or CBA immunised against the A-tumour. Tumour development was retarded or prevented but there was no increase in survival time due to early death from graft-vs-host reaction. Amethopterin did not prevent this complication.

D.Hamer

1275. CHEEK POUCH OF THE SYRIAN HAMSTER AND IMMUNITY TO HETEROTRANSPLANTATION OF A MURINE LEUKAEMIA. R.A.Adams: Nature, Lond., 1963, 197, 1021-1023 (Children's Cancer Res. Fdn, Children's Hosp., Boston, Mass., U.S.A.) Murine leukaemia AK-4 was successfully transplanted into lethally X-irradiated hamsters when introduced i.v. by orbital puncture. Prior exposure of the host to AK-4 or some other leukaemic strains prevented leukaemic re-population of the bone marrow and viscera upon challenge after irradiation. Failure of many transplants to grow in the cheek pouch was due to an immunological reaction. A slight radiation protective effect was noted in animals given prior exposure to AK-4 cells.

G.M.Lewis

1276. BIBLIOGRAPHY OF TUMOUR TRANSPLANTATION. ADDENDUM No.6. A.H.Handler: *Transplantation*, 1963, I, 118-127 (Lab. Tumour Transplantation, Children's Cancer Res. Found., Boston, Mass., U.S.A.) This continues the bibliography section of *Transplant. Bull.* The addendum gives 201 ref. for the whole of 1961.

J.R.Anderson

1277. AUTO-IMMUNE SELECTION OF CARCINOMA CELLS IN MAN. R.B.Goudie: *Nature*, Lond., 1963, 197, 1020 (Univ. Dept. Pathol., Western Infirmary, Glasgow, Scotland) Consideration of the incidence of carcinoma in 3 common diseases involving auto-immunisation in man (thyroiditis, ulcerative colitis and Pernicious anaemia) suggests that auto-Ag loss and immunol. selection occur in tumours of the thyroid, colon and possibly the stomach. CM.Lewis

1278. IN VITRO STUDIES OF MAMMALIAN SOMATIC CELL VARIATION. I. DETECTION OF H-2 PHENOTYPE IN CULTURED MOUSE CELL LINES. II. ISO-IMMUNE CYTOTOXICITY WITH CULTURED MOUSE LYMPHOMA AND SELECTION OF RESISTANT VARIANTS. H.M.Cann and L.A.Herzenberg: *J. exp. Med.*, 1963, 117, 259-265, 267-284 (Gen. Dept., Stanford Univ. Med. Sch., Palo Alto, Calif., U.S.A.) I. The isoantigenic phenotype of the H-2 locus was detected by isohaemagglutinin absorption in a line of mouse lymphoma cells and in 2 established lines of fibroblastic mouse cells. Quant. absorption suggests that there was a higher concn. of H-2 isoAg in the lymphoma cells than in the other 2 lines.

II. When lymphoma cells were incubated with anti-H-2 isoAb and C¹¹¹ 99% of the cells were killed. The viability of cells exposed to Ab alone was unaltered. This effect was sp. for the Ab to the isoAg of the H-2 locus. Variant cells resistant to the cytotoxic action of anti-H-2 isoAb were isolated from lymphoma cell populations surviving multiple exposures to isoAb and C¹¹¹. These could be distinguished morphol. from the sensitive parent-cell line, and possessed a lower concn. of the H-2 isoAg than the Parent cells. H.E.H.Jones

1279. RAT LIVER CELL ANTIGENS DURING THE EARLY STAGES OF AZO DYE CARCINOGENESIS. R.W.Baldwin: *Brit. J. Cancer*, 1962, 16, 749-756 (Cancer Res. Lab., Univ., Nottingham, England) Livers from Wistar rats which had been fed a diet containing 0.06% of 4-Qimethylaminobenzene were fractionated and the cyto-Pksmic Protein fraction analysed immunochem. by agar gel diffusion. There were changes in concn. of normal antigenic components during the early stages of dye feeding and an abnormal Ag was found which did not cross-react with Ag of normal liver. A cross-reaction was obtained between proteins from treated liver and antiserum to | dye-albumin conjugate, indicating that the abnormal Ag in the dye-treated liver contained bound carcinogen. * D.Hamer

1280. LACK OF STAINING OF TESTICULAR TUMOURS BY ANTI-SPERM AND ANTI-TESTIS ANTIBODIES. ^Hiramoto, JJurand, J.Bemecky and D.Pressman: *Pfoc. soc. exp. Biol.*, N.Y., 1962, 111, 505-507 (Dept. Biochem. Res., Park Mem. Inst., Buffalo, N.Y., U.S.A.) [^]Testicular Ag could not be detected by immuno-fluorescence using S¹²⁵I antisera to human testis, seminal fluid and sperm on testicular tumours. M.M.Shapland

1281. A MODIFICATION OF COMPLEMENT FIXATION TEST FOR ESTIMATION OF ROUS SARCOMA VIRUS ANTIBODIES IN TURKEY AND CHICKEN SERUMS. W.Oka-

zaki, H.G.Purchase, T.N.Fredrickson and B.R.Bttrmester: *Proc. Soc. exp. Biol.*, N.Y., 1962, 111, 377-380 (U.S. Reg. Poultry Res. Lab., E. Lansing, Mich., U.S.A.)

M.M.Shapland

1282. CYTOTOXIC ACTIVITY OF ISOANTIBODY ON SARCOMA 1. I.Chouroulinkov, E.A.Boyse and L.J.Old: *Proc. Soc. exp. Biol.*, N.Y., 1962, 111, 263-265 (Div. Exp. Chemotherapy, Sloan-Kettering Inst. Cancer Res., New York, N.Y., U.S.A.) Under suitable in vitro expt. conditions Sarcoma 1 was completely sensitive to cytotoxic isoAb. M.M.Shapland

1283. PASSIVE TRANSFER OF IMMUNITY TO SARCOMA 1 WITH SERUM. M.E.Phillips and C.A.Stetson: *Proc. Soc. exp. Biol.*, N.Y., 1962, 111, 265-270 (Dept. Path., New York Univ. Sch. Med., N.Y., U.S.A.) Passive transfer of immunity to Sarcoma 1 was achieved with immune serum. The effect of isoAb on this tumour was qual. similar to that reported for other transplantable tumours and may account for rejections of Sarcoma 1 homografts. M.M.Shapland

1284. SPECIFICITY OF ANTISERA TO MOUSE ASCITES TUMOUR IN RABBITS IMMUNOLOGICALLY DEPRESSED WITH MOUSE RED CELLS. A.E.Reif, L.M.McVety and E.R.Klein: *J. Immunol.*, 1963, 90, 24-28 (Biochem. Sect., Dept. Surg., Tufts Univ. Sch. Med., Boston City Hosp., Boston, Mass., U.S.A.) One half of the young in 3 litters of rabbits were i*ij. with washed mouse r.b.c. on the day of birth and several times thereafter until day 38 post-natal. The other half (controls) were left uninj. At 9 to 12 months one half of the rabbits in both depressed¹ and control groups were immunised with mouse r.b.c., the other half with L4946 mouse tumour. Antisera from 'depressed' rabbits immunised with (a) r.b.c. had haemagglutinin, haemolysin and cytolytic titres of 17, 6 and 6 times lower than controls (b) tumour cells-6, 2 and 2 times lower. N.R.Ling

1285. TISSUE CELL ANTIGENS: ANTIGENS OF MOUSE TUMOUR CELL GHOSTS. Chaughton and D.A.L. Davies: *Brit. J. exp. Path.*, 1962, 43, 488-495 (Microbiol. Res. Estab., Porton, Wilts., England) Hypertonic NaCl soln. was used to disrupt Landschitz ascites tumour cells. Cell ghosts with 25% of cell mass contained all non-absorbed Ag found in intact cells, but only 10% of the original nucleic acid. D.L.Gardner

1286. PARENCHYMAL CELL DAMAGE AND BILE DUCT ACTIVITY IN THE PRECANCEROUS LIVER. P.M.Sutton: *Brit. J. Cancer*, 1962, 16, 619-625 (Univ. Coll. Hosp. Med. Sch., London, England) Wistar rats of both sexes were maintained on a diet containing 0.06% p-dimethylaminoazo-benzene and given once weekly inhalations of CHCl₃. The development of tumours was compared with appropriate control groups. There was a much greater bile duct proliferation and earlier appearance of cholangiofibrosis than with dye alone. Cholangiofibrosis did not seem to be an essential precursor of liver tumours, although cholangiocarcinomas did in a few cases develop in regions of fibrosis. D.Hamer

1287. HAEMORRHAGIC DISEASE INDUCED BY FOWL TUMOUR VIRUSES. J.G.Carr: *Brit. J. Cancer*, 1962, 16, 626-633 (B.E.C.C. Unit, Poultry Res. Centre, Edinburgh, Scotland) 'Haemorrhagic disease' originates when viruses are inj. into chick embryos. The tissue distribution of the disease in embryos was similar for all viruses which induce it, a finding not compatible with the hypothesis that the action is by necrosis of proliferating

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endothelium. The disease was invariably associated with areas of extra-medullary haematopoiesis and the infection of these by the virus is believed to be the cause of the condition.

D.Hamer

1288. ISOLATION OF CANCER CELLS FROM BLOOD AND THORACIC DUCT LYMPH BY FILTRATION. O.P.Foss.
O.T.Messelt and L.Efskind: *Surgery*, 1963, 53, 241-246 (Oslo, Norway) Detection of cancer cells in the blood was improved by filtering body fluids through Millipore filters of pore size 10 μ (OS) and Wire cloth filters. These selectively removed the larger, predominantly tumour cells. The wire-cloth filter provided the best separation but the cells could not be examined on the filter in the same way as the Millipore prep.

D.N.Wheatley

1289. EXPERIMENTAL FACTORS INFLUENCING HEPATIC METASTASES. XII. EFFECT OF INCREASED ARTERIAL BLOOD FLOW. S.H.Lee, B.Fisher and E.R.Fisher: *Proc. Soc. exp. Biol.*, N.Y., 1963, 112, 126-128 (Dept. Surg., Med. Sch., Univ., Pittsburgh, Pa., U.S.A.) By increasing arterial blood supply of the liver, the no. of Walker-256 carcinoma metastases in the liver was increased. This result suggests that the previous idea that poor oxygenation of the liver increased metastatic 'takes' is not necessarily true, but that hepatic trauma is probably involved when increased incidence of metastases occurs.

D.N.Wheatley

1290. POLAROGRAPHIC CHARACTERISTICS AND CONCENTRATIONS OF PROTEIN AND SIALIC ACID IN THE SERUM OF RATS AFTER INTRAPERITONEAL INJECTIONS OF POLYCYCLIC HYDROCARBONS. C.E.Searle and D.L.Woodhouse: *Brit. J. Cancer*, 1962, 16, 794-805 (Med. Sch., Univ., Birmingham, England) Stock albino rats were given i.p. injn. of various polycyclic hydrocarbons and the polarographic characteristics of die serum were examined over a period of 10 months. Sialic acid and total protein were also determined. DMBA and 1,2:5,6-dibenzanthracene were used, and also the weak carcinogen, 2 β -6-dimethyl-benzanthracene and non-carcinogenic, 1,2:3,4-dibenzanthracene. No consistent polarographic behaviour was observed but the expt. were complicated by development of considerable ascites in rats after injn. of DMBA. There was a transient rise in sialic acid after the injn.

D.Hamer

1291. EFFECT OF ADRENOCORTICAL ADENOCARCINOMA ON GLYCOGEN DEPOSITION IN RAT LIVER. A.S.Mulay: *Proc. Soc. exp. Biol.*, N.Y., 1963, 112, 292-294 (Lab. Path., Nat. Cancer Inst., N.I.H., Bethesda, Md., U.S.A.) Presence of a transplantable adrenocortical adenocarcinoma produced by a diet containing p-dimethyl-aminoazobenzene in rats did not effect glycogen deposition in the liver even in adrenalectomised rats carrying the tumour. Thus the tumour is not suspected to have any glucocorticoid secretion.

D.N.Wheatley

1292. PATHOLOGY OF TUMOURS AND OTHER LESIONS OF GUINEA-PIG LUNG. L.M.Franks and F.C.Chesterman: *Brit. J. Cancer*, 1962, 16, 696-700 (Imperial Cancer Res. Fund., London, England) Routine autopsies were performed in 1080 guinea-pigs, many of which had been used in expt. Lung lesions, in particular, were studied and very many animals showed focal inflammatory lesions. Epithelial hyperplasia was also common and 4 lung tumours (papillary adenomas) were observed.

D.Hamer

1293. HISTOCHEMICAL AND E.M. STUDIES OF A FUNCTIONING INSULINOMA. S.S.Lazarus and

B.W.Volk: *Lab. Invest.*, 1962, 11, 1279-1294 (Albert Res. Inst., Jewish Chronic Dis. Hosp., Brooklyn, N.Y., U.S.A.) The observations indicate that the insulinoma is a tumour of ductular epithelium with differentiation mainly to β -cells.

A.M.Mackay

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1294. PATHOGENESIS OF RESPIRATORY ANTHRAX IN MACACA MULATTA. C.CBerdjis, C.A.Gleiser, H.A. Hartman, R.W.Kuehne and W.S.Gochenour: *Brit. J. exp. Path.*, 1962, 43, 515-524 (U.S. Army Med. Unit, Fort Detrick, Md., U.S.A.) Monkeys were infected with a spore suspension of *Bacillus anthracis* (Vollium 189 strain) by aerosol inhalation. Provided previous parasitic lung disease was present, such as bronchiolitis due to *Pneumonyces simicola*, the bronchiolar wall became the site of necrotising bronchiolitis.

D.L.Gardner

1295. EXPERIMENTAL PARENTERAL ANTHRAX IN MACACA MULATTA. C.CBerdjis, C.A.Gleiser and H.A. Hartman: *Brit. J. exp. Path.*, 1963, 44, 101-114 (U.S. Army Med. Unit, Fort Detrick, Md., U.S.A.) Pathol. lesions of systemic anthrax infection are described following cutaneous inocn. Following local germination of spores, bacteria spread by lymphatics and blood to cause septicaemia which occurred earlier with large inocula and was often accompanied by lung infection. Other visceral lesions were common when death occurred later after smaller inocula.

D.L.Gardner

1296. HKTOPATHOGENESIS OF MOUSEPCK. I. RESPIRATORY INFECTION, n. CUTANEOUS INFECTION. J.A.Roberts: *Brit. J. exp. Path.*, 1962, 43, 451-461, 462-468 (Dept. Microbiol., Australian Nat. Univ., Canberra, Australia) I. Mice were infected with ectromelia virus by aerosol inhalation. Alveolar macrophages or respiratory mucosal cells were shown to contain virus first by fluorescence microscopy using rabbit anti-vaccinia serum. Virus was detected in regional lymph nodes on the 3rd day after infection in macrophages, accompanied by growth in lymphatic endothelium. Virus was also shown to spread from the olfactory mucosa via the perineurium of the olfactory nerve.

II. Following infection of mouse skin with ectromelia virus, dermal cells or cells of the stratum Malpighi were identified as containing virus by the fluorescent Ab technique. Spread of infection was mainly dermal. Epidermal cell proliferation in such primary infections, followed by autoradiography with ^3H -labelled thymidine, was not in vims-infected cells and may be a non-sp. response.

D.L.Gardner

1297. EFFECTS OF ENDOTOXIN ON HAEMODYNAMICS OF STOMACH. E.D.Jacobson, E.S.Dooley, J.B.Scott and E.D.J.Frohlich: *J. clin. Invest.*, 1963, 42, 391-395 (Reed Army List. Res., Washington, D.C., U.S.A.)

The vascular effects of endotoxin on the perfused dog stomach were investigated by employing an acute prep. in which blood flow was held const. The expt. results are interpreted to suggest that the increased gastric vascular resistance observed after giving endotoxin was mediated by circulating vasoactive substances elaborated at sites remote from the stomach.

K

Jones

1298. ENDOTOXIN SHOCK IN THE PRIMATE. R.P.Gubert: Proc. Soc. exp. Biol., N.Y., 1962, 111, 328-331 (Dept. Educ. and Res., Evanston Hosp. Assoc., Evanston, 111, U.S.A.) Hypotension in the monkey caused by the i.v. injn. of bacterial endotoxin was caused by decreased venous return. M.M.Shapland

1299. LOCALISATION OF ENDOTOXIN IN THE WALLS OF THE PERIPHERAL VASCULAR SYSTEM DURING LETHAL ENDOTEXAEMIA. H.S.Rubenstein, J.Fine and A.H.Coons: Proc. Soc. exp. Biol., N.Y., 1962, 111, 458-467 (Labs. Surg. Res., Beth Israel Hosp., Boston, Mass., U.S.A.) *E. coli* endotoxin was localised by immunofluorescence in the walls of die peripheral vascular system in dogs killed 10 and 90 min. after injn. of lethal dose of endotoxin and in the animal that died from endotoxaemia. It is thought that the endotoxin acts directly upon these sites producing the peripheral vascular collapse. M .M .Shapland

1300. EFFECT OF STAPHYLOCOCCAL ENTEROTOXIN ON DERMAL REACTIVITY TO ADRENALINE. V.Bokkenheuser, M.A.Cardella, E.A.Gorynski, G.G.Wright and E.Neter: Proc. Soc. exp. Biol., N.Y., 1962, 112, 18-21 (Dept. Bacteriol., Med. Sch., Buffalo, N.Y., U.S.A.) S-6 strain *Staphylococcus aureus* enterotoxin prep. inj. i.v. or i.d. caused dermal lesions at sites of subsequent i.d. injn. of adrenaline. The toxic factor was heat stable and antiserum did not neutralise the toxic effects. It is suggested, that enterotoxin differs from endotoxin in that it will not provide a provoking dose for a Schwartzman reaction. D.N.Wheatley

1301. HAEMOLYTIC SHOCK. V. THE ROLE OF HKT-AMINE. VI. L.Szabo and CHadnagy: Z. Immun.-Forsch., 1962, 124, 133-139, 140-148 (Physiol. Inst., Tirgu-Mures-Marosvasarhely, Rumania) V. In expt. on dogs and cats, muscle fatigue was noted in the course of haemolytic shock. This was not solely due to the fall in blood pressure. In dogs pretreated with histamine, haemolytic shock was milder than in controls. For these Reasons it is asserted that histamine or histamine-like substances play a part in haemolytic shock.

VI. Haemolytic shock in dogs was accompanied by various changes, including hepatic vein spasm, increased taph production and abnormal respiration. Repeated I²⁵- of blood was less effective in causing shock than the *st injn. Physostigmine accentuated the shock. T g. (German) D .P. Winstanley Ado. 2. **MYOCARDIUM OF THE DOG IN HAEMORRHAGIC SHOCK. A HKTOCHEMICAL STUDY.** A.M.Martin *d D.B.Hackel: Lab. Invest., 1963, 12, 77-91 (Pathol. Dept., Duke Univ. Med Center, Durham, N.C., Di V^s*A⁰) 2° mongrel dogs were bled under Nembutal/for^t-uretilane anaesthesia and a shock state maintained thl * to 2 hr. The blood was returned to the animals and 2 J. were killed 15 min. to 5 weeks later, when myo-^shi^m w^as Prepared f^r a histol. and histochem. study. c^rLi^ral and enzyme alterations indicative of early myo-^rai^s damage are described. A.M.Mackay

1303. MECHANISM OF SHOCK: EFFECT OF LIMB IS-CHA MA ON NON-ESTERIFIED FATTY ACIDS OF RAT PLASMA. H.B.Stoner: Brit. J. exp. Path., 1962, 43, 556-563 (Toxicol. Res. Unit., M.R.C. Lab., Carshalton, Surrey, England) In fed albino rats, non-afte^red Plasma fatty acids were much increased 4 hr. feu Junction of bilat. hind-limb ischaemia; levels "en the ischaemia was relieved. The response was

depressed by reducing sympathetic nervous system activity. In fasting intact rats high fatty acid levels were not increased by ischaemia. D.L.Gardner

1304. THYMUS AND INFLAMMATION. R.J.Girerd and G. Di Pasquale: J. Endocr., 1963, 26, 209-213 (Warner-Lambert Res. Inst., Morris Plains, N.J., U.S.A.) Although thymectomy alone reduced the inflammation in cotton pellet and granuloma pouch procedures, there was no effect on formaldehyde-induced paw-oedema. Cortisone was effective in suppressing the inflammatory response of thymectomised rats to the same procedures. C.F.Blane

1305. HIGHER SUSCEPTIBILITY TO THIOL COMPOUNDS OF PROTEASE IN HEALING SITES OF ARTHUS-TYPE INFLAMMATION AND ITS BIOLOGICAL SIGNIFICANCE. H.Hayashi, K.Udaka, M.Koono and M.Yoshimura: Brit. J. exp. Path., 1962, 43, 575-580 (Dept. Path., Kumamoto Univ. Med. Sch., Kumamoto, Japan) Protease extracted from sites of the Arthus phenomenon in rabbits was activated by reduced glutathione to greater extent than protease from normal sites. D.L.Gardner

1306. SOLUBLE COLLAGEN IN ACUTE INFLAMMATION. C.Olsen and B.K.Forscher: Proc. Soc. exp. Biol., N.Y., 1962, 111, 126-127 (Dept. Biochem., Univ. Kansas City Sch. Dent., Mo., U.S.A.) Histol. observations of collagen fibres in acute inflammation indicate that its disappearance and reappearance was due to proteolysis and de novo resynthesis. M.M .Shapland

1307. QUANTITATIVE RELATION BETWEEN CERTAIN FIBRINOLYSIN FACTORS AND INFLAMMATION. E.Aschheim, V.Tsulcu and A.L.Copley: Proc. Soc. exp. Biol., N.Y., 1963, 112, 434-436 (Dept. Pathol., New York Univ. Med. Sch., N.Y., U.S.A.) Radioiodine extravasation was used to study the effect of 2 fibrinolysins on inflammation induced with histamine dihydrochloride or with plasminogen. 400 U of fibrinolysin were effective. D.N.Wheatley

1308. RELATION OF INFLAMMATION TO CHEMICAL CONSTITUTION OF INJURIOUS AGENTS. PHARMACOLOGY OF INFLAMMATION. E.L.Opie: J. exp. Med., 1963, 117, 425-448 (Rockefeller Inst. Med. Res., New York, N.Y., U.S.A.) Inflammatory reactions caused by i.p. injn. of chemicals were measured by the vol. of peritoneal fluid, the no. of leucocytes and the amount of exuded protein. Inflammation increased with ion dissociation and with increase of valency of both basic and acid ions. Salts of heavy metals which ppt. proteins caused more active inflammation than other electrolytes. Histamine and arginine produced similar inflammation. The amino compounds urea, citrulline and creatinine, glycine, alanine, histidine, arginine and histamine produced inflammatory reactions in the order of severity with which they caused necrosis on i.d. injn. Acids and alkalis were inflammatory when pH approached 1 and 11 respectively, but not at neutral pH. H.E.HJones

1309. PATHOGENESIS OF FEVER. XI. QUANTITATIVE FEATURES OF FEBRILE RESPONSE TO LEUCOCYTIC PYROGEN. D.L.Bomstein, CBredenberg and W.B.Wood: J. exp. Med., 1963, 117, 349-364 (Massachusetts Gen." Hosp. Med. Dept., Boston, Mass., U.S.A.) The febrile response of trained rabbits inj. i.v. with leucocytic pyrogen was only related to the dose at the lower levels of dosage. Above these doses there existed a hyperthermic ceiling at which the response was relatively const, over a wide dosage range. When sufficiently large doses of

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pyrogen were inj. this ceiling was exceeded and a biphasic fever was produced which resembled the usual response to bacterial endotoxin. Similar biphasic fever resulted from continuous infusions of relatively low concn. of leucocytic pyrogen at a const. rate, and to repeated injn. of moderate doses of the pyrogen. When large daily doses were inj. the biphasic response followed the 1st injn. only. Thereafter a state of tolerance existed in which the secondary rise in temp. failed to occur and which persisted as long as the daily injn. were given. During tolerance the response to small doses was depressed. H.E.H.Jones

1310. EFFECT OF PARTIAL HEPATECTOMY ON AUTOLOGOUS TAIL TENDON IMPLANTED IN TOE RAT LIVER. L.Montfort and R.Pérez-Tamayo: Proc. Soc. exp. Biol. N.Y., 1962, 111, 507-509 (Unidad Patol., Fac. Med., Univ. Nac. Autonoma de Mexico, Mexico City, Mexico) In both partially and non-hepatectomised rats autologous tail tendon implants were equally encapsulated, calcified and stim. a foreign body reaction. Both surrounding capsule and tendon were still present after 91 days. M.M.Shapland

1311. INTRAVASCULAR PLATELET CLUMPING IN RABBITS. A.Hughes and R.S.Tonks: J. Path. Bact., 1962, 84, 379-390 (Nevill Hall Hosp., Abergavenny, Wales) Intravascular platelet clumping in rabbits was produced by i.v. injn. of autogenous, artificially clumped platelets, by intragastric NaH₂PO₄ along with s.c. injn. of 2-O-methyl-9CX-chloro-cortisol acetate, or by i.v. injn. of horse serum. In all cases, damage to pulmonary arteries, endocardium and myocardium was similar: Ag-Ab complex was not required for production of these lesions. Cortisone given to rabbits receiving horse serum injn. prevented platelet clumping and tissue lesions: when given to animals receiving i.v. injn. of autogenous artificially clumped platelets, lesions still developed. D.Murray

1312. HISTOGENESIS OF BASEMENT MEMBRANES. G.B. Pierce jun., A.R. Midgley jun. and J.S.Ram: J. exp. Med., 1963, 117, 339-348 (Path. Dept., Univ. Michigan, Ann Arbor, Mich., U.S.A.) The formation of basement membranes was studied with fluorescent Ab techniques in a parietal yolk sac carcinoma of the mouse. The Ab stained the secreted basement membrane-like material as well as the basement membranes of epithelial structures and vessels, and reticulin. After absorption with reticulin and vascular basement membranes of the spleen, and Ab stained only the basement membrane-like material, Reichert's membrane and the basement membranes of the epithelial cells. The yolk sac cells were shown to secrete the basement membrane (Reichert's membrane) upon which they rested by the localisation of ferritin-labelled Ab to the endoplasmic reticulin of the secreting cells. The basement membranes of the epithelial cells are an epithelial secretion and not a condensation of ground substance since they are antigenically different from connective tissue elements. H.E.H. Jones

1313. DISAPPEARANCE RATE OF TRY PAN BLUE IN RAT PLASMA AFTER INTRAPERITONEAL INJECTION.

H.Thilander: Acta path. microbiol. scand., 1963, 57, 57-59 (Dept. Path. Med. Sch., Umea, Sweden) Injn. of 1 ml. of 1% aq. soln. of Trypan Blue/100 mg. body wt. at 24 hr. intervals for 6 days produced no evident signs of toxicity. There was an accumulation of the stain in the plasma, and electrophoresis showed much of it to be in the free state. The results show that if intense vital staining is required for fairly short expt. periods, a suitable interval between the i.p. injn. is 24 hr. Longer periods

involve a risk of toxic action due to accumulation of free Trypan Blue in the plasma. L.Friedmann

1314. PHOTODYNAMIC ACTION I. MECHANISMS OF PHOTODYNAMIC CYTOTOXICITY. R.P.Bolande and L.Wurz. n. THE EFFECTS OF PHOTODYNAMIC ACTION ON CERTAIN PROPERTIES OF HUMAN SERUM. R.P.Bolande, L.Wuiz and E.E.Ecker: Arch. Path., Chicago, 1963, 75, 115-122, 123-126 (Inst. Path., Western Res. Univ., Cleveland, Ohio, U.S.A.)

I. Expt. on direct and indirect photodynamic action of Eosin Y are described in fibroblast strains U^ao, L and FS4. U^ao, L and FS4 were equally susceptible to the direct action whereas strain L was significantly more resistant than the other 2 to indirect action. The cytotoxicity of pre-irradiated eosin was quenched by the addition of glucose or horse serum. It is postulated that the direct cytotoxicity is due to the attack of continuously generated triplet dye molecules on cellular substrate while the indirect action is due to the toxic effect of oxidation products of the dye on the cells.

n. Using Eosin Y, Toluidine Blue and Haematoxylin in-HCl, 0.02% in normal pooled serum, as photosensitisers photodynamic action caused a loss of albumin with an increase of total globulin. Individual globulin peaks became indistinguishable except the Y-peak, which reflected persistence of blood agglutinins. The photosensitisers could decomplement sera, all 4 components being equally suppressed. This decomplexation was associated with destruction of natural cytotoxicity to fibroblast strains U^ao, FS4 and L, mouse ascites tumour Ehrlich (EA) and sarcoma 180. R.Mitchell

1315. ROLE OF MASTOCYTES IN REGIONAL FIXATION OF BLOOD-BORNE PARTICLES. H.Selye, G.Gabbiani and B.Tuchweber: Brit. J. exp. Path., 1963, 44, 37-46 (Inst. Méd. Chir. expt., Univ. Montreál, Que., Canada) Polymyxin, which discharges granules from mast cells, caused localisation of C particles around the injn. site when given i.v. to rats simult. with India ink. When polymyxin was given before India ink many lung capillaries were found occupied by thrombi containing C*. The presence of many mast cells in the lung is suggested as the cause for uptake of C. D.L.Gardner

1316. PROTECTIVE ACTION OF CERTAIN HORMONES AND VITAMINS AGAINST LATHYROGENIC DRUGS. J.M.Cameron, T.G.Pirie and R.A.Robb: Brit. J. exp. Path., 1962, 43, 496-505 (Dept. Path., South Gen. Hosp., Glasgow, Scotland) Lathyrism was produced in young o' chicks with acetone semicarbazone. Using the wt. gain and mean ash content of bone as guides to protection, a-tocopherol (vit. E) and possibly prednisolol* were partly effective. D.L.Gardner

1317. EFFECT OF LATHYROGENIC COMPOUNDS ON GLYCOGEN CONTENT OF CHICK EMBRYO LIVER. CLLevene: Brit. J. exp. Path., 1962, 43, 596-599 (Dunn Sch. Path., Univ., Oxford, England) Assay <*↑ the glycogen content of livers of 16-day chick embryos treated 2 days previously with 6 lathyrogenic compounds showed no correlation between the effect on glycogen aff solubility of bone collagen. D.L.Gardner

1318. ECLAMPSIA-LIKE SYNDROME IN RATS TREATED WITH POLY VINYL ALCOHOL. C.E.Hall and O.Hall: Tex. Rep. Biol. Med., 1963, 21, 16-27 (Univ. Texas* Med. Sch., Galveston, Tex., U.S.A.) Rats inj. sty with 1 c.c. of 5% polyvinyl alcohol daily for several *.

and maintained on a 1% NaCl drinking soln. developed severe hypertension, anaemia and the usual nephrotic syndrome. The mortality reached 75% before the expt. was ended; 4 became comatose or unconscious for a period of time prior to death. Autopsy showed hepatosplenomegaly and enlargement of the hearts and kidneys. A comparison is made between the expt. condition and the toxæmia of pregnancy, in which the clinical and pathologic findings are strikingly similar. AJ.Martin

1319. EFFECT OF GOLD THIOGLUCOSE INJECTIONS ON SURVIVAL, ORGAN DAMAGE AND OBESITY IN THE RAT. J.W.Wagner and J.de Groot: Proc. Soc. exp. Biol., N.Y., 1963, 112, 33-37 (Dept. Anat., Univ. California, San Francisco, Calif., U.S.A.) Long-Evans and Sprague-Dawley rats were inj. with 0·1-0·75 mg./g. of gold thioglucose i.p. Starvation increased the survival time of treated animals but young animals on normal diets showed an LD-50 (14 days) of 0·25 mg./g. There was a small incidence of ventromedial hypothalamic lesions and when animals survived with near lethal doses, obesity occurred. There was less susceptibility to brain lesions with ? animals. The goldthioglucose also had effects on the stomach, pancreas, testes and caused a triphasic response in the blood-glucose content.

D.N.Wheatley

1320. CARDIAC LESIONS IN EXPERIMENTAL HYPERTENSION. R.D.Moore, M.D.Schoenberg and S.Koletsky: Arch. Path., Chicago, 1963, 75, 28-44 (Inst. Path., Western Reserve Univ., Cleveland, Ohio, U.S.A.) Adult of Wistar rats developed cardiac lesions rapidly after renal artery ligation. Alterations in structure in small blood vessels were studied using various stains and pre-enzymic treatments. Fibrinoid material was a product of fibroblasts, endothelial cells and non-cellular protein constituents of blood. R.Mitchell

1321. ARTERIOLAR NECROSIS IN ADRENAL-REGENERATION HYPERTENSION: INFLUENCE OF PREVENTIVE TREATMENT WITH HYDRALAZINE ON TISSUE ELECTROLYTES. D.L.Gardner and P.W.Brooks: Brit. J. exp. Path., 1963, 44, 31-37 (Dept. Path., Univ., Edinburgh, Scotland) Hypertension was induced in rats by adrenal enucleation and high Na intake. Hypertensive arteriolar necrosis and necrotising arteritis were prevented by intermittent treatment with hydralazine. After 56 days, treated animals were found to have higher Extracellular fluid (inulin) space than untreated, whereas ¹⁴Na content of dry, fat free samples of aorta was significantly lowered. D.L.Gardner

***322. DESMOSTEROL DEPOSITION IN HUMAN AND EXPERIMENTAL ATHEROSCLEROSIS.** J.H.Herndon, jun. and M.D.Siperstein: Circulat. Res., 1963, 12, 228-234 (Dept. Int. Med., Univ. Texas Southwest Med. Sch., Dallas, Tex., U.S.A.) In human patients in rabbits on an atherosclerotic diet, the blocking of ¹⁴M step desmosterol-cholesterol by 'triparanol' [MER 29] led to accumulation of desmosterol in arterial lesions. R.E.Moore

23. THROMBO-ATHEROSCLEROSIS IN AORTIC VENOUS AUTOGRRAFTS. L.M.Rivkin, M.Friedman and S.O.Byers: Brit. J. exp. Path., 1963, 44, 16-23 (Expt. Surg. Lab., Mount Zion Hosp., San Francisco, Calif., U.S.A.) Segments of rabbit external jugular vein ^{were autologous} grafted into lower abdominal aortae, leaving ¹⁰¹ ^{assec*} aort^c channels. Following electrolytic induction of thrombus, atheromatosis, produced by a high esterol/fat diet, developed in similar manner in

grafted venous segments, and in intact aortae. In bypassed aortae, the process resembled that in intact venae cavae. D.L.Gardner

1324. DEVELOPMENT OF PSEUDOINTIMA LINING

FABRIC GRAFTS OF AORTA. H.W.J.Florey, SJ.Greer, J.Kiser, J.CF.Poole, R.Telander and N.T.Werthessen: Brit. J. exp. Path., 1962, 43, 655-660 (Dunn Sch.

Path., Univ., Oxford, England) Dacron grafts inserted into aortae of baboons were lined by endothelium, growing partly from the divided ends of the aorta and partly from small vessels opening into the lumen of the graft. Around these vessels endothelial islands arose. Fibroblasts, collagen, macrophages and polymorphs were identified beneath the endothelium after 3 weeks but smooth muscle and elastic appeared later.

D.L.Gardner

1325. MUCOPOLYSACCHARIDES IN ATHEROMATOUS AORTA. R.C.Curran and W.AJ.Crane: J. Path. Bact., 1962, 84, 405-412 (Path. Dept., St. Thomas's Hosp.

Med. Sch., London, England) Mucopolysaccharide distribution was studied histochem. in aortic tissue obtained at necropsy from 30 human subjects whose ages ranged from 4 days to 84 yr. SO₄ uptake in vitro was studied autoradiographically with ³⁵SO₄. The development of atherosclerosis was accompanied by increased formation of mucopolysaccharides, not only in intima but also in the adjacent media.

D.Murray

1326. COLLAGEN CONTENT OF NORMAL AND ATHEROSCLEROTIC HUMAN AORTIC INTIMA.

C.I.Levene and J.CF.Poole: Brit. J. exp. Path., 1962, 43, 469-471 (Dunn Sch. Path., Univ., Oxford, England)

The collagen content of 43 normal and of 58 atherosclerotic intima was determined by assaying hydroxyproline. Normal intima contained a mean of 20% collagen (dry wt.), atherosclerotic intima a mean of 31%. A tendency in normal intima for collagen to increase with age was found, but in neither normal nor atherosclerotic intima was a sex difference in content found.

D.L.Gardner

1327. PULMONARY EMBOLISM BY SMALL BLOOD CLOTS. R.Marshall and P.R.Allison: Thorax, 1962, 17, 289-297 (Radcliff Infirmary, Oxford, England) 20 ml. of finely divided blood clot was inj. into 10 anaesthetised* dogs. There was transient rise of pulmonary artery pressure and transient rapid shallow breathing. Lung compliance fell and diffusing capacity of lungs for CO was decreased. 60 ml. to 80 ml. of clot given in divided doses on one day was tolerated, but 40 ml. to 60 ml. given one week later was fatal.

P.R.Slade

1328. ACONITINE INDUCED PULMONARY OEDEMA.

L.D.Seager and C.D.Wood: Proc. Soc. exp. Biol., N.Y., 1962, 111, 120-121 (Dept. Pharm., Univ. Arkansas

Med. Center, Little Rock, Ark., U.S.A.) Acute pulmonary oedema was induced by bilat. injn. of dil. soln of aconitine into the preoptic area of the hypothalamus" of rats.

M.M.Shapland

1329. DISPOSAL OF INHALED PARTICULATE MATTER,

A UNIFYING HYPOTHESIS. A.G.Heppleston: Amer. J. Path., 1963, 42, 119-131 (Dept. Pathol., Royal Victoria Infirmary, Newcastle-upon-Tyne, England).

D.G.Scott

1330. IN VITRO STUDIES ON UTILISATION OF [1-14C] GLUCOSE BY GUINEA-PIG LUNGS IN EXPERIMENTAL BAGASSOSIS. V.N.Singh, T.A.Venkitasubramanian and R.Viswanathan: Brit. J. exp. Path., 1962, 43,

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661-664 (Chest Inst., Univ.. Delhi, India) Lungs of guinea-pigs with expt. bagassosis had an increased glycogen content, into which [$1-14^{\text{C}}$]glucose was incorporated at an increased rate. D.L.Gardner

1331. EXPERIMENTAL BAGASSE DISEASE OF THE LUNG.

H.F.Smetana, H.G.Tandon, R.Viswanathan, T.A. Venkitasubramanian, S.Chandrasekhar and H.S. Randlawa: Lab. Invest.. 1962, 11, 868-884

(Vallabhbhai Patel Chest Inst., Univ. Delhi, India) Bagassosis in millworkers was studied including bagasse air contamination, bacteriology and chemistry. Bagasse powder was introduced to the lungs of several laboratory animals by various means and the lung histology studied. Inhalation of carbohydrate and ash fraction of bagasse provoked a similar response to native bagasse as did sterile bagasse powder. Inhalation of sterilised bacterial and fungal cultures of bagasse gave a dissimilar response. The extent of the lesions was proportional to air dust concn. Hypersensitivity to a bagasse protein Ag was not elicited. A.M.Mackay

1332. ULTRASTRUCTURAL VARIATIONS OF THE JEJUNUM IN THE MALABSORPTION SYNDROME.

O.Núñez-Montiel, C.A.Bauzá, O.Brunser and H.Sepúlveda: Lab. Invest., 1963, 12, 16-24 (Lab. Est. de la Gastroenteritis, Inst. Venezolano de Investigaciones Científicas, Apartado 1827, Caracas, Venezuela)

Jejunal mucosa from 14 and rectal mucosa from 3 humans with coeliac disease was studied by light and E.M. Diagnostic findings were shortened microvilli, absent terminal web and decreased surface cell height. Other variable changes were noted in mitochondria, Brunner's glands, lamina propria, Meissner's plexus. Bacteria and parasites were absent. A.M.Mackay

1333. THE EFFECT OF OESTROGEN ON THE LIVER IN VIRAL HEPATITIS. W.A.Jones and R.B.Cohen: Amer. J. Path., 1963, 42, 237-246 (Dept. Pathol., Harvard Med. Sch., Boston, Mass., U.S.A.) D.G.Scott

1334. AN E.M. STUDY OF EARLY CYTOPLASMIC ALTERATION IN HEPATIC PARENCHYMAL CELLS OF MOUSE LIVER DURING NECROSIS IN VITRO (AUTOLYSIS). B.F.Trump, P.J.Goldblatt and R.E.Stowell: Lab. Invest., 1962, 11, 986-1015 (Armed Forces Inst. Path., Washington, D.C., U.S.A.)

Mouse liver slices were incubated in a warm sterile environment for up to one hr. after death and compared with tissue fixed for E.M. in 30 sec. Up to 15 min. few changes occurred. Mitochondrial granules disappeared first. Later the organelles swelled and outer membranes ruptured. Vesicular profiles of ergastoplasm increased in no. and size. Membrane-limited inclusion bodies altered later. The plasma membrane at the bile canaliculus formed elaborate concentric membranous structures, whereas, disruptive changes occurred at the sinusoid. A.M.Mackay

1335. HEPATIC CELL DEGENERATION. CORRELATION OF FINE STRUCTURAL WITH CHEMICAL AND HISTOCHEMICAL CHANGES IN HEPATIC CELL INJURY PRODUCED BY CARBON TETRACHLORIDE IN RATS.

C.T.Ashworth, F.J.Luibel, E.Sanders and N.Arnon: Arch. Path., Chicago, 1963, 75, 212-225 (Dept. Path., Univ. Texas South Western Med. Sch., Dallas, Tex., U.S.A.) Following i.p. CCI₄ to adult cf Sprague-Dawley rats (0[#]66 cc./100 gm.) cellular changes were studied. Evidence of cell damage was found at 1 hr. after injn., consisting of centrilobular loss of glycogen.

RNP, reduction or absence of oxidative and phosphorylytic enzymes, increased density of mitochondria and disarrangement of endoplasmic reticulum. A morphol. appraisal of cloudy swelling is submitted and also of hydropic degeneration. R.Mitchell

1336. DIETARY METHOD FOR RAPID INDUCTION OF RAT CIRRHOSIS WITH OBESITY. G.F.Wilgram and D.J.Ingle: Arch. Path., Chicago, 1963, 75, 201-205 (Dept. Physiol., Univ. Chicago, Chicago, Ill., U.S.A.) A method is described whereby cirrhosis and obesity can be induced in Sprague-Dawley rats after 6 weeks of force-feeding a diet high in fat and cholesterol. R.Mitchell

1337. EFFECTS OF ADRENALECTOMY IN EXPERIMENT^A NON-DIETARY CIRRHOSIS. J.A.H.Campbell: Brit. J. exp. Path., 1963, 44, 66-71 (Dept. Path., Univ. Cape Town Med. Sch., Observatory, Cape Province, South Africa) In rats, monolobular liver fibrosis produced by i.v. injn. of egg yolk became rapidly progressive when both adrenals were excised and injn. continued. Unless cortisone was given or regeneration of adrenals occurred* death quickly occurred, but such progress only continued while egg yolk injn. was continued. D.L.Gardner

1338. HEPATIC DAMAGE BY RETICULO-ENDOTHELIA^A INTERFERENCE. E.R.Fisher and B.Fisher: Arch. Path., Chicago, 1963, 75, 191-195 (Path. Dept., Univ. Pittsburgh, Pa., U.S.A.) Blockade of the RE system with Proferrin [Saccharated iron oxide] in rats and Profem¹⁷ Carbon and Thorotrast in rabbits was accompanied by significant elevation of serum GOT and serum GPT. Stimn. of the RE system in rats with endotoxin-lipopoly saccharide of *E. coli* i.p. gave elevation of serum GOT and decrease in serum GPT but had no effect in rabbits. I.v. Proferrin (2mg./100 g.) produced elevation of serum GOT in both animals and a decrease in serum GC^A in rabbits. Lp. BCG (0.5 mg.) only elevated serum GOT in rabbits. R.Mitchell

1339. BASIC FACTORS IN THE PATHOGENESIS OF PANCREATITIS. R.E.Hermann: Cleveland Clin. Quart., 1963, 30, 1-10 (Dept. Gen. Surg., Cleveland Clin., Ohio, U.S.A.) Basic factors involved in the pathogenesis of acute and chronic pancreatitis are: obstruction of the pancreatic duct, bile reflux into the pancreatic ductal system, infection, trauma to the pancreas, vascular ischaemia, circulating proteolytic enzymes, and an allergic response to previous sensitisa*tion. No direct evidence of a toxic effect of alcohol or other agents on the pancreas was obtained. G.M.Lewis

1340. EFFECT ON RENAL GLomerular EPITHELIAL CELLS OF PROTEINURIA INDUCED BY INFUSIONS OF HUMAN SERUM ALBUMIN IN RABBITS AND RATS. R.Lannigan and E.G.McQueen: Brit. J. exp. Path., 1962, 43, 549-555 (Dept. Path., Univ. Birmingham England) Human albumin infusions caused severe proteinuria in 4 rabbits and 2 rats. Extensive loss of r^o processes of glomerular epithelial cells found in only 1 rabbit but in neither rat. Infusion of dextran into 3 rabbits caused neither proteinuria nor foot process damage. D.L.Gardner

1341. MERCURY NEPHROTOXICITY IN THE RAT. I. FACTORS INFLUENCING THE LOCALISATION OF TUBULAR LESIONS. A.E.Rodin and C.N.Crowson: Amer. J. Path., 1962, 41, 297-307 (Dept. Lab. Misericordia Hosp., Edmonton, Alta., Canada) Rats received HgCl₂ in doses of 0.005 mg. and 0.1 mg.

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fluorescence was selective, corresponding to the distribution of vacuolar lesions. The selective localisation of leukoencephalopathies may be related to an innate prop. of white matter permitting or facilitating spread of noxious agents.

G.M.Lewis

1352. ENCEPHALOPATHY IN MICE FOLLOWING INOCULATION OF SCRAPE SHEEP BRAIN. J.A.Morris and D.C.Gajdusek: *Nature, Lond.*, 1963, 197, 1084-1086 (N.I.H., Bethesda, Md., U.S.A.) A chronic, progressive, degenerative disease of the c.n.s. has been induced in mice inoc. with brain material obtained from a sheep with naturally acquired scrapie. There was a remarkable parallel between the bizarre clinical manifestations and course of expt. induced disease in mice and the clinical pattern of scrapie in sheep. G.M.Lewis

1353. INFLUENCE OF ANOXIA ON RESPIRATORY ENZYMES IN RAT BRAIN. M.Macdonald and R.G. Spector: *Brit. J. exp. Path.*, 1963, 44, 11-15 (Paediatric Res. Unit, Guy's Hosp. Med. Sch., London, England) Anoxia (atm. of N) following unilat. common carotid artery ligation in the rat caused lesions in the forebrain with progressive loss of activity of selected enzymes, demonstrated qual. Thus cytochrome oxidase activity first diminished after 1/ hr., ATPase after 5 hr. All enzymes examined were much diminished in activity after 20-24 hr. D.L.Gardner

1354. INDUCTIVE FACTORS IN GLIOSIS. K.A.Osterberg and L.W.Wattenberg: *Proc. Soc. exp. Biol., N.Y.*, 1962; 111, 452-455 (Dept. Path., Univ. Minnesota Sch. Med., Minneapolis, Minn., U.S.A.) Morphol. and histochem. studies of the glial reaction during Wallerian degeneration in the dorsal column of the spinal cord of rats have shown that it is independent of altera-

tions of the blood-spinal cord barrier. These data suggest that substances inducing gliosis may pre-exist in normal c.n.s. tissue.

M.M.Shapland

1355. MODIFICATION OF LOVELL, PRYCE AND BOAKE'S GUINEA-PIG SKIN TEST. ITS POSSIBLE USE IN THE SEMI-QUANTITATIVE EVALUATION OF THE ACTIVITY OF VARIOUS DISEASES. INCLUDING COLLAGEN DISEASE. R.Jaques: *Experientia, Basel*, 1963, 19, 79-80 (Harmaceut. Labs., Ciba AG., Basel, Switzerland) Thirty-three out of 36 normal sera inj. i.d. into guinea-pig skin produced no haemorrhage or necrosis, whereas 89% of 108 sera from patients with various diseases produced skin lesions rating from + to +++, the greatest response being from sera from patients with rheumatoid arthritis, psoriatic arthritis or ankylopoietic spondylitis. R.S.Tonks

1356. EFFECT OF CHRONIC IRRITATION ON MELANOGENESIS IN SKIN. R.S.Snell: *Brit. J. exp. Path.*, 1962, 43, 581-586 (Dept. Anat., Univ. Durham, Newcastle-upon-Tyne, England) Mechanical irritation of guinea-pig skin by a scalpel blade produced an increase in the amount of free melanin and in the no. of melanocytes. Acanthosis was accompanied by an increase in the melanin content of the basal epidermal layer. D.L.Gardner

1357. EFFECT OF COLLAGENASE ON INTACT MUSCLE FASCIA OF RATS IN VIVO. H.H.Gruenagel and A.Gruenagel: *Z. Ges. exp. Med.*, 1963, 136, 517-531 (Anat. Inst., Univ. Clinic, Freiburg i.Br., Germany) Topical application of collagenase prep, from proteolytic enzymes of *Clostridium histolyticum* and *C.welchii* to the fascia of the thigh in rats (200 jg. in powder form) caused dissolution of the connective tissue which was max. after 8-12 hr. (German) P.F.Meyc

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GENERAL

(INCLUDING STRUCTURE AND VARIATION)

- 1358. SPOT-PLATE TECHNIQUE FOR MEASURING BACTERIAL DENSITIES.** R.S.Sathyarayana, L.J. Hetling and D.R. Washington: Indian J. exp. Biol., 1963, 1, 101-103 (Environ. Eng. Div., C.E. Dept., Rensselaer Polytech. Inst., Troy, N.Y., U.S.A.)

A procedure has been developed for accurately determining the bacterial population required in a study of the growth kinetics of Pseudomonas fluorescens. The spot-plate technique overcomes many of the disadvantages of the standard pour-plate. Selected tabulations and visual examples of spot-plate are given. *

- 1359. NEW TECHNIQUES FOR COUNTING COLONIES DEVELOPED ON MEMBRANE FILTERS.** Torloni: Biotech. Bio eng., 1962, 4, 411-412 (Dept. Chem. Eng., Escola Politecnica, Univ. São Paulo, São Paulo, Brazil) The filter is sat. with culture medium, dried, pressed over a slightly heated counting plate, and the stains produced by each colony counted.

R.H.Kimberlin

- 1360. CELL STRUCTURE AND QUANTITATIVE GRAM STAIN OF BACILLUS MEGATERIUM.** R.Scherrer: J. gen. Microbiol., 1963, 31, 135-145 (Inst. Hyg. and Bact., Univ. Basel, Switzerland) Gram staining in a B. megaterium strain was compared in intact organisms and lysozyme-treated bacilli. Intact bacteria showed a greater uptake of Crystal Violet than all lysozyme-depolymerised forms and iodine uptake was dependent on and corresponded with this uptake. Cell wall showed little uptake of these substances. On Gram differentiation with 95% (v/v) ethanol, intact bacteria lost much less dye-iodine complex than lysozyme-treated forms. The cell wall formed a barrier to ethanol extraction and chem. integrity of the cell wall is a prerequisite for Gram Positivity. K.Brew

- 1361. SOME MICROSTRUCTURES OF COMPLEX MORPHOLOGY OBSERVED IN PREPARATIONS OF CARBONACEOUS CHONDrites MADE UNDER STERILE CONDITIONS.** G.Mamikunian and M.H.Briggs: Nature, Lond., 1963, 197, 1245-1248 (Jet Propulsion Lab., California Inst. Technol., Pasadena, Calif., U.S.A.) A selection of photographs of some micro-features of complex morphology occurring in sterile prep. of meteorites is presented. All prep. examined contain a variety of rare microstructures in the size-range £• 20 p which have a complex morphology and have not yet been identified. It is suggested that most of these objects are unusual mineral grains or terrestrial materials which have contaminated meteorites during museum storage.

G.M.Lewis

- 1362. ANTARCTICA: THE MICROBIOLOGY OF AN UNFROZEN SALINE POND.** G.H.Meyer, M.B.Morrow, °.Wyss, T.E.Berg and J.L.Littlepage: Science, 1962, 138, 1103-1104 (Dept. Microbiol., Univ. Texas, II, Austin, Tex., U.S.A.) A distinctive aerobic micro-flora Population was found in saline ponds in Antarctica, low ° or 8a° nisms are adapted to growth at high salt concn., temp, and low org. content of the medium; though claimed to this natural habitat, they could be adapted to artificial culture.

G.M.Lewis

- 1363. BACTERIAL GROWTH AT LOW POPULATION DENSITIES.** H.W.Jannasch: Nature, Lond., 1963, 197, 1322 (Inst. Microbiol., Univ. Göttingen, Germany)

In cultures of Spirillum serpens, expt. on the effect of O₂ and ascorbic acid on the yield demonstrated that the reducing power of the cells became rate-limiting when the population density was below a certain value.

G.M.Lewis

- 1364. CALORIC REQUIREMENTS OF RAT INTESTINAL MICRO-ORGANISMS.** A.N.Booth: Life Sci., 1963, No. 3, 215-218 (West. Regional Res. Lab., Albany, Calif., U.S.A.) A gain in wt. equiv. to that produced by 0.5 g. D-glucose was obtained when neomycin was added to the diet of rats on restricted caloric intake, and a decrease in moisture-free faecal output was observed.

It is concluded that 10% of the dietary caloric intake of rats is required to support the population of intestinal micro-organisms.

K.Jones

- 1365. BACTERIAL TRANSFORMATION: AN ANTIGEN SPECIFIC FOR 'COMPETENT' PNEUMOCOCCI.** G.Nava, A.Galis and S.M.Beiser: Nature, Lond., 1963, 197, 903-904 (Dept. Microbiol., Coll. Physn. and Surg., Columbia Univ., New York, U.S.A.)

Globulin fractions obtained from rabbits immunised with transformable pneumococci inhib. transformation for the 3 markers studied (resistance to streptomycin, micromycin and erythromycin), whereas globulin from rabbits immunised with non-competent cells had no effect on transformation. It is suggested that an Ag is associated with 'competence' in pneumococci, this being the receptor that has been postulated to occur on the surface of transformable cells; this Ag must be lost in the non-competent cell.

G.M.Lewis

- 1366. MICROBIAL TRANSFORMATIONS OF STEROIDS.**

XXI. MICROBIAL PREPARATION OF 1,4-ANDROSTADIENE DERIVATIVES. A.Capek, O.Hanc and M.Tadra: Folia microbiol., 1963, 8, 120-123 (Res. Inst. Pharm. and Biochem., Prague, Czechoslovakia) A⁴-Androstanediene-3,17-dione can be prep. in SQ% yield from A4-androstene-3,17-dione using Fusarium lateritium. 1-Dehydrotestolactone is formed only in traces but is produced in 40% when progesterone is used. Dehydroepiandrosterone is not metabolised by F. lateritium. 1-Dehydrotestosterone can be prep. in 55-60% yield from A4-androstene-3,17-dione using F. lateritium.

J.R.Sargent

- 1367. GROWTH OF RHIZINA UNDULATA Fr. AND ITS PRODUCTION OF CELLULOSE- AND PECTIN-DECOMPOSING ENZYMES.** B.Norkrans and A.Hammarström: Physiol. Plant. 1963, 16, 1-10 (Dept. Microbiol., Royal Pharm. Inst., Stockholm, Sweden)

Under the prevailing culture conditions, the optimal temp, for growth was 20°, and optimum pH 3. Nitrate, NH₄⁺ and amino N₂ were assimilated as well as some sugars. Yeast nucleic acids stimulated growth. Cellulolytic and pectinolytic enzymes were formed in induced synthesis. Casein hydrolysate and an amino acid mixture depressed formation of pectinolytic enzymes.

LDJ.Phillips

BACTERIA

- 1368. GLUCOSE CATABOLISM IN NEISSERIA MENINGITIDIS.** K.Jyssum and S.Jyssum: Acta path. microbiol.

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scand., 1962. 55. 437-446 (Bact. Inst., Univ. Oslo. Norway) Meningococci possess the enzyme systems necessary for a conversion of glucose 6-phosphate to pyruvate and glyceraldehyde-3-phosphate corresponding to the Entner-Doudoroff cleavage. Enzyme catalysed reactions have also been demonstrated which permit a catabolism via the oxidative pentose phosphate pathway.
I.Friedmann

1369. BRITISH COOPERATIVE CLINICAL GROUP 1961. GONORRHOEA STUDY. Brit. J. vener. Dis.. 1963. 39. 1-14. A total of 161 clinics participated in this study. Of male patients in England and Wales 47*2% were born in the U.K., 21*6% in the West Indies and 25*5% elsewhere. Of female patients with gonorrhoea 82P/o were born in the U.K., 9*8% in the West Indies and 8*2% elsewhere. Of male patients 6*3% were aged 15-19 yr., 27*1% 20-24 yr. and 66*6% were in all other age groups. Of females 25-8% were aged 15-19 yr. 37*6% 20-24 yr. and 36*6% were in all other age groups. The problems of gonorrhoea in male immigrants and predominantly U.K.-born teenagers, although obviously overlapping in some places, did not appear to be synchronous.
R.R.Willcox

1370. DEVELOPMENT OF GOOD ROUND CHARACTER. SPECULATION ON ORIGINS OF STAPHYLOCOCCUS. E.J.F.Gale: J. appl. Bact., 1962, 25, 309-323 (M.R.C. Unit Chem. Microbiol., Biochem. Dept.. Univ. Cambridge. England) Review. 50 ref. D.Hide

1371. INTRODUCTION TO CHAOS, OR CLASSIFICATION OF MICROCOCCI AND STAPHYLOCOCCUS. S.T.Cowan: J. appl. Bact., 1962, 25, 324-340 (Central Public Health Lab., London, England) An account is given of the main characters used in the classification of staphylococci and micrococci, i.e., pigmentation, biochem. reactions, production of staphylocoagulase, fibrinolysin and haemolysins, phage-typing and serology and antigenic structure. D.Hide

1372. MICROCOCCI ISOLATED FROM NORTH SEA. J.I.W.Anderson: J. appl. Bact., 1962, 25, 362-368 (Bact. Dept.. Univ. Glasgow. Scotland) 205 strains of Gram-pos., catalase-pos. cocci isolated from the North Sea were subdivided into 17 sub-groups according to their biochem. characters. D.Hide

1373. WATER RELATIONS OF STAPHYLOCOCCUS AND MICROCOCCI. J.H.B.Christian and J.A.Walther: J. appl. Bact.. 1962. 25, 369-377 (Div. Food Preservation, C.S.I.R.O., Ryde, N.S.W., Australia) Review. 17 ref. D.Hide

1374. FOOD POISONING: ANALYSIS OF STAPHYLOCOCCAL TOXINS. F.S.Thatcher and J.Robinson: J. appl. Bact., 1962. 25, 378-388 (Microbiol. Sect.. Food and Drug Directorate, Dept. Nat. Hlth. and Welfare, Ottawa, Canada) Review. 34 ref. D.Hide

1375. PHAGE-TYPING AND EPIDEMIOLOGY OF STAPHYLOCOCCUS AUREUS INFECTION. M.T.Parker: J. appl. Bact., 1962. 25, 389-402 (Cross-Infection Ref. Lab., Central Public Health Lab., London. England) Review. 40 ref. D.Hide

1376. STAPHYLOCOCCI AND MICROCOCCI ASSOCIATED WITH DAIRYING. M.E.Sharpe. F.K.Neave and B.Reiten J. appl. Bact.. 1962. 25. 403-415 (Nat. Inst. Res. in Dairying. Univ.. Reading. England) Bacteria found in raw milk are derived from infected udders and contaminated milk. Enterotoxin producing staphylococci reproduce rapidly during cheese making when infected raw milk is used. These organisms die rapidly as the pH drops. Cheese of neutral pH values contained numerous staphylococci. D.Hide

1377. MICROCOCCI AND COAGULASE NEGATIVE STAPHYLOCOCCI IN CURED MEATS AND MEAT PRODUCTS. A.G.Kitchell: J. appl. Bact.. 1962. 25. 416-431 (Low Temp. Res. Stat.. Cambridge, England) Review. 77 ref. D.Hide

1378. COAGULASE TEST IN IDENTIFICATION OF PATHOGENIC STAPHYLOCOCCI. R.B.Morrison: J. appl. Bact., 1962, 25, 432-435 (Bact. Dept., Anderson Coll., Univ., Glasgow, Scotland) The mode of action of coagulase and the methods used for testing for its production are described. D.Hide

1379. TELLURITE-EGG YOLK MEDIUM FOR ISOLATION AND IDENTIFICATION OF STAPHYLOCOCCI IN HOSPITALS. V.G.Alder, W.A.Gillespie and L.J. Waller: J. appl. Bact.. 1962. 25. 436-440 (Path. Dept., Bristol Royal Infirmary, Bristol, England) As tellurite-egg yolk medium detects the presence of small no. of S. aureus in clinical specimens, the significance of the presence of this organism could be exaggerated. In the bacteriol. examination of clinical specimens this medium should be used in conjunction with other media. D.Hide

1380. PERFORMANCE OF AN EGG YOLK-TELLURITE MEDIUM IN PRACTICAL USE. A.C.Baird-Parker: J. appl. Bact.. 1962. 25. 441-444 (Unilever Res. Lab., Colworth House, Sharnbrook, Bedford. England) Results from seven different laboratories indicate that egg-tellurite-glycine-pyruvate agar is superior to other media for isolation of Staphylococcus aureus from a wide range of food materials. D.Hide

1381. OXIDASE ACTIVITY OF STAPHYLOCOCCUS. K.J.Steel: J. appl. Bact., 1962, 25, 445-447 (Nat. Collection Type Cultures, Colindale Av., London, England) 82 strains of coagulase-pos. staphylococci had no oxidase activity but 23 of 66 strains of coagulase* neg. staphylococci showed oxidase activity. There was no correlation between other biochem. characters and oxidase activity. D.Hide

1382. SOURCES OF STAPHYLOCOCCAL INFECTION IN SURGICAL WOUND SEPSIS. H.F.M.Bassett. W.G. Ferguson. E.Hoffman. M.Walton, R.Blowers and C.A. Conn: J. Hyg., Lond., 1963, 61, 83-94 (Shotley Bridge Hosp., Shotley Bridge, Durham, England) In the 2 hospitals studied, staphylococcal wound sepsis was as frequent in patients who were not nasal carriers as in those who were and skin carriers suffered no more sepsis than non-carriers. Wound sepsis arose more frequently from cross-infection than from self-infection. In one hospital, 21*6% of presumed operating-room infections were

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in.

witn organisms similar to those of carriers in the surgical team, but only 10% of presumed ward infections showed this similarity. J.B.Derbyshire

1383. POST-OPERATIVE WOUND INFECTION IN PROVINCIAL GENERAL HOSPITAL. B.Moore and A.M.N.Gardner: J. Hyg. Lond., 1963, 61, 95-113 (Public Health Lab.. Exeter, England) Post-operative wound infections were studied in 559 surgical patients. The overall incidence of staphylococcal sepsis was 8*6%, but the figure was lower in carriers than in non-carriers. The incidence of sepsis was higher in individuals who carried staphylococci of phage type 80/81 than in carriers of other strains. J.B.Derbyshire

1384. MULLER *S PHENOMENON AND ITS RELATIONSHIP TO PLASMINOGEN ACTIVATION AND TO BLOOD CONSTITUENTS PRODUCING OPACITY IN AGAR GEL. J.G.P.Hutchison: J. Path. Bact., 1962, 84, 289-306 (Univ. Dept. Bact.. Western Infirmary. Glasgow. Scotland) A factor responsible for this Phenomenon is prep. by pptn. with acidic ethanol from cell free extracts of Staphylococcus aureus. Opacity of agar gel produced by denaturation of Hb and interaction of Hb with serum proteins is necessary to demonstrate the phenomenon. The staphylococcal extract is rich in staphylokinase: its action is prevented by inhibitors of staphylokinase. of plasminogen and of plasmin. D.Murray

1385. GROWTH OF STAPHYLOCOCCI IN HUMAN SERUM. S.Fletcher: J. Path. Bact., 1962, 84, 327-335 (Univ. Dept. Bact., Western Infirmary, Glasgow, Scotland) Coagulase-pos. staphylococci grow in human serum containing 5% broth while coagulase-neg. strains fail to do so. Inhibn. of growth of coagulase-neg. strains occurs with serum diluted to 17^{5%} and buffered at pH 8*2-8*8: the inhibitor is active only in the alk. range of pH values and is heat-stable. Inhibn. is not abolished by growth of coagulase-pos. strains, by addition of heat-killed organisms or by addition of coagulase. It is abolished by many proteinaceous Materials. D.Murray

'S6. STAPHYLOCOCCAL LIPOLYSIS AND PIGMENTATION. A.T.Willis and G.C.Turner: J. Path. Bact., 1962, 84, 337-347 (Bact. Dept.. Sch. Med.. Leeds, England) The lipolytic activity of staphylococci jawing on agar media containing tributyrin, egg yolk or man fat does not provide a reliable means of distinguishing coagulase-pos. from coagulase-neg. strains. Growth on agar media containing 1% glycerol mono-^ctate greatly enhances colonial pigmentation. Coagulase-pos. strains are yellow or orange; coagulase-neg. strains are usually porcelain-white. D.Murray

1387. EXPERIMENTAL STAPHYLOCOCCAL INFECTION IN MICE. D.D.Smith: J. Path. Bact., 1962, 84, 359-365 (Univ. Dept. Bact., Western Infirmary, Glasgow, Scotland) Twelve strains and variants of Staphylococcus aureus, representing a wide range in the production of coagulase and of O_r, f_r- and y-lysins p^{re} tested for virulence by i.v. injn. into W-Swiss or vi⁺on albino mice. Production of these substances in ³⁵SO₄ alone or in combination is not apparently corre-
AdY? *** Pathogenicity nor is no. of diffusible Ag. is Utl^m of (X-lysin and of y-lysin from 2 strains tox⁺ to Porton mice: p^{lysin} and coagulase are not in v^{iv} strains producing Otoxin in vitro also produce it D.Murray

1388. EFFECT OF HYPOTHERMIA ON COURSE OF ACUTE INFECTION IN RAT. J.H.Jones and P.J. Campbell: J. Path. Bact., 1962, 84, 428-433 (Path. Dept.. Queen's Univ. Belfast. N. Ireland) Male Wistar rats were inj. i.v. with Staphylococcus aureus (PS/5 strain). Hypothermia was induced by i.p. injn. of pentobarbitone sodium, immersion in ice and finally exposure to cold stream of air. Animals were maintained at 20° for 12 hr. and then rewarmed in a waterbath at 40°. The septicaemia was aggravated and led to increased mortality. D.Murray

1389. FUNCTION OF MAMMARY LYMPHATICS IN STAPHYLOCOCCAL AND STREPTOCOCCAL MASTITIS IN SHEEP. A.K.Lascelles: Brit. J. exp. Path., 1962, 43, 627-638 (Dept. Exp. Path., Australian National Univ., Canberra, Australia) There was a rapid increase in flow and protein content of lymph from mammary gland of sheep infected with staphylococci or streptococci. Lymph flow decreased 12-24 hr. after infection especially in those animals in which gangrenous mastitis developed. D.L.Gardner

1390. INTESTINAL FLORA IN CLOSED PEDIATRIC COMMUNITY. L.S.Cohen and L.E.Cluff: Amer. J. Hyg., 1962, 76, 262-266 (Dept. Med., Johns Hopkins Univ. Sch. Med., Baltimore, Md.. U.S.A.) Staphylococcus albus in combination with a Gram-neg. bacillus occurred in 72% in S. aureus in 4% of specimens collected. PJ.Baron

1391. BEHAVIOUR OF CONCENTRATED STAPHYLOCOCCAL COAGULASE PREPARATIONS IN IMMUNO-DIFFUSION TESTS. K.A.Borchardt, W.A.Pierce, jun. and M.F.Shaffer: Tex. Rep. Biol. Med., 1963, 21, 3-11 (Dept. Microbiol., Tulane Univ. Med. Sch., New Orleans, La., U.S.A.) Rabbits were immunised with (a) cone, coagulase prep, obtained by acid- and ethanol-fractionation of cultures grown in brain heart infusion dialysate medium, or (b) whole cells from strains (42D and 81) of Staphylococcus aureus grown under conditions favouring or depressing coagulase production. Reactions of such antisera in immuno-diffusion tests with coccal extracts or with the cone, coagulase prep, demonstrated well the antigenic inhomogeneity of the latter. AJ.Martin

1392. INFLUENCE OF HOST AGE AND DNA PRECURSORS ON INTRACELLULAR STAPHYLOCOCCI. M.G.Sheyaganji, J.A.Peterson and W.Braun: Proc. Soc. exp. Biol., N.Y., 1962, 11, 438-441 (Inst. Microbiol., Rutgers, State Univ., New Brunswick, N.J., U.S.A.) In vitro studies have shown that virulent staphylococci survive longer in monocytes derived from newborn rabbits than from adult animals. Addition of DNA precursors and MgSO₄ to the culture medium increased intracellular survival in adult animal monocytes but not in those from newborn. M.M.Shapland

1393. TEST IN AGAR MEDIUM FOR PRODUCTION OF DNase BY STAPHYLOCOCCI. H.Osowiecki and W.T.Dobrzanski: Bull. Acad. pol. Sci., 1963, 11, 85-86 (Dept. Microbiol. and Hyg.. Sch. Med., Warsaw, Poland) A qual. test. J.E.Hobbs

1394. L-FORMS AND PROTOPLASTS OF GROUP A STREPTOCOCCI. II. CHEMICAL AND IMMUNOLOGICAL PROPERTIES OF CELL MEMBRANE. E.H.Freimer: J. exp. Med., 1963, 117, 377-399 (Rockefeller Inst. Med. Res., New York, U.S.A.)

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Bacterial membranes were isolated from Group A streptococci after the cell walls had been enzymically dissolved. Membranes obtained by differential centrifugation of mechanically disrupted streptococci were chem. and serol. identical with them. Membranes were different from the cell walls and composed of 72% protein, 26% lipid and Zfo carbohydrate. Immunol. precipitin analysis showed that the Ag of the membranes was distinct from those of the cell walls and of the cytoplasm, and is common to the membranes of Group A streptococci. It can be distinguished by immunodiffusion from related Ag present in the membranes of several other groups of haemolytic streptococci. This Ag does not cross-react with Ag in the membranes of other Gram-pos. cocci.

H.E.HJones

1395. EFFECT OF PERIODATE ON CELL WALL ANTIGENS OF STREPTOCOCCI. C.S.Cummins and H.D. Slade: Proc. Soc. exp. Biol. N.Y., 1962, 111, 360-363 (Dept. Microbiol., Northwestern Univ. Med. Sch., Chicago, 111., U.S.A.) In 11 of 23 strains tested the serol. reactivity was destroyed by O'OM periodate in 2 hr.

M.M.Shapland

1396. ISOLATION OF GROUP SPECIFIC PRODUCTS FROM LACTOBACILLUS CASEI AND L. CASEI VAR. RHAMNOSUS. K.W.Knox: J. gen. Microbiol., 1963, 31, 59-72 (Inst. Dental Res., United Dental Hosp., Sydney, Australia) Serol. reactive products from 4 strains of L. casei (serol. groups B and C) and 2 strains of L. casei var. rhamnosus (serol. group C) were obtained as the sol. indiffusible products from Streptomyces muralyuc enzyme-hydrolysed cell wall prep. Rhamnose is the major component in group B organisms and glucose in L. casei group C prep. Two products differing considerably in composition were obtained from each strain of L. casei var. rhamnosus. The serol. prop. of the prep. are described and found to confirm the division of L. casei strains into 2 serol. groups.

K.Brew

1397. SEROLOGICAL CLASSIFICATION OF VARIETIES OF LACTOBACILLUS CASEI. J.Glastonbury and K.W. Knox: J. gen. Microbiol., 1963, 31, 73-77 (Inst. Dental Res., United Dental Hosp., Sydney, N.S.W., Australia) The serol. prop. of 35 strains of L. casei and the carbohydrate components of corresponding cell-wall prep. were compared. All L. casei var. rhamnosus were of serol. group C whereas L. casei var. casei strains belonged to group B or C. The major cell wall component of group B strains was rhamnose. Of group C strains, only L. casei var. rhamnosus contained rhamnose in the cell wall. Galactose and glucose were major cell-wall components of all group C strains.

K.Brew

1398. STUDIES ON ANTIGENIC STRUCTURE OF MYCOBACTERIA WITH GEL DIFFUSION TECHNIQUE. F.Gimpl and J.Weissfeiler: Acta microbiol. Acad. Sci. hung., 1962, 9, 175-181 (Dept. Microbiol., Inst. Exp. Med., Acad. Sci. Hung., Budapest, Hungary) Virulent and attenuated human and bovine Mycobacterium strains showed no serol. differences but their antigenic structure differed considerably from some saprophytic strains. The antigenic components of 2 atypical strains were usually common with the mammalian ones. The antigenic structure of M. phlei and M. fortuitum differed markedly from each other but no serol. difference was found between M. butyricum and M. smegmatis.

S.Igali

1399. COMPARATIVE SEROLOGICAL STUDY OF MYCOBACTERIUM AVIUM, M. ULCERANS, M. BALNEI AND M. MARINUM BY MEANS OF DOUBLE DIFFUSION-IN-GEL METHODS; PRELIMINARY INVESTIGATION.

A.Lind and M.Norlin: Scand. J. din. Lab. Invest., 1963, 15, Supp. 69, 152-163 (Dept. Bacteriol., Univ. of Goteborg, Sweden) All 4 strains of mycobacteria studied had at least one Ag factor in common. There were close serol. relationships between M. avium and M. ulcerans, and between M. balnei and M. marinum. Serol. dissimilarities were found between the 2 first-mentioned strains and 2 latter strains.

K.Jones

1400. MYCOBACTERIUM LEPRAEMURUM IN TISSUE CULTURE. R.J.W.Rees and R.D.Tee: Brit. J. exp. Path., 1962, 43, 480-487 (Nat. Inst. Med. Res., Mill Hill, London, England) Rat leprosy bacillus (M. leprae) grown in rat fibroblast culture was a source of sol. Ag, mainly of polysaccharide nature. Non-multiplying organisms produced no Ag. No Ag was found in fibroblasts when bacteria multiply.

D.L.Gardner

1401. MYCOBACTERIUM OBTAINED FROM THE GOLDEN HAMSTER (CRICETUS AURATUS) AFTER INOCULATION WITH LEPROMATOUS TISSUE. C.H.Binford: Lab. Invest., 1962, 11, 942-955 (Geographic Path. Div., Armed Forces Inst. Path., Washington, D.C., U.S.A.) Mycobacterial granulomas of hamster (C. auratus) ear and testis were obtained by inocn. with human leprosy. The organism is readily passed serially from hamster to hamster, grows well only in ears, foot pad and testes, and can produce Schaumann bodies and amyloidosis. It differs from Mycobacterium leprae. Some animals are resistant to infection.

A.M.Mackay

1402. EFFECT OF SOME METALS AND VITAMINS ON THE GROWTH AND VITAMIN B₁₂ PRODUCTION OF NOCARDIA RUGOSA. C.Spalla: G. Microbiol., 1961, 9, 224-235 ('Farmitalia'. Milano, Italy)

N. rugosa required biotin for growth. Using alumina to remove metals from the medium, Zn, Fe and Mn were necessary for vit. B₁₂ production. Fe and Zn stim. both growth and vit. B₁₂ production and acted synergistically in increasing the vit. B₁₂ production. Mn only promoted growth and Cu had no effect at all.

(Italian) G.N.Godson

1403. NEW SPECIES OF NOCARDIA CAPABLE OF OXIDISING STEROIDS AT THE 16a-POSITION. C.Spalla, A.Amici and M.Bianchi: G. Microbiol., 1961, 9, 248-253 ('Farmitalia'. Milano, Italy) A new species has been isolated and described and named N. italica. The organism possesses ability to introduce an OH group at the 16(X-position of a steroid mol.

(Italian) G.N.Godson

1404. MICROBIAL TRANSFORMATIONS OF STEROIDS. XX. TRANSFORMATION OF REACTIONS OF STEROIDS AS A DIAGNOSTIC FEATURE IN CLASSIFICATION OF ACTINOMYCETES. O.Vondrova and A.Capek: Folia Microbiol., 1963, 8, 117-119 (Inst. Microbiol., Czechoslovak Acad. Sci., Prague, Czechoslovakia) On the basis of reaction with progesterone Actinomycetes can be divided into 3 groups: (a) spp. which transform progesterone in the 16^o-t-position, (b) spp. transforming progesterone in the 6^o-position, (c) spp. which do not transform progesterone.

J.R.Sargent

1405. RECOMBINATION IN STREPTOMYCES OF HETEROKARYOTIC ORIGIN. ANALYSIS OF RECOMBINANTS. J.Horváth: Acta microbiol. Acad. Sci. hunfr'

1962, 9, 189-195 (Inst. Microbiol., Univ. Agricult. Sci., GSdSlo*. Hungary) Interspecific unstable recombinants were synthesised and analysed on the basis of their morphol. characters and antibiotic production. The colour, the micro-morphol. of the aerial mycelium and the antibiotic production were inherited independently. S.Igali

1406. TERMINAL PHASE OF ANTHRAX. H.Smith and J.Keppe: Brit. J. exp. Path., 1962, 43, 684-686 (Microbiol. Res. Establishment, Porton, Wilts., England) A commentary on low O₂ concn. found in terminal rabbit anthrax by Nordberg et al. Measurement of anoxia terminally is regarded as misleading. D.L.Gardner

1407. ANTHRAX TOXIN: CAUSATIVE AGENT IN THE DEATH OF RHECUS MONKEYS. F.Klein, D.R.Hodges, B.G.Mahlandt, W.I.Jones, B.W.Haines and R.E.Lincoln: Science, 1962, 138, 1331-1333 (U.S. Army Biol. Lab., Fort Detrick, Frederick, Md., U.S.A.)

Evidence is presented that rhesus monkeys infected with anthrax die of toxæmia, since the toxin increases in concn. in both blood and lymph as the disease progresses. Sterile toxin alone causes death. A rapid toxæmic death occurs after injn. of 10^{5.1} *Bacillus anthracis* spores, although 10¹ spores or less require 20 or more hr. of growth in vivo to cause death. The use of antitoxin to combat anthrax is advocated. G.M.Le'wis

1408. FRACTIONATION OF CELL CONSTITUENTS OF *BACILLUS MEGATERIUM* IN A POLYMER TWO-PHASE SYSTEM. V.Hofsten and Baird: Biotech. Bioeng., 1962, 4, 403-410 (Inst. Biochem., Univ., Uppsala, Sweden) Using an aq. 2-phase system containing dextran and polyethylene glycol, a suspension of disrupted cells was fractionated into cell walls, lipid granules and sol. cell material after a few counter-current distributions. A mixture of whole cells and protoplasts was fractionated and if NaCl was added to the system, vegetative cells and spores could be separated. R.H.Kimberlin

1409. BASE EXCHANGE AND HEAT RESISTANCE IN BACTERIAL SPORES. G.Aldepton and N.Snell: Biochem. biophys. Res. Comm., 1963, 10, 139 (Western Peg. Res. Lab., Albany, Calif., U.S.A.) *Bacillus megaterium* spores have a relatively high cation ^change capacity. Heat resistance varies with the cation imposition of the medium. B.Ketterer

1410. FRACTIONATION OF CLOSTRIDIUM WELCHII S-ANTIGEN ON CELLULOSE ION EXCHANGERS. P.O.Thomson: J. gen. Microbiol., 1963, 31, 79-90 (Dept. Anaerobic Bacteriol., Wellcome Res. Labs., Langley Court, Beckenham, Kent, England) A low-^protein medium for production of *C. welchii* frjerfringens ^Prototoxin is described. ^Ag in young cultures in this ^edium was mainly in the form of prototoxin. The purity of ^Ag was 5Kb and fractionation of the protein on DEAE-V*d CM-celluloses implied the presence of proteins intermediate between G-prototoxin and C-toxin. These increased in concn. and no. on prolonged incubation of cul-^T's. The intermediates were probably formed from ^Procotoxin by degradation. Results suggest that these ij^Pounds are non-toxic but could become activated in ^animal body. Physical data and amino acid composi-^n of e-prototoxin are presented. K.Brew

1411. INTERACTIONS BETWEEN CLOSTRIDIUM SEPTI-CUM AND *C. HISTOLYTICUM* TOXINS AND ANTI-

TOXINS. M.Sterne and G.H.Warrick: J. Path. Bact., 1962, 84, 277-288 (Wellcome Res. Lab., Beckenham, Kent, England) Antitoxin and toxin are assayed in vivo by i.v. injn. in mice and by i.d. injn. in guinea-pigs and in vitro by haemolysis of horse r.b.c. The sera of horses hyperimmunised with *C. septicum* culture filtrates contain Ab to *C. histolyticum* toxin and vice versa. An apparent fall in the homologous *septicum* antitoxin titre of *septicum* antisera occurs on addition of the heterologous *histolyticum* toxin. This is due to dissociation of the *histolyticum* toxin-*septicum* antitoxin complex on addition of homologous *septicum* toxin. D.Murray

1412. IMPORTANCE OF SAMPLE SIZE IN STUDIES BASED UPON THE SEROLOGICAL CLASSIFICATION OF *E. COLI*. K.L.Vosti, A.S.Monto and L.A.Rantz: Proc. SOC. exp. Biol., N.Y., 1962, 111, 201-204 (Div. Inf. Dis., Stanford Univ. Sch. Med., Palto Alto, Calif., U.S.A.) Most of the serol. O groups of *E. coli* present in a single specimen were identified by examination of only 5 colonies but the possibility of finding additional strains was not exhausted even by a study of 25 colonies. M.M.Shapland

1413. SEROLOGICAL RELATIONS THAT MAY LEAD TO ERRONEOUS DIAGNOSIS OF *E. COLI* INFECTIONS BY MEANS OF FLUORESCENT ANTIBODY TECHNIQUES. B.R.Davis and W.M.Ewing: Amer. J. clin. Path., 1963, 39, 198-202 (Communicable Disease Center, Public Health Service, U.S. Dept. Health, Atlanta, Ga., U.S.A.) Inter-relationships were found between various Enterobacteriaceae Ag and the OB groups of *E. coli* which have been associated with infantile diarrhoea."* B.A.Woodger

1414. COMPARATIVE STUDIES ON *SALMONELLA TYPHI* GROWN IN VIVO AND IN VITRO. I. VIRULENCE, TOXICITY, PRODUCTION OF INFECTION-PROMOTING SUBSTANCES AND DPNase ACTIVITY. A.L.Olitzki and D.Goldinger. II. EFFECT OF EXTRACTS FROM NORMAL AND INFECTED ORGANS ON BACTERICIDAL SERUM ACTION ON STRAINS GROWN IN VIVO AND IN VITRO. A.L.Olitzki and O.Kaplan: J. Hyg. Lond., 1963, 61, 1-19, 21-31 (Bacteriol. Dept., Hebrew Univ. Hadassah Med. Sch., Jerusalem, Israel)

I. The lethal dose for mice of *S. typhi* strain Ty2 grown i.p. in mice was lower than that of in vitro cultures, but strain O 901 did not behave in this way. Extracts of infected spleens and livers had a greater infection-promoting effect in mice than extracts of normal organs. Glycogen and Na taurocholate also enhanced virulence. Infected organ extracts and extracts of bacteria grown in vivo showed high NADase activity. Infected organ extracts produced Ab to sol. bacterial Ag in rabbits. Spleen grown bacteria absorbed host Ag and produced anti-spleen precipitins in rabbits.

II. *S. typhi* was more sensitive to the bactericidal action of immune serum when the bacteria were in the lag or exponential phases of growth. Non-multiplying cells in a non-nutritive medium were resistant to serum. Organ extracts from mice infected with strain Ty2 inhib. the bactericidal action of serum on this strain, but to a less extent on strain O 901. J.B.Derbyshire

1415. IMMUNOGENIC SIGNIFICANCE OF Vi AND O ANTIGENS OF *SALMONELLA TYPHI* IN MOUSE-PROTECTING TEST. K.Rauss and I.Kétyi: Acta microbiol. Acad. Sci. hung., 1962, 9, 197-208 (Inst. Microbiol., Univ. Med. Sch., Pécs, Hungary) The Vi and O Ag of *S. typhi* are immunol. equiv. The protective power of the combined treatment equals the sum of their separate immunogenic value. S.Igali

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1416. ENDOTOXIC ACTIVITY OF L-FORMS DERIVED FROM SALMONELLA PARATYPHI B. B.L.Dasinger and E.Suter: Proc. Soc. exp. Biol., N.Y.. 1962. 111. 399-400 (Dept. Microbiol.. Coll. Med.. Univ. Florida. Gainesville, Fla., U.S.A.) L-forms derived from S. paratyphi B are 5*5 to 9*0 times less toxic than their parent bacterial form. Toxicity remains relatively const. during successive transfers in die L-state. M.M.Shapland
1417. PREPARATION AND PROPERTIES OF AN ALUMINIUM CITRATE-ENDOTOXIN COMPLEX FROM SALMONELLA ENTERITIDIS. W.T.Haskins, E.Ribi. M.Landy, R.L.Anacker and K.C.Milnen Proc. Soc. exp. Biol.. N.Y., 1963. 112. 113-119 (Dept. HEW. Pub. Health Service. N.I.H., Rocky Mountain Lab.. Hamilton, Mont., U.S.A.) Phenol treated aq. ether extracted endotoxin from S. enteritidis was complexed by reacting with UAIH4 and citric acid soln. The resultant complex was very sol. in water and showed little contamination with amino acids. It retained a high biol. activity. D.N.Wheatley
1418. COLONIAL VARIANTS OF SHIGELLA FLEXNERI. L.Kerekes: Acta microbiol, Acad. Sci. hung.. 1962. 9. 123-132 (State Inst. Hygiene, Budapest, Hungary) Under oblique transmitted light new colonial variants with altered antigenic structures and virulence were detected and described among strains of S. flexneri on yeast agar plates. S.Igali
1419. EFFECT OF PSEUDOMONAS TABACI ON THE METABOLISM OF STARCH IN TOBACCO LEAVES. L.Lpvrekovich, Z.Klement and G.L.Farkas: Nature, Lond.. 1963, 197, 917 (Res. Inst. for Plant Protection, Budapest, Hungary) The toxin-induced chlorotic halo formed in tobacco leaves infected with P. tabaci contains no starch. Injn. of bacteria-free culture filtrate into the leaves caused a striking fall in phosphorylase activity concomitant with the decrease in starch content; amylase activity was not affected. Phosphorylase activity in vitro was not inhib. by the culture filtrates. G.M.Lewis
1420. CAPSULAR POLYSACCHARIDE OF KLEBSIELLA PNEUMONIAE TYPE A (STRAIN 1265). S.A.Barker. J.S.Brimacombe, J.L.Eriksen and M.Stacey: Nature, Lond., 1963, 197, 899-900 (Chem. Dept., Univ., Birmingham, England) The acidic polysaccharide of K. pneumoniae type A (strain 1265) consisted of glucose, fucose, glucuronic acid and an oligosaccharide which hydrolysed to glucuronic acid, glucose and lyxose. The presence of 1:3 linkages in the polysaccharide is indicated by rapid formation of saccharinic acids in alkali, failure to oxidise with periodate. and through methylation studies. G.M.Lewis
1421. IMMUNOCHEMICAL STUDIES ON SOME SEROLOGICAL CROSS-REACTIONS IN THE KLEBSIELLA GROUP. V. REAPPEARANCE OF FUCOSE IN THE CAPSULAR POLYSACCHARIDE OF A FUCOSE-LESS STRAIN OF K. OZAENAE TYPE AE. S.D.Henriksen and J.Eriksen. VI. CHEMICAL ANALYSIS OF THE CAPSULAR POLYSACCHARIDE OF KLEBSIELLA TYPE 3 (C) AND OF TWO CROSS-REACTING STRAINS. J.Eriksen and S.D.Henriksen. Vn. SEROLOGICAL REACTIONS OF SOME STRAINS OF TYPE 3(C) AND SOME CROSS-REACTING STRAINS. S.D.Henriksen and J.Eriksen: Acta path. microbiol., scand., 1962, 54, 382-386. 387-390. 391-397 (Bact. Inst., Oslo Univ., Norway) V. Fucose was found in the capsular polysaccharide of a previously fucose-less Klebsiella

strain, originally classified, as type AE. The appearance of fucose reduced rather than enhanced the cross-reactivity of the strain with other fucose-containing strains of type AE. This and the fact that fucose in this polysaccharide disappeared after oxidation with periodic acid in contrast to the fucose of other strains suggest that the fucose of this strain may have a different location.

VI. Four different strains of Klebsiella sero-type 3, classified as the spp. K. rhinoscleromatis, ozaenae, Dneumoniae (Citrobacter?^) and aerogenes had capsular polysaccharides of the same qual. and quant, composition; also a cross-reacting strain of K. aerogenes. Another strongly cross-reacting strain related to enterobacter contained 2 additional sugar components.

VII. Capsular polysaccharides from strains of K. rhinoscleromatis, K. ozaenae, K. pneumoniae and Aerobacter (Klebsiella) aerogenes, all classified as type 3, had the same serol. specificity. They contained a small quantity of a second, strain-sp. Ag, possibly an O-Ag. Of 2 cross-reacting strains one had almost the same specificity as type 3, but contained 2 additional sugar components, whereas the other, which gave only a moderate cross-reaction with type 3, had the same composition as the type 3 polysaccharides. I.Friedmann

1422. SPINAL CORD COMPRESSION FOLLOWING VERTEBRAL OSTEOMYELITIS DUE TO ALKALESSENS-DISPAR. J.Briggs and R.G.Lascelles: J. clin. Path., 1963. 16, 155-157 (Dept. Clin. Path.. St. Thomas's Hosp.. London. England) A member of the Alkalescens-Dispar group was isolated from a spinal osteomyelitic lesion in man, but Ab to this organism was not found in the patient 's serum. J.B.Derbyshire

1423. ELECTRON MICROSCOPE STUDY OF PENICILLIN-INDUCED SPHEROPLASTS IN VIBRIO CHOLERAE. A.C.Shipstone and S.C.Agarwala: Indian J. exp. Biol.. 1963. 1, 103-105 (Central Drug Res. Inst., Lucknow, India) E.M. study of spheroplasts of V. cholerae cellst produced by growing the cells on papain-meat digest-agar containing penicillin, has revealed a residual cell wall in the spheroplasts. Formation of spheroplasts is quicker and more complete when V. cholerae cells are grown on a solid medium. Evidence has been obtained for binary fission in the naked spheroplasts.

1424. CHOLERA VACCINE. I. PROTECTIVE ANTIGENS OF HAFFKINE INSTITUTE CASEIN HYDROLYSATE CHOLERA VACCINE. II. PURIFICATION. S.H.Asmani and S.S.Rao: Indian J. Microbiol.. 1962, 2, 51-54, 55-58 (Haffkine Inst., Bombay, India) I. The heat-stable protective Ag in Haffkine Inst. cholera vaccine was one of 4 O Ag present in the supernatant; 7 heat-labile H Ag were also present.

II. Protective Ag were purified from heated casein hydrolysate cholera vaccine af'er lyophilisation and extracted first with ethylene glycol followed by TCA and saline. The protective Ag appears to be a polysaccharide with low N2 content. • G.M.Lewis

1425. SOLUBLE PROTECTIVE ANTIGEN FROM BORDETELLA PERTUSSIS PREPARED WITH SODIUM DEOXYCHOLATE. G.Barta: J. Immunol., 1963, 90, 72-80 (Connaught Med. Res. Labs., Univ. Toronto, Canada) The optimal conditions for solubilisation of the protective Ag are: 0-5-1 '0% deoxycholate pH 8[#]5, 0-2°, and a reduction in O.D. of 40-50%. Approx. l&fo of the bacterial dry wt. was dissolved under these conditions. The sol. fraction was virtually non-toxic. Soln. of protective Ag could be sterilised by millipore filtration. N.R.Ling

1426. BRUCELLA ANTIGENS. II. CYTOPLASMIC AND CELL-WALL FRACTIONS. J.Roux and A.Serre: Ann. Inst. Pasteur, 1963, 104, 238-245 (Fac. Méd.. Univ., Montpellier, France) It has been possible to prepare cell-wall fractions of 3 spp. of Brucella which were free from cytoplasmic Ag, but it was more difficult to prepare cytoplasmic Ag free from cell-wall contaminants. This has been demonstrated by double-diffusion in gel and immunoelectrophoresis in presence of corresponding immune sera. It was not possible to demonstrate one fraction sp. for Brucella spp. (French) B.Payne

1427. CHEMICAL BASIS OF VIRULENCE OF BRUCELLA ABORTUS. III. FOETAL ERYTHRITOL A CAUSE OF LOCALISATION OF B. ABORTUS IN PREGNANT COWS. A.E.Williams, J.Keppie and H.Smith. IV. IMMUNOGENIC PRODUCTS FROM B. ABORTUS GROWN IN VIVO AND IN VITRO. H.Smith, J.Keppie, J.H.Pearce and K.Witt: Brit. J. exp. Path., 1962, 43, 530-537. 538-548 (Microbiol. Res. Estab., Porton, Wilts., England) III. Erythritol was found cone, in chorion, cotyledons and foetal tissue. Erythritol in vitro stim. B. abortus growth in fig. quantities, and enhanced infection in 1-5 day calves.

IV. Crude cell wall extracts from B. abortus were immunogenic for guinea-pigs and for mice; cytoplasmic constituents were not. Both complex and synthetic media were used to prepare culture filtrates with immunogenic prop. D.L.Gardner

1428. HABITAT OF 'BACTERIUM EURYDICE¹'. L.Bailey: J. gen. Microbiol., 1963, 31, 147-150 (Rothamsted Exp. Stn., Harpenden, Herts., England) The alimentary canal of adult bees is the main source of 'Bacterium eurydice' [Achromobacter eurydice] which spreads between bees and to larvae, pollen and honey, from the mouths of infected adults. Most natural spread happens when foraging activity is greatest, probably because infected adults then collect and contaminate pollen which is soon eaten by the young brood-rearing bees. K.Brew

1429. INFLUENCE OF TEMPERATURE ON THE SIZE AND SHAPE OF BACTERIUM ANITRATUM. B.Brzin: Acta path. microbiol. scand.. 1963, 57, 188-198 (Vaccine-afdeling, Statens Seruminst. Copenhagen, Denmark) Striking changes in the size and shape of B. anitratum, occur dependent on temp, due to inhibn.of cell division at 37°, while the organisms continue to grow to oversized cells at the same temp. The dependence on temp, of cell growth in the strains described is different from that of cell reproduction. Aerobiosis and adequate humidity of the media used are important co-factors in this process. LFriedmann

1430. ROLE OF SERUM AND TISSUE LYSOZYME UPON TREPONEME IMMOBILISATION REACTION. M.Metzger: Amer. J. Hyg.. 1962, 76, 267-275 (Dept. Protozoology, Ludwik Hirszfeld Inst. Immunol., Polish Acad. Sci., Wroclaw, Poland) The lysozyme normally present in £ and immune serum influences the kinetics of the treponeme immobilisation reaction. Removal of the enzyme increases the rate of immobilisation but does not abolish completely. PJ.Baron

1431. FALSE POSITIVE REACTIONS IN TREPONEMAL TESTS. AJJulian, J.Portnoy and H.N.Bossak: Brit. J. vener. Dis., 1963, 39, 30-32. Immobilising Ab against T. pallidum were produced in goats immunised ^{J^1*} normal rabbit testicular homogenates. Absorption of ^{nur}nan sera with normal rabbit testicular homogenates did not affect their reactivity in the TPI and FTA tests. R.R.Willcox

1432. FRACTIONATION STUDIES OF ANTIBODIES DETECTED IN SEROLOGICAL TESTS FOR SYPHILIS. J.Portnoy, AJJulian, J.F.Smith and A.Harris: Brit. J. vener. Dis., 1963, 39, 33-36. Continuous flow paper electrophoresis was employed to fractionate 5 human sera obtained from 2 patients with early syphilis, 2 persons presumed non-syphilitic and 1 biol. false-pos. reactor. R.R.Willcox

1433. ENHANCEMENT BY LYSOZYME OF THE SENSITIVITY OF TREPONEMA PALLIDUM IMMOBILISATION [TPI] TESTS. J.F.Kent and J.B.De Weerdt: Brit. J. vener. Dis., 1963, 39, 37-40. The incorporation of 0.0075% lysozyme in treponemal survival medium affected a 3- to 4-fold increase in the sensitivity tests for TPI Ab. This increase, superimposed on that achieved by incubating for 40 hr. instead of the usual 18 hr., resulted respectively in 7-8 fold and 15-16 fold mean increases in the titres of syphilitic human and rabbit sera. R.R.Willcox

1434. HAEMOLYSIS IN IDENTIFYING EATON'S PLEUROPNEUMONIA-LIKE ORGANISM. W.A.Clyde, jun.: Science, 1963, 139, 55 (Dept. Paediatrics, Sch. Med., Univ. North Carolina, Chapel Hill, N.C., U.S.A.) Eaton's pleuropneumonia-like organism may be differentiated from other mycoplasma strains by its ability to cause clear haemolysis of mammalian r.b.c. G.M.Lewis

1435. GENITAL STRAINS OF HUMAN PLEUROPNEUMONIA-LIKE ORGANISMS. D.K.Ford and M.Duvernet: Brit. J. vener. Dis., 1963, 39, 18-30. Pleuropneumonia-like organisms were demonstrable in the urethral exudate of 24 of 100 service recruits, 55 of 100 gaol inmates and in 84 of 100 patients with non-gonococcal urethritis. The T strain was found in 21, 47 and 79% respectively in the 3 groups. R.R.Willcox

1436. MYCOPLASMA (PPLO) STRAINS WITH LYtic ACTIVITY FOR MURINE LYMPHOMA CELLS IN VITRO. P.M.Kraemer, V.Defendi, L.Hayflick and L.A.Mason: Proc. Soc. exp. Biol., N.Y.. 1963, 112, 381-387 (Wistar Inst. Anat. Biol., Philadelphia, Pa., U.S.A.) The lytic activity of various PPLO mycoplasma viral strains designated 'B-7' and '12-3' against murine lymphosarcoma cells in culture (L5178Y and P388 Di) has been demonstrated. There is no lytic effect on other normal cell cultures. Any effect of B-7 in vivo upon ascitic lymphosarcoma was obscured by host effects and no difference in susceptibility to the tumour was found in treated or untreated animals. D. N# Wheatley

RICKETTSIAE AND VIRUSES

1437. ECOLOGY OF ROCKY MOUNTAIN SPOTTED FEVER IN WESTERN MONTANA. I. ISOLATION OF RICKETTSIA RICKETTSII FROM WILD MAMMALS. W.Burgdorfer, V.F.Newhouse, E.G.Pickens and D.B. Lackman: Amer. J. Hyg.. 1962, 76, 293-301 (N.I.H., Rocky Mountain Lab., Hamilton, Mont., U.S.A.) Seven highly virulent strains of R. rickettsii were recovered; 1 from the blood of a snowshoe hare, 1 from the spleen of a golden-mantled ground squirrel and 5 from the spleen tissues of chipmunks. p.j.Baron

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1438. PRODUCTION OF RICKETTSIA BURNETI ANTIGEN FOR COMPLEMENT FIXATION TESTS BY TRYPSIN PURIFICATION OF YOLK-SAC SUBSTANCE. K.Linde and H.Urbach: *Z. Immun.-Forsch.*, 1962, 124, 240-248 (Hyg. Inst., Univ. Jena, Germany)
Yolk sacs infected with R. burnetii are triturated with sand and the resulting suspension is purified by centrifugation followed by treatment with 1% trypsin for 48 hr. at 42°. The yield is 4-6 times larger than that obtained by other methods.
(German) D.P.Winstanley

1439. INDUCTION OF PROLONGED LATENCY IN PSITTACOSIS INFECTED CELLS BY AMINOPTERIN. M.Polland and N.Sharon: *Proc. Soc. exp. Biol.*, N.Y., 1963, 112, 51-54 (Lobund Lab., Univ. Notre Dame, Notre Dame, Ind., U.S.A.) Psittacosis virus was used to infect cultured McCoy cells (derived from human synovial tissue). Virus was sensitive to aminopterin up to 20 hr. after infection, after which a factor arose which led to less sensitivity. Folinic acid reversed the aminopterin effect even after 4 weeks of latent infection with aminopterin present. However folinic acid differs from the virus desensitising factor by having beneficial effects on both tissue culture cells and virus whilst the latter benefits primarily the virus. D.N.Wheatley

1440. STUDY BY FLUORESCENCE MICROSCOPY OF REPLICATION OF LYMPHOGRANULOMA VENEREUM VIRUS IN HeLa CELL MONOLAYERS. G.Furness and G.W.Csonka: *J. gen. Microbiol.*, 1963, 31, 161-165 (Lister Inst. Preventive Med., Chelsea, London, England) HeLa cells infected with a single lymphogranuloma virus and stained with Acridine Orange showed one particle of RNA of 2 μ diam. in fluorescence microscopy of the cytoplasm after 7 hr. at 37°. 2 particles after 12 hr. and an exponentially increasing no. thereafter with a mean generation time of 2 hr. At 18-21 hr. a vacuole was formed round those initial bodies and at 21-24 hr. smaller particles staining orange to yellowish green appeared. Yellowish green particles (DNA) had almost entirely replaced the initial bodies by 33 hr. and the no. then decreased as virus was released. K.Brew

1441. GROWTH OF TRACHOMA AND INCLUSION BLENNORHOEAE VIRUSES IN EMBRYONATED EGGS. P.Reeve and J.Taverne: *J. Hyg., Lond.*, 1963, 61, 67-75 (M.R.C. Trachoma Res. Unit, Lister Inst., London, England) Seven strains of trachoma virus and 4 strains of inclusion blennorrhoea virus were titrated in the yolk sacs of embryonated eggs. Some strains killed the embryos more rapidly than others, and these strains produced relatively few elementary bodies per LD₅₀, and formed inclusions in HeLa cells. On passage, the virulence of 3 strains was enhanced, and they began to form inclusions in HeLa cells. J.B.Derbyshire

1442. ANTIGENIC STRUCTURE OF HERPES SIMPLEX VIRUS. K.E.Schneweis: *Z. Immun.-Forsch.*, 1962, 124, 173-196 (Hyg. Inst., Univ. Gottingen, Germany) The N Ag is thermolabile and reacts with neutralising Ab. The V Ag is thermostable and reacts in the CF test. S Ag is not well defined, and may merely be an altered fraction of N or V Ag.
(German) D.P.Winstanley

1443. NEUTRALISATION OF ANIMAL VIRUSES. m. EQUILIBRIUM CONDITIONS IN THE INFLUENZA VIRUS-ANTIBODY SYSTEM. IV. PARAMETERS OF THE INFLUENZA VIRUS-ANTIBODY SYSTEM. S.Fazekas de St.Groth and R.G.Webster. *J. Immunol.*

1963, 90, 140-150, 151-164 (Dept. Microbiol., Australian Nat. Univ., Canberra, Australia) III The quantal assay system of influenza virus multiplying in surviving allantois is suited to the quant. study of neutralisation. The final equilibrium is the same whether approached from the side of virus or Ab excess. Changes in test vol. lead to predictable shifts of equilibrium. The effect of non-infective virus particles is compatible only with random reversible combination of Ab mol. with Ag sites.

IV. Counts of virus particles of haemagglutinating and infective units are presented for the same prep, and 2 techniques are developed for estimating the no. of Ab mol within sera ($\pm 30\%$). The no. of Ag sites/virus particle is calc. to be of the order of 2000 for each virus tested. The equilibrium const. of the Ag-Ab reaction were between 9×10^{10} and 5×10^{11} and were significantly different for each pair of reactants. N.R.Ling

1444. OBSERVATIONS OF SOME LITTLE-KNOWN ADENOVIRUSES. L.Rosen, J.F.Hovis and J.A.Bell: *Proc. Soc. exp. Biol.*, N.Y., 1962, 111, 166-171 (Lab. Inf. Dis., Nat. Inst. Allergy and Inf. Dis., Bethesda, Md., U.S.A.) Adenoviruses types 9, 10, 12, 13, 16, 17, 24, 25, 26, 28. BP-6 and BP-7 were isolated from anal specimens of children in whom increased homotypic haemaggl. inhibn. Ab levels were found. M.M.Shapland

1445. EFFECT OF ORGANIC AND INORGANIC ACIDS ON POLIOVIRUS AT 50°. C.Wallis and J.L.Melnick: *Proc. Soc. exp. Biol.*, N.Y., 1962, 111, 305-308 (Dept. Virol., Baylor Univ. Coll. Med., Houston, Tex., U.S.A.) Type 1 attenuated poliovirus was stabilised at 50° at pH 4*0-5*0 in acetic, oxalic and lactic acids, at pH 4*0 in citric, tartaric, benzoic and salicylic acids and at pH 3*0-5'5 in HCl, HNO₃, H₃PO₄ and H₂SO₄. Type 1 virulent strain was inactivated almost completely at 50° in these acids. M.M.Shapland

1446. COMPARISON OF NEUTRALISATION RATE AND AGAR DIFFUSION METHODS FOR INTRATYPIC SERO* DIFFERENTIATION OF POLIOVIRUSES. W.A.Woods, R.A.Weiss and F.C.Robbins: *Proc. Soc. exp. Biol.*, N.Y., 1962, 111, 401-404 (Dept. Pediatrics, Cleveland Met. Gen. Hosp., Cleveland, Ohio, U.S.A.) Comparable results were obtained for antigenicity of polioviruses using the McBride neutralisation rate test and the Melnick agar diffusion test. M.M.Shapland

1447. POLIOVIRUS NEUTRALISING PROPERTIES OF EQUINE AND OTHER SERA. G.Plummer: *Nature*, Lond., 1963, 197, 870-872 (Wellcome Res. Lab., Beckenham, Kent, England) Inhibitors for poliovirf* in equine sera were most active against type II virus and least against type I, and cause progressive neutralisation of poliovirus during incubation. The inhibitors were stable up to 63° and ppts. as y-globulins. Horses inj. with attenuated virus developed Ab slowly and showed no clinical reaction. Poliovirus could not be isolated from horses. It is suggested that these inhibitors are Ab to Ag common to enteroviruses. G.M.Lewis:

1448. OUTBREAK OF POLIOMYELITIS IN A PARTIALLY VACCINATED POPULATION. THE EPIDEMIC IN GOTHENBURG IN 1961. T.Anden and E.Lycke: *Acta path. microbiol. scand.*, 1963, 57, 73-80 (Municipal Virol. Lab., Gothenburg, Sweden) 100 cases were registered. 50 of which were of a paralytic nature. The

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attack rate per 100000 population was 24*7. The attack rate was highest among children in the pre-school age-groups and lowest among the school-children who were vaccinated to *d&Jo*. Eleven of the affected individuals had received 3 injn. with poliovaccine. The vaccine efficacy was 98*7% as regards reduction of paralytic polio and 91-9% if based on the figures for aparalytic as well as paralytic polio.

LFriedmann

1449. POLIOVIRUSES AND FLIES; EPIDEMIOLOGY OF ENTEROVIRUSES IN URBAN AREA. T.Wayne Downey: Yale J. Biol. Med., 1963, 35, 341-352 (Dept.

Epidemiology and Pub. Hlth., Yale Univ. Sch. Med., New Haven, Conn., U.S.A.) Flies were trapped during 2 successive summers in several areas and were studied using monkey kidney tissue culture techniques to determine how readily enteroviruses could be isolated from them, and whether any correlation existed between the strains isolated from flies and those from patients. In the first year an epidemic of poliomyelitis occurred and it was found that poliovirus type 1 strains, similar to strains isolated from patients, could be recovered in areas with a high degree of infection. In the second yr. the converse was observed when there was no clinical disease and no enteroviruses were recovered from flies.

J.B.Parish

1450. MEASLES AND POLIOVIRUS ANTIBODIES IN COMMERCIAL PREPARATIONS OF HUMAN γ -GLOBULIN.

V.J.Cabasso, K.H.Kiser, F.H.Clarke and M.R.Stebbins: J. Immunol., 1963, 90, 81-85 (Viral and Rickettsial Res. and Biol. Production Section, Lederle Labs., American Cyanamid Co., Pearl River, N.Y., U.S.A.) Commercial prep. (23 lots) of human γ -globulin derived from placental extracts were titrated in HeLa cell cultures for Ab neutralising measles virus using cytopathology as an indicator. Titres ranged between 10*2*70 and 10-3*30/O*1 ml. of globulin. Titres of poliomyelitis Ab by the metabolic inhibn. test on monkey kidney cells were 10-3-91 and 10-4*39/0*25 ml. of globulin for type L 10-4-09 and 10-4*70 for type II and 10-3-79 and 10-4 * 39 fo, type m.

N.R.Ling

1451. ALTERATION OF SALIVARY CHLORIDE SECRETION IN WEANLING MICE DURING INFECTION WITH COXSACKIE BI (CONN 5) VIRUS. W.B.Wilson and W.J.Cheatham: Amer. J. Path., 1962, 41, 359-363 (Dept. Pathol., Vanderbilt Univ. Sch. Med., Nashville, Tenn., U.S.A.)

D.G.Scott

U52. PAROTITIS IN WEANLING MICE PRODUCED BY COXSACKIE BI (CONN 5) VIRUS. W.B.Wilson and J.Cheatham: Amer. J. Path., 1962, 41, 415-421 (Dept. Pathol., Vanderbilt Univ. Sch. Med., Nashville, Tenn., U.S.A.)

D.G.Scott

1453. EFFECT OF ANTICELLULAR SERUM ON PLAQUE FORMATION BY ENTEROVIRUSES IN HUMAN AMNIOTIC TISSUE CULTURE. M.C.Timbury: Brit. J. exp. Path., 1962, 43, 506-514 (Univ. Glasgow Virus Lab.,

Ruchill Hosp., Glasgow, Scotland) Using antihuman amniotin cells after one week in growth medium, rabbit ^aacellular serum was prep. Serum had cytotoxic effect, ^b>t c -dependent. In diln. greater than those needed to ^cbow cytotoxicity, anti-amniotin cell antisera showed ^dllping but incomplete inhibn. of plaque formation by ^ef HO viruses and by Coxsackie virus type A9 but not of. S^fque formation by 3 types of poliovirus or by Coxsackie ^gviuses of Group B.

D.L.Gardner

1454. SUSCEPTIBILITY OF BABOON (PAPIO DOGUERA) KIDNEY CELLS TO HUMAN ENTEROVIRUSES.

S.S.Kalter, R.Fuentes-Marins, A.R.Rodriguez, A.Hellman, R.A.Crandell and N.T.Werthessen: Proc. Soc. exp. Biol. N.Y., 1962, 111, 337-340 (Sch. Aerospace Med., Brooks Air Force Base, San Antonio, Tex., U.S.A.) Baboon (*P. doguera*) kidney cells demonstrate a susceptibility to human enteroviruses, in general, similar to that of the rhesus monkey. Relative lack of 'native' viruses and ability to show the presence of vacuolating virus (SV 40) suggests a more widespread application to virol. studies and vaccine production.

M.M.Shapland

1455. PROPAGATION OF YELLOW FEVER VIRUS (17D STRAIN) IN PRIMARY TRYPSINISED CELL CULTURES. S.Hotta, A.Ohyama, N.Fujita and T.Yamada: Amer. J. trop. Med. Hyg., 1962, 11, 811-816 (Dept. Microbiol., Kobe Med. Coll., Kobe, Japan) The 17D strain yellow fever virus multiplies, in primary trypsinised kidney cell cultures of animal origin. 27 ref.

A.A.Zimmerman

1456. COMPARISON OF CHICKEN EMBRYONIC CELL CULTURES AND MICE FOR DETECTING NEUTRALISING ANTIBODY TO JAPANESE ENCEPHALITIS VIRUS [JEV]. USE OF MICROCULTURES FOR VIRUS- AND SERUM-DILUTION NEUTRALISATION TESTS. T.Miura and W.F.Scherer: Amer. J. Hyg., 1962, 76, 197-208 (Dept. Microbiol., Univ. Minnesota, Minneapolis, Minn., U.S.A.) Similar results were obtained in

virus-diln. neutralisation tests for Ab to JEV with weanling mice, inoc. intracranially, and with chicken embryonic cell cultures under agar medium. Serum-diln. neutralisation tests for JEV Ab were performed in micro-cultures of chicken embryonic cells under agar medium. Diln. titres > 1 in 4 were obtained with serum found pos. or equivocal by virus-diln. test.

Pj.Baron

1457. VARIATION IN SIZE OF PLAQUES PRODUCED IN TISSUE CULTURE BY STRAINS OF WESTERN EQUINE ENCEPHALITIS VIRUS [WEE]. I.D.Marshall, R.P. Scrivani and W.C.Reeves: Amer. J. Hyg., 1962, 76, 216-224 (Divn. Epidemiology, Sch. Pub. Hlth., Univ. California, Berkeley, Calif., U.S.A.)

Plaques formed by strains of WEE in chick embryo tissue cultures under agar varied in size from 1*4 to 13*8 mm. diam. Large plaques (7 mm. and larger) were characteristic of field strains. Predominant plaque type was varied by passage procedure.

Pj.Baron

1458. VIRUS OF VENEZUELAN EQUINE ENCEPHALOMYELITIS [VEE] IN TRINIDAD, W.I. I. THE 1943-1944 EPIZOOTIC. W.D.Tigertt and W.G.Downs: SEROLOGICAL STATUS OF HUMAN BEINGS. W.D.Tigertt, T.O.Berge and W.G.Downs. III. REISOLATION OF VIRUS. W.G.Downs, L.Spence and T.H.G.Aitken: Amer. J. trop. Med. Hyg., 1962, 11, 822-834, 835-840, 841-843 (Rockefeller Foundn., New York, U.S.A.)

I. A detailed chronology of the events associated with the 1943-1944 epizootic in Trinidad is presented. Findings are assessed and all known data appertaining to human infection are reviewed.

II. A total of 687 sera from adults and children in 3 areas of Trinidad were tested for the presence of neutralising Ab against VEE virus. In southwestern Trinidad, the area involved in the 1943-44 epizootic, Ab were found only in sera from individuals living in 1944. In the Port of Spain area, evidence of post-1944 experience with the virus was very slight. By contrast, in the non-epizootic area of central Trinidad, an appreciable incidence of

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serol. positivity was found in all age groups, including children born after 1944, some even born as late as 1949. Possible explanations for these last findings are discussed. Of these, the most tenable postulates the existence in this area of a well-established focus of VEE virus, or a closely related strain, which produces essentially symptomless infection in man. Possible origins of this focus are considered.

H1. Isolation of numerous strains of VEE virus from mosquitoes, sentinel mice and field rodents in Trinidad in 1959, 1960 and 1961 is reported. These constitute the first recoveries of this agent in Trinidad since the original isolations in 1943.

A.A.Zimmerman

1459. VIRUS OF VENEZUELAN EQUINE ENCEPHALOMYELITIS. m. DISTRIBUTION IN TISSUES OF EXPERIMENTALLY INFECTED MICE. J.B.Tasker, M.L. Miesse and T.O.Berge: Amer. J. trop. Med. Hyg., 1962, 11, 844-850 (Dept. Pathol. Bact., New York State Vet. Coll., Ithaca, N.Y., U.S.A.) A study

was made of the rates and sites of accumulation of equine encephalomyelitis virus in tissues of young adult mice following infection by a peripheral route. Virus accumulated more slowly in brain, but eventually reached the highest content found in any other organ.

A.A.Zimmerman

1460. INHIBITION OF ARBOR VIRUSES (GROUP A) BY A PROTEIN-LIKE CONSTITUENT OF A CORYNEBACTERIUM. D.H.Carver and K.Naficy: Proc. Soc. exp. Biol., N.Y., 1962, 111, 356-360 (Res. Div. of Inf. Dis., Children's Hosp. Med. Cen., Boston, Mass., U.S.A.) A factor (BIF) has been demonstrated in an unidentified sp. of Corynebacterium which inhibits multiplication of 2 group A arbor viruses, Sindbis and Chikungunya, in cultures of human amnion and chick embryo cells. Evidence is presented that inhibn. occurs after the virus has entered the cell.

M.M.Shapland

1461. ARTHROPOD-BORNE VIRUSES IN SOUTH-CENTRAL FLORIDA. J.R.Henderson, N.Karabatsos, A.T.C.Bourke, R.C.Wallis and R.M.Taylor: Amer. J. trop. Med. Hyg., 1962, 11, 800-810 (Dept. Epidemiol. and Publ. Hlth., Yale Univ. Sch. Med., New Haven, Conn., U.S.A.) An account is given of an ecological study carried out in Florida to determine the nature and distribution of arbor viruses.

A.A.Zimmerman

1462. ELECTRON MICROSCOPY OF NEUROTROPIC AFRICAN HORSE-SICKNESS VIRUS. A.Polson and D.Deeks: I. Hyg., Lond., 1963, 61, 149-153 (Virus Res. Unit, Cape Town Univ. Med. Sch., Cape Town, S. Africa) African horse-sickness virus was purified from infected mouse brain extracts by a combination of polyethylene glycol pptn., ultracentrifugation and zone electrophoresis. The purified material still contained normal brain components, but virus particles could be recognised. These were 70-80 mji diam., and they were estimated to have 92 rod-shaped sub-units radiating from a spherical body.

J.B. Derbyshire

1463. RECENT EPIDEMIOLOGICAL DATA ON INFECTIOUS HEPATITIS. C.Solt: Acta microbiol. Acad. Sci. hung., 1962, 9, 157-165 (State Inst. Hygiene, Budapest, Hungary) The present epidemiol. state, age specificity, relation between age sp. morbidity and seasonality and lethality data on infectious hepatitis in Hungary is discussed in detail.

S.Igali

1464. MEASLES IN NIGERIAN CHILDREN. A STUDY OF THE DISEASE IN WEST AFRICA. AND ITS MANIFESTATIONS IN ENGLAND AND OTHER COUNTRIES DURING DIFFERENT EPOCHS. D.Morley, M.Woodland and W.J.Martin: J. Hyg., Lond., 1963, 61, 115-134 (Wesley Guild Hosp., Illesha, W. Nigeria) A description of the clinical characteristics of measles in Nigeria.

J.B.Derbyshire

1465. PROPAGATION IN TISSUE CULTURE OF CYTOPATHIC AGENTS FROM PATIENTS WITH RUBELLA-LIKE ILLNESS. T.H.Weller and F.A.Neva: Proc. Soc. exp. Biol., N.Y., 1962, 111, 215-225 (Dept. Trop. Pub. Hlth., Harvard Sch. Pub. Hlth., Boston, Mass., U.S.A.) Propagation of viruses, isolated from urine and blood from patients with rubella-like illness, in primary human amnion cultures produced cytopathic changes characterised by aggregation of nuclear material and presence of inclusion bodies. It is suggested that these viruses may be responsible for a significant proportion of illnesses now clinically diagnosed as rubella.

M.M.Shapland

1466. RECOVERY OF RUBELLA VIRUS FROM ARMY RECRUITS. P.D.Parkman, E.L.Buescher and M.S. Artenstein: Proc. Soc. exp. Biol., N.Y., 1962, 111, 225-230 (Dept. Virus Dis., Walter Reed Army Inst. Res., Washington, D.C., U.S.A.) A virus recognised by its capacity to multiply in grivet monkey kidney cultures and to interfere in such cultures with subsequent multiplication of ECHO-11 virus, was isolated from army recruits with rubella, but rarely from those hospitalised at the same time or place with scarlet fever.

M.M.Shapland

1467. ISOLATION IN TISSUE CULTURE OF AN INTERFERING AGENT FROM PATIENTS WITH RUBELLA. J.A.Veronelli, H.F.Maassab and A.V.Hennessy: Proc. Soc. exp. Biol., N.Y., 1962, 111, 472-476 (Dept. Epidemiol., Sch. Pub. Hlth., Ann Arbor, Mich., U.S.A.) Agents interfering with the growth of ECH-11 virus in primary or continuous grivet monkey kidney cells were recovered from upper respiratory secretions of 7 rubella patients. Rise in the neutralising prop. of the sera obtained in the convalescent period as compared with the acute sera was a const. feature in all specimens tested.

M.M.Shapland

1468. INHIBITORY EFFECT OF (NH₄)₂SO₄ ON COLUMBI SK VIRUS PROPAGATION IN MOUSE ASCITES TUMOUR CELLS IN VITRO. E.Furusawa and W.Cutting: Proc. Soc. exp. Biol., N.Y., 1962, 111, 71-75 (Dept. Ueversity Microbiol., Stanford Univ., Calif., U.S.A.) Propagation of a haemaggl. [HA] pos. strain of virus was inhibited by (NH₄)₂SO₄ in vitro cultures of mouse ascites tumour cells. HA neg. strain was completely resistant in the same system.

M.M.Shapland

1469. VIRUS-CONTAINING LEUKOCYTES IN POLIOMYELITIS. E.Nelson, H.Hager and E.Kovács: Science, 1963, 139, 499-500 (Divn. Neurol., Univ. Minnesota Med. Sch., Minneapolis, Minn., U.S.A.) S.c. injn. in white mice of brain homogenate infected with MM strain of Columbia SK virus results in severe poliomyelitis in which cryst. aggregates of virus occur in polymorphonuclear w.b.c. in association with osmophilic granular structures which are occasionally membrane-bound. This suggests either a phagocytosis and segregation of virus by w.b.c. or a utilisation of the w.b.c. by the vH as a host cell for replication.

G.M.Lev

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1470. INTERFERING PROPERTIES OF SIMIAN VIRUSES.

G.Plummer: Brit. J. exp. Path.. 1963. 44, 58-65
(Wellcome Res. Labs., Beckenham, Kent, England)
Monkey kidney cultures were used to study production by 4 simian viruses of interferon and their sensitivity to interferon prep, from inactivated influenza A virus. Only strain SV 5 stim. interferon production. SV 5 and foamy virus were sensitive to interferon but SV 40 was insensitive.

D.L.Gardner

1471. ELECTRON MICROSCOPIC STUDIES ON DEVELOPMENT OF VESICULAR STOMATITIS VIRUS IN KB CELLS. M.Mussgay and J.Weibel: J. cell Biol.. 1963. 16. 119-129 (I.V.I.C., Dept. de Virol. Caracas, Venezuela)

The virus inoculum subjected to 12 Passages through KB cell cultures was added to the growth medium of 2-day old cell cultures containing $5 \times 10^6 \times 10^8$ cells per flask and incubated for 1 hr. The non-adsorbed virus was removed and cells were harvested 1, 4, 7, 10, 14 and 20 hr. after inocn. and centrifuged. The supernatant was assayed by the plaque test in chick embryos and electron micrographs of infected cells studied. After 10 hr. virus rods were observed attached to cytoplasmic membranes, inside vacuoles and on the surface membrane of the cells. The origin of these membranes remains obscure. Spherical particles possibly related to foci development were observed at these sites.

P.Barrow

1472. STRESS AND SUSCEPTIBILITY TO VIRAL INFECTION. I. RESPONSE OF ADRENALS. LIVER, THYMUS, SPLEEN AND PERIPHERAL LEUKOCYTE COUNTS TO SOUND STRESS. II. SOUND STRESSES AND SUSCEPTIBILITY TO VESICULAR STOMATITIS VIRUS.

M.M.Jensen and A.F.Rasmussen: J. Immunol.. 1963, 90, 17-20, 21-23 (Div. Virol., Dept. Infections Dis., Univ. California Med. Sch., Los Angeles, Calif., U.S.A.) I. Daily 3 hr. exposures to high-intensity sound induced adrenal hypertrophy in mice. Peripheral v.b.c. counts responded biphasically to this stressor, exhibiting a leucopenia during and a leucocytosis following the stress period on each day. Leucopenia was not seen in stressed adrenalectomised mice. n. The susceptibility of mice to intranasally inoculated virus was significantly increased by daily exposure to sound. Periods of high intensity sound (123 db). Adrenalectomised mice inoc. on the 2nd day of stress responded like manner. Animals inoc. before stress were more susceptible whereas those inoc. after were more resistant to virus than controls.

N.R.Ling

1473. EXPERIMENTAL INFECTION WITH RESPIRATORY Syncytial VIRUS IN SEVERAL SPECIES OF ANIMALS. J.V.Coates and R.M.Chanock: Amer. J. Hyg., 1962, 16, 302-312 (N.I.H. Pub. Hlth. Serv., Nat. Inst. Allergy and Inf. Dis., Bethesda, Md., U.S.A.)

was recovered from the upper part of the respiratory tract of ferrets, mink and a marmoset after intranasal inoculation of the A-1 strain. At least a 4-fold rise in either neutralising Ab, or both, in ferrets, guinea-pigs, AKR mice and chinchillas was seen.

P.J.Baron

1474. ENCEPHALOMYOCARDITIS [EMC] VIRUS AND ITS RNA: SEDIMENTATION CHARACTERISTICS.

J. SEDIMENTATION COEFFICIENTS OF ENCEPHALOMYOCARDITIS VIRUS AND ITS RNA. A.T.H.Burness, S. M. and F.W.Clothier. **H. SEDIMENTATION PROPERTIES OF INFECTIVE RNA EXTRACTED FROM ENCEPHALOMYOCARDITIS VIRUS.** L.Montagnier and

F.K.Sanders: Nature, Lond.. 1963. 197. 1177-1178. 1178-1181 (M.R.C. Lab., Carshalton, Surrey, England) I. S of EMC virus using haemagglutinin activity and virus infectivity as markers was 161-164 S. i of virus RNA using infectivity as marker was 37 S.

II. 32P-labelled EMC virus RNA was prep, by infecting ascites cells with EMC in the presence of [³²P]phosphate. Phenol extraction of purified virus from this system yielded an RNA which was infective as judged by ability to form plaques on agar suspensions of susceptible cells. The bulk of this infective RNA appears to consist of mol. each of which corresponds in size to the total RNA content of 1 virus particle.

J.R.Sargent

1475. PNEUMONIA VIRUS OF MICE [PVM] IN CELL CULTURE. R.W.Tennant and T.G.Ward: Proc. Soc. exp. Biol., N.Y.. 1962. 111, 395-398 (Dept. Microbiol., Georgetown Univ. Sch. Med. and Dent., Washington, D.C., U.S.A.)

Evidence has been presented for the growth of PVM in suckling hamster kidney cell culture monolayers. Tissue components which combine with the virus *in vivo* were not detected in culture fluids. Propagation in cell culture appears to free PVM from the Riley Agent present as a contaminant of the animal passaged virus.

M.M.Shapland

1476. ISOLATION OF A VIRUS FROM INFECTIOUS BOVINE KERATO-CONJUNCTIVITIS [IBKC]. J.A.Sykes, L.Dmochowski, C.E.Grey and W.O.Russell: Proc. Soc. exp. Biol., N.Y.. 1962. 111, 51-56 (Sect. Virol., Univ. Texas M.D., Tex., U.S.A.)

A DNA containing virus, cytotoxic to bovine and human cells, was isolated from biopsy material from eyes of cattle with IBKC. Per nasal installation of virus containing tissue culture fluids induced classical IBKC. Seria from animals with expt. induced disease neutralised the cytotoxic effect of the virus.

M.M.Shapland

1477. CYTOPATHIC EFFECT OF INFECTIOUS LARYNGOTRACHEITIS VIRUS IN CULTURES OF CHICKEN EMBRYO KIDNEY CELLS. A.M.Watrach and L.E. Hanson: Proc. Soc. exp. Biol., N.Y.. 1963. 112, 230-232 (Dept. Vet. Path. and Hyg., Coll. Vet. Med., Univ. Illinois, Urbana, Ill., U.S.A.)

Chicken embryo kidney cells cultured in Hank's BSS, lactalbumin hydrolysate and 20% sheep serum were infected with virus strain N71851 which derived from a chicken with laryngotracheitis in 1953. Five days after infection the treated cultures were showing necrotic cells with giant multinucleate cells present and many nuclear inclusion bodies. There was also some increase in cytoplasmic vacuolarity and granularity. The nuclear inclusion bodies were found to be DNA-containing material. Pycnosis was present also. Giant cells were found as early as 18 hr. after infection and the nuclear inclusions as early as 12 hr.

D.N.Wheatley

1478. EFFECT OF A MURINE HEPATITIS VIRUS ON THE LIVER. AN ANATOMIC AND HISTOCHEMICAL STUDY. W.A.Jones and R.B.Cohen: Amer. J. Path.. 1962. 41. 329-342 (Dept. Pathol., Harvard Med. Sch., Boston, Mass., U.S.A.)

Mice were inoc. with a homogenate of liver containing a virulent strain of mouse hepatitis virus. A reduction in the activity of most of the oxidative enzymes preceded histol. changes by 24 hr. Enzyme aberrations affected all lobules equally whereas histol. changes were of random distribution. Although the earliest histol. changes, foci of necroses involved both sinusoidal lining and hepatic cells it is thought that the initial site of virus attack is the Kuppfer cell.

D.G.Scott

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1479. MOUSE HEPATITIS VIRUS INFECTION AS A HIGHLY CONTAGIOUS, PREVALENT, ENTERIC INFECTION OF MICE. W.P.Rowe, J.W.Hartley and W.I.Capps: Proc. Soc. exp. Biol., N.Y., 1963, 112, 161-165 (Dept. HEW, Natl. Inst. Allergy and Infectious Dis., Bethesda, Md., U.S.A.) Mouse hepatitis virus could be demonstrated in faeces of weanling mice from infected mothers. Young mice in an animal house showed a higher mortality when expt. mice with hepatitis virus were also present. Hepatitis viral infections are highly contagious and can be transmitted by the faeces from infected mice very easily. D.N.Wheatley
1480. USE OF CENTRIFUGAL FORCE TO PROMOTE ADSORPTION OF MYXOMA VIRUS TO CELL MONOLAYERS. B.L.Padgett and D.L.Walker: Proc. Soc. exp. Biol., N.Y., 1962, 111, 364-367 (Dept. Med. Microbiol., Univ. Wisconsin Med. Sch., Madison, Wis., U.S.A.) Max. plaque-forming units of myxoma virus were obtained after centrifugation for 15 min. at 1900 g on to preformed monolayers of rabbit kidney and heart fibroblast cells. M.M.Shapland
1481. ACCENTUATION OF PLAQUES OF MYXOMA AND FIBROMA VIRUSES BY IMMUNE SERUM. M.S.Moore and D.L.Walker: Proc. Soc. exp. Biol., N.Y., 1962, 111, 493-497 (Dept. Med. Microbiol., Univ. Wisconsin Med. Sch., Madison, Wis., U.S.A.) Addition of sp. antiserum to the agar overlay enhances plaque development by 2 or 3 days and enables a count to be made on an unstained cell sheet. M.M.Shapland
1482. INDUCED LATENT INFECTION OF MONKEYS WITH VACUOLATING SV-40 PAPOVA VIRUS. VIRUS IN KIDNEYS AND URINE. A.Ashkenazi and J.L. Melnick: Proc. Soc. exp. Biol., N.Y., 1962, 111, 367-372 (Dept. Virol. and Epid., Baylor Univ. Coll. Med., Houston, Tex., U.S.A.) High titre SV-40 virus was isolated from the urine of green monkeys in the first 4 weeks of infection. Neutralising Ab were recovered from blood and urine late in the infection period. 3 to 8 months after infection, when there was no virus in urine, SV-40 was detected in kidney biopsies when grown as explants in tissue culture. M.M.Shapland
1483. DEFECTIVENESS OF ROUS SARCOMA VIRUS. H.Hanafusa, T.Hanafusa and H.Rubin: Proc. nat. Acad. Sci., Wash., 1963, 49, 572-580 (Virus Lab., Univ. California, Berkeley, Calif., U.S.A.) The high titre strain of Rous sarcoma virus is defective since it cannot generate the production of new infectious virus unless a helper virus such as Rous-associated virus is multiplying in the same cell. The ability to cause malignant transformation is expressed continuously and does not require the production of mature virus. Both the potential for virus production and the ability to transform cells are perpetuated in a cell line by hereditary transmission. J.R.Sargent
1484. PROPERTIES OF BACTERIOPHAGE DERIVED FROM E. COLI K235. M.A.Jesaitis and J.J.Hutton: J. exp. Med., 1963, 117, 285-302 (Rockefeller Inst. for Med. Res., New York, U.S.A.) A bacteriophage was isolated from the colicinogenic strain of *E. coli* K235 and characterised. It is related to the virus morphol., serol. and, possibly, genetically, and bears no relationship to the T-even phages. It was shown that the phage and colicine K differ both in their host range and in their immunol. specificity, and that the prophage does not

induce colicinogenesis in its host bacterium. It was concluded that the formation of colicine K and the phage in *E. coli* K235 are controlled by different genetic determinants.

H.E.Hjones

1485. EFFECTS OF MITOMYCIN AND ALPHA RAYS ON THE CAPACITY OF E. COLI B FOR PHAGE T3.

F.Hercík: Folia biol., Praha, 1963, 9, 42-50 (Inst. Biophysics, Czech. Acad. Sci., Brno, Czechoslovakia)

The phage-forming capacity of *E. coli* was studied following the action of a-ray irradiation upon cultures, with prior and later treatment with mitomycin. Mitomycin reduces the capacity for phage production, the decrease being proportional to the time the *E. coli* is left in contact with mitomycin. Capacity is reduced at a greater rate when mitomycin is added after irradiation, but the 2 factors do not act synergistically since the combined effects are less than the summed effects of the 2 separate treatments. It is probable that changes in DNA of the *E. coli* caused by mitomycin and irradiation differ qual.

M.S.Laverac*

1486. EFFECT OF HEAT ON THE ABILITY OF A HOST STRAIN TO SUPPORT THE GROWTH OF A STAPHYLOCOCCUS PHAGE. E.A.Asheshov and M.P.Jevons:

J. gen. Microbiol., 1963, 31, 97-107 (Staphylococc* Ref. Lab., Central Public Hlth. Lab., Colindale, London, England) A group of epidemiol. related *Staphylococcus aureus* strains became sensitive to typing phage 187 after holding the inocula at 56° for 2 min. TW strains were lysogenic and the interference of the carried phage, phage 5504', against phage 187 was overcome w. the heat treatment. Phage 187 grown in heated cocci was capable of lysing unheated lysogenic organisms and multiplication of phage 5504' appeared to be necessary for multiplication of phage 187. U.v. irradiation had a similar but lesser effect than heating.

K.BreV

1487. SPONTANEOUS LYSIS IN LYSOGENIC STAPHYLOCOCCI. E.D.Rosenblum and M.B.Laughlin: Proc. Soc. exp. Biol., N.Y., 1963, 112, 156-158 (Dept. Microbiol., Univ. Texas, Southwestern Med. Sch., Dallas#, Tex., U.S.A.)

The differential between free phag in slowly lysogenic cultures when plated for its plaque-forming capacity with spun (2000 r.p.m. for 10 min.) cultures when staphylococci were used has been studied. Plating out over time on streptomycin or penicillin medium with antibiotic resistant strains effected the plaque-forming freq. It was considered that the increas¹ in cell concn. with time caused considerable readsopt¹ of phage which became inactive in this state.

D.N. Wheat*

1488. ISOLATION AND SOME CHARACTERISTICS OF BACILLUS SUBTILIS PHAGES WITH TRANSDUCING ACTIVITY. G.Ivánovics and K.Csiszár: Acta microbiol. Acad. Sci. tang., 1962, 9, 209-218 (Inst. Microbiol., Univ. Med. Sch., Szeged, HungaT)

Temperate phages of *B. subtilis* were isolated from soil samples by means of the authors' streptomycin method and prototrophy was transduced to some auxotrophs. Phages with marked temperate character and with transducing activity possessed a poor plaque forming ability on complete media and therefore their assay could be carried out effectively on a synthetic medium contain[^] glutamic acid and glycerol.

S. K.

1489. INCREASE OF PLANT VIRUS INFECTION BY MAGNESIUM IN THE PRESENCE OF PHOSPHATE.

C.L.Kado: Nature, Lond., 1963, 197, 925-926 < >
Plant Pathol., Univ. California, Berkeley, Calif. u*

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The infectivity for their host plants of alfalfa mosaic, cucumber mosaic, tobacco necrosis, tobacco rattle and tobacco mosaic viruses was decreased by Mg alone, but increased by phosphate; the magnitude of the phosphate effect was significantly increased by Mg, the effect being greater for the less stable viruses. K, Na and Ca ions had no effect.

G.M.Lewis

1490. SPECIFIC LIPIDS PRODUCED BY SUGAR BEET INFECTED WITH YELLOWING VIRUSES. V.H.Booth and G.E.Russell: Nature, Lond., 1963, 197, 1328-1329 (Dunn Nutr. Lab., Milton Rd., Cambridge, England) Two unrelated viruses producing yellowing of sugar beet may be differentiated by chromatography of the lipids found in the leaves; one virus produced sp. fluorescing substances, the other, pigments.

G.M.Lewis

1491. RAPID DIAGNOSIS OF NECROTIC RINGSPOOT VIRUS INFECTION OF STONE FRUITS BY SEROLOGICAL MEANS. M.H.V.Van Regenmortel and D.J.Engelbrecht: S. Afr. J. agric. Sci., 1962, 5, 607-614.

I.A.B.S.

1492. AGROPYRON MOSAIC AS A DISEASE OF WHEAT IN CANADA. J.T.Slykhuis: Canad. J. Bot., 1962, 40, 1439-1447 (Plant Res. Inst., Res. Branch, Canada Dept. Agric., Ottawa, Canada) Wheat is more susceptible to manual inocn. with agropyron mosaic virus than Agropyron repens or any other grass seedlings. Symptoms appear in 6 days at 20° and 25° and are most pronounced at 25°. No symptoms develop on wheat kept at 10° or 35° for 19 days, but sap from these plants is infectious. Field tests show that the virus can be perpetuated on immature wheat. No natural vector of the virus has been determined.

A.Meany

1493. INDICATION OF SHOESTRING VIRUS IN THE LOWBUSH BLUEBERRY VACCINIUM ANGUSTIFOLIUM. C.L.Lockhart and I.U.Hall: Canad. J. Bot., 1962, 40, 1561-1562 (Res. Sta., Canada Dept. Agric., Kentville, Nova Scotia, Canada) A note.

A.Meany

1494. TIME REQUIRED FOR SYMPTOM APPEARANCE OF POTATO LEAF ROLL AND TURNIP LATENT VIRUSES IN PHYSALIS FLORIDANA INOCULATED BY APHIDS. J.P.Mackinnon and M.C.Clark: Canad. J. Bot., 1962, 40, 1562-1565 (Res. Sta., Canada Dept. Agric., Fredericton, New Brunswick, Canada) A note.

A.Meany

YEASTS AND FUNGI

1495. LIPID FORMATION IN CRYPTOCOCCUS TERMOOLUS. V. OXIDATION OF FATTY ACIDS BY CELL SUSPENSIONS. T.A.Pedersen: Physiol. Plant, 1963, 16, 151-166 (Dept. Microbiol., Agr. Coll. of Norway, Vollebekk, Norway) All the acids tested were oxidized by V. ²east though at varying rates and to different degrees. Chain length of the acid was most important in determining oxidation patterns. Addition of NH_4^+ increased O₂ uptake in presence of fatty acids. DNP 10-4M increased the oxidation rate of fatty acids.

L.D.Philip

1496. ISOLATION OF HISTOPLASMA CAPSULATUM AND MICROSPORUM GYPSEUM FROM SOIL AND BAT GUANO IN PANAMA AND THE CANAL ZONE.

R.L.Taylor, M.H.Shacklette and H.B.Kelley: Amer. J. trop. Med. Hyg., 1962, 11, 790-795 (Mycology Section, Middle America Res. Unit, Balboa Heights, Canal Zone) Eight potential areas of histoplasmosis endemicity in the Republic of Panama and the Canal Zone were located by the isolation of H. capsulatum from soil or bat guano.

A.A.Zimmerman

1497. NATURALLY ACQUIRED HISTOPLASMOSIS IN THE MAMMALS OF THE PANAMA CANAL ZONE.

R.L.Taylor and M.H.Shacklette: Amer. J. trop. Med. Hyg., 1962, 11, 796-799 (Mycology Section, Middle America Res. Unit, Balboa Heights, Canal Zone)

The endemicity of 2 areas in the Canal Zone, where clinical cases of histoplasmosis had occurred, was established by recovery of Histoplasma capsulatum from animals with naturally acquired histoplasmosis. H. capsulatum was isolated from 12 spiny rats (Proechimys semispinosus). 7 common opossums (Didelphis marsupialis) and 4 four-eyed opossums (Philander o. fuscogriseus).

A.A.Zimmerman

1498. INFECTION WITH HISTOPLASMA DUBOISII IN DIFFERENT EXPERIMENTAL ANIMALS. M.Okudaira and J.Schwarz: Mycologia, 1961, 53, 53-63 (Clin. Lab., Jewish Hosp., Cincinnati, Ohio, U.S.A.)

Expt. infection with H. duboisi in animals, shows that this sp. may possess biol. and morphol. prop. different from H. capsulatum.

J.G.Brown

1499. GENUS CANDIDA BERKHOUT. I. TYPING OF CANDIDA ALBICANS (ROBIN) BERKHOUT.

A.Kockova-Kratochvilova, J.Sandula and L.Hronska: Folia microbiol., 1963, 8, 109-116 (Chem. Inst., Slevah Acad. Sci., Czechoslovak Acad. Sci., Bratislava, Czechoslovakia) 111 strains isolated from various sources and originally identified as C. albicans are described. These strains have been typed by assessing the average size of blastopore cells, by detection of chlamydospores, by tests on agar with phosphomolybdic acid and by serol. tests.

J.R.Sargent

1500. EFFECTS OF VISIBLE LIGHT ON RESPIRATION IN YEAST. P.Matile: Ber.schweiz. bot. Ges., 1962, 72, 236-261.

The effect of light on respiration of yeast cells and isolated mitochondria maintained under aerobic conditions was studied. Endogenous respiration was increased by light but O₂ absorption was inhib. after 1 hr. of illumination and blocked entirely by long exposure to light. Glucose respiration was inhib. by light, but CO₂ output was not affected. The succinoxidase activity of the mitochondria was inhib. The light effect was independent of temp.

M.Blandin

1501. ZINC TOXICITY IN BREWER'S YEAST.

I.J.Witham: Nature, Lond., 1963, 197, 1113 (Dept. Biochem., Univ. Western Australia, Nedlands, Perth, Australia) Saccharomyces carlsbergensis grown in media containing toxic concn. of ionic Zn shows a significant reduction in O₂ uptake, aerobic and anaerobic fermentation, and cytochrome oxidase activity, indicating interference by the Zn with the levels of haem enzymes.

G.M.Lewis

1502. OSMOTIC BEHAVIOUR OF S. CEREVIAE AS AFFECTED BY BIOTIN DEFICIENCY. A.H.Rose:

J. gen. Microbiol., 1963, 31, 151-160 (Dept. Bacteriol., King's Coll., Univ. Durham, Newcastle-upon-Tyne, England) The extinctions of dilute suspensions of S. cerevisiae in phosphate buffer containing

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different NaCl concn. were followed as an index of osmotic behaviour. The extinction of biotin-optimal yeast suspensions increased as NaCl concn. increased to 1^o5M but yeast grown in unsupplemented or aspartate or olate + aspartate supplemented biotin-deficient medium showed a decrease in extinction. Yeast grown in oleate-supplemented biotin-deficient medium showed osmotic behaviour resembling biotin optimal yeast in NaCl concn. up to 0^o7M. The differences in behaviour were due to increased permeability to Cl⁻, accompanied by increased permeability to H₂PO₄⁻ and high mol. wt. solutes.

K.Brew

1503. CHANGES IN THE RATE OF FERMENTATION OF MALTOSE DURING PROPAGATION OF INDUSTRIAL BAKERS' YEAST. K.Beran, J.Huba and J.Hospodka: *Folia Microbiol.*, 1963, 8L 93-101 (Dept. Tech. Microbiol., Inst. Microbiol., Czech. Acad. Sci., Prague, Czechoslovakia) Yeast cells show a relatively constancy to ferment glucose, but maltase activity as well as the character of anaerobic fermentation of maltose undergo changes depending on the character of cultivation. Maltase activity in cell-free prep. shows an initial drop and then is maintained fairly const. throughout growth cycle until termination of growth when a rapid drop occurs.

J.R.Sargent

1504. NEW METHOD FOR QUANTITATIVE DETERMINATION OF MEMBERS OF THE GENUS SACCHAROMYCES IN MIXTURES WITH OTHER YEAST GENERA.

L.Silhankova: *Folia Microbiol.*, 1963, 8, 102-108 (Dept. Biol. Sci. Coll. Chem. Technol., Prague, Czechoslovakia) The method is based on the relatively high resistance of Saccharomyces to phenylhydrazine. The method can be used for detecting Saccharomyces individuals in cannery or wine-making raw materials and products, for purity control of production and collection strains of yeast and for detecting contamination with Saccharomyces spp. during fodder yeast production.

J.R.Sargent

1505. VARIANT STRAIN OF SACCHAROMYCES CEREVIAE INDUCED BY PALUDRINE. C.V.Pichappa and E.R.B.Shanmugasundaram: *Ann. Biochem.*, 1963, 23, 75-80 (Univ. Biochem. Lab., Madras, India)

Three variants of S. cerevisiae resistant to higher amounts of paludrine were obtained by growing them in the presence of the drug. One of them was stable though its resistance to the drug was only about twice that of the parent strain. The prop. of stable variant bore close resemblance to those of the parent culture.

K.Jones

1506. ONTOGENY OF APOTHECIA OF PYRONEMA DOMESTICUM. E.J.Moore: *Amer. J. Bot.*, 1963, 50, 37-44 (Plant Pathol. Dept., Cornell Univ., Ithaca, N.Y., U.S.A.) Investigation of P. domesticum

showed that a single hyphal strand produces a cluster of antheridia and ascogonia; each pair of like or unlike sex differentiation, and each cluster forms one apothecium. Nuclear migration from the antheridia follows plasmogamy and an ascogenous system develops from each ascogonium. Sterile hyphae arise from the stalk cells supporting the ascogonia and antheridia. Proliferation of all structural elements brings about apothecial expansion. Comparisons are made with P. omphalooides.

T.H.Thomas

1507. BEAUVERIA TENELLA. [FUNGUS]. T.C.Cordon and J.H.Schwartz: *Science*, 1962, 138, 1265-1266 (U.S. Dept. Agric, Philadelphia, Pa., U.S.A.) B. tenella, an insect pathogen, grows well and sporulates

freely in submerged culture. Enzymes that loosened bovine hair that was found in broth cultures were not produced in the presence of chitin, and substitution of peptone broth for peptone-glucose broth did not increase their concn. Under certain conditions, oxalic acid was the main product in the peptone medium. G.M.Lewis

1508. LIGHT AND THE ASEXUAL REPRODUCTION OF PILOBOLUS. R.M.Page: *Science*, 1962, 138, 1238-1245 (Dept. Biol. Sci., Stanford Univ., Calif., U.S.A.) The responses of Pilobolus to light, as well as its specialised nutrition, are considered as manifestations of the adaptation of this fungus to its environment.

G.M.Lewis

1509. EFFECT OF TEMPERATURE ON ASCOGONIAL AND PERITHECIAL DEVELOPMENT IN CERATOCYSTIS FAGACEARUM. F.W.Cobb, jun., C.L.Fergus and W.L. Stambaugh: *Mycologia*, 1961, 53, 91-97 (Dept. Bot. and Plant Path., Pennsylvania State Univ., University Park, Pa., U.S.A.) C.fagacearum colonies grown at 15°, 20° and 27° produced significantly fewer perithecia than at 24°. No ascogonial formation or perithecia than at 24°. No ascogonial formation or perithecial development occurred at 1Cf or 3(f). Optimum temp. for conidiation is 20°. Temp. affected the length and width of perithecial necks.

J.G.Brown

1510. FUNGAL LUMINESCENCE. M.D.Berliner:

Mycologia, 1961, 53, 84-90 (AVCO, Wilmington, Mass., U.S.A.) Mature cultures of Panus stipticus kept at 10° and 40° for 2 weeks showed some luminescence. Optimum range for light emission was 18°-26°. Cultures exposed to X-irradiation of 0^o3 r-20 r showed a large increase in luminescence intensity in 2-3 hr., whilst those exposed to 100 r-5000 r showed a sharp increase in 30 sec.-3 min.

J.G.Brown

1511. MORPHOLOGICAL RESPONSE OF TRICHOPHYTON MENTAGROPHYTES TO METHIONINE. D.T.Klein:

J. gen. Microbiol., 1963, 31, 91-96 (Dept. Microbiol. and Immunol., Einstein Coll. Med., N.Y., U.S.A.) Granular T. mentagrophytes cultures changed their growth habit when grown on a medium containing the 19 L-amino acids in hydrolysed casein as source of N. The response was not shown when methionine was omitted. Pleomorphic cultures of T. mentagrophytes grown on this medium were not modified. The methionine effect was used successfully to differentiate between normal granular cultures and pleomorphic cultures, and atypical pleomorphic isolates could be classified as metabolically granular or pleomorphic.

K.Brew

1512. COEXISTENCE OF PULMONARY MYCOSIS AND AMOEBOIC ABSCESS OF THE LIVER. REPORT OF 6 AUTOPSY CASES. A Gonzalez-Mendoza, H.Brandt and A.Gonzalez-Licea: *Amer. J. trop. Med. Hyg.*, 1962, 11, 786-789 (Unidad de Patol., Fac. de Med. U.N.A.M., Hosp. General, Mexico, D.F., Mexico)

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Autopsy and clinical findings on 6 cases of pulmonary aspergillosis associated with hepatic amoebic abscess are reviewed. In no case was aspergillosis suspected on clinical grounds. The possible mechanisms involved in this uncommon association are discussed. A brief review of the literature concerning pulmonary aspergillosis is given¹

A.A.Zimmerman¹

OTHER MICRO-ORGANISMS

(Some abstracts on Protozoa, Diatoms, etc. may be found in the Experimental Zoology and Botany Sections)

1513. EPIDEMIOLOGY OF TOXOPLASMOSIS. D.G.Fleck: J. Hyg., Lond., 1963, 61, 61-65 (Publ. Hlth. Lab., Swansea, Wales) Serum samples from normal adults and from suspected toxoplasmosis patients were tested for toxoplasma Ab by the dye test. Only the patients with choroiditis had higher titres than normal. The no. of pos. sera from patients with cat-scratch fever was not significantly greater than in the normal group.

J.B.Derbyshire

1514. ELECTRON MICROSCOPE STUDIES OF REPRODUCING AND INTERKINETIC TOXOPLASMA. M.A. Gavin, T.Wanko and L.Jacobs: J. Protozool., 1962, 9, 222-234 (Ophthalmol. Branch, Nat. Inst. Neurol. Dis. and Blindness, N.I.H., Bethesda, Md., U.S.A.)

The reproduction of Toxoplasma gondii obtained 9 days after i.p. inocn. of mice, was investigated in osmium fixed and sedimented mouse peritoneal exudate. T.gondii appeared to be an intracellular parasite and its re-production could occur in one of 3 ways. Firstly there is a schizogonic cycle, with at least 4 progenies delineated within a rosette-shaped, multi-nucleated Toxoplasma cell. The second form is a special type of schizogony, where only 2 merozoites are produced within 1 parent. It would appear that binary fission can also occur. From the investigation it is concluded that the genus Toxoplasma belongs to the class Sporozoa.

R.J.Walker

1515. ELECTRON MICROSCOPE STUDY OF TOXOPLASMA CYSTS IN MOUSE BRAIN. T.Wanko, L.Jacobs and M.A.Gavin: J. Protozool., 1962, 9, 235-242 (Ophthalmol. Branch, Nat. Inst. Neurol. Dis., N.I.H., Bethesda, Md., U.S.A.) Toxoplasma aggregates in sub-acute and chronically infected mouse brain were studied with special regard to interparasitic relationships, encapsulating wall formation and host-parasite interaction. The parasites within a cyst are separated by an ^paque substance which appears to be a component of the ^st wall. The cyst wall also consists of vesicular and membranous structures which it is suggested are derived from the endoplasmic reticulum of the host wall. The cyst wall is however independent of the host cell membrane.

R.J.Walker

1516. TRYPANOSOMA EVANSI INFECTION IN GOATS. * EXPERIMENTAL INFECTION. J.Samaddar and B.S. 2nd II. HAEMATOLOGICAL STUDIES. J.Samaddar, B-S.Gill and D.K.Sen. III. BIOCHEMICAL STUDIES. Ifamaddar: Indian J. Microbiol., 1962, 2, 63-66, J⁶;70, 71-74 (Indian Vet. Res. Inst., Izamagar, U.P., India)

Developed a mild and cryptic form of surra accompanied by intermittent fever. Infection could be detected by mouse blood tests but rarely by microscopic examination of the blood.

?: evansi infection in goats is accompanied by changes involving microcytic hyperchromic anaemia and leucopenia. Neutrophils and monocytes increased.

in progressive decrease in total serum protein accompanied T. evansi infection in goats. Albumin/globulin ratio increased with rise in temp. The cholesterol level in serum fell progressively.

G.M.Lewis

1517. LEKMANIASIS IN THE SUDAN REPUBLIC. VI. CLINICAL AND LABORATORY ASPECTS OF KALA-AZAR IN HOSPITALISED PATIENTS FROM UPPER NILE PROVINCE. P.F.D. Van Peenen and T.P.Reid, jun.: Amer. J. trop. Med. Hyg., 1962, 11, 723-730 (Dept. Epidemiol. and Biostatistics, U.S. Naval Med. Res. Unit No.3, Cairo, U.A.R.) Clinical and laboratory findings in 30 autochthonous cases of kala-azar from an area in the centre of Upper Nile Province, Republic of Sudan, are presented. The value of culture techniques and of bone marrow puncture in the diagnosis of the disease is emphasised. In general, kala-azar in this area appears to resemble visceral leishmaniasis as encountered elsewhere: however, a case fatality rate of over 20% apparently due to complications in hospitalised patients, the absence of leishmania in the peripheral blood, and the finding of patients from all age groups is contrary to the usual pattern of the disease in other countries. The significance of these findings is discussed.

A.A.Zimmerman

1518. MALARIA PARASITES: FLUORESCENT ANTIBODY TECHNIQUE FOR TISSUE STAGE STUDY.

R.L.Ingram and R.K.Carver: Science, 1963, 139, 405-406 (Lab. Parasite Chemother., Nat. Inst. Allergy and Inf. Dis., Chamblee, Ga., U.S.A.) Tissue forms of Plasmodium gallinaceum and P.cynomolgi B and PT strains were stained by the fluorescent Ab technique using immune sera labelled with fluorescein isothiocyanate. The technique permits a study of the immunol. relationships among tissue stages of malaria parasites and of the cycle in mammalian hosts. Previously undescribed exoerythrocytic stages of simian malaria in monkeys were observed by this method.

G.M.Lewis

1519. PARASITOLOGICAL SURVEYS ON INDIAN RESERVATIONS IN MONTANA, S. DAKOTA, NEW MEXICO, ARIZONA AND WISCONSIN. D.M.Melvin and M.M. Brooke: Amer. J. trop. Med. Hyg., 1962, 11, 765-772 (Dept. Hlth., Educn. and Welfare, Atlanta, Ga., U.S.A.) The results of stool examinations from 907 and anal swabs from 1324 Indians on 5 reservations in the U.S. are discussed. 69% of the Indians examined were pos. for one or more organisms. No clear-cut correlation could be found with environmental conditions.

A.A.Zimmerman

1520. PARASITIC INFECTION IN RELATION TO ANAEMIA AND STOMACH ACID VALUES IN THE NEGROID POPULATION OF CURACAO. B.Vinke and W.Jansen: Amer. J. trop. Med. Hyg., 1962, 11, 781-785 (Dept. Int. Med., St. Elisabeth Hosp., Curacao)

The highest rate of parasitic infection is in the immigrant negroes whilst the immigrant whites have the highest rate of pathogenic intestinal bacilli. In the indigenous groups anaemia is more prevalent among the poor.

A.A.Zimmerman

AGENTS ACTING AGAINST MICRO-ORGANISMS

(See also Pharmacology)

ANTIBIOTICS AND CHEMOTHERAPY

1521. MODIFIED RAPID PLATE METHOD FOR DETERMINING THE ANTIBIOTIC SENSITIVITY OF BACTERIA. J.M.Moses, B.N.Joshi, V.H.Kalgi and

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R.K.Gadgil: Indian J. Microbiol., 1962, 2, 58-62
 (Dept. Patbol., Grant Med. Coll., Bombay, India)
 The method uses a mixture of Methylene Blue and Azure I dyes. Tests using penicillin, streptomycin, tetracycline, chlortetracycline and chloromycetin and 6 different bacteria gave better results than the standard disc agar diffusion method.

CM.Lewis

1522. PENICILLIN THERAPY OF EXPERIMENTAL STAPHYLOCOCCAL SEPTICAEMIA IN MICE EXPOSED TO COLD. J.H.Jones and P.H.Campbell: J. Path. Bact., 1962, 84, 433-437 (Path. Dept., Queen's Univ., Belfast, N. Ireland) Male VSBS strain mice are inj. i.v. with Staphylococcus aureus (PS/5 strain). Doses of penicillin ordinarily effective in controlling the resulting septicaemia are ineffective following intermittent exposure of the mice to 2-4°. In vitro studies show that low incubation temp. (less than 34°) diminish the effect of penicillin in S. aureus cultures but potentiate that of tetracycline.

D.Murray

1523. IN VITRO ACTIVITY OF STAPHYLOMYCIN. SPECTRUM, ROUTINE SENSITIVITY TESTS, AND CROSS-RESISTANCE. V.F.Thomsen: Acta path. microbiol. scand., 1963, 57, 120-128 (Pneumococcus Dept., Statens Seruminst., Copenhagen, Denmark) The new antibiotic staphylomycin is produced by a sp. related to Streptomyces virginiae. It is closely related to oleandomycin. The in vitro activity of staphylomycin was determined against 175 strains belonging to 19 different genera. The inhibitory concn. against Staphylococcus pyogenes was about 0.2 µg./ml. Staphylomycin affects almost exclusively the Gram-pos. bacteria and is particularly active against Gram-pos. cocci. No cross-resistance of staphylomycin has been demonstrable with penicillin G, tetracyclin, chloramphenicol and erythromycin.

LFriedmann

1524. ANTIGENIC VARIATION, VIRULENCE, MOTILITY AND POPULATION STUDY OF CHLORAMPHENICOL RESISTANT AND SENSITIVE STRAINS OF SALMONELLA THYPHI. I.S.Mathur, S.B.Misra, S.Ghatak and S.K.Gupta: Indian J. exp. Biol., 1963, 1, 70-75 (Central Drug Res. Inst., Lucknow, India) Chloramphenicol resistance has been developed, on gradient plates of Szybalski in a multi-step fashion, in 5 standard strains of S. typhi. Watson V strain loses its motility permanently in the presence of 250-300 µg./ml. of chloramphenicol. Chloramphenicol resistance developed is unstable as shown by growing resistant mutants in drug-free nutrient broth and keeping them at 4°. Back mutation to sensitivity occurs rapidly in the chloramphenicol resistant variant of strain Ty-2. No difference is noticed in virulence of chloramphenicol resistant mutants and their sensitive parents. Antigenic variations is present in resistant mutants even after 2 passages in drug-free heart infusion agar as shown by Ouchterlony and agar-gel electrophoresis techniques. *

1525. ANTIBIOTIC ACTIVITY OF MICRO-ORGANISMS ISOLATED FROM THE RUMEN. O.Spalla: G. Microbiol., 1961, 9, 221-225 ('Farmitalia', Milano, Italy) Out of 500 micro-organisms isolated from the rumen of 6 animals, 58% were found to produce antibiotic substances that were active against one or several of 11 bacterial spp. selected from widely different genera for screening purposes. (Italian)

G.N.Godson

1526. ANTIBIOTIC ACTIVITY OF AMINOSIDIN SUL-

PHATE. B.Scarpa: G. Microbiol., 1961, 9, 213-220 (1st. microbiol., Univ., Cagliari, Italy) 140 strains of staphylococci, isolated from pathol. material and human carriers, were screened for resistance to various antibiotics. When tested against 60 µg./ml. of antibiotic, in vitro, 11.6% of the strains were resistant to chloramphenicol, 10.4% to streptomycin, 26.1% to penicillin and none against aminosidin. (Italian)

G.N.Godson

1527. COLKTIN (COLISTINMETHANESULPHONATE) IN EXPERIMENTAL SYPHILIS. J.W.Clark and B.B.Brown: Brit. J. vener. Dis., 1963, 39, 28-29. I.m. injn. of colistinmethanesulphonate in aq. soln. every 8 hr. for 6 days in doses of 1, 5 and 10 mg./kg. daily had no effect on primary rabbit syphilis.

R.R.Willcox

1528. INVESTIGATION OF SUBMERGED PRODUCTION OF THE ANTIBIOTIC CYANEIN. V.Betina, P.Nemec and H.Strmenova: Folia Microbiol., 1963, 8, 125-127 (Dept. Technical Microbiol. and Biochem., Fac. Chem., Slovak Coll. Technol., Bratislava, Czechoslovakia) Penicillium cyaneum S-II produces cyanein satisfactorily even under submerged conditions of cultivation. Semi-synthetic media containing molasses and coin-steep were less suitable for production than synthetic media containing trace elements.

J.R.Sargent

1529. GLUCOSE METABOLISM OF STREPTOMYCES RIMOSUS. I.Horváth and A.Szentirmai: Acta microbiol. Acad. Sci. hung., 1962, 9, 105-11G (Dept. Microbiol., Res. Inst. Pharm. Industry, Budapest, Hungary) Investigations of intermediary metabolism of glucose showed that loss of oxytetracycline production in S.rimosus is closely connected with decrease of activity "5F" the hexose monophosphate shunt and increase of the Embden-Meyerhof pathway. The active acetate formed from pyruvic acid presumably plays an important role in the production of oxy tetracycline.

S.Igali

1530. SYNTHESIS AND ANTIBACTERIAL ACTIVITY OF N⁴-(L-VALYL-L-VALYL)SULPHANILAMIDE AND ANALOGUES. S.Shankman, S.Makineni and V.Gold: Arch. Biochem., 1963, 100, 431-435 (Pasadena Fdn. Med. Res., Pasadena, Calif., U.S.A.) N⁴-(L-valyl-L-valyl)sulphanilamide inhib. growth of Pediococcus cerevisiae which was not inhib. by sulphamamide. The mode of action appeared to differ from that of sulphamides. Similar findings were obtained with Lactobacillus plantarum, L. casei and Leuconostoc mesenteroides.

B.M.Stevens

1531. EFFECT OF PUROMYCIN ON THE REPLICATION OF WESTERN EQUINE ENCEPHALITIS [WEE] AND POLIOMYELITIS VIRUSES. E.Wecker: Nature, Lond., 1963, 197, 1277-1279 (Wistar Inst. Anat. and Biol., Philadelphia, Pa., U.S.A.) Puromycin inhibits formation of infectious viral RNA in HeLa cells infected with polio and WEE viruses. Removal of puromycin from infected cells results in rapid synthesis of viral RNA without a lag phase. It is indicated that HeLa cells can synthesize viral RNA without prior synthesis of new proteins.

J.R.Sargent

1532. TRIACETYLOLEANDOMYCIN (EVRAMYCIN) IN LYMPHOGRANULOMA INGUINALE. J.L.Fluker: Brit. J. vener. Dis., 1963, 39, 24-27. Thirteen patients with lymphogranuloma inguinale were treated with tri-acetyloleandomycin, in most cases with 250 mg. 4 times daily for 10 days. The results were very good or excellent in 8 cases, good or improved in 3, while in 2 cases no response was noted.

R.R.Willcox

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1533. TROBICIN (ACTINOSPECTACIN) IN NON-GONOCOCCAL URETHRITIS. R.R.Willcox: Brit. J. vener. Dis., 1963, 39, 21-23. Of 30 patients given single injn. of 1-4 g. Trobicin alone 27 were followed and there were 16 recurrences (59.2%) within 3 months. Of 42 patients given Trobicin combined with sulphadiazine there were 13 recurrences (38%) within 3 months. The drug did not appear to have any particular activity in non-gonococcal urethritis. R.R.Willcox

1534. CHANGES IN INTRACELLULAR CONSTITUENTS OF CANDIDA ALBicans ON NYSTATIN AND AMOPHOTERICIN B TREATMENT. A.Ghosh and J.J.Ghosh: Ann. Biochem., 1963, 23, 113-121 (Dept. Appl. Chem., Univ. Coll. Sci. Technol., Calcutta, India) Lower concn. of nystatin and amphotericin B acted as fungistatic and higher concn. as fungicidal, higher concn. reducing the intercellular level of free metabolic pool. 13-20% of the protein content and 28-30% of the RNA content decreased, while that of DNA remained unaffected. The significance of the findings is discussed. K.Jones

1535. INHIBITORY ACTIVITY ON YEASTS OF FLAVOFUNGIN AND DESERTOMYCIN. L.Ferenczy, J.Zsolt and J.Uri: Acta microbiol. Acad. Sci. hung., 1962, 9, 183-187 (Inst. Plant Physiol., Univ. Szeged, Hungary) Flavofungin inhib. completely the growth of 50 yeast strains at a concn. of 50 µg./ml. The inhibitory effect of desertomycin was considerably weaker. Both antibiotics are produced by Streptomyces flavofungini. S.Igali

OTHER AGENTS

1536. ANTIBACTERIAL ACTION OF HUMAN SALIVA. III. CO-FACTOR REQUIREMENTS OF A LACTOBACILLUS BACTERICIDIN. BJ.Zeldow: J. Immunol., 1963, f0. 12-16 (Sch. Dent., Univ. Washington, Seattle, Washn U.S.A.) The co-factor necessary for activation of a salivary bactericidin active against Lactobacillus acidophilus ATCC 4357 was identified both in vitro and in vivo as CNS-. Although I" in sufficient concn. would also substitute for the co-factor the amount required was incompatible with the concn. found in saliva. N.R.Iing

1537. INHIBITORY EFFECT OF SIMPLE ALIPHATIC AMINES ON INFLUENZA VIRUS IN TISSUE CULTURE. E.M.Jensen and O.C.Liu: Proc. Soc. exp. Biol., N.Y., 1963, 112, 456-459 (Smith Kline and French Labs., Res. and Develop. Div., Philadelphia, Pa., U.S.A.) The effects of various aliphatic amines were studied on growth of influenza virus in dog kidney cells in tissue culture. The most effective compounds were n-propylamine and tert. butylamine. The activity is often masked by toxicity of the substance. It is suggested that the amines behaved in a similar fashion to lumecamycin. D.N.Wheatley

1538. MECHANISM OF ACTION OF INTERFERON. H.B. Levy, L.Snellbaker and S.Baron: Life Sci., 1963, No. 3, 204-209 (Lab. Biol. Viruses, Nat. Inst. Allergy and Infec. Dis., U.S. Publ. Hlth. Serv., Bethesda, Md., U.S.A.) Interferon exerted an inhibitory action on incorporation of pHLiridine into rapidly labelled RNA in

chick embryo fibroblast cells infected with Sindbis virus. Some results of the studies on the effect of interferon on uninfected cell metabolism are also reported, and possible mechanisms for its action are discussed. K.Jones

1539. CYTOCHEMICAL ASSAY OF INTERFERON PRODUCED BY DUCK HEPATITIS VIRUS. E.A.Sueltenfuss and M.Pollard: Science, 1963, 139, 595-596 (Lobund Lab., Univ. Notre Dame, Ind., U.S.A.) A microscopic, cytochem. technique for assay of interferon is described. The development of psittacosis virus in chick embryo cells is checked at the non-infective 'red ball' stage when the tissue is exposed to interferon produced in homologous cells by duck hepatitis virus. G.M.Lewis

1540. EFFECT OF 8-AZAGUANINE ON SYNTHESIS OF VACCINIA VIRUS. J. Cogniaux-le Clerc: Brit. J. exp. Path., 1962, 43, 587-595 (Inst. Pasteur du Brabant, Brussels, Belgium) 8-Azaguanine added with vaccinia virus to culture medium inhib. virus synthesis in chick embryo cells. Guanine or guanosine suppressed this action but only incompletely if addition was delayed 1-2 hr. Incorporation of 8-azaguanine into cellular RNA did not cause inhibn. if 8-azaguanine was absent from culture medium during infectious cycle. D.L.Gardner

1541. EFFECT OF 8AZAGUANINE ON THE GROWTH AND VIABILITY OF BACILLUS MEGATERIUM. R.Mangalo and J.T.Wachsman: J. Bact., 1962, 83, 27-34 (Dept. Microbiol., Univ., Illinois, 111., U.S.A.) Addition of 8-azaguanine to exponentially growing cells of Bacillus megaterium inhibits growth after a lag of approx. 30 min. However [2-¹⁴C]8-azaguanine is incorporated into the nucleic acids in a linear fashion without a detectable lag. The inhibitory action is reversed by purines and their deriv., but not by uridine, thymine or cytidine. 8-azaguanine is bactericidal, especially where growth (RNA synthesis) is possible. Growth in the presence of a complete amino acid mixture, either before or during exposure to 8-azaguanine, increases the rate of killing. Chloramphenicol has little or no effect on the bactericidal action of the analogue. C.Toothill

1542. MARINE BACTERIA WITH ANTI-YEAST ACTIVITY. J.D.Buck, S.P.Meyers and K.M.Kamp: Science, 1962, 138, 1339-1340 (Inst. Marine Sci., Univ. Miami, Fla., U.S.A.) Bacteria isolated from sea water and marine sediments were tested for activity against Bacillus megaterium, Staphylococcus aureus, E. coli, Pseudomonas aeruginosa, Saccharomyces cerevisiae, Rhodotorula minuta, Candida albicans and Cryptococcus neoformans; activity against the yeasts was most frequently encountered. G.M.Lewis

1543. ANTIBACTERIAL EFFECT OF NATURAL NON-COUMARIN PIGMENTS ON STAPHYLOCOCCUS AUREUS. P.M.Naha: India J. Microbiol., 1962, 2, 91-94 (Dept. Microbiol., Bosehst., Calcutta, India) Both streptomycin-sensitive and resistant strains of S.aureus were sensitive to the antibacterial effect of cyann, and less so to orcein, carmine, apigenin and haematoxylin. CM.Lewis

1544. EFFECT OF URANYL NITRAIE ON THE GROWTH OF SYNECHOCOCCUS CEDRORUM Sauv. S.K.Sarkar: Indian J. Microbiol., 1962, 2, 79-88 (Dept. Bot., Banaras Hindu Univ., Varanasi, India) S. cedrorum was exposed to ionising radiation by incorporation of uranyl nitrate in the medium. A strain developed

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by abnormally long cells and lack of division. The new strain showed decreased reduction of triphenyl tetrazolium chloride in the presence of succinate compared with the parent strain, presumably due to reduced enzyme concn.

G.M.Lewis

1545. EFFECTS OF p-MERCAPTOETHANOL AND DITHIODIGLYCOL ON GROWTH OF E.COLI AND S.CEREVISIAE. S.limbosch-RoUn: Ex p. Cell Res., 1963, 29, 61-72 (Lab. Morphol. Ani., Univ. Ubre de Bruxelles, Belgium) g-Mercaptoethanol and dithiodiglycol inhib. cell division in bacteria and yeast cultures, but this action did not appear to be due to any change in the redox potential of the culture medium. The reduction of dithiodiglycol to mercaptoethanol in the presence of bacteria and yeasts is attributed to the action of a disulphide reductase. The respiratory process was not the essential target of mercaptoethanol inhibn., since the latter occurred whether the yeast cells were able to respire or not.

(French) K.Jones

1546. EVALUATION OF THE ANTIBACTERIAL EFFECT OF PRESERVATIVES, WITH SPECIAL REFERENCE TO PHEMEROL AND THIOMEROSAL. P.E.Christensen: Acta path. microbiol. scand., 1963, 57, 104-110 (Serum and Toxoid Dept., Statens Seruminst., Copenhagen, Denmark) Quaternary ammonium compound benzetonium chloride (phemerol) in a concn. of 100 $\mu\text{g}/\text{ml}$, had a bactericidal effect on the test organisms including the *Pseudomonas aeruginosa* group. 50 $\mu\text{g}/\text{ml}$. showed a marked antibacterial activity while this was partially or totally lost for several strains if the concn. was reduced to 25 $\mu\text{g}/\text{ml}$. A synergistic action between thiomerosal and pemerol could be demonstrated for a *P. aeruginosa* culture partially resistant to the 2 com* pounds separately.

L.Friedmann

1547. GLYCIDALDEHYDE VAPOUR AS DISINFECTANT. F.W.Dawson: Amer. J. Hyg., 1962, 76, 209-215 (Dept. Microbiol., Evanston Hosp. Assn., 111, U.S.A.) Glycidaldehyde vapour is capable of inactivating bacterial spores and vegetative micro-organisms. Inactivation rate is dependent on R.H., ambient temp, and chem. concn. of the glycidaldehyde.

P.J.Baron

1548. DIFFERENTIAL RESPONSES OF PARAMOECIUM AURELIA TO CIGARETTE COMPONENTS. H.Wang: Nature, Lond., 1963, 197, 946-948 (Dept. Anat., Stritch Sch. Med., Loyola Univ., Chicago, 111, U.S.A.) Effects of tobacco, main-stream smoke, ash of whole cigarettes, and ash of cigarette papers were studied on *P. aurelia*. Tobacco and main-stream smoke caused marked tranquillisation of cells followed by death. Ash of whole cigarettes and cigarette papers initially induced increased motility, followed by death. Main-stream smoke was the most toxic component studied. Possible use of *P. aurelia* in studies of toxicity of cigarette components is suggested.

J.R.Sargent

1549. EFFECT OF VARIOUS POST-IRRADIATION TREATMENTS ON ULTRA-VIOLET IRRADIATED SHIGELLA SONNEI. M.Nakamura and C.M.Ramage: J. Hyg., Lond., 1963, 61, 77-82 (Montana State Univ. Bot. Dept., Missoula, Mont., U.S.A.) The following factors were studied for their effect on the survival of *S. sonnei* following u.v. irradiation: the composition of the recovery medium, incubation temp, and time interval between irradiation and plating. A chem. defined medium gave a higher recoverey rate than complex media

such as nutrient agar. An incubation temp. of 37° was more favourable for recovery than 15°, 27° or 44°. Recovery of irradiated organisms was increased by holding the cells in 0.15M phosphate buffer for 2i hr. before plating.

J.B.Derbyshire

1550. INCREASED SURVIVAL OF U.V.-IRRADIATED SHIGELLA SONNEI BY DECREASING THE SURFACE TENSION. M.Nakamura and C.M.Ramage: Nature, Lond., 1963, 197, 1028-1029 (Dept. Bot., Montana State Univ., Missoula, Mont., U.S.A.) Addition of surface tension lowering substances, Na taurocholate, Tween 20' or Na sulphosuccinate, to the suspending medium prior to u.v. irradiation of *S. sonnei*, increased the recovery of irradiated cells.

G.M.Lewis

1551. BOWIE AND DICK AUTOCLAVE TAPE TEST. L.H.Bowie, J.C.Kelsey and G.R.Thompson: Lancet, 1963, i, 586-587 (Royal Inf., Edinburgh, Scotland) The use of heat-sensitive indicator tape is recommended for testing sterilisers.

G.H.Bell

1552. IONS AND THERMAL RESISTANCE. STUDIES ON GROWTH. CLjunger: Physiol. Plant, 1963, 16, 121-131 (Dept. Microbiol., List. Plant Physiol., Lund, Sweden) Normal max. temp. of bacterial activities were raised by addition of various ions to the growth medium. The ions Mg, Ca, Na and K inhib. growth of *E. coli* at lower temp, but sdm. at temp. near the max. growth temp.

I.D.J.Phillips

SOIL MICROBIOLOGY

1553. NITRIFICATION OF ARTHROBACTER GLOBIFORMIS. H.B.Gunner: Nature, Lond., 1963, 197, 1127-1128 (Microbiol. Res. Inst., Canada Dept. Agrio Ottawa, Canada) A strain of *A. globiformis*, a ubiquitous soil inhabitant, oxidises ammonia to hydroxyl amine, nitrite, nitrate, and possibly a gaseous intermediate.

CM.Lewis

1554. UPTAKE OF AMINO ACIDS BY BACTERIA PRESENT IN RHIZOSPHERE AND NON-RHIZOSPHERE SOILS. A.K.Banerjee and M.K.Mukherjee: Indian J. Microbiol., 1962, 2, 41-44 (Jute Agric. Res. Inst., Barrackpore, West Bengal, India) Jute seedlings secrete amino acids through the roots; this affects die proportion of amino acid-dependent bacteria in the rhizosphere* CM.Lewis

1555. INFLUENCE OF GIBBERELLIC ACID APPLICATION ON OXYGEN UPTAKE BY RHIZOSPHERE AND FALLOW SOIL MICRO-ORGANISMS. P.Chandra: Indian J. e*P Biol., 1963, 1, 108-109 (Lab. Plant Physiol., Oregon State Univ., Corvallis, Ore., U.S.A.) Gibberellic acid, when applied at 50, 100 and 200 p.p.m. rates to fallow soil and a rhizosphere soil in which *Festuca arunacea* Schreb. plants were grown for 8 weeks stim. 02**" take by micro-organisms in fallow soil but depressed 02 uptake by micro-organisms in rhizosphere soil. The rate of application of gibberellic acid had no significant effect on 02 absorption by micro-organisms in fallow sou but had a significant effect on O2 uptake by micro-organisms in rhizosphere soil. *

1556. MICRO-ORGANISMS IN THE INTESTINES OF EARTHWORMS. J.N.Parle: J. gen. Microbiol., 1963, 31, 1-11 (Soil Microbiol. Dept., Rothampsted Exp.

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Stn., Haipenden, Herts., England) A rapid increase in no. of actinomycetes and bacteria, but not fungi was found during the passage of food through the worm gut. The main agents digesting cellulose and chitin appear to be enzymes produced by the worm rather than micro-organisms. Rate of movement of material through the intestine depends on whether the animal is feeding or not. In burrow formation, material passes in 12 hr.

K.Brew

1557. MICROBIOLOGICAL STUDY OF EARTHWORM CASTS. J.N.Parle: *J. gen. Microbiol.*, 1963, 31, 13-22 (Soil Microbiol. Dept., Rothampsted Expt. Stn.,

Haipenden, Herts., England) Filamentous fungi and yeasts increased in no. rapidly after production of worm casts, but not the initially numerous bacteria and actinomycetes. Increased growth of fungi was shown by measurements of hyphal length. A declining respiratory activity and increasing aggregate stability with ageing casts was shown, possibly due to formation of bacterial resting stages and increasing amounts of fungal hyphae respectively. Polysaccharide, and total and mineral N levels of casts were greater than those of soil. NH₃ was the major form of org. N and was rapidly converted to nitrate.

K.Brew

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ANTIBIOTICS AND CHEMOTHERAPY

1558. PLASMA CONCENTRATIONS AND ANTIBACTERIAL ACTIVITY OF SULPHADIAZINE AND TRIPLE SULPHAPYRIMIDINES IN MAN. L.Weinstein and C.A. Samet: Amer. J. med. Sci., 1963, 245, 52-57 (Dept. Med. Tufts Univ. Sch. Med., Boston, Mass., U.S.A.) Triple sulphapyrimidines produce, on the whole, higher (chem. determined) blood levels of sulphonamides than an equivalent dose of sulphadiazine. Little or no correlation exists between plasma drug concn. and antibacterial activity. E.E.Hobbiger

1559. SYNTHESIS AND PHYSIOLOGICAL PROPERTIES OF SOME HETEROCYCLIC-AROMATIC SULPHIDES AND SULPHONES. IV. BIOLOGICAL INVESTIGATIONS. P.A.Van Zwieten, LMeltzer and H.O.Huisman: Rec. Trav. Chim. Pays-Bas, 1962, 81, 616-623 (Org. Chem. Lab., Univ., Amsterdam, Netherlands) The ability of some new halogen-substituted heterocyclic-aromatic sulphides and sulphones to kill the red spider mite Tetranychus cinnabarinus has been investigated. They show little ability to kill adults but have varying abilities to kill the eggs. G.C.Barr

1560. ADMINISTRATION OF MAXIMUM DOSES OF CHLORAMPHENICOL. B.A.Waisbren, CSimski and P.L.Chang: Amer. J. med. Sci., 1963, 245, 1-12 (Infect. Dis. Control Unit., Milwaukee County Gen. Hosp., Wis., U.S.A.) Observations in 95 patients who had been treated with the highest tolerated doses of chloramphenicol failed to reveal any drug-induced toxicity. The average dose of chloramphenicol given amounted to 64 g. E.E.Hobbiger

1561. CHLORAMPHENICOL AND ITS SULPHAMOYL ANALOGUE. R.MJiji, E.J.Gangarosa and F. de la Macorra: Arch. intern. Med., 1963, 111, 70-82 (Univ. Hosp., Redwood and Greene St., Baltimore, Md., U.S.A.) Chloramphenicol and its sulphamoyl analogue, given in doses of 49 to 68 mg./kg. body wt./day for 13 to 42 days, produced in healthy volunteers a reversible erythropoietic lesion, including vacuolisation of the proerythroblasts, elevation of serum iron, mild thrombocytopenia, and occasionally leukopenia. The bone marrow toxicity of chloramphenicol was less than that of its analogue. E.E.Hobbiger

1562. SUSCEPTIBILITY OF A TRACHOMA AGENT GROWN IN FL CELL CULTURES TO ANTIBIOTICS AND A SULPHA DRUG. H.Benkopf, P.Mashiah and Y. Becker: Proc. Soc. exp. Biol., N.Y., 1962, 111, 61-67 (Virus Lab., Hebrew Univ.-Hadassah Med. Sch., Jerusalem, Israel) Streptomycin, bacitracin and neomycin had no inhibitory effect on the development of T^{ang} strain of trachoma. Other antibiotics including chloramphenicol, erythromycin and chlortetracycline were tested but teta- and oxytetracycline were the most effective. Penicillin resembled tetracycline in its inhibitory effect on the later development cycle stages, whereas the effect of the sulpha drug was limited to the early stages. M.M.Shapland

1563. ROLE OF D-BENZYL PENICILLINIC ACID IN THE SENSITISATION OF R.B.C. JJ.Fischer and C.M.De-Simone: Biochim. biophys. Acta, 1963, 69, 412-414 (Dept. Pharmacol., Harvard Med. Sch., Boston, Mass., U.S.A.) Attempts were made to sensitise r.b.c. with

penicillins G, V and O or with a-phenoxyethylpenicillin, 2,6-dimethoxyphenylpenicillin, 6-aminopenicillanic acid, DL-penicillamine, D-benzylpenicillenic acid, penillic acid, penilloic acid or penicilloic acid. B.M.Stevens

1564. EFFECT OF PENICILLIN ON THYROXINE-BINDING BY PLASMA PROTEINS. M.LSurks and J.H.Oppenheimer: Endocrinology, 1963, 72, 567-574 (Endocrine Serv. Med. Div., Montefiore Hosp., N.Y.67, N.Y., U.S.A.) Penicillin was shown to increase the dialysis of [131I]thyroxine across a semi-permeable membrane, and enhance the uptake of [131I]thyroxine by r.b.c. in plasma. Electrophoretic and dialysis expt. have shown that penicillin reversibly inhibits the binding of thyroxine to its albumin carrier. H.C. Jones

1565. DIFFERENCES BETWEEN PENICILLINASES FROM GRAM-POSITIVE AND GRAM-NEGATIVE BACTERIA. J.T.Smith and J.M.T.Hamilton-Miller: Nature, Lond., 1963, 197, 976-978 (Dept. Bact., Guy's Hosp. Med. Sch., London, England) Major qual. differences exist between penicillinases from Gram-pos. and Gram-neg. cells. Penicillinases from Gram-neg. cells have marked specificity differences from those from Gram-pos. cells, each Gram-neg. sp. appearing to have a specificity pattern peculiar to itself. Penicillinases from Gram-neg. cells are not inducible, have a marked differential permeability barrier, differ in cell wall fixation from Gram-pos. penicillinases and have a lower activation energy than Gram-pos. penicillinase. J.R.Sargent

1566. PENICILLIKASE PRODUCTION IN SOME BACILLI. R.A.Day and R.Shah: Science, 1962, 138, 1108-1109 (Dept. Biol. Chem., Univ. Cincinnati, Ohio, U.S.A.) Penicillinase production in strains of Bacillus cereus and B. subtilis in response to 6 types of penicillin was measured. Enzyme production was a function of the type of penicillin used both in strains in which it was constitutive as well as in strains in which it was inducible. In the constitutive strains, some cases were noted of repressive effects and some of enhancement of enzyme production. G.M.Lewis

1567. ESTIMATION OF PENICILLINS AND PENICILLIN DESTRUCTION. J.M.T.Hamilton-Miller, J.T.Smith and R.Knco: J. Pharm., Lond., 1963, 15, 81-91 (Guy's Hosp. Med. Sch., London, England) Review. 97 rei. J.M.Whitmarsh

1568. BACTERIOSTATIC ACTIVITY OF OLEANDOMYCIN, TRIACETYLOLEANDOMYCIN AND SPIRAMYCIN ON MYCOBACTERIA. J.Viallier and J.Augagneur: C.R. Soc.Biol., Paris, 1962, 156, 1435-1457 (Lab. Pathol., Fac. Méd., Lyon, France) The bacteriostatic activity of oleandomycin, triacetyloleandomycin and spiramycin was tested on 7 strains of virulent mycobacteria of human origin and 47 strains of atypical mycobacteria. The activity of these compounds was greater in liquid media than in solid media. The bacteriostatic activity was more pronounced on saprophytic bacteria. The sensitivity of a strain was similar for each of the compounds tested. (French) M.A. Price

1569. EFFECT OF DIHYDROSTREPTOMYCIN TREATMENT ON GLUCOSE TOLERANCE OF TUBERCULOUS GUINEA-PIGS. V.N.Singh, T.A.Venkatasubramanian and R.Viswanathan: Indian J. exp. Biol., 1963, 1, 82-83. Glucose tolerance test performed on tuberculous guinea-pigs, tuberculous guinea-pigs treated with dihydrostreptomycin and normal guinea-pigs has shown

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that tuberculous guinea-pigs treated with the antibiotic and untreated tuberculous guinea-pigs exhibit normal and lower glucose tolerance respectively. The normalising effect of dihydrostreptomycin treatment on the lowered glucose tolerance of tuberculous guinea-pigs is ascribed to the general improvement in the tuberculous condition of the animals. *

1570. EFFECT OF STREPTOMYCIN AND KANAMYCIN ON THE COURSE OF EXPERIMENTAL TULARAEMIA IN GUINEA-PIGS. B.Lukas, M.Hejzlar and J.Libich: Folia Microbiol., 1963, 8, 80-88 (Military Inst. Hyg., Epidemiology and Microbiol., Prague, Czechoslovakia) Administration of streptomycin or Kanamycin (10 mg. daily doses) for 1 and 2 weeks after s.c. injn. with Pasteurella tularensis caused marked protection from death. Prolonged persistence of micro-organisms, however, occurred in regional lymph nodes and spleen. This effect was not observed when antibiotics were administered Prior to infection. Streptomycin caused an intense allergic reaction which was not observed with Kanamycin. J.R.Sargent

1571. STUDIES IN ANTIBACTERIALS. in. SYNTHESIS OF SOME HALOGENOCHALKONES. S.S.Vemkar and S.Rajagopal: Rec. Trav. Chim. Pays-Bas, 1962, 81, 710-712 (Chem. Dept., Kamatak Univ., Dharwar, S. India) The synthesis of some new chalkones is described. These have bacteriostatic activity for Staphylococcus aureus and E. coli. G.C.Barr

1572. GLUTARIMIDE ANTIBIOTICS. II. SYNTHESIS AND STEREOCHEMISTRY OF DL-NEOCYCLOHEXIMIDE, NEW ISOMER OF CYCLOHEXIMIDE. F.Johnson, W.D. Guowitz and N.A.Starkovsky. m. DETERMINATION OF STEREOCHEMISTRY OF METHYL GROUPS OF CYCLOHEXIMIDE ISOMERS BY NUCLEAR MAGNETIC RESONANCE SPECTROSCOPY. F.Johnson and N.A. Starkovsky: Tetrahedron Letters, 1962, 25, 1167-1171, 1173-1177 (Dow Chem. Co., Eastern Res. Lab., Framingham, Mass., U.S.A.) Letters. I.A.B.S.

!573. THE STRUCTURE OF ACTINOMYCIN C2 AND ACTINOMYCIN C3. H.Brockmann and P.Boldt: Naturwissenschaften, 1963, 50, 19-20 (Org. Chem. Inst., Univ. of Gottingen, Germany). (German) A. G. Wansbrough

1574. NEW CATIONIC ANTIMICROBIAL AGENT, N-DODECYL-4-AMINOQUINALDINIUM ACETATE (LAUROLINIUM ACETATE). W.A.Cox and P.F.D'Arcy: J. Pharm., Lond., 1963, 15, 129-137 (Allen and Hanbury Ltd., Ware, Herts., England) This agent (Laurodin) has bacteriostatic and bacteriocidal activity against Gram-pos. and neg. bacteria, fungi and some protozoa. Its activity is antagonised by anionic substances ^{but} some is retained in the presence of org. matter. It is ^{well} suited for topical use ^{sui} but is too toxic for parenteral [%] ***. J.M.Whitmarsh

1575. ISOLATION OF THE ACTIVE PRINCIPLES FROM A STRAIN OF BACILLUS SUBTIUS. M.Sen and P.Nandi: Indian J. Chem., 1963, 1, 135-136 (Bose Inst., Calcutta, India) Two antibiotic principles were isolated from strain B 344. LA.B.S.

1576. EFFECT OF 5-FLUOROURACIL ON THE ADRENAL-[^]CTQMKFn ANIMAL. B.Tipton and W.J.Regan: Surgery, 1963, 53, 495-499 (Surg. Res. Lab., St. [^]Mercy Hosp., Ann Arbor, Mich., U.S.A.) It has been found that human beings adrenalectomised and

oophorectomised and subsequently treated with 5-fluorouracil has led to fatal results in 3 known cases. The expt. performed with bitches has shown that fatality from 5-fluorouracil treatment after adrenalectomy and oophorectomy in 80% of the animals could be reduced to 0% by maintenance on high dose hydrocortisone administration along with the 5-fluorouracil. D.N.Wheatley

D.N.Wheatley

1577. THE GROWTH-STIMULATING EFFECT OF TSPA AND 5-FU ON CELLS OF SARCOMA 180. Y.A.El-Ghaffar: Cancer, Philad., 1963, 16, 8-12 (Cancer Res. Unit., Ein Shams Univ., Cairo, U.A.R.) Triethylenethiophosphoramide [TSPA] and 5-fluorouracil [5-FU] in relatively small doses were found to stimulate the growth of sarcoma 180 both *in vivo* or afterincubation of the tumour with these drugs before s.c. implantation in mice. This effect was only demonstrated when fractionated doses of the total stimulating quantity were given. An almost complete summation effect was shown when the 2 drugs were combined. Hyaluronidase had a growth-stimulating effect on the tumour *in vitro* and also augmented the stimulating effect of TSPA. An explanation for these results and the implications of the clinical use of these drugs are discussed. D.I. Connell

1578. IN VITRO TEST SYSTEMS FOR CANCER CHEMO-THERAPY. I. INHIBITION OF DEHYDROGENASES AND GROWTH IN THE EHRLICH ASCITES TUMOUR. J.A. DiPaolo: Cancer Res., 1963, 23, 184-190 (Roswell Park Mem. Inst., Buffalo, N.Y., U.S.A.) Methylbis (P-chloroethyl)amine [HN2], N,N^f-triethylenethiophosphoramide [TSPA], methotrexate, actinomycin D[AD] methylbis(3-chloroethyl)amine N-oxide [HN2O], benzyl (bis-(1-aziridinyl)phosphinyl) carbamate and 5-fluorouracil and, to a lesser extent, 6-mercaptopurine, ethyl-N-bis-(2, 2-dimethylenthylidenimido)-phosphorocarbamate and 5-mercaptouracil inhib. dehydrogenase activity, as indicated by Methylene Blue, in suspensions of fresh ELD ascites in agar pour plates and of ascites cultured in agar suspension. Growth of ascites in Petri dishes as monolayers overlaid by agar was inhib. by HN2, TSPA, AD and HN2O. With a completely defined medium all except 5-mercaptouracil inhibited. When cells from a culture in complete medium containing antimetabolite were incubated in test tubes at 37° before transfer to T-flasks all compounds began to inhibit growth within 72 hr. Some additional compounds were found inhibitory.

B.M.Stevens

1579. CONTROLLED-DOSE CHEMOTHERAPY AS AN ADJUNCT TO SURGERY. W.H.Wolberg, R.O.Johnson and A.R.Curreri: Cancer, Philad., 1963, 16, 5-7 (Surg. Dept., Cancer Res. Hosp., Univ. Wisconsin Med. Sch., Madison, Wis., U.S.A.) Following s.c. inoc. with cell suspension of 256 Walker carcinosarcoma, groups of white rats were put on 1 of 3 diets; (1) complete synthetic, (2) protein deficient, and (3) 5% dextrose in saline. From the 2nd day after tumour transplant the animals were given 5-fluorouracil for 6 days. Fifteen days after tumour transplant the animals were killed. The results indicated that by reducing the dose of 5-fluorouracil given in the post-operative period the toxicity is controlled without sacrificing the anti-tumour effect. D.J.Connell

1580. EFFECT OF ANTIMETABOLITES ON THE BIO-SYNTHESIS OF TETRACYCLINES. Goodman and P.A. Miller: Biotech. Bioeng., 1962, 4, 391-402
Lederle Labs. Div., American Cyanamid Co., Pearl River, N.Y., U.S.A.) Several antimetabolites including antifolics, **p**-amino benzoic acid antagonists and

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sulphonamides were tested. *Streptomyces aureofaciens* BC-41 produces 90-95% chlortetracycline and 5-10% tetracycline. Sulphadiazine caused the formation of a considerable proportion of 6-dimethyl chlortetracycline.

R.H.Kimberlin

1581. MECHANISM OF ACTION OF PHLEOMYCIN. A TUMOUR INHIBITORY ANTIBIOTIC. N.Janaka, H. Yamaguchi and H.Umezawa: Biochem. biophys. Res. Comm., 1963, 10, 171 (Inst. Appl. Microbiol., Univ. Tokyo, Japan) Results are given showing that phleomycin selectively inhibits DNA synthesis in *E. coli* and HeLa cells.

B.Ketterer

1582. BIOLOGICAL INTERRELATIONSHIPS IN THE CHEMOTHERAPY OF MOLONEY VIRUS LEUKAEMIA. J.P.Glynn, J.B.Moloney, M.A.Chirigos, S.R.Humphreys and A.Goldin: Cancer Res., 1963, 23, 269-278 (Lab. Chem. Pharmacol., Nat. Cancer Inst., Bethesda, Md., U.S.A.) Therapy of the transplantable leukaemia with Cytoxan, triethylene melamine, Melphalan or X-irradiation produced an appreciable no. of long term survivors most of which subsequently succumbed with widely disseminated lymphocytic neoplasia. The extensive survival time and the gross and microscopic pathology of this neoplastic process indicated that the virus associated with the initial cellular implant induced a primary leukaemia.

B .M .S te vens

1583. EFFECT OF ANTIBACTERIAL DRUGS ON WEIGHT OF MICE. R.Dubos, R.W.Schaedler and R.L.Costello: J. exp. Med., 1963, 117, 245-257 (Rockefeller Inst. Med. Res., N.Y., U.S.A.) NCS mice gain wt. rapidly¹ when fed a gluten diet deficient in several amino acids, but there was retardation of growth if these mice were given anti-bacterial drugs. Growth could not be entirely corrected by adding lysine and threonine to the gluten diet. Treatment with penicillin on any diet caused a retardation of wt. gain, which was more pronounced in mice on a semi-synthetic diet than when the mice were fed commercial pellets. These differences probably arise from the influence on drug-induced changes in the faecal flora of the composition of the diet. Drugs which retarded wt. gain of NCS mice, in contrast increased wt. gain in ordinary Swiss mice. It is probable that this is due to the more complex intestinal flora found in the Swiss mice.

H.E.Jones

1584. EFFECT OF ANTIBACTERIAL DRUGS ON FAECAL FLORA OF MICE. R.Dubos, R.W.Schaedler and M. Stephens: J. exp. Med., 1963, 117, 231-243 (Rockefeller Inst. Med. Res., N.Y., U.S.A.) Oral administration of penicillin, terramycin or chloramphenicol to NCS mice increased the no. of enterococci and Gram-neg. bacilli in the faeces, while causing the lactobacilli to disappear. Isoniazid administration had no effect. The faecal flora returned to its pretreatment state in less than 4 weeks of discontinuing administration of the drugs if the mice were fed with commercial pellets, but not if they were fed a semi-synthetic diet containing either 15% casein or 15% wheat gluten as protein. The faeces of penicillin-treated mice contained large no. of lactose-fermenting Gram-neg. bacilli, not found in untreated animals. These persisted for several months after discontinuance of the drug in mice fed casein or gluten diets, but they disappeared rapidly from mice fed pellets. Similar, but less striking, results were obtained in Swiss mice.

H.E.H.Jones

1585. NOTE ON THE EFFECT OF HAMYCIN ON ELECTROLYTES IN THE FROG HEART. H.R.K.Arora and V.Arora:

J. Pharm., Lond., 1963, 15, 149-150 (Dept. Pharmacol., Maulana Azad Med. Coll., New Delhi, India) Hamycin, an antifungal antibiotic, when presented to isolated heart effected an increase in the K content of the perfusion fluid. Changes in Na content were not observed. The effect is therefore digitalis-like.

J.M.Whitmarsh

1586. POLYSEROSITIS INDUCED BY PSICOFURARINE IN MAN AND COMPARATIVE TOXICITY IN THE RAT, MOUSE, DOG, CHICKEN AND MONKEY. R.W.Talley and R.G.Carlson: Toxicol. appl. Pharm., 1963, 5, 235-246 (Div. Oncol., H.Ford Hosp., Detroit, Mich., U.S.A.) Psicofurarine, a substance which has an antitumour activity against several transplanted rat tumours, was found to be devoid of any significant anti-tumour activity in man. Ten of 12 patients treated with the substance developed a serious reaction of the pericardium, pleura and/or peritoneum. Expt. in animals failed to throw any light on the cause of the drug-induced polyserositis in man.

E.E.Hobbiger

CENTRAL NERVOUS SYSTEM

1587. ASSESSMENT OF CONDUCTION ANAESTHESIA. G.C.Jefferson: J. Pharm., Lond., 1963, 15, 92-99 (Dept. Pharmacol., Univ., Manchester, England)

In frog sciatic nerve prep, the 'f₀ reduction of action potential gives a better assessment of conduction anaesthesia than does the regression of potential with time, and it bears a linear relationship to the log. of the concn. of local anaesthetic applied to the nerve.

J.M.Whitmarsh

1588. GAS CHROMATOGRAPHIC DETERMINATION OF METHOXYFLURANE IN BLOOD. R.H.Gadsden, W.M. McCord, E.F.Woods and E.E.Bagwell: Anesthesiology, 1962, 23, 831-836 (Depts. Biochem. and Pharmacol., Med. Coll. of South Carolina, Charleston, S.C., U.S.A.) A method for isolating methoxyflurane froif blood by distillation, and its detection and quant. measurement by the technique of gas chromatography is described. The vol. of blood sample needed is quite small (4 ml. for man) and the accuracy is within ± 5%

A.A.Zimmermann

1589. UPTAKE AND EXCRETION OF SUBANAESTHETIC CONCENTRATIONS OF NITROUS OXIDE IN MAN.

E.Salanitre, H.Rackow, L.T.Green, D.Klonimus and R.M.Epstein: Anesthesiology, 1962, 23, 814-822 (Dept. Anesthesiol., Coll. Physn. and Surgs., Columbi* Univ., New York, N.Y., U.S.A.) Good correlation was found in die composite uptake and excretion curves using 10% N₂O in O² in 5 awake supine subjects. The composite excretion curve was compared with a corresponding curve of a group of anaesthetised subjects. The 2 curves differed only in the upward displacement of the curve seen under anaesthesia. 15 references.

A.A.Zimmerman*

1590. EFFECT OF ANAESTHETIC AGENTS ON PATIENTS RECEIVING RESERPINE THERAPY. W.M.Munson and J.A.Jenicek: Anesthesiology, 1962, 23, 741-746 (Anesthesia and Operative Serv., Brooke Gen. Hosp., Brooke Army Med. Center, Ft. Sam Houston, Tex., U.S.A.) Administration of *Rauwolfia* alkaloids need

not be discontinued before anaesthesia and surgery. Withdrawing patients from reserpine therapy from 10 to V

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days before elective surgery does not ensure that circulatory instability will not occur. 41 references given.

A.A.Zimmerman

1591. EFFECT OF CYCLOPROPANE AND HALOTHANE ON THE BLOOD VOLUME IN MAN. E.Grable, A.J. Finck, A.L.Abrams and J.A.Williams: *Anesthesiology*, 1962, 23, 828-830 (Harvard Med. Sch., Boston, Mass., U.S.A.) Serial measurements of circulating Plasma vol. and r.b.c. mass were made in 10 patients undergoing cyclopropane anaesthesia and 10 patients undergoing halothane anaesthesia. The blood vol. were calc. by the summation of the r.b.c. mass and plasma vol. determined by simult. and independent radioisotope diln. assays. Cyclopropane caused no significant change, while halothane caused a 10-15% increase in blood vol. under the conditions studied. A.A. Zimmerman

1592. ACTIONS OF HALOTHANE AND NORADRENALINE IN THE ISOLATED MAMMALIAN HEART. W.Flacke and M.H.Alper: *Anesthesiology*, 1962, 23, 793-801 (Harvard Med. Sch., Boston, Mass., U.S.A.) Expt. on the heart-lung prep. of the dog suggests that the depressant effects of halothane and the stimulant actions of noradrenaline on the heart are in fact independent and that the 2 drugs do not interact at the same receptor.

A.A.Zimmerman

1593. MEPHENTERMINE AND CYCLOPROPANE-ADRENALINE ARRHYTHMIAS IN DOGS. H.W.EUliott: *Anesthesiology*, 1962, 23, 762-765 (Dept. Pharm. and Expt. Therap., Univ. California Med. Center, San Francisco, Calif., U.S.A.) Mephentermine was found incapable of reversing cyclopropane-adrenaline arrhythmias per se in dogs in contrast to its reported ability to decrease the incidence of ventricular fibrillation in dogs anaesthetised with cyclopropane and given adrenaline. A.A. Zimmerman

1594. A DOSE-EFFECT STUDY OF PRE-OPERATIVE MEDICATION IN CHILDREN. H.Rackow and E.Salannitri: *Anesthesiology*, 1962, 23, 747-754 (Dept. Anesthesiol., Coll. Phys. and Surgs., Columbia Univ., New York, U.S.A.) Data are presented on the dose-effect relationships of quinalbarbitone sodium [secobarbital], morphine and meperidine with reference to children.

A.A.Zimmerman

1595. ACUTE AND CHRONIC TOXICITY OF OXETHAZAINE: A HIGHLY POTENT LOCAL ANAESTHETIC. J.M.Glassman, A.Dervinis, W.J.Beachfield and J. Seifter: *Tcocicol. appl. Pharm.*, 1963, 5, 185-200 (Wyeth Labs., Inc., Radnor, Pa., U.S.A.) Oxethazine (N, N-bis-(N-methyl-N-phenyl-*tert*-butylacetamido)¹⁸P-hydroxyethylamine is 500 times more potent than cocaine as a local anaesthetic. It is devoid of irritant & P. and there is a considerable margin of safety for its intragastric, s.c., i.m., intrarectal and intravesicular route of administration. The i.v. toxicity is high and death is attributable to a depression of myocardial contractility and impairment of conduction in the heart. No toxic manifestations were observed in rats and dogs fed for months on a diet containing oxethazaine.

E.E.Hobbiger

1596. LOCAL ANAESTHETIC TOXICITY MODIFIED BY OXYGEN AND BY COMBINATION OF AGENTS. F.G. Daos, L.Lopez and R.W.Virtue: *Anesthesiology*, 1962, 23, 755-761 (Div. Anaesthes., Univ. Colorado of Med. Center, Denver, Colo., U.S.A.) Inhalation of 100% oxygen delayed the death of white female rats receiving 100% jets of procaine, chloroprocaine, mepivacaine or lidocaine. The addition of tetracaine resulted in additional toxicity. A.A. Zimmerman

1597. THIALKOBUMAL (BAYTINAL) AS AN INTRAVENOUS ANAESTHETIC FOR RABBITS. Bo.E:son Schildt and E.E: son Schildt: *Acta pharmacol.*, Kbh., 1962, 19, 377-388 (Res. Inst., Nat. Defence Dept. 1, Sundbyberg, Sweden) Thialisobuman (sodium salt of 5, 5-allyl-L2-methylpropyl]-thiobarbituric acid) in a 10% soln. has an anaesthetic index (ratio between lethal and anaesthetic dose) of 1:78 in rabbits where a dose of 90 mg./kg. i.v. over 4 min. produced a post-anaesthetic period of 165 min. R.S.Tonks

1598. FAILURE OF ETHANOL AND BARBITURATES TO ALTER BRAIN MONOAMINE CONTENT. D.H.Efron and G.L.Gessa: *Arch. int. Pharmacodyn.*, 1963, 142, 111-116 (Lab. Chem. Pharmacol., Nat. Heart Inst., Bethesda, Md., U.S.A.) The effects of ethanol 2 g./kg. i.v. on rabbit brainstem and rat brain 5HT and noradrenaline concn. are studied. 1 hr. after a single dose or after 7 daily doses amine concn. do not differ from those in control animals. S.E.Smith

1599. INFLUENCE OF CERTAIN RADIO-PROTECTORS ON THE ENZYME SYSTEM OF LIVER MICROSOMES DEGRADING HEXOBARBITONE. A.Thomou, C.Liébecq and Z.M.Bacq: *Arch. int. Pharmacodyn.*, 1963, 142, 271-273 (Biochem. Lab., Univ. IISG, Belgium)

The enzyme system in liver microsomes responsible for the oxidation of hexobarbitone was inhib. in vitro by cystamine, 5HT and histamine. (French) T.J.Sullivan

1600. DOSE-RESPONSE RELATIONS OF AMPHETAMINE-BARBUTRATE MIXTURES. R.Rushton and H.Ste4nberg: *Nature*, Lond., 1963, 197, 1017-1018 (Dept. Ptarmacol., University Coll., London, England) The effect of amphetamine-barbiturate mixtures on the spontaneous activity of rats was studied. Although high doses inhib. activity completely, at peak doses of amphetamine: amylbarbitone mixtures (1:20), activity was enhanced, but ataxia was present. When the ratio of drugs was 1:6*5 as is used clinically, a peak mixture dose produced a similar increase in activity without ataxia.

G.M.Lewis

1601. EFFECT OF α -METHYL-DOPA AND α -METHYL-META-TYROSINE α -MMT] ON AMPHETAMINE TOXICITY. H.Lai, S.Ginocchio and A.Shefner: *Life Sci.*, 1963, 3, 190-192 (Life Sci. Res. Dept., Armour Res. Fdn., Illinois Inst. Technol., Chicago, Ill., U.S.A.) α -Methyl-dopa and α -MMT protected against the increased toxicity of amphetamine in aggregated mice. This protection appeared to follow the same time-course as that found for effects of these agents on brain noradrenaline. K.Jones

1602. EFFECT OF α -METHYL-DOPA AND N-2-HYDROXYBENZYL-N-METHYL HYDRAZINE (NSD 1039) ON BLOOD PRESSURE OF RENAL HYPERTENSIVE RATS. R.A.Davis, DJ.Drain, M.Horlington, R.Lazare and A.Urbanska: *Life Sci.*, 1963, 3, 193-197 (Smith and Nephew Res. Ltd., Hunsdon Labs., Ware, Herts., England) The hypotensive action of α -methyl-dopa was not correlated with its ability to inhibit brain dopa/5HTP decarboxylase in the rat. It is suggested that the hypotensive action is caused by the decarboxylation products of α -methyl-dopa and not by the amino acid itself.

K.Jones

1603. EVALUATION OF A NEW RESPIRATORY STIMULANT: DIMEFLINE. W.P.Bailey, jun. and CL.Brinkman: *Amer. J. med. Sci.*, 1962, 244, 744-748 (Pulmonary Div., H. Ford Hosp., Detroit, Mich., U.S.A.)

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Dimefline, 3- methyl- 7- methoxy- 8- dimethylamino methyllavone hydrochloride, stimulates respiration when given i.v., but at the same time produces undesirable side effects, e.g. convulsions. E.E.Hobbiger

1604. NEUROPHARMACOLOGICAL EFFECTS OF TRYPTAMINE ACETATE. R.J.Matthews : Arch. int. Pharmacodyn., 1963, 142, 90-110 (Pharmacol. Dept. Upjohn Co., Kalamazoo, Mich., U.S.A.) Pharmacol. actions of tryptamine are studied in cats. Tryptamine 10 mg./kg. i.v. causes arousal patterns in the cortical e.e.g. which is not present in 'cerveau isolé' prep. Its effects in cats subjected to various brainstem lesions suggest that it produces activation of caudal parts of the brainstem reticular formation. S.E.Smith

1605. INFLUENCE OF CERTAIN CENTRAL DEPRESSANTS ON FIGHTING BEHAVIOUR OF MICE. G.Chen, B.Bohner and A.C.Bratton jun.: Arch. int. Pharmacodyn., 1963, 142, 30-34 (Res. Div., Parke, Davis and Co., Ann Arbor, Mich., U.S.A.) A comparative study was made of the suppressive activities of meprobamate, phenobarbitone, pentobarbitone, carbromal, chloral hydrate and trichloramate on fighting episodes induced in mice by foot shock. Suppression of lie fighting reaction appeared to be due to the sedative action these drugs had in common. T.J.Sullivan

1606. BEHAVIOURAL EFFECTS ON THE RAT OF BENZQUINAMIDE AND BENZQUINAMIDE-ALCOHOL COMBINATIONS. R.B.Fomey and F.W.Hughes: Arch. int. Pharmacodyn., 1963, 142, 237-242 (Dept. Pharmacol. and Toxicol., Indiana Univ. Sch. Med., Indianapolis, Ind., U.S.A.) Behavioural effects of benzquinamide are studied on weanling rats using avoidance responses. Benzquinamide 10-20 mg./kg. i.p. appears to reduce "anxiety" without affecting performance. Larger doses show general depressant effects which are exaggerated by ethanol 0.5 g./kg. given simult. S.E.Smith

1607. ADH-LIKE EFFECT OF TRANQUILLISERS IN AMPHIANS. N.Khazan, M.Ben-David and F.C.Sulman: Proc. Soc. exp. Biol., N.Y., 1963, 112, 490-494 (Dept. Appl. Pharm., Hebrew Univ. Sch. Pharm., Jerusalem, Israel) The effects of 17 different tranquillisers on the release of ADH are studied. The uptake of water was used as a measure of the ADH stimn. in *Bufo viridis* and *Rana pipiens*. Chlorpromazine had a strong, long-lasting effect (stronger than exogenous pitressin) and Phenothiazine deriv. with Cl in the 2-position and a dimethylaminopropyl group in the 10 position as a side chain were very effective. Such tranquillisers as chlor-diazepoxide, meprobamate, benactyzine and reserpine had no significant effect. Chlorpromazine had a slight effect on hypophysectomised animals' uptake of water suggesting that there is some hypothalamic secretion of ADH but that the bulk comes from the posterior pituitary. Oxytocin did not have an antagonistic effect on ADH in the animals used in this study. D.N.Wheatley

1608. THYMOL BASIC ETHERS AND RELATED COMPOUNDS: C.N.S. DEPRESSANT ACTION. A.Ashford, C.J.S. and F.J. Stephens: Nature, Lond., 1963, 197, 969-971 (Res. Dept., Crookes Lab., Park Royal, London, England) A series of basic ethers were synthesised derived from thymol which had c.n.s. depressant activity. Max. activity was obtained when a 0 -diethyl-aminoethyl side chain was attached. The probable structure of these compounds is discussed and compared

with that of morphine-like analgesics. Three compounds are described in some detail. G.M.Lewis

1609. THE SEDATIVE, CENTRAL ANALGESIC AND ANTICONVULSANT ACTIONS OF LOCAL ANAESTHETICS. T.Kopppanyi: Amer. J. med. Sci., 1962, 244, 646-654 (Dept. Pharmacol., Georgetown Univ. Med. Center, Washington, D.C., U.S.A.) Review. 52 ref. E.E.Hobbiger

1610. PSYCHOPHARMACOLOGY OF SPONTANEOUS ALTERNATION IN RATS. E.Grandjean and K.Battig: Helv. physiol. pharmacol. Acta., 1962, 20, 373-381 (Inst. Hyg. und Arbeitsphysiol., Eidg. Technische Hochschule, Zürich, Switzerland) Rats repeatedly arriving at the junction of a T-maze unit, alternate the direction of their exploration in 70-75% of tests. Amphetamine 1-4 mg./kg., Imipramine 5-20 mg./kg., amylobarbitone 10-40 mg./kg., Methaminodiazepoxide 20-80 mg./kg. reduced the % of alternation, chlorpromazine 0.75-3 mg./kg. increased it. All drugs except Meprobamate depressed the running speed to food. (German) V.Eisen

1611. E.E.G. AND BEHAVIOURAL ANALYSIS OF ANTI-CONVULSANT ACTION OF AMPHENIDONE IN THE RABBIT. W.CSteiner and H.E.Himwich: Arch. int. Pharmacodyn., 1963, 142, 1-8 (Thudicum Psychiat. Res. Lab., Galesburg State Res. Hosp., Galesburg, Ill., U.S.A.) In anaesthetised, curarised, artificially respired rabbits, thresholds for drug-induced convulsions were raised by pre treatment with amphenidone. It did not, however, abort seizures. In the conscious, unrestrained animal, pretreatment was effective against leptazol and picrotoxin but not against strychnine convulsions. T.J.Sullivan

1612. ANALEPTIC ACTIVITY OF TREMOR-PRODUCING AMINO-ALCOHOLS. J.P.Ayton and P.B.Marshall: J. Pharm., Lond., 1963, 15, 217-218 (Dept. Pharmacol., Queen's Coll., Dundee, Scotland) Activity was shown by 1,1, 3-triphenyl-3-amino-propan-1-ol and 1,1, 2-triphenyl-2-amino-ethanol. L.M.Whitmarsh

1613. CONVULSANT EFFECT OF HYDROXYLAMINE IN EPILEPTIC MONKEYS AND RATS. L.M.Kopeloff and J.G.Chusid: Proc. Soc. exp. Biol., N.Y., 1963, 112, 306-308 (Dept. Bacteriol., New York Psychiat. Inst., New York City, N.Y., U.S.A.) Monkeys made epileptic by cerebral application of alumina cream and rats made epileptic by intracerebral injn. of cobalt were found to be more susceptible to the convulsant effect of hydroxylamine than unoperated controls.

D.N.Wheatley
1614. GROWTH RETARDING AND GROWTH PROMOTING EFFECT OF CHLORPROMAZINE [CPZ] ON DEVELOPING AMBLYSTOMA MEXICANUM [AXOLOTL] EMBRYOS. Z.Eyal and H.Eyal-Giladi: Exp. Cell Res., 1963, 29, 394-399 (Dept. Surg., Hadassah Univ. Hosp., Jerusalem, Israel) Low concn. of CPZ cause increased growth in axolotl embryos, as shown by the measurements of surface area of the head of larvae. The biphasic effect of CPZ in vivo correlated well with its W¹ phasic effect on isolated enzyme systems. This effect is suggested to involve changes in P/O ratio as well as changes in mitotic activity. K.Jones

1615. REDUCTION BY CHLORPROMAZINE OF ULCERS DUE TO ACUTE STARVATION IN MICE. C.J.Pfeiffer, G.H.Gass and C.S.Schwartz: Nature, Lond., 1963

197, 1014-1015 (Dept. Physiol., Southern Illinois Univ., Carbondale, 111, U.S.A.) The incidence of gastric glandular ulcers in mice starved for 3 days was significantly reduced by injn. of chlorpromazine, 10 mg./kg. on the 1st day and 5 mg./kg on subsequent days. The drug caused lethargy, and decreased postural muscle tone; it may affect ulceration by decreasing gastric secretion or preventing stress hypoglycaemia. G M-Lewis

1616. EFFECTS OF MORPHINE HYDROCHLORIDE ON THE PREVENTION OF ULCERS INDUCED BY CONSTRAINING RATS. M. Simler, J. Schwartz and F. Schmid: C.R. Soc. Biol., Paris, 1962, 156, 1495.

1497 (Inst. Pharmacol., Strasbourg, France) ^{83/} of normal rats which had been constrained for 24 hr. developed ulcers. Two injn. of 6 mg. morphine hydrochloride per kg. prevented the appearance of gastric ^{14C}J[®]. A single injn. did not protect the animal. Injn. of L^{14C}-morphine showed that the majority of metabolites are eliminated within 12 hr. (French) M.A.Pnce

1617. CENTRALLY MEDIATED INHIBITION OF GASTRO-INTESTINAL PROPULSIVE MOTILITY BY MORPHINE OVER A NON-NEURAL PATHWAY. S. Margolin: Proc. Soc. exp. Biol., N.Y., 1963, 112, 311-315 (Scheruig Corp., Bloomfield, N.J., U.S.A.) Morphine sulphate inj. intracerebrally produced marked reduction in gastrointestinal activity (peristalsis) in albino mice. The use of many other known inhibitors of parasympathetic and sympathetic nerve activity e.g. aminophylline, atropine, strichine, had no effect on the morphine sulphate effect, nor had surgical disruption of the a.n.s. It is concluded that morphine sulphate initiates a neurohumoral factor which controls gut movements. D.N.Wheatley

1618. N-ALLYLNORQXYMORPHINE: A NEW POTENT NARCOTIC ANTAGONIST. F.F. Foldes, J.N. Luim, J. Moore and L.M. Brown: Amer. J. med. Sci., 1963, 245, 23-30 (Dept. Anesthesiol., Mercy Hosp., Pittsburgh, Pa., U.S.A.) N-Allyl oxymoipnone, 5 µg./kg. i.v., produced no significant respiratory or circulatory effects, but prevented the respiratory depressant effect, but not the circulatory effects, of axymorphone, ²⁰ fg./kg. i.v. The former also reversed the respiratory depression caused by axymorphone, meperidine or alptia-Ptodine and in this respect was 6 and 30 times more effective than levallorphan and nalorphine, respectively. E.E.Hobbiger

W19. RAPID SEPARATION OF DRUGS AND POISONS BY HIGH TEMPERATURE REVERSED PHASE PAPER CHROMATOGRAPHY. n. PHENOTHIAZINE TRANQUILLISERS AND IMIPRAMINE. in. ALKALOIDS. H.V. Street: Acta pharmacol. Khb., 1962, 19, 312-324, 325-329 (Dept. Forensic Med., Univ. Edinburgh, Scotland). R.S.Tonks

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162^a; RELATION BETWEEN CHEMICAL CONSTITUTION *m PHARMACOLOGICAL ACTION. M. Guyonneau: J. Physiol., Paris, 1962, 54, Suppl. 4 (Lab. de Pharm. [•] Fac. Med. Paris, France) Some relation-ship between the constitution of molecules having the general formula of $\pm c - P - (\text{CH}_2) - N <$,

in which P is a polar group, and their spasmolytic, ganglion-exciting or blocking and neuromuscular blocking prop, are reported. (French) A.Angel

1621. ANTICHOLINERGIC DRUGS AND THE CENTRAL CONTROL OF THIRST. L. Stein: Science, 1963, 139, 46-48 (Wyeth Lab., Philadelphia, Pa., U.S.A.) Atropine and scopolamine were compared with their quaternary analogues, the methyl nitrates, for effects on food and water intake in rats. All the drugs inhibited eating, but only the centrally active compounds inhibited drinking. Anticholinergic drugs evidently block drinking by a central effect and eating by a peripheral effect. G.M.Lewis

1622. PHARMACOLOGY OF (2-BENZILOXYETHYL)DIMETHYL (N-OCTYL)-AMMONIUM BROMIDE, A NEW SPASMOlytic AGENT. E.B. Sigg: Toxicol. appl. Pharm., 1963, 5, 225-234 (Geigy Res. Labs., Ardsley, N.Y., U.S.A.) The substance has an atropine-like action on the dilator pupillae muscle in mice, on the bronchi of guinea-pigs and on the gut and urinary bladder of anaesthetised dogs and cats. Its midriatic potency is 2% of that of atropine. Data on toxicity are reported. E.E.Hobbiger

1623. SMOOTH MUSCLE RELAXING EFFECT OF THYME (THYMUS VULGARIS L.). K.B.Jensen and O.K. Dyrud: Acta pharmacol., Khb., 1962, 19, 345-355 (Biol. Dept., Pharmaceur. Inst., Univ. Oslo, Norway) A 50% reduction in submaximal contractions induced by ACh in isolated smooth muscle prep, is possible with thyme extracts corresponding to 10-100 fig. dried herb/ml. Much higher concn. of extracts are needed to reduce contractions caused by 5HT, histamine, oxytocin and bradykinin. R.S.Tonks

1624. POST-TETANIC RELIEF OF NEUROMUSCULAR BLOCK. L. Wislicki and F. Benzakein: Arch. int. Pharmacodyn., 1963, 142, 23-29 (Dept. Pharmacol., Hadassah Med. Sch., Jerusalem, Israel) In pento-barbitone-anaesthetised cats partial gastrocnemius neuromuscular blockade by decamethonium or gallamine is antagonised by direct or indirect tetanic stimm. When tetanic stimm. is applied repeatedly the post-tetanic gains are often cumulative. S.E.Smith

1625. DETECTION AND DETERMINATION OF HYPOTENSIVE DRUGS IN HUMAN SERUM. S.L. Tompsett: Acta pharmacol. Khb., 1962, 19, 265-367 (Biochem. Lab., North Gen. Hosp., Edinburgh, Scotland) Serum levels of 10 µg./ml. of hexamethonium, bretylium and guanethidine can be determined using the Sakaguchi reaction on paper chromatograms. R.S.Tonks

1626. INFLUENCE OF GUANETHIDINE ON THE CATECHOLAMINE DEPLETING EFFECTS OF TYRAMINE IN THE RAT HEART. B. Bhagat: J. Pharm. Lond., 1963, 15, 152 (Dept. Pharmacol., Univ. Wisconsin, Madison, Wis., U.S.A.) Guanethidine had no effect. J.M.Whitmarsh

1627. RELEASE OF CATECHOLAMINES FROM THE ATRIUM OF THE DOG BY TYRAMINE. W.J. Hall and J.D. Sheehan: Nature, Lond., 1963, 197, 1116-1117 (Dept. Physiol., Univ. Coll., Cork, Ireland) The isolated right atrium of the dog in which the P receptors for catecholamines were blocked with dichloroisoproterenol released small amounts of a vasoactive substance on incubation with tyramine. The pharmacol. prop. of this substance indicated that it was a catecholamine. G.M.Lewis

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1628. SUPERSENSITIVITY OF THE CAT HEART TO CATECHOLAMINE-INDUCED ARRHYTHMIAS FOLLOWING RESERPINE PRETREATMENT. W.W.Fleming: Proc. Soc. exp. Biol., N.Y., 1962, 111, 484-486 (Dept. Pharm., West Virginia Univ. Med. Center, Morgantown, W. Va., U.S.A.) Pretreatment with reserpine for 7-28 days causes a significant increase in sensitivity of the cat heart to catecholamine-induced arrhythmias and there is indication that this sensitivity increases progressively with increased duration of reserpine treatment. M.M. Shapland

1629. ACTION OF CATECHOLAMINES ON BOVINE IRIS MUSCLE. B.Djahanguir: Arch. int. Pharmacodyn., 1963, 142, 276-278 (Expt. Therap. Inst., Univ., Liège, Belgium) On the sphincter iris muscle, isopropylnoradrianol caused [3] effects similar to those of adrenaline but weaker than those of isoprenaline. (French) T.J.Sullivan

1630. ACTION OF CATECHOLAMINES ON ISOLATED TRACHEAL MUSCLE OF THE GUINEA-PIG. R.Dejardin: Arch. int. Pharmacodyn., 1963, 142, 279-281 (Expt. Therap. Inst., Univ. Liège, Belgium) Adrenaline, isoprenaline and noradrenaline caused relaxation of ACh induced contraction of tracheal muscle. The prep, was desensitised to those three substances by (\pm)nor-metanephrine. (French) T.J.Sullivan

1631. SELECTIVE POTENTIATION OF SYMPATHOMIMETIC AMINES BY RESERPINE, SYROSINGOPINE, AND₂, 6-XYLYLCHOLINEETHER BROMIDE [TM-10] IN THE DOG. C.A.Ross, H-C.Wenger, C.T.Ludden and C.A.Stone: Arch. int. Pharmacodyn., 1963, 142, 141-151 (Merck Inst. Therap. Res., West Point, Pa., U.S.A.) In anaesthetised, vagotomised dogs, reserpine, syrosingopine and TM-10 potentiated the vasopressor responses to phenethylamine and tyramine, and only to a lesser extent those to noradrenaline and dopamine. Reserpine and syrosingopine were 40 times more potent than TM-10. Similar actions were not demonstrable with guanethidine, bretylium, methyldopa, iproniazid and cocaine. The phenomenon may be due to a sensitising action on catecholamine stores, upon which phenethylamine is presumed to act. T.J.Sullivan

1632. ANALYSIS OF ADRENERGIC BLOCKING ACTIVITY OF CYSTEAMINE. V.Varagid, R.Debijadji and S.E.I.Cić: Arch. int. Pharmacodyn., 1963, 142, 206-215 (Inst. Aviat. Med., Zemun, Yugoslavia) The adrenergic blocking actions of cysteamine are studied on rat b.p. and on isolated rabbit uterus, atrial and intestinal prep. In most tissues cysteamine appears to block both α and β receptors, though it does not influence the action of adrenaline on the rabbit duodenum. On guinea-pig ileum it produces a stimulant effect and potentiates the similar response to adrenaline. S.E.Smith

1633. ENZYME ACTION ON NORADRENALINE AND ADRENALINE. E.Jisalo: Acta pharmacol., Khb., 1962, 19, Suppl. 1, 1-90 (Dept. Pharmacol., Univ. Turku, Finland) Enzymic metabolism of noradrenaline and adrenaline takes place in homogenates of bovine heart, lung, uterus, small intestine, spleen, liver, kidney and brain tissue, and to a limited extent in skeletal muscle. Amphetamine and iproniazid did not produce 100% inhibn. of MAO in the tissues examined. R.S.Tonks

1634. EVIDENCE FOR RAPID TURNOVER OF NORADRENALINE IN RAT HEART AND BRAIN. S.Spector,

K.Melmon and A.Sjoerdsma: Proc. Soc. exp. Biol., N.Y., 1962, 111, 79-81 (Expt. Therap., NJH.L, Bethesda, Md., U.S.A.) Administration of an indolyl alkylarylpiperazine depletes the noradrenaline content of heart and brain within 3 hr. without affecting brain 5HT; return to normal being effected within 8 hr. M.M.Shapland

1635. PERIPHERAL NORADRENERGIC REACTIVITY. A.F. de Schaepdryver, M.Bogaert, A.L.Delaunois and P.Bernard: Arch. int. Pharmacodyn., 1963, 142, 243-259 (J.F. Heymans List. Pharmacol., Univ., Ghent, Belgium) In morphine-chloralose-anaesthetised dogs i.v. infusions of noradrenaline 0.5 µg./kg./min., L-dopa, dopamine or normetadrenaline do not sensitise hindleg vasoconstriction, splenic contraction and cardiac acceleration to postganglionic sympathetic stimulation, nor do they restore these responses after their abolition by reserpine, methyldopa or guanethidine pretreatment. S.E.Smith

1636. VARIABLE ACTION OF MAO-INHIBITING HYDRAZINES ON 5HT METABOLISM. E.Kirberger: Nature, Lond., 1963, 197, 1211-1212 (Nervenklin. der Stadt und Univ., Frankfurt am Main, Germany) Urinary excretion of 5-HIAA after oral loading with 5HT is decreased after treatment with the MAO inhibitors 'Marsilid', 'Marplan', 'Nardil' and 'Niamid', but only 'Marsilid' and 'Marplan' decreased the excretion after oral loading with 5-HIAA itself. The significance of this finding is discussed. CM.Lewis

1637. MECHANISM OF THE HAEMODYNAMIC EFFECTS OF HYDRALAZINE IN MAN. B.Ablad: Acta pharmacol. Khb., 1963, 20, Suppl. 1, 1-53 (Dept. Pharmacol., Univ., GÖteborg, Sweden) Hydralazines site of action in the peripheral vascular bed determines its haemodynamic effects in man. Given i.a. in low dosage to the forearm and hand, it decreases regional vascular resistance of long duration after a slow onset. It produces a pronounced relaxation of the resistance vessels and a smaller relaxation of the capacitance vessels. R.S.Tonks*

1638. LETHAL DOSE, PRESS OR EFFECT AND INTESTINAL ACTIVITY OF SOME PYRROLIDINE N-SUBSTITUTED NORNICOTINE DERIVATIVES. N.Mattila and A.Vartiainen: Acta pharmacol. Khb., 1962, 19, 330-336 (Dept. Pharmacol., Univ., Helsinki, Finland) Ethyl-, allyl-, benzyl-, acetyl- and carbaminoyl-nornicotine all produced a contraction of the isolated guinea-pig ileum which could be abolished by cocaine, hexamethonium or thiamine but hardly at all by atropine, except that caused by acetylnornicotine. R.S.Tonks

ENDOCRINES

1639. INHIBITION OF THE BIOLOGICAL ACTION OF THYROID HORMONES BY ACTINOMYCIN D AND PUROMYCIN. J.R.Tata: Nature, Lond., 1963, 197, 1167-1168 (Nat. Inst. Med. Res., Mill Hill, London, England) Administration of puromycin and actinomycin D to rats suppresses the physiol. action of L-thyroxine and 3, 5, 3'-triiodo-L-thyronine. It is concluded that stimm. of protein synthesis is an essential requirement for the full physiol. response to thyroid hormones. J.R.Sargent

1640. EFFECT OF 3:5:3'-TRIIODOTHYROACETIC ACID [TRIAC] ON THE IN VITRO OXYGEN UPTAKE OF LEUCOCYTES OF HYPOPIITUITARY PATIENTS. LProvan, CMurray and S.K.Bisset: Nature, Lond., 1963, 197, 1209-1210 (Univ. Dept. Med., Royal Infirmary, Glasgow, Scotland) 4 patients with untreated secondary hypothyroidism did not show the stimm. of O₂ uptake of their leukocytes treated with TRIAC as had been observed with primary hypothyroidism. One Patient treated with cortisone, did show this stimm., and it is suggested that cortisone facilitated the access of the thyroid hormone to the site of action; secondary adrenal insufficiency was present in the other patients.

G.M.Lewis

1641. THE USE OF SODIUM DEXTRO-THYROXIN IN PATIENTS WITH ANGINA PECTORIS. C.Moses, J.R. Jablonski, J.H.Sunder and L.B.Katz: Amer. J. med. Sci., 1962, 244, 731-735 (Ad.H.Gibson Lab. Sch. Med., Univ. Pittsburgh, Pa., U.S.A.) Dextro-thyroxin, 4 mg. daily, reduces the serum g-lipoprotein cholesterol level but has no effect on the serum CL-uprotein cholesterol and the triglyceride levels. In some patients this action is associated with an increased freq. of angina attacks. E.E.Hobbiger

1642. INHIBITION OF OVULATION AND THYROID GLAND ACTIVATION IN RAT BY NEMBUTAL. K.Brown-Grant: J. Endocr., 1963, 26, 299-300 (Dept. Human Anat., Univ. Oxford, England) Doses of sodium pentobarbitone which block ovulation when given to the pro-oestrus rat also significantly reduce the thyroid uptake of 131I. It is suggested that TSH as well as LH secretion is inhib. by barbiturate. CF.Blane

1643. EFFECT OF DEXAMETHASONE ON EXCRETION OF OESTRIOL AND FOLLICLE-STIMULATING HORMONE IN PATIENTS WITH STEIN-LEVENTHAL SYNDROME. W.R.Butt, A.C.Crooke, F.J.Cunningham and R.Palmer: J. Endocr., 1963, 26, 303-304 (United Birmingham Hosp., Dept. Clin. Endocr., Sparkhill, Birmingham, England) Urinary oestriol levels were raised in all the patients treated with dexamethasone. Where FSH levels were measured these were found to be concomitantly raised. It is postulated that suppression of pituitary ACTH secretion by administration of exogenous corticoid may lead to a compensatory rise in FSH production. CF.Blane

1644. CLINICAL AND SERUM LIPID EFFECTS OF A COMBINATION OF NORETHYNODREL PLUS ETHYNODIOL-3-METHYL ETHER IN POST-MENOPAUSAL WOMEN. R.W.Robinson, W.D.Cohen and N. Jjigano: Amer. J. med. Sci., 1962, 244, 736-743 (Wes. Lab. and Med. Div., Memorial Hosp., Worcester, Mass. - u.s.A#) The 3-methyl ether of ethynodiol given in a dose of 5 mg. daily has an estrogen-like effect on serum HPids. This does not take place when the dose is doubled. The side effects of treatment are described. E.E.Hobbiger

1645. INCREASED SURVIVAL TIME IN DYSTROPHIC JELLY TREATED WITH METHYLANDROSTENEDIOL J'ENANTHOYLACETATE. R.F.Borgman: Nature, 1963, 197, 1304-1305 (Dept. Food Technol., Wisconsin, U.S.A#) Treatment of mice bovine diet with muscular dystrophy (fdydy) with the anabolic steroid methylandrostenediol dienanthoylacetate, which is a weak lengthened survival time, but did not alter the disease syndrome. G*M.Lewis

1646. MECHANISM OF TRIPARANOL-INDUCED ADRENAL HYPERSTROPHY AND REDUCED ADRENAL FUNCTION. S.Gordon, S.Mauer, W.P.Cekleniak and R.Partridge: Endocrinology, 1963, 72, 643-648 (Biochem. Res., American Cyanamid Co., Pearl River, N.Y., U.S.A.) Expt. on triparanol administration to rats suggest that the adrenal enlargement and impaired adrenal function in intact rats was primarily due to adrenal steroid depletion. The failure of the enlargement to occur in hypophysectomised animals was thought to be due to failure of the adrenal feedback mechanism to stimulate the adrenals via the pituitary. H.C.Jones

1647. EFFECT OF HYDROCORTISONE ON EXPERIMENTAL SILICOTIC NODULE. R.C.Talley and B.Burrows: Proc. Soc. exp. Biol., N.Y., 1963, 112, 119-122 (Dept. Med., Univ. Chicago, 111, U.S.A.) Swiss mice were inj. i.v. with 7.5 mg. of sandstone with particles of 1-2 μ in size. Treatment with hydrocortisone was either concurrently with the silicotic material or 95 days subsequently. It was found by histol. examination of the left lobes of the liver at regular intervals after injn. that fibrosis was reduced as long as hydrocortisone treatment continued. D.N. Wheatley

1648. EFFECT OF HYDROCORTISONE ADMINISTRATION ON THE HYALURONIC ACID FRACTIONS OF SYNOVIAL FLUID IN RHEUMATOID ARTHRITIS. V.Nanto, P.Seppala and E.Kulonen: Clin. chim. Acta, 1962, 7, 794-799 (Dept. Med. Chem., Univ., Turku, Finland) The hyaluronate of the rheumatoid synovial fluids could be separated into fractions by a stepwise dissolution of the cetylpyridinium complex into salt soln. The distribution of the fractions is continuous but skewed. Physicochem. data on the fractions are given. Treatment with hydrocortisone affected the distribution of the fractions. V.M.Wootton

1649. INHALATION CORTICOSTEROID (DEXAMETHASONE PO₄) MANAGEMENT OF CHRONICALLY ASTHMATIC CHILDREN. S.B.Crepea: J. Allergy, 1963, 34, 119-126 (Med. and Res. Dept., Sahuaro Sch. for Asthmatic Children, Tucson, Ariz., U.S.A.) Dexamethasone PO₄ powder, particle size 0.5-4 μ and propelled by a fluorocarbon compound was inhaled daily by 29 asthmatic children between 6 and 13 yr. whose condition before this treatment had required maintenance with oral dexamethasone at a daily rate from 0.75-2.25 mg. The daily amount of powder inhaled was 0.67 mg., and all the children but one became symptom-free, requiring no other medication on average for 19 days, some relapses beginning after 2 days. The 24 hr. urinary 11-OH corticoid excretion was investigated in 15 children and found depressed. In 7 of them ACTH gel was given and increased the excretion promptly. In 7 of them ACTH gel increased the excretion promptly. It is concluded that less corticoid is necessary for the control of asthma if inhaled as powder than if given orally but that adrenocortical suppression occurs in both cases. H.Herxheimer

1650. COMPARATIVE ACTIONS OF CORTISONE, ANDROGENS AND VITAMIN B₁₂ ON BODY WEIGHT AND INCIDENCE OF DISEASE IN MICE. A.A.Ashburn, W.L. Williams and T.R.Arlander: Anat. Rec., 1962, 144, 1-17 (Dept. Anat., Univ. Mississippi Sch. Med., Jackson, Miss., U.S.A.) The report presents an account of the changes in body wt. and of the incidence of cardiac, hepatic and renal lesions in mice inj. with cortisone, or one of three androgens, or vit. B12. or with cortisone plus an androgen or vit. B12*. F.Beck

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1651. COMPARISON OF POTENCY ESTIMATES FOR GLUCOCORTICOIDS USING TWO THYMOLYTIC ASSAY PROCEDURES. S.J.Mauer, E.Heyder and I.Ringler: Proc. Soc. exp. Biol., N.Y., 1962, 111, 345-348 (Dept. Metabol. Chemother., Expt. Therap. Res. Sect., American Cyanamid Co., Pearl River, N.Y., U.S.A.) Comparison of thymolytic activity for glucocorticoids showed that the potency of the single injn. 48 hr. assay was 0.82 times that of the multiple inj. 5 day assay. M.M.Shapland

1652. ORAL THYMOLYTIC ACTIVITIES FOR RAT OF 21-PHOSPHATE AND 21-ACETATE ESTERS OF SOME ANTI-INFLAMMATORY STEROIDS. R.M.Atkinson, M.A.Pratt and E.G.Tomich: J. Endocr., 1963, 26, 297-298 (Glaxo Res. Ltd., Greenford, Middx, England) Although the acetates of prednisolone and cortisone were more potent orally than their alcohols, the acetate and the alcohol of betamethasone were approx. equipotent and dexamethasone acetate was less active than the alcohol. Phosphates of all 4 steroids were less active than the corresponding alcohol. G.J.F.Blanen

1653. QUANTITATIVE RELATIONSHIP BETWEEN CORTISOL PRODUCTION AND SPONTANEOUS OUTPUT OF URINARY TRYPSIN INHIBITOR IN MAN. H.J.Faarvang: Acta pharmacol. Khb., 1962, 19, 305-311 (Biol. Inst., Carlsberg Fdn., Copenhagen, Denmark) The total spontaneous trypsin inhibitor output in man is produced by cortisol. Cortisone has the same effect on the output of trypsin inhibitor and the sensitivities to cortisol and cortisone vary from person to person. R.S.Tonks

1654. ACTIVITY OF SOME RESPIRATORY ENZYMES IN LIVER MITOCHONDRIA OF RATS TREATED WITH CORTISONE AND ANABOLIC ANDROGENS. K.Kowalewski: Arch. int. Pharmacodyn., 1963, 142, 9-16 (Surg.-Med. Res. Inst., Univ. Alberta, Edmonton, Alta., Canada) Liver mitochondrial respiratory enzyme activity is studied in rats pretreated with corticosteroids. Cortisone 5 or 10 mg./day for 14 days inhibits succinic dehydrogenase. Norethandrolone 5 or 10 mg./day and methandienone 5 mg./day have no effect, nor does methandienone prevent the inhibitory effect of cortisone. None of the steroids affects cytochrome oxidase. S.E.Smith

1655. EFFECT OF RESERPINE ANALOGUE, METHYL-18-EPI-O METHYL RESERPATE HYDROCHLORIDE ON LACTOGEN RELEASE FROM RAT ANTERIOR PITUITARY. R.R.Gala and R.P.Reece: Endocrinology, 1963, 72, 649-657 (Dept. Dairy Sci., N. Jersey Agric. Stn., New Brunswick, N.J., U.S.A.) Expt. on rats show that the reserpine analogue, methyl-18-epi-O-methyl reserpate hydrochloride has a lactogen releasing action on the ant. pituitary. It prolonged the oestrous cycle, stim. mammary gland activity and decreased the ant. pituitary lactogen content in lactating females. H.C.Jones

1656. ACTION OF STEROIDS ON LYSERGIC ACID DIETHYLAMIDEMETABOLISM. J.R.Bergen, L.Perkins and M.Hayano: Proc. Soc. exp. Biol., N.Y., 1962, 111, 427-428 (Worcester Fdn., Expt. Biol., Shrewsbury, Mass., U.S.A.) In vitro metabolism of LSD in a rat liver homogenate fraction was significantly reduced by steroids in concn. as low as 10⁻⁶M. It is thought that this is due to blocking of LSD-receptor relationship in the cell. M.M.Shapland

GENERAL PHARMACOLOGY

1657. A FLUX-CARRIER HYPOTHESIS OF DRUG ACTION. D.Mackay: Nature, Lond., 1963, 197, 1171-1173 (Dept. Pharmacol., Sch. Med., Univ., Leeds, England) A flux-carrier hypothesis designed to explain the actions of drugs on ganglia and neuromuscular junctions contained features of both the receptor theory and potential theory. It is suggested that depolarisers, including ACh, may depolarise the post-synaptic membrane by penetrating it. G.M.Lewis

1658. INFLUENCE OF EXTERNAL FACTORS AND AROUSAL MECHANISMS ON THE RATE OF DRUG TOLERANCE DEVELOPMENT. S.Irwin: Arch. int. Pharmacodyn., 1963, 142, 152-156 (Neuro-pharmacol. Dept., Schering Corp., Bloomfield, N.J., U.S.A.) In rats, the rate of onset of tolerance to chlorpromazine was accelerated by increasing the intensity of the conditioned buzzer or unconditioned electro-shock stimulus employed in an avoidance study. It is suggested that the expt. situation, affecting behaviour and response to drugs, accounts for many diverse expt. findings. T.J.Sullivan

1659. ACTION OF SOME PSYCHOTOMIMETIC AGENTS ON EXCITATORY AND BIOCHEMICAL PROCESSES OF FROG SARTORIUS MUSCLE. L.C.Abood, C.M.Smith, I.Koyama and K.Koketsu: J. Neurochem., 1963, 10, 95-111 (Dept. Psychiat. and Biochem., Univ. Illinois Med. Coll., Chicago, Ill., U.S.A.) At 10-4-105 M in a Ca-free [EDTA-containing] medium methylpyrrolidylmethylcyclopentylphenylglycolate [PPG] 4 deriv. of piperidyl benzilate, atropine and cocaine inhib. lactate production and spontaneous twitching, and increased isometric contraction of the isolated muscle. 105M PPG in Ca-free media also increased hexose-6-phosphate and glycogen levels but phosphocreatine and ATP levels remained normal. Under similar conditions PPG prolonged neg. after potentials following electrical stim. of the muscle. On switching from a Ca-containing to a Ca-free medium the usual drop in resting potential was retarded by 10⁻⁵M PPG. These results are discussed with respect to PPG action being mediated by the Ca and PO₄ effects on excitatory membranes. R.Woodman

1660. RELATIONSHIP OF PLASMA SALICYLATE CONCENTRATION TO URINARY SAUCYLATE EXCRETION RATE. E.Nelson and G.Levy: Nature, Lond., 1963, 197, 1269-1270 (Sch. Pharm., State Univ. New York, Buffalo, N.Y., U.S.A.) Both plasma salicylate level and data on urinary excretion rates of salicylate are satisfactory indicators of the relative absorption rates of orally ingested salicylates. J.R.Sargent

1661. INHIBITION OF MALIC DEHYDROGENASE BY SALICYLATE AND RELATED COMPOUNDS. M.J.H. Smith and C.Bryant: J. Pharm., Lond., 1963, 15, 189-191 (King's Coll. Hasp. Med. Sch., London, England) The enzyme in rat liver mitochondria w& inhib. by salicylate and resorcylate, this was reversed by nicotinamide adenosine dinucleotide. A general structural requirement for inhibitory activity appears to be a phenolic OH group in the o position to a COOH group, except that 2-hydroxyphenylacetate also inhibits. J.M.Whitmarsh

1662. PHARMACOLOGICAL AND CHROMATOGRAPHIC DIFFERENTIATION BETWEEN A SECONDARY KININ FROM HUMAN URINE AND BRADYKININ. K.B.Jensen, U.

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and A.M.VennerOd: *Acta pharmacol. Kbh.*, 1962, 19, 337-344 (Biol. Dept., Pharmaceut. Inst., Univ., Oslo, Norway) Assays with the rat uterus and guinea-pig ileum or rat b.p. distinguished between synthetic bradykinin and a secondary kinin (Z2) from human urine. Indices of discrimination of 12 and 15 respectively were obtained.
R.S.Tonks

1663. UTERINE RELAXANT PROPERTIES OF BRADYKININ IN VITRO. R.Landesman, W.L.Campbell and K.Wilson: *Nature, Lond.*, 1963, 197, 1208-1209 (Cornell Univ. Med. Coll., Dept. Obstet., New York, N.Y., U.S.A.) In non-pregnant human uteri, 0-2 /ig./ml. bradykinin Produced a significant relaxant response in 57% of tests. In pregnant uteri, 0-8 jig./ml. completely inhib. spontaneous or induced contractions. G.M.Lewis

1664. METABOLISM OF DRUGS. XXXVII. ENZYMIC OXIDATION OF METHYLHEXABITAL. II. REVERSIBLE OXIDATION OF 3-HYDROXY-METHYLHEXABITAL [3-OH-MHB]. K.Toki, S.Toki and H.Tsukamoto: *J. Biochem. Tokyo*, 1963, 53, 43-49 (Inst. Pharmaceut. Sci., Fac. Med., Kyushu Univ., Fukuoka, Japan)

The sol. fraction of rabbit liver contained an enzyme which oxidised 3-OH-MHB to 3-keto-methylhexabital. NAD and NADP were equally effective as H acceptors. Coenzymes appeared to be rather firmly bound. β -Chloromeicurbenzoate, a,d'-dipyridyl and α -Phenanthroline inhib. FAD, FMN, Methylene Blue, ferri-cyanide, menadione, glutathione, cystine ora-lipoic acid activated in the presence of pyridine nucleotide. B.M.Stevens

1665. BIOCHEMISTRY AND PHARMACOLOGY OF 6-URACIL METHYL SULPHONE [UMS]. W.A.Creasey and R.C.Haff: *Cancer Res.*, 1963, 23, 462-467 (Dept. Pharmacol., Yale Univ. Sch. Med., New Haven, Conn., U.S.A.) UMS inhib. the conversion of ribonucleotides to deoxyribonucleotides by mammalian tissue. UMS was rapidly destroyed in vivo by reaction with ^3H containing compounds. During i.a. infusion of UMS in dogs a much larger concn. gradient was set up between Rin*ed* and contralat. limbs than that attained during infusion of Evans Blue. UMS did not interfere with orotic acid metabolism. B.M.Stevens

1666. CLINICAL AND PHARMACOLOGICAL STUDIES WITH 2^f, 3\ 5*-TRIACETYL-6-AZAURIDINE. W.A. freasey, M.E.Fink, R.E.Jiandschumacher and P.Cala-J*esi: *Cancer Res.*, 1963, 23, 444-453 (Dept. Int. Med., Yale Univ. Sch. Med., New Haven, Conn., U.S.A.) The compound, fed to 11 patients with advanced neoplastic disease, was absorbed rapidly from the gastrointestinal tract. Significant blood levels of 6-azauridine were maintained in the 8 hr. between doses of ^{14}C -cetylated deriv. Examination of the fate of i.v. ^{14}C -cetylated deriv. and *ol* urinary orotidine and ^3H acid excretion indicated that the conversion of ^3H acid to uridine nucleotides was depressed during ^{14}C -Py. Metabolic effects and clinical changes were ^{14}C -able to those produced by equiv. i.v. doses of 6-azauridine. B.M.Stevens

1667. AUTORADIOGRAPHIC STUDIES ON THE DETRITION OF [3H]MEPROBAMATE IN THE BODY. J.Ewaldsson: *Arch. int. Pharmacodyn.*, 1963, 142, 169 & Pharmacol., Royal Vet. Coll., Stockholm Sweden) The distribution of PHbieprobamate is studied with autoradiography. One minute after ^{3}H -injection the largest quantities are found in the liver,

adrenals, intestine and kidneys. Renal excretion occurs rapidly and all tissue levels decrease equally rapidly. S.E.Smith

1668. NOTE ON THE METABOLISM OF o-(2-ETHOXY-ETHOXY)-BENZAMIDE TO o-(CARBAMOYL)-PHENOXYACETIC ACID INlrFAN. AJ.Cummings: *J. Pharm. Lond.*, 1963, 15, 212-214 (Nicholas Res. Inst., Slough, Bucks., England) After oral administration of the first-named the only metabolic product was the 2nd. J.M.Whitmarsh

1669. PHYSICO-CHEMICAL EXPERIMENTS WITH PHOSPHATIDYL ETHANOLAMINE SOLS. D.C.Robins and I.L.Thomas: *J. Pharm. Lond.*, 1963, 15, 157-166 (Welsh Coll. Adv. Technol., Cardiff, Wales) Solubilities in some org. solvents were determined. Surface tension studies of aq. sols indicated marked surface-active prop. and showed that surface ageing occurs. The effects of pH, concn., mono- and divalent salts were investigated and are discussed. The critical micelle concn. is 0-002-0-01% w/v. The isoelectric point is at pH 3-1. J.M.Whitmarsh

1670. DIMETRIDAZOLE: ABSORPTION, EXCRETION AND METABOLISM IN TURKEYS. G.L.Law, G.P.Mansfield, D.F.Muggleton and E.W.Pamell: *Nature, Lond.*, 1963, 197, 1024-1025 (Res. Lab., May and Baker Ltd., Dagenham, Essex, England) Examination of faeces and urine of turkeys by polarography and colorimetry after feeding 1-300 mg./kg. dimetridazole showed that 64% of the dose was excreted within 3 days. Radiochem. methods following administration of [^{14}C]dimetridazole in drinking water showed that no detectable amounts of the compound or its metabolites remained in the tissues 3 days later. Chromatographic techniques showed that metabolites included nitroimidazoles, hydroxymethyl deriv. and conjugated glucuronides. G.M.Lewis

1671. DETERMINATION OF POLDINE METHYL METHSULPHATE IN BIOLOGICAL FLUIDS. P.F.Langley, J.D. Lewis, K.R.L.Mansford and D.Smith: *J. Pharm. Lond.*, 1963, 15, 100-106 (Beecham Res. Lab., Ltd., Betchworth, Surrey, England) The substance is coupled with Methyl Orange and simult. extracted in a mixture of ethylene dichloride and isopentanol. The extract is acidi-fied with alcoholic H_2SO_4 and the O.D. of the pink colour is read at 525 mji. Recovery was 99.2 \pm 1.8%. The pH for coupling must be 4-9. Prolinol methyl methosulphate does not couple. J.M.Whitmarsh

1672. TEST FOR METABOLIC ATTACK ON TRIS (HYDROXYMETHYL)AMINOMETHANE AND HYDROXYMETHYL SERINE IN THE RAT. H.R.Christensen and J.Clifford: *Proc. Soc. exp. Biol., N.Y.*, 1962, 114, 140-143 (Dept. Biol. Chem., Univ. Michigan, Ann Arbor, Mich., U.S.A.) Tris undergoes no significant metabolic oxidation in the rat. M.M.Shapland

1673. PREPARATION AND MEASUREMENT OF THE SURFACE ACTIVITY OF A SERIES OF 4-ALKYL-1¹-SPIROLIPIPERIDINIUM BROMIDES. J.Thomas and D. Clough: *J. Pharm., Lond.*, 1963, 15, 167-177 (Dept. Pharm., Univ., Manchester, England) The prep. are described. The surface tension of aq. soln. is reported. None of the compounds formed micelles in the concn. range studied. The relationship between micelle formation of quaternary NH_4 ions and antibacterial activity is discussed. J.M.Whitmarsh

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1674. PREPARATION OF PORPHYROXINE FROM OPIUM.

K.Genesi and D.G.Faimilo: J. Pharm., Lond., 1963, 15, 197-201 (Dept. Nat. Hlth., Tunney's Pasture, Ottawa, Canada) An extract of opium was passed through columns of Florisil and alumina (basic and neutral). Elution with solvents of varying polarity yielded poiphyroxine. The m.p., spectral and paper chromatographic findings are reported. J.M .Whitmarsh

1675. MODE OF ACTION OF TYRAMINE. MJ.Davey

and J.B.Jarmer: J. Pharm., Lond., 1963, 15, 178-182 (Pfizer Ltd., Sandwich, Kent, England) Repeated administration to the isolated perfused guinea-pig heart lowered the pos. inotropic response and the nor-adrenaline content of the heart decreased. A decrease also occurred when phenylethylamine and guanethidine were administered until no further pos. inotropic effect was obtained, but amphetamine, bretylium and ephedrine in similar circumstances did not bring about such a decrease. J. M. Whitmarsh

1676. PHARMACOLOGICAL ACTION OF TYRAMINE ON THE CARDIOVASCULAR SYSTEM IN MAN. M.L.

Mashford, D.A.Wolochow and W.A.Mahon: Proc.Soc. exp. Biol., N.Y., 1962, 111, 308-311 (Clin. Pharm. Div. Med. Serv. Lemuel Shattuck Hosp., Boston, Mass., U.S.A.) I.v. injn. of tyramine in man causes elevation of b.p. and total peripheral resistance, but inconsistent effects on cardiac output and pulse rate. Changes in the site of impulse formation and conduction were observed in the e.c.g. M.M.S hap land

1677. MODIFICATION OF CARDIOVASCULAR EFFECTS OF THEOPHYLLINE BY 7-DIHYDROXYPROPYL SUBSTITUTION. C.B.Nash and E.Manley: Arch. int. Pharmacodyn., 1963, 142, 67-73 (Pharmacol. Dept., Tennessee Univ. Med. Units, Memphis, Tenn., U.S.A.)

Dihydroxypropyl theophylline [DHPT] was 10 to 20 times less potent than aminophyllin in increasing coronary flow and as a myocardial stimulant in anaesthetised dogs and on isolated cat hearts. In unanaesthetised animals it had a more prolonged action and relatively less effect on heart rate. TJ.Sullivan

1678. NITRITES. XX. PHARMACOLOGICAL STUDIES WITH 1-ETHYGLYCERYL TRINITRATE [EGT]. R.M.

Burgison, G.G.Lu, F.K.Bell and J.C.Krantz, jun.: Proc. Soc. exp. Biol., N.Y., 1962, 111, 245-247 (Dept. Pharm., Sch. Med., Univ. Maryland, Baltimore, Md., U.S.A.) It has been shown that EGT quant, and qual. evokes the same character of coronary dilation as does glyceryl trinitrate. M.M.Shapland

1679. BIPHASIC ACTION OF DIGITOXIN ON VAGAL CONTROL OF THE HEART. T.Godfraind and A.

Godfraind-De Becker: Arch. int. Pharmacodyn., 1963, 142, 288-290 (Pharmacol. Lab., Lovanium Univ., Leopoldville, Congo) Digitoxin caused a biphasic effect on vagal stimm. of the mammalian heart in vivo. After i.v. injn. vagal bradycardia was at first potentiated, but subsequently the heart rate reverted to sinus rhythm. (French) T.J.Sullivan

1680. ANALYSIS OF KC1-DIGITOXIN ANTAGONISM.

T.Godfraind and A.Godfraind-De Becker: Arch. int. Pharmacodyn., 1963, 142, 291-292 (Pharmacol. Lab., Lovanium Univ., Leopoldville, Congo) By measuring antagonism between digitoxin and histamine, and varying KC1 content in the digitoxin soln. it was concluded that antagonism between KC1 and digitoxin was only

partly competitive. There appeared to be 2 types of digitoxin receptor, only one of which could be antagonised by KC1. (French) TJ.Sullivan

1681. BINDING OF QUINIDINE TO MYOCARDIAL CELLULAR COMPONENTS. R.B.Arora, J.N.Sharma, T.K.

Tarak and Y.R.Saxena: J. Pharm. Lond., 1963, 15, 151 (Dept. Pharmacol., All-India List. Med. Sci., New Delhi, India) A letter. J.M.Whitmarsh

1682. CONTROLLED OBSERVATION OF PROLONGED ORA& TREATMENT WITH PERSANTIN. G.Neuhaus, D.

Lerche and L.Seki: Z.Kreisl.-Forsch., 1963, 52, 164' 170 (Cardiol. Dept., I. Med. Clin., Free Univ., Berlin, Germany) Persantin, a piperidine-pyrimidine deriv., was given for several months (12*5 mg. by mouth 3-4 times daily) to 11 male patients with angina d effort whose e.c.g. showed marked ST segment depression during induced hypoxia; periods of treatment were repeatedly interrupted by periods of placebo medication. Periods of treatment were associated with statistically significant improvement in symptoms and also in the e.c.b' response to hypoxia. This improvement was lost during periods of placebo medication. (German) P.F.Meyer

1683. PHARMACOLOGICAL STUDIES OF 2, 6-BIS(I-

PIPERIDYL METH YL)-4-(a, a - DIMETHYLBENZ YL)-PHENOL DIHYDROCHLORIDE (Ro 2-5803) ON CARP^ VASCULAR SYSTEM. V.N.Sharma and K.P.Singh: Arch. int. Pharmacodyn., 1963, 142, 185-197 (Dept' Pharmacol. and Expt. Ther., S.M.S. Med. Coll., Jaipur, India) The cardiovascular actions of Ro 2* 5803 [Rhythmol] are investigated in dogs and on isolated frog and rabbit heart prep. It has hypotensive, neg. ino* tropic and chronotropic actions similar to those of quini'dine and anti-arrhythmic effects more potent than those of quinidine. S.E.Smith

1684. CARDIOVASCULAR ACTIONS OF 2, 6-BIS[2-

HYDROXYETHYL]AMINO]-4, 8-DIPIPERIDINOPYRI' MIDO[5,4-D]PYRIMIDINE[RA-8]. M.Ben, G.C.BO**¹, C.C.Scott and M.R.Warren: Arch. int. Pharmacodyn.* 1963, 142, 228-236 (Warner-Lambert Res. Inst., Morris Plains, N.J., U.S.A.) Following intracoronary or i.v. administration in dogs RA-8 produces coronary vasodilatation. By mouth RA-8 is ineffective. S.E.Smith¹

1685. EFFECTS OF SODIUM SELENITE ON SEVERAL :

BLOOD COMPONENTS. M.A.Heinrich, jun.: Tc**f appl. Pharm., 1963, 5, 267-271 (Dept. Physiol. and Pharmacol., Sch. Med. Sci., State Univ. S. Dakota*, Vermillion, S. Dak., U.S.A.) The effect of sodW selenite, given to dogs i.v. in doses up to 2 mg./kg. on & levels of plasma Na, Ca, P, K, lactate, pyruvate and proteins, on the haematocrit and the venous pH was investigated. The observed changes are thought to be due to a combination of 'adrenaline' release, reduction in cardiac output and plasma flow, haemo-concn., and enzyme inhibn. E.E.Hobbiger

1686. EFFECT OF HEPARIN, PROTAMINE, DICOUMAROL, STREPTOKINASE AND 6 -AMINO-n-CAPROIC ACID [EACA] ON THE GROWTH OF HUMAN CELLS IN VITRO. A.Iisnell and L.Mellgran: Acta path. micr. biol. scand., 1963, 57, 145-153 (Dept. Path., Uni*

Gothenberg, Sweden) Human cell strains grown directly on glass in fluid medium containing 1 to 125 ^{125I} heparin showed no inhibn. of cell growth. Protamine, coumarol, streptokinase, and EACA all inhib. the growth with rising concn. LFriedman

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1687. CONTROL OF ANTICOAGULANT THERAPY. P.A. Owren: Arch. intern. Med., 1963, 111, 248-258 (Univ. Hosp., Oslo, Norway) A survey of new tests, illustrated by results obtained by the author.

E.E.Hobbiger

1688. A STUDY WITH LOW AND HIGH MOLECULAR WEIGHTS OF HEXODIMETHRINE BROMIDE - AN ANTIHEPARIN AGENT. E.T.Kimura, P.R.Young and C.H.Barlow: Proc. Soc. exp. Biol., N.Y., 1962, 111, 37-41 (Res. Div., Abbott Labs., North Chicago, Ill., U.S.A.) Increase in i.v. toxicity and in vitro mast cell disruption are interrelated through an increase in Polymer average mol. wt. Polymers of varying toxicity can be fractionated by dialysis without loss of anti-heparin potency. M.M.Shapland

1689. STUDIES IN THE FIELD OF DIURETIC AGENTS. VII. 4-CHLORO-2^f-METHYL-3-SULPHAMOYL-BENZANILIDE. V.Petrow, O.Stephenson and A.M. Wild: Vm. SOME MISCELLANEOUS DERIVATIVES. G.B.Jackman, V.Petrow, O.Stephenson and A.M. Wild: J. Pharm. Lond., 1963, 15, 138-148, 202-211 (B.D.H. Ltd., Graham St., London, England) VII. A new route to the anilides of 4-halogeno-3-sulphamoylbenzoic acid is described. They, and in particular the title compound, are potent orally active diuretic agents. VIII. New deriv. of 4-chloro-3-sulphamoylbenzoic acid and of 4-chloro-3-sulphamoylaniline are described along with some formally related quinazolones. J.M.Whitmarsh

1690. 5-CHLORO-2-CYCLOHEXYL-1-OXO-6-SULPHAMOYL KOINDOLINE [M AND B 8430]: A NEW DIURETIC. E.J.Cornish, G.E.Lee and W.R.Wragg: Nature, Lond., 1963, 197, 1296-1297 (Res. Lab., May and Baker Ltd., Dagenham, Essex, England) Analogues of the diuretic chlorothiazide, in which pterocyclic ring was modified, were synthesised. The isoindolene, M and B 8430, was 100 times as active as chlorothiazide on oral administration to rats and dogs; the onset and duration of diuresis and the excretion of J_{ia} and K ions were very similar for equipotent doses of the 2 compounds. The therapeutic dose appeared to be about 50 mg. a day and was well tolerated.

G.M.Lewis

1691. THE VASCULAR EFFECT OF THE THIAZIDE DIURETICS. J.Conway and H.Palmero: Arch. intern. Med., 1963, 111, 203-207 (Dept. Med., Univ. Hosp., Ann Arbor, Mich., U.S.J.V.) Chlorothiazide reduces peripheral vascular resistance in man. It is thought that a change either in body content or in distribution of water or electrolytes, is responsible for this action. The hypotensive action of chlorothiazide is not related in magnitude to its diuretic action nor are the 2 processes closely related in time. E.E.Hobbiger

1692. COMPARISON BETWEEN EFFECTS OF CARINAMIDE AND PROBENECID ON THIOSULPHATE SECRETION IN THE RENAL TUBULES OF THE DOG. ^Berglund: Acta pharmacol. Khb., 1962, 19, 371-CAH⁸ (B.P.-Pharmacol., Univ. Goteborg, Sweden) lev-carbamide inhibits thiosulphate secretion at plasma lev¹³ of u¹³ fi./ml. whereas probenecid did not at car^u? to and above 150 μ g./ml. The SO₂ group in carbamide may have an affinity for a thiosulphate-tube cells, a characteristic probenecid to it due to the attachment of the SO₂ group benzene ring. R.S.Tonks

1693. ANTAGONISTIC RELATIONSHIP BETWEEN myo-INOSITOL AND 2-O, C-METHYLENE-myo-INOSITOL IN ANIMALS. P.A.Weinhold, N.Thanukrishna Iyer and L.Anderson: Proc. Soc. exp. Biol., N.Y., 1963, 112, 165-168 (Dept.Biochem., Agric. Coll., Univ. Wisconsin, Madison, Wis., U.S.A.) Mice of the Taconic strain were given 2-O, C-methylene-myo-inositol i.p. and were found to tolerate 20 to 30 mg./kg. but 40 mg./kg. caused severe depression of the growth rate. Necrosis of epithelial cells of the kidney were found as early as 8 hr. after injn. Histol. examinations of other organs revealed that only the stomach and the spleen were somewhat affected also. Blood urea was found to be high and therefore it was believed the kidney was damaged due to uraemia. It is suggested that this deriv. of myo-inositol may be acting competitively with the parent compound which has some as yet unknown role in the metabolism of kidney epithelial cells.

D.N.Wheatley

1694. EFFECTS OF VASOACTIVE DRUGS ON SERUM ELECTROLYTES IN HYPERTENSIVE AND NORMOTENSIVE HUMANS. M.A.Greene, AJ.Boltax, M.Niv and E.S.Scherr: Proc. Soc. exp. Biol., N.Y., 1962, 111, 423-427 (Cardiopulm. Lab., Dept. Med., Bronx Hosp., New York City, N.Y., U.S.A.) No significant changes in serum Na, K and Cl were observed after administration of trimethaphan or phenylephrine to normal and hypertensive humans indicating that extravascular electrolytes are better evaluated by direct analysis of tissues. M.M.Shapland

1695. FAT ACCUMULATION IN ACUTE LIVER INJURY. K.R.Rees and V.L.Shotlander: Proc. Roy. Soc. B², 1963, 157, 517-535 (Dept. Chem. Pathol., University Coll. Hosp. Med. Sch., London, England) Various aspects of the triglyceride cycle were studied in rats treated with liver poisons. Within 2 hr. of poisoning with CCl₄, there is an inhibn. of the synthesis of the protein moiety of lipoprotein and damage to the secretory mechanism. With dimethylnitrosamine, inhibn. of protein synthesis precedes damage to the secretory mechanism of the endoplasmic reticulum by many hr., while thiocacetamide, which produces necrosis without the accumulation of fat, has no effect on the triglyceride cycle.

G.M.Lewis

1696. SIDE EFFECTS OF TRIPARANOL THERAPY. H.O. Perry, R.K.Winkelmann, R.W.P.Achor and T.J.Kirby, jun.: Amer. J. med. Sci., 1962, 244, 556-559 (Mayo Clin. and MayoFdn., Rochester, Minn., U.S.A.) Triparanol, which blocks the formation of cholesterol from its immediate precursor, causes ichthyosis, loss of hair and a change in the colour of the hair. This is more pronounced in othan in ? E.E.Hobbiger

1697. A PHARMACOLOGICALLY ACTIVE SUBSTANCE IN MAMMALIAN TISSUE EXTRACTS. J.H.Gaddum and M.W.Smith: Proc. Roy. Soc. B², 1963, 157, 492-506 (A.R.C. Inst. Animal Physiol., Babraham, Cambridge, England) When substance P was assayed in crude extracts of guinea-pig tissues by the goldfish intestine test system, estimates more than 1000 times too high were obtained. The substance responsible for this effect was purified and identified as undine diphosphate. G.M.Lewis

1698. EFFECT OF PILOCARPINE ON ACID SOLUBLE PHOSPHATE COMPOUNDS OF RAT FOLLOWING HEPATECTOMY. W.A.Robinson, W.A.Engle and D.L Smith: Proc. Soc. exp. Biol., N.Y., 1962, 111, 477I 479 (Dept. Pharm., Univ. Colorado Sch. Med., Denver,

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Colo., U.S.A.) I.p. injn. of sodium diphenylhydantoin 10 days before and continuation of treatment after partial hepatectomy resulted in an increased rate of liver regeneration from day 2 to 5 after operation. No effect was observed when the drug was given only after operation.
M.M.Shapland

1699. EFFECT OF PILOCARPINE ON ACID-SOLUBLE PHOSPHATE COMPOUNDS OF RAT SUBMAXILLARY GLANDS. R.H.Dreisbach and E.Gerlach: Proc. Soc. exp. Biol., N.Y., 1962, 111, 526-529 (Inst. Physiol., Freiburg i. Br., Germany) Administration of pilocarpine increases the rate of entry of ^{32}P into rat submaxillary glands by approx. 20% but does not seem to effect ^{32}P incorporation into or concn. of, creatine phosphate or adenosine phosphates in the glands.
M.M.Shapland

1700. EXPERIMENTAL RESEARCH ON A NEW SYNTHETIC ANTI-HISTAMINE, CINNARAZINE. B.N.Halpem, C.Stiffel, M.Liacopoulos-Briot and L.Conovici: Arch. int. Pharmacodyn., 1963, 142, 170-184 (Centre Allergie and Immunol. Res., Broussais Hosp., 96 Rue Didot, Paris, France) Cinnarazine is N-*bsnzhydryl*- N^1 -cinnamyl-piperazine. It protected guinea-pigs against the effects of histamine aerosols, against lethal systemic doses of histamine and against anaphylactic shock. It antagonised the action of histamine on isolated intestine. It did not affect normal cardiovascular, respiratory or digestive functions, had low toxicity and was long acting. (French) TJ.Sullivan

1701. INFLUENCE OF COMPOUND 48/80 ON TUMOURS TRANSPLANTED TO THE HAMSTER CHEEK POUCH. MJMJCetzel and Y.Kobayashi: Proc. Soc. exp. Biol., N.Y., 1962, 111, 22-25 (Worcester Fdn. Expt. Biol., Shrewsbury, Mass., U.S.A.) Treatment with compound 48/80 (a histamine release agent) increased the rate of cheek pouch rejection of mouse ascites tumour cells.
M.M.Shapland

1702. CHEMICAL DETERMINATION OF ABSOLUTE CONFIGURATION OF LYSERGIC ACID. P.A.Stadler and A.Hofmann: Helv. chim. Acta, 1962, 45, 2005-2011 (Pharm.-chem. Forschungslab., Sandoz A.G., Basel, Switzerland) The abs. configuration of natural lysergic acid was determined as (5R:8R) by ozonisation of 6-methyl-8-methylene-7-keto-ergolene and subsequent oxidation with performic acid to D-N-methyl-aspartic acid which was identified in the form of its di-n-propyl ester. (German) A.D.Smith

1703. LYSERGIC ACID DIETHYLAMIDE: ITS EFFECTS ON A MALE ASIATIC ELEPHANT. LJ.West, CM. Pierce and W.D.Thomas: Science, 1962, 138, 1101-1102 (Dept. Psychiat., Univ. Oklahoma Sch. Med., Oklahoma City, Okla., U.S.A.) 0-1 mg./kg. LSD was inj. into a sexually mature male elephant. He quickly developed a tonic left-sided seizure, in which mild clonic movements were present and died by strangulation due to laryngeal spasm less than 2 hr. later despite attempts at therapy with promazine and pentobarbital. The temporal gland contained no dark brown secretion as is released during musth; it contained 2 distinct types of cell suggesting that it may function as an exocrine and endocrine organ. The possible role of the temporal gland and psychotomimetic substances in the causation of musth in male elephants is discussed.
G.M.Lewis

1704. INFLUENCE OF LYSERGIC ACID DIETHYLAMIDE ON EXPERIMENTAL ALLERGIC ENCEPHALOMYELITIS. DJ.O'Brien, F.W.Hughes and L.Newberne: Proc. Soc. exp. Biol., N.Y., 1962, 111, 490-493 (Dept. Pharm., Indiana Univ. Sch. Med., Indianapolis, Ind., U.S.A.) Administration of LSD to guinea-pigs inj. with homologous brain adjuvant reduced the incidence of paralysis and mortality rate.
M.M.Shapland

1705. SUPPRESSION C¹ EXPERIMENTAL ALLERGIC ENCEPHALOMYELITIS BY CYTOTOXIC DRUGS. D.B. Calne and S.Leibovitz: Nature, Lond., 1963, 197, 1309-1310 (Dept. Expt. Med., Guy's Hosp., London, England) The production of expt. allergic encephalomyelitis in guinea-pigs and the formation of haemolysin to sheep cells was inhibited by treatment with daily injn. of the alkylating agent cyclophosphamide (20 mg./kg.) or the folic acid anti-metabolite 4-amino-N-methyl-pteroylglutamic acid (5 mg./kg.). G.M.Lewis

1706. INHIBITION OF PURINE METABOLISM IN EHRIICL ASCITES CARCINOMA CELLS BY PHENANTHRIDIN-IUM COMPOUNDS RELATED TO ETHIDIUM BROMIDI J.F.Henderson: Cancer Res., 1963, 23, 491-495 (Dept. Pharmacol., George Washington Univ. Sch. Med., Washington, D.C., U.S.A.) Only 1 deiv. of the 10 examined markedly inhib. the incorporation of glycine into nucleic acid and proteins in vitro but all the deriv. inhib. the incorporation of adenine into nucleic acids.
B.M. Stevens

1707. RAPID MEMBRANE FILTRATION TECHNIQUES FOR STUDYING THE ACTION OF 6-THIOGUANINE ON TUMOUR CELLS IN VITRO. F.U.Brown, M.Klein, T¹* Kandaswamy and H.C.Mandel: Cancer Res., 1963, 23, 254-259 (Dept. Pharmacol., George Washington Univ. Sch. Med., Washington, D.C., U.S.A.) Leukaemia L1210 ascites cells, sensitive to 6-thioguanine, were incubated aerobic ally in a glucose-balanced salts medium with glutamine and rates of incorporation of various isotopic precursors were examined by radio-assay of various cell fractions on membrane filters. Incorporation of precursors represented net synthesis rather than exchange. Thioguanine decreased P^3C formate and methyl labelled [^{14}C]thymidine uptakes into the acid-insol. fraction by approx. 50% and 30% respectively but did not affect [^{35}S]methionine of [2- ^{14}C]acetate incorporation. Incorporation of [^{14}C]formate into nucleic acids was inhib. but proteins were only slightly affected* Molar activities of isolated nucleic acid bases were reduced.
B.M.Stevens

1708. SUPPRESSION OF THE IMMUNE RESPONSE BY DRUGS IN COMBINATION. S.Bieber, G.B.Eliot, GH¹* Hitchings, D.C.Hooper and H.C.Nathan: Proc. Soc. exp. Biol., N.Y., 1962, 111, 334-337 (Wellcome Re* Lab., Tuckahoe, N.Y., U.S.A.) Combinations of purine with pyrimidine analogues were tested for their effect on formation in mice of haemagglutinins to r.b.c.* Greater than additive effects were obtained with 6-mercaptopurine and thioguanine in combination with 5* bromodeoxyuridine, 4-thiodeoxyuridine, 5-acetoxy-uracil and 6-azauracil plus urethane.
M.M.Shapland

1709. PYRETOGENIC EFFECTS OF BACTERIAL LIPO-POLYSACCHARIDE AND THE ASSAY OF ANTIPYRE* DRUGS IN RATS. C.A.Winter and G.W.Nuss: Toxic* appl. Pharmacol., 1963, 5, 247-256 (Merck Inst.

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Therap. Res., West Point, Pa., U.S.A.) *The rat does not, as commonly supposed, exhibit an aberrant response to pyrogens but gives a reasonably uniform and predictable hyperthermic response to i.p. or i.v. injn. of bacterial pyrogen (lipopolysaccharide prepared from *E. coli*). The hyperthermic response is related to the log dose of the pyrogen over a wide range of doses and can be adapted to die assay of antipyretic drugs.*

E.E.Hobbiger

1710. EMETIC EFFECT OF PURIFIED STAPHYLOCOCCAL ENTEROTOXIN IN CATS. W.G.Clark, G.J.F.Vanderhoof and H.L.Borison: Proc. Soc. exp. Biol., N.Y., 1962, 111, 205-207 (Dept. Phaim., Univ. Utah Coll.

Med., Salt Lake City, Utah, U.S.A.) Intra-ventricular administration of toxin did not elicit vomiting. Chemoceptor trigger zone ablation did not influence emetic response to i.v. toxin. Midbrain transection abolished die emetic response. It is possible that this stimulus is similar to that produced by X-rays and nitrogen mustard.

M.M.Shapland

1711. SEARCH FOR POTENT HYPOGLYCAEMIC AGENTS:

PART IE. MODE OF ACTION WITH SPECIAL REFERENCE TO BIGUANIDES. S.P.Paul, A.N.Bose and U.P. Basu: Indian J. exp. Biol., 1963, 1, 76-79 (Bengal Immun. Res. Inst., Calcutta, India) *In vivo administration of biguanides, particularly Ad3 (a-phenethyl biguanide hydrochloride) and Ad4 (p-phenethyl biguanide hydrochloride) under condition of carbohydrate loading does not cause depletion of liver and muscle glycogen but raises the plasma inorg. P level. In fasting guinea-pigs, blood lactate concn. are also found to be increased after biguanide administration. Both tolbutamide and insulin under similar conditions show hypophosphataemia and increased accumulation of liver and muscle glycogen. ¹⁷¹¹ vitro addition of biguanide does not have any appreciable effect on the sponaneous glucose release and glyco-genolysis of liver slices, but succinic dehydrogenase activity of liver homogenate is inhib. Ad3 in comparison to ^obiguanides in equiv. doses, however, shows no significant hypeiphosphataemia and no alteration in blood lactate concn.*

1712. STUDIES ON THE EFFECT OF TOLBUTAMIDE ON INSULIN SECRETION. E.Anderson and F.X.Wherry: Proc. Soc. exp. Biol., N.Y., 1962, 111, 446-450 (Nat. Inst. Arthritis and Met. Dis. N.I.H., U.S. Dept. H.E.W., Bethesda, Md., U.S.A.) *I.v. injn. of Na foibutamide had no effect on the insulin secretion rate ¹⁷¹¹ dates fasted for 24 hr.*

M.M.Shapland

1713. TOE UTILISATION OF SCHARDINGER DEXTRINS BY THE RAT. G.H.Andeisen, F.M.Robbins, F.J. Domingues, R.G.Moores and C.L.Long: Toxicol. appl. pharmac., 1963, 5, 257-266 (Res. Center, Gen. Foods of Pn., New York, N.Y., USA) *The metabolism of ³H-labelled starch and a- and β -dextrin, i.e. cyclic dextrins composed of 6 and 7-D-glucopyranose units linked by 1- \rightarrow 4 bonds as in amylose, was investigated in the rat. Starch was initially metabolised more rapidly than the dextrins, but after 24 hr. the total amount metabolized was the same. Starch and dextrins also produced the same distribution of radioactivity in the body.*

E.E.Hobbiger

1714. ANGIOTENSIN H DEGRADATION BY HUMAN COHIN PLASMA FUNCTIONS. R.L.Wolf, M.Mendlovitz, S.E.Gitlow, J.Roboz and N.Naftchi: Proc. Soc. exp. Biol., N.Y., 1963, 112, 209-212 (Dept. Med., Mt. Sinai Hosp., New York City, N.Y., U.S.A.) *It*

has been found that Angiotensin n- IS1j could be degraded more rapidly by heat inactivated Cohn fractions of human serum than by untreated fractions. Hie Cohn fraction V was easily the most active and appeared electrophoretically and from its solubility in cold-ethanol like an albumin.

D.N.Wheatley

1715. ALIMENTARY ABSORPTION OF SOME ENTERIC-COATED NaCl AND KCl TABLETS. V.Wynn and J. Landon: J. Pharm. Lond., 1963, 15, 123-128 (Surg. Unit, St. Mary's Hosp., London, England) *Absorption was satisfactory with tablets coated with a mixture of cellulose acetate phthalate, acacia, sucrose, gelatin, CaSO₄ and talc ('nuseal'). Of 3 other brands one was poorly absorbed, producing diarrhoea, a 2nd was poorly absorbed by 1 in 5 patients, a 3rd was moderately satisfactory. All brands passed the in vitro tests for disintegration of B.P. (1958, App. 21B).*

J.M.Whitmarsh

1716. ABSORPTION AND EXCRETION OF CASTOR OIL IN MAN. W.C.Watson, R.S.Gordon jun., A.Kannen and AJover: J. Pharm., Lond., 1963, 15, 183-188 (N.I.H., Bethesda, Md., U.S.A.) *The amount of absorption is inversely related to the dose and in 4 g. doses is complete. Fat balance studies were made both with 1311 labelled oil and by a new method depending on the rapid detection of ricinoleic acid by gas-liquid chromatography on a silicone gum column. Improved methods for collecting and extracting faecal lipid are described.*

J.M.Whitmarsh

1717. SOME IN VITRO TESTS ON Na GLUCONATE-DIHYDROXOALUMINATE. IE. A SOLUBLE BUFFER ANTACID. F.Giessmith: J. Pharm. Lond., 1963, 15, 114-122 (Beecham Res. Lab. Ltd., Brentford, Middx., England) *A 40% w/v aq. soln. of a complex considered to be the title compound was compared with existing antacid prep. A dose of 4 ml. had high neutralising capacity, speed of action and buffering power. The soln. did not ppt. protein.*

J.M.Whitmarsh

1718. STABILITY OF LIQUID MULTIVITAMIN PREPARATIONS DURING USE. T.K.Murray, O.Pelletier and J.A.Campbell: J. Phaim. Lond., 1963, 15, 192-196 (Dept. Nat. Hlth., Tunney's Pasture, Ottawa, Canada) *Six prep. were examined for thiamine and vit. A and C stability. No losses occurred during storage of unopened bottles. Destruction of vitamins was increased by daily opening for sampling. Stability at R.T. was unsatisfactory. It is suggested that expiry dates should take account of loss during normal use. Retrovitamin A was found in one prep., indicating the need for more detailed study.*

I.M.Whitmarsh

1719. ACTION OF ANTI-INFLAMMATORY DRUGS ON THE PERMEABILITY OF MESENTERIC MESOTHELIUM TO PLASMA PROTEIN. B.J.Northover: J. Pharm. Lond., 1963, 15, 153-154 (Dept. Pharm., Christian Med. Coll., Vellore, S. India) *Rat mesentery offers a useful in vitro system of testing these drugs.*

J.M.Whitmarsh

1720. EFFECT OF PROPHYLACTIC BETHANECHLORIDE ON POST-OPERATIVE REHABILITATION. G.A. Jansen, A.E.Kreiger, T.A.Miller, R.H.Huff and D.K. Kubo: Arch. int. Pharmacodyn., 1963, 142, 17-22 (Dept. Pharmacol. and Expt. Therap., Med. Sch., Calif. Univ., Los Angeles, Calif., U.S.A.) *Dogs were submitted to partial jejunectomy, and the post-operative progress of 5 receiving 5 mg. bethanechol*

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chloride by s.c. inj. after operation was compared with 5 controls. It was found that the drug reduced the incidence of urinary retention, diminished peristalsis and absence of defaecation.

T.J.Sullivan

1721. EFFECT OF PYROGALLOL ON ACUTE LEARNING IN RATS. I.Izquierdo and A.B.Merlo: *J. Pharm. Lond.*, 1963, 15, 154-155 (Fac. Farm. y Bioquim., Junin 956, Buenos Aires, Argentina) A letter. J.M.Whitmarsh

wt./day remained unaffected by the diet. The acute oral LD₅₀ of calcium EDTA in rats, rabbits and dogs is reported

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E.E.

.Hobbiger

1727. EFFECTS OF COPPER SULPHATE, SODIUM PENTACHLOROPHENATE AND A SULPHONATED HYDROCARBON ON THE EGGS OF ONCOMELANIA. L.W.Chi and L.R.Winkler: *Amer. J. trop. Med. Hyg.*, 1962, 11, 851-854 (Dept. HLoL, Immaculate Heart Coll., Los Angeles, Calif., U.S.A.) The effects of 3 molluscicides on the eggs of *O. formosana* are discussed. It is found that sodium pentachlorophenate is the most effective in preventing hatching.

A.A.Zimmerman

1728. STUDIES ON THE SNAKE VENOMS OF THE NEAR EAST*. WALTERINNESIA AEGYPTIA AND PSEUDOCERASTES FIELDII. S.Gitter, CM.Perlmutter, J.H.Boss, E.Livni, R.Rechnic, N.Goldblum and A. de Vries: *Amer. J. trop. Med. Hyg.*, 1962, 11, 861-868 (Dept. Prev. Med., Hebrew Univ., Hadassah Med. Sch., Jerusalem, Israel) The venoms of *W. aegyptia* and *P. fieldii* are found to be predominantly neurotoxic, but possess also haemorrhagic and hepatotoxic activity.

A.A.Zimmerman

1729. FORMATION OF METHAEMOGLOBIN BY p-AMINO* PROPIOPHENONE [PAPP] IN MAN. G.Paulet, "X.Aubertin, L.Laurens and J.Bouirelier: *Arch. int. Pharmacodyn.*, 1963, 142, 35-51 (Physiol. Lab., Fac. Med., Rennes, France) The long acting effect of PAPP in causing methaemoglobinæmia after oral administration was studied because of the protective effect of methaemoglobinæmia against cyanide intoxication. The drug caused up to 48% methaemoglobinæmia, lasting about 4 hr. which was well tolerated by humans aged 23 to 52 yr. It is suggested that 80-100 mg. PAPP taken 30 min. before exposure to risk of cyanide poisoning would give substantial protection.

(French)

T.J.Sullivan

1730. THROMBOCYTOPENIC PURPURA IN TOLUENE DIISOCYANATE WORKERS. CH.Jennings and N.D. Gower: *Lancet*, 1963, i, 406-408 (Edgware Gen. Hosp., Edgware, Middx., England) Two cases are reported but the mechanism is still unclear.

CH.Bell

1731. MERCURY NEPHROTOXICITY IN THE RAT. H. INVESTIGATION OF THE INTRACELLULAR SITE OF MERCURY NEPHROTOXICITY BY CORRELATED SERIAL TIME HISTOLOGIC AND HISTOENZYMIC STUDIES. A.E.Rodin and CN.Crowson: *Amer. J. Path.*, 1962, 41, 485-495 (Dept. Lab. Med., Misericordia Hosp., Edmonton, Alta., Canada). D.G.Scott

1732. SOME CHEMICAL AND BIOTAL CHARACTERISTIC OF BOTTOM DEPOSITS IN A STREAM POLLUTED BY SUGAR FACTORY AND DISTILLERY WASTES. P.Ray⁵ Indian J. exp. Biol., 1963, 1, 109-111 (Central India* Fish. Res. Sub-Stn., Allahabad, India) In river V&W (Bihar), a stream polluted by sugar factory and distilled wastes, the polluted zone is found to show a high carbon/nitrogen ratio, low value of dissolved O₂, high ammonia concn. associated with high abundance of Oligochaete St. Chironomids and bacteria, and absence of Molluscs. I*⁶ significance of carbon/nitrogen ratio rather than their abs. values in demarcating polluted from unpolluted z<& has been discussed, and it is shown that merely an abs. ii¹ increase in either org. matter, carbon or nitrogen does not indicate pollution and that carbon/nitrogen ratio is the crucial factor.

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1722. SUBSTITUTED DITHIOCARBAMATES AND RELATED COMPOUNDS AS TRICHOMONACIDES. R.M. Michaels, LJ.Peterson and G.L.Stahl: *J. Pharm. Lond.*, 1963, 15, 106-113 (Upjohn Co., Kalamazoo, Mich., U.S.A.) In vitro the most active compound was Na dimethylthiocarbamate, causing 90% inhibn. of *T. vaginalis* and *T. foetus* at 0*07 fig./ml. the other compounds being active at 0*17-115 |ig./ml. There was no direct correlation between in vitro and in vivo activity. Na 4-morpholinecarbodithioate was the most active in mice infected s.c. with *T. vaginalis* but would not cure those infected i.v. In s.c. infected mice Na 1-pyrrolidine-carbodithioate and bis (dimethylthiocarbamyl) sulphide were effective at low but not at higher doses. This is explained in terms of differences in solubility of metal complexes formed.

J.M.Whitmarsh

1723. EXPERIMENTAL INDUCTION OF CIGUATERA TOXICITY IN FISH THROUGH DIET. P.Helfrich and A.H.Banner: *Nature*, Lond., 1963, 197, 1025-1026 (Hawaii Marine Lab., Univ. Hawaii, Honolulu, Hawaii) The non-toxic fish *Acanthurus xanthopterus* were fed for many months on flesh of a fish containing ciguatera toxin. They then became toxic when fed to mongoose, proving that the toxin causing ciguatera may be passed through the food chain.

G.M.Lewis

1724. IMMUNOGENIC ACTIVITY OF THE LARVAL STAGES OF HAEMONCHUS PLACEL. J.C.Ross: *Nature*, Lond., 1963, 197, 1221-1222 (Vet. Res. Div., Min. Agric, Stormont, Belfast, N. Ireland) Expt. in which the antihelmintic 'Neguvon'¹ was used to terminate infection of calves with *H. placei* at different stages, showed that the early 5th stage of the larva is of prime importance in producing immunity.

G.M.Lewis

1725. COMPARATIVE SUBACUTE TOXICITY FOR RABBITS OF CITRIC, FUMARIC, AND TARTARIC ACIDS. E.W.Packman, D.D.Abbott and J.W.E.Harrison: *Toxicol. appl. Pharm.*, 1963, 5, 163-167 (LaWall and Harrison Res. Labs., Inc., Philadelphia, Pa., U.S.A.) Rabbits fed for 150 days on a diet containing the Na salts of fumic, citric or tartaric acid in a concn. equiv. to 5% of the org. acids in the diet showed no gross or histopathol. changes.

E.E.Hobbiger

1726. SAFETY EVALUATION STUDIES OF CALCIUM EDTA. B.L.Oser, M.Oser and H.C.Spencer: *Toxicol. appl. Pharm.*, 1963, 5, 142-162 (Food and Drug Res. Labs., Inc., Maspeth 78, N.Y., U.S.A.) Rats and dogs fed for 2 yr. and 1 yr.^f respectively, on a diet estimated to contain up to 250 mg. calcium EDTA/kg. body

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- 1733. EFFECT OF PHENYLALANINE [Phe] ON TOXICITY OF S-(DICHLORO-VINYL)-L-CYSTEINE [DCVC] IN THE RAT AND THE CALF.** M.O.Schultze, R.F.Derr, N.S.Mizuno, D.D.Joel and J.H.Sautter: Proc. Soc. exp. Biol., N.Y., 1962, 111, 499-502 (Dept. Agric. Biochem., Univ. Minnesota, St. Paul, Minn., U.S.A.)

Both enantiomers of Phe. when inj. i.p. into rats can greatly reduce the toxicity of DCVC. To be most effective the DCVC and Phe. must be given simult., a delay of 1 hr in injn. of Phe. markedly reduces its effect. Injn. of L-Phe. has no effect on the toxicity of DCVC in calves.

M.M.Shapland

- 1734. ALIPHATIC AMIDES OF CYCLIC AMINES AND TOLYL MALEIMIDES AS MOSQUITO REPELLENTS.** B.H.Alexander and M.Beroza: J.econ. Entomol., 1963, 56, 58-60 (Entom. Res. Div., Agric. Res. Serv., U.S.D.A., U.S.A.) Compounds were tested at 10% strength by exposing arms covered with treated cotton stockings in cages of *Aedes aegypti* mosquitoes. Amides *j?* *C₄*, *c₄* and *CQ* cyclic amines showed excellent repellency when the straight-chain acid was monobasic in the *C₆-C₈* range. Dibasic acid diamides were ineffective. The *o*-form was a much more effective repellent than the *m* or *p*-tolyl maleimides.

H.W.Spencer

- 1735. POISONING BY ORGANIC PHOSPHORUS PESTICIDES POTENTIATED BY PHENOTHIAZINE DERIVATIVES.** T.B.Gaines: Science, 1962, 138, 1260-1261 (Toxicol. Sect., Communicable Dis. Center, U.S. publ. Hlth. Serv., Atlanta, Ga., U.S.A.) Repeated administration of chlopromazine and promazine increased the toxicity of a single dose of parathion in rats, the effect being more marked in males. Promazine did not increase the toxicity of Phosdrin for female rats.

G .M.Lewis

- 1736. DIMINUTION OF IMIPRAMINE MORTALITY IN HYPOTHYROID MICE.** A.J.Prange jun., M.A.Lipton and G.N.Love: Nature, Lond., 1963, 197, 1212-1213 (Sch. Med., Univ. N. Carolina, Chapel Hill., N.C., U.S.A.) Hyperthyroid mice are significantly more sensitive to imipramine than hypothyroid mice significantly less sensitive, than euthyroid mice, to the mortal effects of imipramine.

CM.Lewis

- 1737. TOXICOLOGICAL STUDIES ON BRIGHTENERS.** F. H.Snyder, D.L.Oddyke and H.L.Rubenkoenig: Toxicol. appl. Pharm., 1963, 5, 176-183 (Procter and Gamble Co., Miami Valley Lab., Cincinnati, Ohio, U.S.A.) The acute oral toxicity, carcinogenic activity (skin) and skin-sensitising prop. of 5 substances which are widely used as 'optical bleaches' in household detergents was investigated. The results indicate that the substances are innocuous in the concn. at which they are used.

E.E.Hobbiger

- 1738. EFFECT OF AET ON γ RAY RADIATION CATARACTS.** CHanna and J.E. O'Brien: Arch. int. Pharmacodyn., 1963, 142, 198-205 (Pharmacol. Dept., Vermont Univ. Med. Coll., Burlington, Vt., U.S.A.) Protective compound S, 2-aminoethylisothiouromium bromide hydrobromide [AET] was given to rats just before radiation of one eye with 2000 r of γ -radiation, the other being killed, [³H]thymidine was inj. into each chamber of each eye to serve as a marker of cell division in the DNA synthetic phase of division. AET treatment saved marked protection against early radiotoxic-induced changes in the lens, compared with controls.

T.J.Sullivan

- 1739. REVERSAL OF NITROGEN MUSTARD INTOXICATION BY 5HT ANTAGONIST.** J.B.Field, A.Mireles and E.C.Dolendo: Proc. Soc. exp. Biol., N.Y., 1962, 111, 1-3 (Inst. Cancer and Leukaemia Res. Culver City, Calif., U.S.A.) The mortality and leukopenia resulting from i.p. injn. of a nitrogen mustard (mechlurethamine) was considerably reduced by i.p. injn. of the 5HT antagonist, 1-(N-methyl-piperidyl 1-4) 3-phenyl 1- 4- benzyl- pyrazolone. M.M.Shapland

- 1740. ANTIMETABOLITE IMIDAZOLE AS A PESTICIDE.** R.J.Pence: J. econ. Entomol., 1963, 56, 1-7 (Dept. Entom., Univ. California, Los Angeles, Calif., U.S.A.) This antimetabolite of histamine and nicotinic acid is a safe pesticide, 1% satisfactorily controlling these fabric-feeding insects: *Tineola bisselliella*, *Attagenus piceus*, *Anthrenus flavipes* and *A.verbasci*. It is synergised by boric acid. Compared with imidazole, histamine, its hydrochloride and diphosphate showed reversal effects on *A.flavipes* larvae. Spread cereals sprayed with 1% aq. imidazole when dry were exposed to *Oryzaephilus surinamensis*, *Ste^obium paniceum*, *Trichogramma confusum*, *Tenebrio molitor* and *Plodia interpunctella* and appreciable mortality of them resulted. Imidazole is a promising mosquito larvicide, expt. effective against various insects and related arthropods but has little residual effect on hard surfaces through atm. evaporation.

H.W.Spencer

- 1741. INSECTICIDE ABSORBED BY THE C.N.S. OF SUSCEPTIBLE AND RESISTANT COCKROACHES EXPOSED TO Dieldrin.** J.W.Ray: Nature, Lond., 1963, 197, 1226-1227 (Biochem. Dept., A.R.C. Pest Infestation * Lab., London Rd., Slough, Bucks., England) The concn. of dieldrin in the tissues and nerve cords of *Blattella germanica* after topical application of the compound in acetone was the same in both resistant and susceptible insects. Resistance is not, therefore, due to failure of the compound to penetrate the nerve cord.

G.^A.Lewis

- 1742. SUSCEPTIBILITY OF HONEYBEES TO SOME INSECTICIDE SPRAY FORMULATIONS USED ON CITRUS.** L.H.Wiese: S. Afr. J. agric. Sci., 1962, 5, 557-588 (Plant Protection Res. Inst., Pretoria, S. Africa)

I.A.B.S.

- 1743. RESPONSE OF CITRUS RED MITE TO CHEMICAL STERILANTS.** A.W.Cressman: J. econ. Entomol., 1963, 56, 111 (Entom. Res. Div., Agric. Res. Serv., U.S.D.A., Ryeiside, Calif., U.S.A.) In this mite *Panonychus citri*, unfertilised eggs produce d. Tepa, * apholate and aphamide were the most effective compounds. At 0-1%, fecundity of? and viability of esas was reduced.

H.W.Spencer

- 1744. PURIFICATION AND POTENCY OF SEX ATTRACTANT FROM INTRODUCED PINE SAWFLY DIP-SIMILK.** J.E.Casida, H.C.Coppej and T.Watseka, J. econ. Entomol., 1963, 56, 18-24 (Univ. Wisconsin, Madison, Wis.) S.s S. ^ ^ day from emergence in gelatin capsules 200 virgin *i* flies were placed in a 2 quart screen-lidded jar with crumpled filter paper till death after 5-7 days. F1 & were fed with sugar and also the paper and jar were rinsed with ether. Such extracts were dried with Na₂SO₄, filtered and cone, by slow ether evaporation. The glass-paper wash was the most potent, 'fly-washes' were not attractive. The attractant was released by* from 6 hr. after removal from capsules. In the field virgin were attractive 30 sec. after capsule removal *tellustasTafta?* which is a possible mechanism of attractant destruction.

H.W.Spencer

PHARMACOLOGY

- 1745. RESISTANCE TO DDT IN THE MOSQUITO FISH, GAMBUSIA AFFINIS.** S.B.Vinson, C.E.Boyd and D.E. Ferguson: Science, 1963, 139, 217-218 (Dept. Entomol., Mississippi State Univ., State Coll., Miss., U.S.A.) A significant resistance to DDT was noted in mosquito fish bred in areas that have a long history of insecticide applications. CM.Lewis
- 1746. ISOLATION OF DDT, PARATHION AND LINDANE FROM BIOLOGICAL FATTY MATERIALS BY LIQUID-LIQUID PARTITION CHROMATOGRAPHY.** M.D.Abdallah and CA.Landheer: J. Chromatography, 1962, 9, 245-247 (Lab. Org. Chem., Agric. Univ., Wageningen, Netherlands) Notes. P.D.Dawkins
- 1747. EFFECT OF CARBON TETRACHLORIDE INTOXICATION ON TOE ACTIVITY OF ENZYMES OF TOE UREA CYCLE IN TOE LIVER OF THE RAT.** F.Rossi and P.McLean: Nature, Lond., 1963, 197, 1207-1208 (1st di Patol. Gen., Univ. de Padova, Italy) As early as 90 min. after treatment of rats with CCl₄, there was an increase in the 2 mitochondrial-linked enzymes, carbamyl phosphate synthetase and ornithine transcarbamylase, while other enzymes of the urea cycle, located in the sol. fraction of the cell, were completely unchanged. Later, as the liver wt. increased, the levels of all the enzymes of the urea cycle fell. G.M.Lewis
- 1748°. LIVER LIPID PEROXIDE LEVELS IN CARBON TETRACHLORIDE POISONING.** R.E.Priest, E.A.Smuckler, OJV.Iseri and E.P.Benditt: Proc. Soc. exp. Biol., N.Y., 1962, 111, 50-51 (V.A. Hosp., Univ. Washington-Sch. Med., Seattle, Wash., U.S.A.) Lipid peroxides play no significant role in the early phase of CCl₄ poisoning. M.M.Shapland
- 1749. EFFECT OF TREATMENT ON EXPERIMENTAL LIVER CIRRHOSIS IN RATS. II. EFFECT OF GLUCOCORTICOIDS, ANDROGENS AND TOLBUTAMIDE ON THIOACETAMIDE-CIRRHOSIS.** P.Rottger, F.Nolte, H.A.Kfflin and W.Creutzfeldt. IE. EFFECT OF GLUCOCORTICOIDS, WITH OR WITHOUT ANTIBIOTICS AND ANDROGENS, ON CCl₄-CIRRHOSIS. R.Discher, H.Laaf, and W.Creutzfeldt and H.A.Kfflin: Z. Ges. exp. Med., 1963, 136, 486-499, 500-516 (Med. Univ. Clin., Freiburg i.Br., Germany) II. Liver damage was induced in rats by acute or prolonged poisoning with CH₃C₆NH₂(2 doses of 175 mg./kg.in 24 hr. or 40 mg./kg. daily for 12 weeks by mouth). The histol. changes in the liver were unlike those of human cirrhosis and were characterised by intense proliferation of bile ducts. The

histol. changes in the liver were not modified when poisoned rats were treated with steroids, androgens or tolbutamine.

III. Liver damage was induced in rats by twice weekly s.c. injn. for 12 weeks of 0-75 ml./kg. CCl₄. Rats treated simult. with cortisone (2*5-25 mg./kg. s.c.) or prednisolone (0-3-0*6 mg./kg.s.c.) showed less proliferation of connective tissue than untreated poisoned rats. This protective effect which was not seen when steroids were given by mouth did not suffice to prevent the development of cirrhotic changes nor were steroids able to prevent fatty infiltration of the liver. Treatment with penicillin and streptomycin reduced the mortality of CCl₄ intoxication without modifying the moiphol. changes in the liver. Androgens were ineffective.

(German) P.F. Meyer
1750. STUDIES IN DETOXICATION BY MEANS OF THE ISOLATED PERFUSED LIVER. E.A.Eisenlord and C.H.Hine: Toxicol. appl. Phaim., 1963, 5, 129-141 (Dept. Pharmacol. and Expt. Ther., Univ. California, San Francisco, Calif., U.S.A.) The uptake of ethanol, pentobarbitone, morphine and lead by the isolated perfused liver of normal rats and of rats previousB treated with CCl₄ or allyl alcohol, was investigated. It was found that the livers of allyl-alcohol-treated rats had a reduced uptake of ethanol and pentobarbitone, whereas both CCl₄ and allyl alcohol treatment increased the uppta* of lead but failed to affect the uptake of morphine.

E.E.Hobbiger
1751. HYDRAZINE-INDUCED ALTERATIONS IN RAT LIVER. A CORRELATION OF CHEMICAL AND HISTOLOGICAL CHANGES IN ACUTE HYDRAZINE INTCKI' CATION. J.S.Amenta and E.H.Johnston: Lab. Invest. 1962, 11, 956-962 (Military Environmental Path. Div., Armed Forces Inst. Path., Washington, D.C., U.S.A.) One s.c. injn. of hydrazine sulphate produced periportal and midzonal accumulation of lipid and glycogen loss in rat liver. Glycogen accumulation is in** paired. The lesion is rapidly repaired within 72 hr. both necrosis and inflammation being absent. A.M.Mackay

1752. THE HAEMOPOIETIC TISSUE TOXICITY OF BENZENE VAPOURS. W.B.Deichmann, W.E.MacDonald and E.Bemal: Toxicol. appl. Pharm., 1963, 5, 201-224 (Dept. Pharmacol., Univ. Miami Sch. Med., Fla., U.S.A.) Rats exposed for several wee[* to benzene vapour concn. of 61 p.p.m. or higher, admin*! stered for 5 hr./day on 4 days/week, developed leucopenia It is thought that the margin of safety presently accepted for benzene is small compared with that of other substances.

E.E.Hobbiger

METHODS

1753. THE STUMP-TAILED MACAQUE: A PROMISING LABORATORY PRIMATE. A.Kling and J.Orbach: Science, 1963, 139, 45-46 (Inst. Psychosomatic and Psychiat. Res., M.Reese Hosp., Chicago, 111., U.S.A.) *Macaca speciosa* is a very suitable primate for neuro-Psychol. investigation. G.M.Lewis

1754. PHYSICAL FACTORS GOVERNING FLOW OF CONTRAST SUBSTANCES THROUGH CATHETERS. R.N. Cooley and L.B.Beentjes: Amer. J. Roentgenol., 1963, 89, 308-314 (Dept. Radiol., Univ. Texas Med. Branch, Galveston, Tex., U.S.A.) The data suggest that in most cases Blasius's Law, rather than Poiseuille's, should ^ used in calculating flow rates. Examples are given of the application of a suitable formula. D.E.Evans

1755. SIMPLE RESPIRATOR FOR LABORATORY USE. F.Palec'ek: J. appl. Physiol., 1963, 443-444 (Pharmacol. Dept., Res. Inst. Natural Drugs, Prague, Czechoslovakia) A Hg interrupter has been developed to ^ apply intermittent pos. pressure breathing to small animals. The apparatus is simple but must be used on restrained animals. H.C.Jones

1756. PULSE-RATE MONITOR ALLOWING CONTINUOUS REGISTRATION WITH INSTANTANEOUS, STEADY AND LINEAR RESPONSE. H.Krause: Z. Kreisl.-Forsch., 1963, 52, 128-138 (Physiol. Inst., Univ. Freiburg i. Br., Germany) A new pulse-rate monitor with instant response to changes in pulse rate is described, and the circuit is illustrated. (German) P.F.Meyer

1757. REMOVAL OF DISTORTION FROM INDICATOR DILUTION CURVES WITH ANALOGUE COMPUTER. J.K.Cooper, J.-R.Schweikert, T.G.Arnold, jun. and W.W.Lacy: Circulat. Res., 1963, 12, 131-137 (Dept. Med., Vanderbilt Univ. Med. Sch., Nashville, Tenn., U.S.A.) Corrections could be made by manually adjusting the computer to match 'input' and 'output' ^ sensitometercurves. Catheter shape affected the correct- ^ in Presumably by altering flow patterns. R.E.Moore

1758. SILVER-SILVER CHLORIDE ELECTRODE AS A NON-POLARISABLE BIOELECTRODE. W.Feder: J. appl. Physiol., 1963, 18, 397-401 (Med. Dept., Chicago Univ., Chicago, 111., U.S.A.) A method for the prep. of ^ S/AgCl electrodes for biol. use in the microvolt range is ^ described. Measurements of \pm 5 μ V can be made accurately, H.C. Jones

1759. MOUNTING OF MICROELECTRODES FOR INTRACELLULAR RECORDINGS OF CONTRACTILE TISSUES. P.-H.Benoit: C.R. Soc. Biol., Paris, 1962, 156, 1465-if66 (Lab. Physiol. anim., Fac. Sci. Paris, Centre CM? ^ Ord? y. France) A method is described for intracellular recording of electrical activity in the heart of ^ ^ The microelectrodes were mounted on a thin poly- ^ ^{ta}ne caPiHary tube containing 3M KC1 and made by caW¹⁰? ^ t catheter tubing in a small film. The electri- ^ distance of the capillary was such that this method ^ ^ ot 1 ^ ^ the sensitivity of the recording technique. ^ ^ apportion of KC1 at the junction of the capillary ^ ^ microelectrode was prevented by liquid parafin. ^ ^ French} M.A.Pnce

1760. LOW PROFILE ELECTRODE SYSTEM FOR RECORDING ECTICAL E.E.G. OF UNANAESTHETISED RATS.

S.F.Gottlieb, R.VJagodzinski and W.J.Semerau: J. appl. Physiol., 1963, 18, 442-443 (Res. Lab., Linde Co., Div. Union Carbide Corp., Tonawanda, N.Y., U.S.A.) A technique is described for rapid chronic insertion of e.e.g. electrodes 6-0 mm. long using a template which fits the rat's head. H.C.Jones

1761. PERMANENTLY IMPLANTED ELECTRODE FOR ELECTROMYOGRAPHY OF THE DIAPHRAGM IN THE WAKING CAT. A.Schoolman and B.R.Fink: Electroenceph. clin. Neurophysiol., 1963, 15, 127-128 (Dept. Neurol. Surg., Coll. Physns. Suigns., New York, N.Y., C.B.B.Downman

1762. A SUBMINIATURE RADIO E.E.G. TELEMETER FOR STUDIES OF DISTURBED CHILDREN. R.Vreeland, C. Collins, L.Williams, C.Yeager, A.Gianascol and J. Henderson, jun.: Electroenceph. clin. Neurophysiol., 1963, 15, 327-329 (Res. and Develop. Lab., Univ. California Med. Center, San Francisco, Calif., U.S.A.) C.B.B.Downman

1763. A MULTIPLE CHANNEL E.E.G. TELEMETERING SYSTEM. F.T.Hambrecht, P.D.Donahue and R.Melzack: Electroenceph. clin. Neurophysiol., 1963, 15, 323-326 (Res. Lab. Electronics, M.I.T., Cambridge, Mass., U.S.A.) Circuit and working details. C.B.B.Downman

1764. AN AMPLIFIER WITH CONSTANT UNITY GAIN FOR MICROELECTRODE STUDIES. R.Elul and A.Tamari: Electroenceph. clin. Neurophysiol., 1963, 15, 118-122 (Rogoff Lab. Physiol., Hadassah Med. Sch., Jerusalem, Israel) C.B.B.Dovnman

1765. SIMPLE METHOD OF SECURING CONNECTORS TO THE HEADS OF ANIMALS FOR E.E.G. RECORDINGS. J.I.Jimenez and I.Escobar: Electroenceph. clin. Neurophysiol., 1963, 15, 123-124 (Physiol. Dept., Univ. Antioquia Sch. Med., Medellin, Colombia, S. America) C.B.B.Downm:n

1766. MULTIPURPOSE CANNULA FOR ACUTE AND CHRONIC INTRACEREBRAL CHEMICAL AND ELECTROPHYSIOLOGICAL STUDIES. J.W.Wagner and J. de Groot: Electroenceph. clin. Neurophysiol., 1963, 15, 125-126 (Dept. Anat., Med. Center, Univ. California, San Francisco, Calif., U.S.A.) C.B.B.Downman

1767. MICROSCOPE AS STEREOTAXIC INSTRUMENT FOR RAT. TJ.Barry, W.D.Hagamen and J.E.Sherlock: J. appl. Physiol., 1963, 18, 445-446 (Anat. Dept., Cornell Univ. Med. Coll., N.Y.U.S.A.) A methods described whereby the ordinary microscope can be cheaply converted into an accurate stereotaxic instrument for the rat. H.C.Jones

1768. COMPUTER PROGRAMME FOR ANALYSIS OF DATA FROM 'PARALLEL LINE' BIOLOGICAL ASSAYS T.Thoislund and C.A.Paulsen: Endocrinology, *1963, 72, 663-665 (Med. Dept., Univ. Washington Med. Sch Seattle, Wash., U.S.A.) A programme for computer analysis of parallel time bioassay data has been devised All important indices of precision, analysis of variance tables, slopes and relative potency estimates are obtained with this method. H.C.Jones

PHYSIOLOGY

BODY TEMPERATURE

- 1769. CAUSES OF DIURNAL BODY TEMPERATURE RHYTHM IN MAN, WITH REFERENCE TO OBSERVATIONS DURING VOYAGE.** K.Ogata and T.Sasaki: Jap. J. Physiol., 1963, 13, 84-96 (Dept. Physiol. Hyg., Inst. Constitutional Med., Kumamoto Univ., Kumamoto, Japan) The time of morning rise in body temp. coincided best with the respective local time, and less with the respective longitude, the time of sunrise or sunset. During severe vertigo due to sea-sickness, the temp. rise in the daytime was suppressed, but the morning rise did not disappear under any circumstances. It is suggested that the mechanism for the establishment and maintenance of diurnal body temp. rhythm is primarily attributable to the inner rhythm of functional pattern which has been acquired mainly through vestibular functions. **K. Jones**
- 1770. SKIN TEMPERATURE AFTER EATING: EVIDENCE BEARING UPON A THERMOSTATIC CONTROL OF FOOD INTAKE.** AJ.Stunkard, W.L.Clovis and S.M. Free: Amer. J. med. Sci., 1962, 244, 622-627 (Dept. Psychiat., Univ. Pennsylvania, Philadelphia, Pa., U.S.A.) Nineteen subjects were fed a meal containing 120 g. of protein, after adaptation to an ambient temp. of 21°. A rise of 1° in skin temp. of the thumb occurred within 30 min. ($p < 0.025$). No skin temp. changes were observed at 5 other sites and obese and non-obese subjects gave the same results. **E.E.Hobbiger**
- 1771. THERMAL COMFORT IN HOT HUMID TROPICS OF AUSTRALIA.** C.H.Wyndham: Brit. J. industr. Med., 1963, 20, 110-117 (Dept. Physiol., Med. Sch., Univ. Witwatersrand, Johannesburg, S. Africa) From questionnaires completed by 'white' subjects, it was found that the upper limits of 'effective' temp. at which 50% of the subjects felt comfortable were 25°5' and 25°5' for day and night respectively. No restrictions were placed upon clothing. Continued exposure to a high or low temp. led to some adaptation of the 'comfort limits'. **D.E.Evans**
- 1772. EVIDENCE OF THERMAL SWEATING IN FOOT PAD OF THE CAT.** D.P.C.Lloyd: Proc. nat. Acad. Sci., Wash., 1963, 49, 492-496 (Rockefeller Inst., N.Y., U.S.A.) Activity of sweat glands was studied by observation of potential changes and impedance changes across the foot pad. Innervated glands showed spontaneous potential variations which changed to a limited degree in the temp. range 37°5'-39°5'. Above this temp. a rapid increment occurred in the level of spontaneous potential variations. Impedance across the foot pad decreased slightly over the temp. range 37°-40° and decreased rapidly at temp. > 40°. **J.R.Sargent**
- 1773. TEMPERATURE REGULATION OF ESKIMOS, INDIANS AND CAUCASIANS IN BATH CALORIMETER.** F.A.Milan, J.P.Hannon and E.Evonuk: J. appl. Physiol., 1963, 18, 378-382 (Physiol. Dept., Arctic Aero Med. Lab., Fort Wainwright, Alaska, U.S.A.) Eskimos had higher rates of heat production and heat loss and higher metabolic rates than Athapascan Indians who had higher values than Caucasian subjects. The Eskimos had the lowest % of body fat and it is calc. that the lower insulation in Eskimos is independent of lack of fat and reflects a greater peripheral blood flow. **H.CJones**
- 1774. ARTIFICIAL ACCLIMATISATION OF WOMEN TO HEAT.** B.A.Hertig, H.S.Belding, K.K.Kraning,

D.L.Batterton, C.R.Smith and F.Sargent, II: J. appl. Physiol., 1963, 18, 383-386 (Grad. Sch. Publ. Hlth., Pittsburgh Univ., Pa., U.S.A.) Nine female subjects became acclimatised to heat as shown by reduced pulse rate, reduced rectal temp., and lower skin temp. **H.CJones**

1775. DIFFERENT EFFECTS OF HYPOTHERMIA ON TWO SYNDROMES OF POSITIVE ACCELERATION. E.R. Stiehm: J. appl. Physiol., 1963, 18, 387-392 (Aviation Med. Acceleration Lab., U.S. Naval Air Development Center, Johnsville, Pa., U.S.A.)

Normal rats have a decreasing survival time when subject to headward acceleration up to 30 g, above which only slight decreases are seen. Hypothermia decreases tolerance to headward acceleration at 20 jj but increases it at acceleration over 30 g. The effect is max. at 40 g, when the survival time is considerably greater in hypothermic animals. **H.CJones**

WORK AND METABOLISM

1776. DIFFERENCES BETWEEN ETHNIC GROUPS IN PHYSICAL WORKING CAPACITY. C.H.Wyndham, N.B.Strydom, J.F.Morrison, J.Peter, C.G.Williams, G.A.G.Bredell and A.Joffe: J. appl. Physiol., 1963, 18, 361-366 (Appl. Physiol. Lab., Transvaal and Orange Free State Chamber of Mines, Johannesburg, S. Africa) Max. O₂ uptake /kg. body wt. was similar, about 48 ml./min./kg. for Caucasian, Bantu and Bushmen d¹ subjects. O₂ consumption against work rate is lower for Bantu and Bushmen than for Caucasian. **H.CJones**

1777. ENERGY COST OF RUNNING. R.Margaria, P.Cerretelli, P.Aghemo and G.Sassi: J. appl. Physiol., 196⁴, 18, 367-380 (Physiol. Lab., Univ., Milano, Italy) Energy expenditure has been calc. from calorimetric measurements for athletes running at different speeds any gradients. With inclines -20 to + 15% the net kcal./kg./km. was related to incline rather than speed. Athlete subjects showed values 5-7% lower than non-athletes. **H.CJones**

1778. KINETICS AND MECHANISM OF OXYGEN DEBT CONTRACTION IN MAN. R.Margaria, P.Cerretelli, P.E. Di Prampero, C.Massari and G.Torelli: J. appl* Physiol., 1963, 18, 371-377 (Physiol.Lab., Univ.Milano, Italy) O₂ consumption during exercise was found to increase exponentially with time, the max. level generally being independent of the intensity of the exercise. Blood pyruvic acid level increased similarly but to a max. level which is higher the greater the intensity of w* exercise. Blood lactic acid increased linearly with time and reached a max. value towards the end of exercise. It also increased with the intensity of the exercise. **H.CJones**

1779. FACTORS MODIFYING DURATION OF THE SWIMMING TEST ON RATS AND MICE: INFLUENCE OF TEMPERATURE AND WEIGHT. B.Coquet, B.Drevon, A.Cier, G.Roche and J.Aphatie: C.R. Soc. Biol., ?& 1962, 156, 1403-1407 (Inst. Physiol., Fac. Méd., Lyon, France) There was a linear relationship between the duration of swimming of rats and the wt. SUF ported. With a wt.> 5% of the body wt. the animal did not swim continuously. Max. duration of swimming observed in rat at a water temp. of 25°. In mice max. duration was observed at a temp. of 38°. (French) **M.A.Price**

PHYSIOLOGY

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1780. VARIANCE AS MEASURE OF TREMOR AMPLITUDE. J.E.Randall and J.M.Metzger: *J. appl. Physiol.*, 1963, 18, 440-441 (Physiol. Dept., Missouri Univ. Med. Center, Columbia, Mo., U.S.A.) An analogue computer is described which provides a moving estimate of variance of a voltage obtained from a transducer sensitive to body tremor movements. H.C.Jones

1781. DIET AND HISTAMINE IN THE RUMINANT. O.V. Sjaastad and H.Stormorken: *Nature*, Lond., 1963, 197, 907-908 (Dept. Physiol., Vet. Coll. Norway, Oslo, Norway) Histamine was extracted from the rumen liquor in sheep by passage through ¹Amberlite resin. Histamine levels increased sharply after ingestion of silage, which contains large amounts of histamine. The absence of symptoms of intoxication after silage feeding are attributed to efficient detoxication of histamine in the liver. G.M.Lewis

1782. INFLUENCE OF INTRAVENOUS GLUCOSE ON BLOOD INSULIN ACTIVITY AND ON GLUCOSE UPTAKE OF DIAPHRAGM AND ADIPOSE TISSUE OF RATS. M.C.Garcia-Fernandez and J.L.R-Candela: *Biochim. biophys. Acta*, 1963, 71, 172-177 (List. 'G.Marañón', Madrid, Spain) Glucose injn. into ⁰ increased diaphragm glucose uptake and plasma insulin activity after 10 min. An inhibn. of glucose uptake by epididymal adipose tissue was observed for 60 min. 10 ^min. after L-leucine injn. blood insulin and glucose up-^{J^e} by diaphragm and adipose tissue were all increased. Total inhibn. of glucose uptake by adipose tissue after glucose injn. was not produced in adrenalectomised rats. B.M.Stevens

1783. CONTROL OF ADIPOSE TISSUE LIPASE ACTIVITY BY SYMPATHETIC NERVOUS SYSTEM. R.Maickel, H.Sussman, K.Yamada and B.Brodie: *Life Sci.*, 1963, No.3, 210-214 (Lab. Chem. Pharmacol., Nat. Heart Inst., Bethesda, Md., U.S.A.) The administration [^]catecholamines stim. adipose tissue lipase, and elevated the level of plasma free fatty acids in rats. It is concluded that the activation of the adipose tissue lipase by sympathetic nervous system is a unique confluence of biochem. and physiol. in which a neurohormone released at nerve endings stimulates a biochem. mechanism. K.Jones

1784. ADIPOKINETIC ACTIONS OF ADRENOCORTICO-TROPHIN, THYROID STIMULATING HORMONE, VASOPRESSIN, a- AND S-MELANOCYTE-STIMULATING HORMONES, FRACTION H, ADRENALINE AND NORADRENALINE IN THE RABBIT, GUINEA-PIG, HAMSTER, RAT, PIG AND DOG. D.Rudman, SJ. Jawn and M.F.Malkin: *Endocrinology*, 1963, 72, 527-543 (Med. Dept., Columbia Univ., New York, N.Y., U.S.A.) ACTH, TSH, a- and p -MSH, arginine vasopressin, fraction H, noradrenaline and adrenaline were all found to have adipokinetic activity in one or more mammalian sp. The slope of the dose-response curves was similar for the first 6 of these substances. The magnitude of the action varied markedly from one sp. to another. H.C.Jones

SKIN AND BONE

1785. INDIRECT ESTIMATION OF DERMAL LOSSES OF K IN HUMAN METABOLIC BALANCE STUDIES.

B.Isaksson and B.SjOgren: *Scand. J. clin. Lab. Invest.*, 1963, 15, Supp. 69, 108-113 (Metab. Ward, Med. Clin. II, Sahlgrenska sjukhuset, Univ., GÖteborg, Sweden) Daily mean dermal loss of K in 3 human subjects was 7.9, 9.0 and 4.0 mequiv. respectively, as calc. indirectly from the results of orthodox balance technique combined with repeated determinations of total exchangeable K in the body. K.Jones

1786. GAS TRANSFER ACROSS SKIN IN MAN. R.A. Klocke, G.H.Gurtner and L.E.Farhi: *J. appl. Physiol.*, 1963, 18, 311-316 (Physiol. Dept., Univ. Buffalo Med. Sen., Buffalo, N.Y., U.S.A.) The outward transfer of inert gases across the skin of the forearm and hand has been measured for He, Ar, and N₂. Transport was limited by diffusion through the skin barrier, but it increased with temp, indicating that capillary blood flow also plays a part. H.C.Jones

1787. RACIAL DIFFERENCES IN SKIN RESISTANCE. L.C. Johson and N.L.Corah: *Science*, 1963, 139, 766-767 (Navy Med. Neuropsychiat. Res. Unit., San Diego, Calif., U.S.A.) Negro subjects have a higher skin resistance than a comparable white population. There was no difference in other autonomic variables or reactivity. It is suggested that the thicker stratum comeum in Negroes or a difference in no. of eccrine sweat glands may be the reason for this result. G.M.Lewis

1788. SKIN RESISTANCE LEVELS AND GALVANIC SKIN RESPONSE: UNILATERAL DIFFERENCES. P.A.Obrist: *Science*, 1963, 139, 227-228 (Dept. Psychiat., Univ. North Carolina, Chapel Hill, N.C., U.S.A.) Differences in skin resistance between the 2 sides of the body were found in 3 normal human subjects. The left side had the higher resistance, and levels were higher during rest than during learning stress. In 2 subjects, unilat. differences were found in galvanic skin response. G.M.Lewis

1789. SKIN RESISTANCE RECORDING IN THE UNRESTRAINED RAT. S.Kaplan and R.Kaplan: *Science*, 1962, 138, 1403-1404 (Dept. Psychol., Univ. Michigan, Ann Arbor, Mich., U.S.A.) Skin resistance can be measured in the unrestrained rat on a grid floor through which a subthreshold current is passed. The resistance varied between 50 kohm and 2 Mohm according to the degree of alertness and stimulus situation. G.M.Lewis

1790. STIMULATION OF BONE RESORPTION BY PARATHYROID HORMONE IN TISSUE CULTURE. LG.Raisz: *Nature*, Lond., 1963, 197, 1015-1016 (Dept. Pharmacol., Univ. Rochester Sch. Med., Rochester, N.Y., U.S.A.) Rats 15-16 days pregnant were inj. with 45ca, then the radius and ulna of their embryos removed 3 days later and cultured in vitro. Addition of parathyroid hormone stimulated bone resorption, which was correlated with release of Ca into the medium. The response was related to the dose of parathyroid extract and may be due to a direct effect on Ca transport. G.M.Lewis

1791. INHIBITION BY HYPOPHYSECTOMY OF ORGAN LESIONS NORMALLY PRODUCED BY PARATHYROID HORMONE OR DIHYDROTACHYSTEROL [DHT]. H.Selye, G.Gabbiana and Pjean: *Lab. Invest.* 1962, 11, 1332-1339 (Inst. Med. et de Chir. exp., Univ. Montreal, Canada) Expt. in rats indicate that soft tissue calcification and osteitis fibrosa-like bone changes induced by parathormone or DHT are inhib. but not prevented by hypophysectomy. This does not prevent DHT induced hypercalcemia. A.M.Mackay

PHYSIOLOGY

1792. NATURE OF 'IMPERFECT' ELASTICITY OF ARTICULAR CARTILAGE. S.M.Elmore, L.Sokoloff, C.Norris and P.Carmeci: *J. appl. Physiol.*, 1963, 18, 393-396 (Nat. Heart Inst., N.I.H., Bethesda, Md., U.S.A.) The compression of articular cartilage under static loading has been measured during immersion. Measurements in salt soln. have shown that previously reported 'imperfect' elasticity is an artefact.
H.C.Jones

MUSCLE

1793. FURTHER STUDY OF ELECTRICAL RESPONSES IN SLOW AND TWITCH MUSCLE FIBRES OF THE FROG. R.K.Orkand: *J. Physiol.*, Lond., 1963, 167, 181-191 (Biophys. Dept., University Coll., London, England) Individual muscle fibres in the tonus bundle of the frog's iliofibularis were found to be innervated either by slowly conducting or rapidly conducting motor axons. Single or repetitive nerve stimm. produced all or none action potentials in muscle fibres innervated by rapidly conducting axons, but never elicited a muscle spike from fibres innervated by slowly conducting axons. As a result of relatively low output of transmitter from the nerve terminals a single impulse in some rapidly conducting axons produced only a sub-threshold end-plate-potential in some twitch muscle fibres. *

1794. METABOLISM OF PHOSPHOCREATINE DURING AN ISOMETRIC TETANUS IN THE FROG SARTORIUS MUSCLE. C.Maréchal and W.F.H.M.Mommaerts: *Biochim. biophys. Acta*, 1963, 70, 53-67 (Dept. Med., Los Angeles County Heart Assocn. Cardiovasc. Res. Lab., Univ. California, Los Angeles, Calif., U.S.A.) The rate of phosphocreatine breakdown in anaerobic iodoacetate poisoned muscle in the course of tetanisation at 0° was $0.28 \mu\text{mole/g.sec}$, apart from the earliest moments. The rate was const, for up to 60 sec. until almost all the phosphocreatine was exhausted, although the tension decreased by 0.89%/sec. and was not affected by dividing the stimm. period into several tetani. An extra-metabolism, proportional to the no. of tetani and not their durations, averaged $0.33 \mu\text{mole/g.tetanus}$. A small part of this was due to elastic work and internal shortening during tension generation and a larger part is suggested to represent the residual activation heat during relaxation.
B.M.Stevens

1795. SOME EFFECTS OF CALCIUM AND MAGNESIUM IONS ON GUINEA-PIG UTERINE MUSCLE. P.C.Clegg P.Hopkinson and V.R.Pickles: *J. Physiol.*, Lond., 1963, 167, 1-17 (Physiol. Dept., Univ., Sheffield, England) Spontaneous rhythmical contractions of guinea-pig uterus *in vitro* are increased by increasing the external [Ca] within the range 0.1-3 mM, and decreased by increasing [Mg] within the range 0-10 mM. The sensitivity to vasopressin is increased by either ion. The sensitivity to component A (a lipid stimulant extracted from menstrual fluid) depends in a more complex way on the concn. of both ions. The results suggest that whereas vasopressin acts at one site in the uterine cell, component A acts at 2 sites, one of which may be intracellular and also controls the spontaneous* contractions. *

1796. EFFECT OF TETRAETHYL AMMONIUM ION ON THE ELECTRICAL ACTIVITY OF SMOOTH MUSCLE CELL. T.Suzuki, A.Nishiyama and H.Jnomata:

Nature, Lond., 1963, 197, 908-909 (Dept. Appl. Physiol., Tohoku Univ., Sch. Med., Sendai, Japan) Tetraethylammonium ion (15 mM) caused marked prolongation of action potentials in the taenia coli of guinea-pig.
C.M.Lewis

1797. MECHANISM OF ACTION OF 5-HYDROXY-TRYPTAMINE. F.Cugurra and S.Parodi: *Arch. int. Pharmacodyn.*, 1963, 142, 52-66 (Pharmacol. Inst., Genoa Univ., Italy) The action of 5HT on the isolated rat stomach strip is studied. Relationships between 5HT concn. and the size of contraction and between the rates of perfusion and recovery from contractions suggest that the reaction between 5HT and the receptors is bimolecular. (Italian)
S.E.Smith

BLOOD

1798. DETERMINATION OF THE TOTAL DRY MASS OF HUMAN ERYTHROCYTES BY QUANTITATIVE E.M. J-F.Bahr and E.Zeikler: *Lab. Invest.*, 1962, 11, 912-917 (Armed Forces Inst. Path., Washington, D.C., U.S.A.) The dry mass of r.b.c. from 7 persons was estimated by photometric evaluation of E.M. neg. of r.b.c. smears. Results agree with those of interference microscopy and microradiography and are remarkably uniform. The median wt. is 29.9×10^{-12} g.
A.M.Mackay

1799. ERYTHROCYTE-LFE-SPAN, RED CELL MASS AND PLASMA VOLUME OF NORMAL GUINEA-PIGS AS DETERMINED BY USE OF CHROMIUM-51, PHOSPHORUS-32 LABELLED DIISOPROPYL FLUOROPHOSPHONATE [DF³²P] AND IODINE-131 LABELLED HUMAN SERUM ALBUMIN. P.W.Edmondson and J.R.Wyburn: *Brit. J. exp. Path.*, 1963, 44, 72-80 (M.R.C. Radiobiol. Res. Unit, Harwell, Berks., England) DF³²P was used to label guinea-pig r.b.c., life-span of which was found to be 79 days, using packed vol. to measure activity. When 51Cr was used life-span was found to be 81 days. Figures for rats and mice using DF32P were similar to those obtained by others.
D.L.Gardner

1800. POSSIBLE EXISTENCE IN OR ON ERYTHROCYTES OF A SPECIFIC CORTisol BINDING AGENT. P. de Moor and O.Steno: *J. Endocr.*, 1963, 26, 301-302 (Lab.voorExp.Geneskunde, Rega-Inst., Univ.Klinieken St. Rafael, Leuven, Belgium) No evidence was obtained to support the concept of a sp. cortisol-binding agent in or on human r.b.c.
G.F.Blane

1801. REVERSIBLE AGGLOMERATION USED TO REMOVE DIMETHYLSULPHOXIDE FROM LARGE VOLUME OF FROZEN BLOOD. C.E.Huggins: *Science*, 1963, 139, 504-505 (Harvard Med. Sch., Boston, Mass., U.S.A.) Reversible agglomeration of r.b.c in the presence of glucose, sucrose or glycine(probably mediated by r.b.c. y-globulin copptn.) has proved a simple, effective and inexpensive method for rapidly removing dimethylsulphoxide from thawed blood for transfusion.
G.M.Lewis

1802. CONCENTRATION OF DILUTE HAEMOGLOBIN SOLUTIONS WITH SEPHADEX. B.Deutsch, R.D. Levere and J.I.Vine: *J. clin. Path.*, 1963, 16, 183 (Downstate Med. Center Dept. Med., New York, N.Y., U.S.A.) Approx. 3-fold concn. of Hb soln. was achieved by the addition of Sephadex, a hydrophilic polysaccharide, without pH change or Hb denaturation.
J.B.Derbyshire

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Oxford, England) The Coulter electronic counter was used to count platelets in platelet-rich plasma by reducing the aperture and increasing the aperture current setting and discriminator voltage. Results obtained by this technique were as accurate as those from visual counting.

J.B.Derbyshire

1816. EFFECT OF ADP ON THE CONCENTRATION OF PLATELETS IN CIRCULATING BLOOD. G.V.R.Born and M.J.Cross: Nature, Lond., 1963, 197, 974-976 (Dept. Pharmacol., Royal Coll. Surgeons, Lincoln's Inn Fields, London, England) Infusion of 10^{-2} M ADP into cats caused an immediate fall in concn. of circulating platelets; lower concn. had no effect. AMP and adenosine did not significantly affect the platelet count. The effect of ADP appeared to be independent of changes in b.p. It aggregated platelets in plasma in vitro, a second addition of ADP being less effective than the first.

G.M.Lewis

1817. PLATELET CLUMPING IN VIVO. A.J.Honour and J.R.A.Mitchell: Nature, Lond., 1963, 197, 1019-1020 (Dept. Regius Prof. Med., Radcliffe Infirmary, Oxford, England) If a cerebral cortical artery in the rabbit brain was pinched firmly with ophthalmic forceps so as to produce slight bleeding and transient vasoconstriction, white bodies composed of platelets formed spontaneously at the site of injury and embolised; ADP, ATP or 5HT did not affect their size or rate of production. Very gentle pinching of the arteries which caused no bleeding did not produce white bodies, unless ADP, ATP or 5HT were applied to the site. 5HT antagonists prevented platelet clumping by 5HT but not by ADP or ATP. Sofne inhibn. of platelet clumping was effected by fluoroacetate, mono-iodoacetate, and Na azide, but not by CN⁻ or DNP.

G.M.Lewis

1818. HAEMOSTATIC EFFECTS OF HETEROLOGOUS PLATELETS IN THROMBOCYTOPENIC RATS. A.J. Roy, H.Yoshimura and I.Djerassi: Proc. Soc. exp. Biol., N.Y., 1962, 111, 15-18 (Children's Cancer Res. Fdn., Harvard Med. Sch., Boston, Mass., U.S.A.) Transfusion of fresh human platelets reduced the output of r.b.c. into the lymph. The effect of homologous platelets was more marked and persistent.

M.M.Shapland

1819. ACTION OF NEAR EASTERN VIPERIDAE VENOMS ON HUMAN BLOOD PLATELETS IN VITRO. S.Aloof, C.Kirschmann and A. de Vries: Arch. int. Pharmacodyn., 1963, 142, 216-227 (Dept. Expt. Biol., Rogoff Med. Res. Inst., Tel Aviv, Israel) The actions of snake venoms from *Echis colorata* on human blood platelets are investigated". Thromboplastin generation and clot retraction are diminished. At high concn. the venom lyses the platelets and releases pyrophosphatases. These actions are inhib. by the presence of plasma. It is suggested that these effects are mediated by a venom protease. *Vipera palaestinae* venom has no such actions.

S.E.Smith

1820. EFFECTS OF VARIOUS FACTORS ON BLOOD CLOTTING SYSTEM. (A) INFLUENCE OF THYROID FUNCTION. (B) EFFECT OF EXERCISE. (C) EFFECT OF OEDEMA DRAINAGE. (D) EFFECT OF VENOUS CONGESTION. O.Egeberg: Scand. J. clin. Lab. Invest., 1963, 15, 1-7, 8-13, 14-19, 20-28 (Inst. Thrombosis Res., Univ. Hosp., Rikshospitalet, Oslo, Norway).

K.Jones

1821. COAGULATION OF BLOOD IN TEMPERATURE ACCLIMATISATION. P.Griminger, H.S.Weiss and K.G.Hollands: Nature, Lond., 1963, 197, 1118 (Lab. Nutr., Rutgers State Univ., New Brunswick,

N.J., U.S.A.) Chickens were kept for at least 3 months at 32°, 21° or f. There was a trend towards hypocoagulability of the blood with increasing environmental temp. Birds kept at the higher and lower temp, lost wt. and the females decreased in productive activity. There was no difference in body or blood temp. Haematoctiits increased with decreasing ambient temp.

1822. BLOOD CLOTTING : THE FORCE OF RETRACTION. E.Rubenstein: Science, 1962, 138, 1343-1344 (Dept. Med., Stanford Univ. Sch. Med., Calif., U.S.A.)

The max. force of clot retraction induced by platelets in human venous blood was about 1.2×10^4 dyne/cm², equal to about 9 mm. Hg; this is sufficient to deform many soft tissues and to allow clots to retract in vivo.

CM.Lewis

1823. INFLUENCE OF SURFACE CHARGE OF PHOSPHOLIPIDS ON THEIR CLOT-PROMOTING ACTIVITY.

D.Papahadjopoulos, C.Hougie and D.J.Hanahan: Prd Soc. exp. Biol., N.Y., 1962, 111, 412-416 (Dept. Biochem., Univ. Washington, Seattle, Wash., U.S.A)

¹ Thromboplastic activity' of a particular phospholipid emulsion derived from beef brain or egg yolk, depends largely on the surface charge of the particles (as measured by electrophoresis).

M.M.Shapland

1824. ANTI-COAGULANT EFFECTS OF CONCENTRATED CEPHALIN IN THROMBOPLASTIN GENERATION TEST. K.J.Coffield and M.A.Cocanour: J. appl. Physiol., 1963, 18, 325-328 (Inst. Med. Res., Toledo, Ohio, U.S.A.) Cone, suspensions of phospholipid (cephalin) inhibit thromboplastin generation through inactivation of factors V and VIII.

H.C.Jones

1825. ELEVATION OF PLASMA ANTITHROMBIN IN AGEING ARTERIOSCLEROTIC SUBJECTS. L.O.PilgejT. am, A.CSchram and D.A.Loegering: J. appl. Phys., 1963, 18, 329-333 (Arteriosclerosis Res. Lab., St. Barnabas' Hosp. Res. Fdn., Minneapolis, Minn., U.S.A.) Plasma antithrombin activity was measured in subjects that had fully recovered from the trauma of myocardial infarct, and it was found to be increased up to 33%.

H.C.Jones

1826. MILD HAEMOPHILIA A: PROBABILITY OF A VARIANT. A.J.Quick: Amer. J. med. Sci., 1962, 244, 535-547 (Dept. Biochem., Marquette Univ. Sch. Med., Milwaukee, Wis., U.S.A.) Evidence is presented which indicates that a deficiency of a hitherto recognised factor may, in addition to factor VIII, be involved in haemophilic bleeding.

E.Hobbiger

1827. SIALIC ACID IN FIBRINOGEN AND "VULCANISATION" OF THE FIBRIN CLOT. K.Laki and N.Chandrasekhar: Nature, Lond., 1963, 197, 1267-1268 (Nat. Inst. Arthritis and Metabol. Dis., Bethesda, Md., U.S.A.) Studies on the mode of action of blood clotting factor (Laki-Lorand Factor, fibrin stabilizing factor, fibrinase) which is activated by thrombin indicate that this factor enzymically removes sialic acid from fibrinogen. Removal of sialic acid from fibrinogen allows the introduction of strong bonds between fibrin mol. (vulcanisation).

J.R.Sargent

1828. IN VIVO ACTIVATION OF FIBRINOLYTIC ENZYME SYSTEM OF DOGS. F.B.Taylor, J.Singeton, Jr. and A.F.Bickford, jun.: J. appl. Physiol., 1963, 18, 334-336 (Cardiovasc. Res. Inst., Univ. California Med. Sch., San Francisco, Calif., U.S.A.) Infusions of streptokinase and plasmin into dogs result in an enhanced lysis of blood clots, a temporary lowering of serum plasminogen and plasmin levels, and a temporary decrease in plasma fibrinogen levels.

H.C.Jones

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- 1829.** THE COURSE OF FIBRINOLYSIS. M.J.Whichelow
Proc Soc exp Biol N.Y. 1962, 111, 129-131 (Univ. Virginia Sch. Med., Charlottesville, Va., V.S.A.) The max. rate of fibrinolysis was proportional to the amount of plasminogen incorporated into the clot. This rate at const. Plasminogen assay was a measure of the amount of activator (urokinase) added. M.M.Shapland
- 1830.** EFFECTS OF PHYSICAL EXERCISE ON BLOOD CLOTTING AND FIBRINOLYSIS. S.G.Iatridis and Fergusson: J. appl. Physiol., 1963, 18, 337-344 (Physiol. Dept., N. Carolina Univ. Med. Sch., Chapel Hill, N.C., U.S.A.) Normal subjects showed a shortening of whole blood clotting time after strenuous exercise, plasma factors VIII and XII rose during this time and fibrinolytic activity increased. Hageman-deficient subjects did not show these changes with exercise.
- 1831.** T.O. ESTIMATION OF HEPARIN CO-FACTOR IN SERUM. J.J.Temperley: J. clin. Path., 1963, 16, 119 (Sch. Path. Trinity Coll., Dublin, Ireland) The effect of heparin on the thrombin clotting time in the presence of excess heparin. The thrombin thrombin time was measured as the time taken for bovine of Ca. to clot pure bovine fibrinogen in the presence of J.B.Derbyshire
- 1832.** DISTRIBUTION OF UL-AMINO N, UREA N AND TOTAL PROTEIN BETWEEN ERYTHROCYTES AND WVSMA IN HEALTHY MALES AND FEMALES. K.B. Jornesjo: Scand. J. clin. Lab. Invest., 1963, 15, 69, 25-37 (Dept. Clin. Chem., Central Hosp., the distribution of ex-amino N and non-protein N with sex differences found in signif. with Sher r.b.c./plasma ratio in females, while urea Vatp. all distributed between r.b.c. and plasma blyk? in both sexes. But the abs. values of urea N in 183 W're significantly lower in *.* K. Jones
- 1833.** BLOOD VOLUME, TOTAL PROTEIN AND TOTAL CHOLESTEROL IN NORMAL AND DIABETIC HAMSTERS. E.L.House, B.Pausky, R.Raphaely, J.Palmer, J.M.Jacobs: Anat. Rec., 1962, 144, 25-30 (Dept. Anat., New York Med. Coll., Flower and Fifth Ave. Hosp., New York, N.Y., U.S.A.) Observations on blood volume, total protein and total cholesterol in the young hamsters induced diabetic hamsters and animals compared with young and adult control. F.Beck
- 1834.** IT ELECTROLYTES AND COLLOID BLOOD PRESSURE OF PLASMA SERUM AND PLASMA SERUM ALBUMIN SOLUTION. B.Goetzman: Proc. Soc. exp. Biol., N.Y., 1962, 111, 43-44 (Dept. of Medicine, Univ. Minnesota, Minn., U.S.A.) Toluidine Blue and Neutral Red had no significant effect on ³⁵Ca in vitro colloid-osmotic pressure of dog plasma and serum or 6% bovine serum albumin.
- 1835.** HYPERLIPIDOPATHY INDUCED HYPERLIPIDAEMIA IN DOGS. K.R.Woods, E.B.Freeman and A.Kellner: Proc. Soc. exp. Biol., N.Y., 1962, 111, 257-261 (Dept. Path., New York Hosp/Cornell Med. Center, N.Y., U.S.A.) Repeated s.c. injn. or i.v. infusion of H₂O caused immediate elevation of plasma non-esterified fatty acids, accumulation of kidney and liver VPerUpaemia. M.M.Shapland
- 1836.** INTENSIVE METHOD FOR ESTIMATION OF GLUCOSE IN BLOOD AND OTHER FLUIDS BY

AUTOANALYSER. G.Discombe: J. clin. Path., 1963, 16, 170-172 (Central Middx. Hosp., London, England) An enzymic micro-method for glucose estimation was developed. This was based on the Hill and Kessler method, which was modified by pptn. of F¹¹ before dialysis and replacing the phosphate buffer by a tris-maleic acid-NaQH buffer. This enabled a reagent containing less peroxide and glucose oxidase to be used without significant reduction in sensitivity. J.B.Derbyshire

- 1837.** TURNOVER OF GLYCEROL IN PLASMA. J.H. Hagen: Life Sci., 1963, No.3, 170-174 (Dept. Physiol., Univ. Manitoba, Winnipeg, Canada) The turnover of plasma glycerol was measured using ¹⁴C-glycerol. The calc. half-life was 2.01 min. and 1.32 min. in 2 sets of expt. respectively. K Jones
- 1838.** EFFECT OF INSULIN ON CONCENTRATION OF PLASMA GLYCEROL. J.H.Hagen: J. lipid Res., 1963, 4, 46-51 (Dept. Physiol., Univ. Manitoba, Winnipeg, Canada) I.v. infusion of insulin into anaesthetised rabbits causes a decrease in concn. of plasma glycerol. Insulin does not alter the in vitro release of glycerol from mesenteric adipose tissue of fasting rabbits, either in the presence or absence of glucose. Insulin increases the rate of disappearance of infused glycerol in vivo.

- J.R.Sargent
- 1839.** SIMPLE METHOD FOR DETERMINATION OF PLASMA CORTICOIDS. B.P.Murphy, W.Engelberg and C.J.Pattie: J. clin. Endocr., 1963, 23, 293-300 (Clin. Invest. Unit, Queen Mary's Veterans' Hosp., Montreal, Canada) The steroid-binding prop. of plasma is used to estimate cortisol and corticosterone in human plasma. This method requires 1 ml. of test plasma and gives S.D. ± 1 µg. over the range of 0-10 µg./100 ml., and is not affected by haemolysis or by drugs which interfere with other methods. K. Jones
- 1840.** EVIDENCE FOR MULTIPLE CALCIUM POOLS IN THE BLOOD OF DOGS. M.J.Wiester, S.H.Whitla and R.Goldsmit: Nature, Lond., 1963, 197, 1170-1171 (Radioisotope Lab., V.A. Hosp., Cincinnati, Ohio, U.S.A.) 48 hr. following injn. of ⁴⁵Ca into dogs, the sp. activity of total blood Ca (protein-bound + complexed + ionic forms) differed from that of ultrafilterable blood Ca (complexed + ionic forms). The sp. activity of ultrafilterable blood Ca was also greater than that of excreted Ca, suggesting that complexed and ionic forms of Ca are treated differently in the renal tubule. J.R.Sargent

- 1841.** PLASMA POTASSIUM CHANGES DURING RE-BREATHING IN DOGS. R.I.Lade and E.B.Brown, jun.: Proc. Soc. exp. Biol., N.Y., 1963, 112, 330-331 (Dept. Physiol., Univ. Minnesota, Minneapolis, Minn., U.S.A.) Dogs were made to rebreathe the same air for 90 min. under anaesthesia. As the CO₂ tension rose, the blood K concn. rose gradually, not transiently, until it remained const. after about 60 min. for the rest of the rebreathing time. On returning the dogs to air there was a sudden further increase in the K level in the blood.

- D.N.Wheatley
- 1842.** SERUM POTASSIUM LEVELS IN HYPERVENTILATED DOGS. K.D.Hall and F.H.Reeser, jun.: Proc. Soc. exp. Biol., N.Y., 1962, 111, 251-252 (Dept. Anesth., Duke Univ Med. Center, Durham, N.C., U.S.A.) Hyperventilation of anaesthetised dogs caused a slight increase of scrum K concn. in the first 4 min. 2nd then a marked decrease during the next 2 hr. The K level did not begin to increase until at least 20 min. after cessation of hyperventilation. M.M.Shapland

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1843. POTASSIUM LEVELS, ACID-BASE BALANCE AND MASSIVE BLOOD REPLACEMENT. O.Schweizer and W.S.Howland: Anesthesiology, 1962, 23, 735-740 (Dept. Anesthesiology, Mem. Hosp. for Cancer and Allied Dis., New York, N.Y., U.S.A.) The major factor responsible for the elevation of the serum K level during operation is a decrease in pH value of the blood. In the presence of both extensive tissue trauma and uncompensated metabolic acidosis there is a consistent increase in the level of K during operation in comparison with the preoperative value. A.A.Zimmerman

1844. DECREASE IN PLASMA POTASSIUM DURING THE DISULFIRAM ETHANOL REACTION IN RABBITS.

T.Brundin, W.Green and E.S.Perman: Acta pharmacol., Khb., 1962, 19, 389-391 (Dept. Physiol., Karolinska Inst., Stockholm, Sweden) A significant decrease in plasma K occurs during the disulfiram-ethanol reaction in awake rabbits. Increased arterial pH, associated with the hyperventilation during the reaction may be of importance for this hypopotassemia. R.S.Tonks

1845. ACTION OF POTASSIUM AND CALCIUM ON HISTAMINE BINDING ACTION OF SERUM. J.-L. Parrot and M.Mordelet-Dambrine: J. Physiol., Paris, 1962, 54, 579-590 (Lab. Physiol. path., Hop. Boucicaut, Paris, France) In rats and guinea-pigs treated with K, serum loses its histamine binding ability for periods up to several weeks, this binding ability could be restored by Ca injn. In asthmatic patients whose serum showed reduced histamine binding a single i.v. injn. of Ca gluconate restored the binding and produced simultaneously a marked clinical improvement. (French) A.Angel

1846. EFFECT OF OESTROGENIC SUBSTANCES ON TOTAL IRON LEVEL IN BLOOD AND OTHER TISSUES OF ALBINO RATS. B.Dutta and A.K.Mukherjee: Indian J. exp. Biol., 1963, 1, 91-95 (Dept. Physiol., Presidency Coll., Calcutta, India) The effect of oestrogenic substances, both natural and synthetic, on Fe metabolism in rats has been investigated. In oestrogen-treated rats, the blood Fe level shows a significant fall as compared to the untreated rats. Fe content of liver and kidney increases in oestrogen-treated animals whereas a lowering of Fe content in spleen and bone marrow is observed. The rise in Fe level in liver and kidney and fall in spleen and bone marrow is attributed to the action of oestrogen on bone marrow in the regeneration and formation of r.b.c. Low r.b.c. count in oestrogen-treated animals also indicates the action of oestrogen on bone marrow. A controlling action of oestrogen on Fe metabolism in rats is suggested. *

1847. NEW METHOD FOR DETERMINATION OF SERUM IRON. R.Sanford: J. clin. Path., 1963, 16, 174-177 (N.S.W. Red Cross Blood Transf. Serv., Sydney, N.S.W., Australia) The method depended on the release of Fe from its complex with transferrin by the combined action of Teepol and ascorbic acid, without pptn. of the serum proteins. Fe estimation was from the colour developed following the addition of orthophenanthroline. J.B.Derbyshire

BODY FLUIDS AND ELECTROLYTES

1848. DETERMINATION OF Cu IN CEREBROSPINAL FLUID BY ACTIVATION ANALYSIS. K.Kjellin: J. Neurochem., 1963, 10, 89-93 (Dept. Neurol., Serafimerlasarettet, Stockholm, Sweden) Cs.f. from 15 psychoneurotic patients (defined as free from somatic

disease) was sampled by a new technique that avoids contamination with Cu from the puncture needle and other instruments. With a modified procedure for fractionating the sample, after neutron activation, by ion exchange, values of 1.4 ± 0.4 /ig./Cu/100 ml. cs.f. were obtained. This value compares with 5.50 /ig./100 ml. cs.f. found by other workers and is similar to the values for serum. Evidence for cs.f. Cu being bound to protein is presented. R.Woodman

1849. DETERMINATION OF Na IN BODY FLUIDS BY GLASS ELECTRODE. E.W.Moore and D.W.Wilson: J. clin. Invest., 1963, 42, 293-304 (Med. Serv., Lemuel Shattuck Hosp., Dept. Publ. Hlth., Boston, Mass., U.S.A.) A method is described for the rapid and reproducible determination of Na in body fluids by selective glass electrodes. Results by this technique agreed with flame photometer values within about 2% . K.Jones

1850. EFFECT OF HYDROGEN ION ON THE RATES OF MIGRATION OF SODIUM AND POTASSIUM IONS: POSSIBLE RELATIONSHIP TO MAGNETISM. W.K. George: Nature, Lond., 1963, 197, 1209 (Wihuri Re* Inst., Helsinki, Finland) Movements of Na, K, and Cl ions occurred across a dialysis membrane influenced by a strong magnetic field. Ca and Mg did not change in concn. G.M.Lewis

1851. OBSERVATIONS IN EXPERIMENTAL Mg DEPLETION. R.Whang and L.G.Welt: J. clin. Invest., 1963, 42, 305-313 (Dept. Med. Sch. Med., Univ. North Carolina, Chapel Hill., N.C., U.S.A.) The characteristics of Mg depletion in * rats are described and the possible mechanisms for the alterations are discussed* The K loss is considered as a consequence of Mg at the tissue level, rather than as due to a renal tubular defect in conserving K. K.Jones

RESPIRATION

1852. CHRONIC TRACHEOSTOMY IN DOGS. O.G.Tbi'lenius and C.B.Vail: J. appl. Physiol., 1963, 18, 439-440 (Physiol. Dept., Chicago Univ., Chicago, 111., U.S.A.) A surgical procedure is described for producing a chronic tracheal opening in dogs. A hole is cut in the trachea and the skin is inverted over the surface and sutured to the tracheal mucosa. H-C.Jones

1853. ACOUSTIC TRANSMISSION CHARACTERISTICS OF THORAX. R.Zalter, H.C.Hardy and A.A.Luisad*: J. appl. Physiol., 1963, 18, 428-436 (Div. Cardiov^ Res., Chicago Med. Sch., Chicago, 111., U.S.A.) Attempts have been made to resolve the acoustic transmission characteristics of the thorax in dogs. Sounds were recorded using a microphone applied to the chest by suction. Sounds were introduced into the heart using a small underwater loudspeaker on a cardiac catheter. H.C.Jones

1854. MUSCLE-TRANSDUCER METHOD OF RECORD^A RESPIRATORY MOVEMENTS IN SMALL ANIMALS. B.Bhatia and V.N.Rao: J. appl. Physiol., 1963, 18, 418-419 (Def. Sci. Lab., Metcalfe House, Delhi, India) Respiratory movements of unrestrained sm^A animals can be recorded using 2 wires of dissimilar roe* inserted into the abdominal or intercostal muscles. &¹ this way the muscles act as a transducer, the respiratory movements altering the electrical resistance of the muscle which alters the e.m.f. generated between the wires. H.C.Jones

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*^{1855.} CIRCULATORY AND VENTILATORY EFFECTS OF EXERCISE IN SMOKERS AND NON-SMOKERS. R.B. Chevalier, J.A.Bowers, S.Bondurant and J.C.Ross: *J. appl. Physiol.*, 1963, 18, 357-360 (Krannert Heart Inst., Indianapolis, Ind., U.S.A.) There was no difference between smokers and non-smokers in pulmonary junction or O₂ uptake achieved in max. exercise. The O₂ debt accumulation was greater, and heart rate before and after exercise was faster in smokers. H.C.Jones

^{1856.} CARDIOPULMONARY EFFECTS OF LARGE PNEUMOTHORAX IN CONSCIOUS AND ANAESTHETISED DOGS. K.H.Kilburn: *J. appl. Physiol.*, 1963, 18, 279-283 (U.S. Army Med. Res. and Nutr. Lab., Fitzsimmons Gen. Hosp., Denver, Colo., U.S.A.) A Pneumothorax of twice the functional residual capacity was induced in conscious and pentobarbital anaesthetised dogs by intrapleural injn. of air. Greater cardiopulmonary depression occurred in anaesthetised animals and compensatory mechanisms were reduced. H.C.Jones

^{1857.} NEW METHOD FOR MEASUREMENT OF COMPLIANCE AND RESISTANCE OF LUNGS AND THORAX. M.B.McIlroy, D.F.Tierney and J.A.Nadel: *J. appl. Physiol.*, 1963, 18, 424-427 (Cardiovasc. Res. Inst., Univ. California Med. Sch., San Francisco, Calif., U.S.A.) The compliance of lungs and thorax has been measured on trained subjects by analysing small relaxed expirations. Vol. and flow of air and oesophageal pressure are recorded. The results obtained were reproducible but different from those of previous reports. H.C.Jones

^{1858.} COMPARISON OF STATIC VOLUME-PRESSURE RELATIONS OF EXCISED PULMONARY LOBES OF DOGS. N.R.Frank: *J. appl. Physiol.*, 1963, 18, 274-278 (Physiol. Dept., Harvard Univ. Sch. Publ. Hlth., Boston, Mass., U.S.A.) The vol.-pressure relations of the lobes of excised dog lungs were studied during deflation from a max. distension pressure. At a given pressure most of the lobes held similar gas volumes per unit weight. H.C.Jones

^{1859.} FACTORS LIMITING DEPTH OF MAXIMAL INSPIRATION IN HUMAN SUBJECTS. J.Mead, J.Milic-Emili and J.M.Turner: *J. appl. Physiol.*, 1963, 18, 295-296 (Physiol. Dept., Harvard Sch., Boston, Mass., U.S.A.) Oesophageal and gastric pressures have been measured in trained and untrained subjects during voluntary capacity manoeuvres. From the results it is concluded that in trained subjects the limitation to further expansion arises from elastic recoil of the respiratory system and from diminishing effectiveness of inspiratory muscles at high lung vol. H.C.Jones

^{1860.} PULMONARY NITROGEN CLEARANCE IN RELATION TO AGE IN HEALTHY MALES. A.Bouhuys: *J. Appl. Physiol.*, 1963, 18, 297-300 (Lab. Clin. Univ., Hos. P*, Leiden, Netherlands) The distribution of inspired gas in the lungs, estimated from N₂ clearance measurements, showed little change in subjects from 24-65 yr. but there was a greater range of variation among older subjects. H.C.Jones

^{1861.} CHANGE IN DIFFUSING CAPACITY WITH BLOOD ¹⁴N₂ IMPROVED ISOLATED LUNG PREPARATION. Rosenberg: *J. appl. Physiol.*, 1963, 18, 269-273 (Univ. Montreal, Canada) The isolated lung preparation, used at lung S prep, has been improved so that ¹⁴N₂ up to 500 ml./min. can be used. Pulmonary diffusing capacity for CO increased with blood flow. H.C.Jones

^{1862.} ALVEOLAR-ARTERIAL DIFFERENCE IN OXYGEN TENSION AND PHYSIOLOGICAL DEAD SPACE IN NORMAL MAN. J.M.Raine and J.M.Bishop: *J. appl. Physiol.*, 1963, 18, 284-288 (Med. Dept., Birmingham Univ., Queen Elizabeth Hosp., Birmingham, England) The alveolar-arterial O₂ tension difference in man increased with age and the alveolar O₂ pressure decreased with age. The physiol. dead space: tidal vol. ratio increased with age in the supine position but not when subjects were sitting. H.C.Jones

^{1863.} CHANGING STATE OF BREATHING DURING INHALATION OF CO₂ STUDIED WITH AN INEXPENSIVE RECORDING CO₂-ANALYSER. J.L.Anderton and E.A.Harris: *Quart. J. exp. Physiol.*, 1963, 48, 370-381 (Dept. Therapeut., Edinburgh Univ., Scotland) A simple method is described for recording alveolar CO₂ tension. From data obtained from the changing state of hyperventilation due to CO₂ in the inspired air the steady-state ventilatory response to CO₂ has been derived. H.C.Jones

^{1864.} TRANSIENT RESPONSES TO CO₂ BREATHING OF HUMAN SUBJECTS AWAKE AND ASLEEP. F.J.D.Fuleihan, T.Nakada, J.T.Suero, E.S.Merrifield, R.E.Dutton, S.Permutt and R.L.Riley: *J. appl. Physiol.*, 1963, 18, 289-294 (Dept. Environmental Med., Johns Hopkins Univ., Baltimore, Md., U.S.A.) The respiratory response to breathing 4% CO₂ in O₂ was measured in awake and sleeping subjects. In the control period ventilation was lower in sleeping subjects but the response to 4% CO₂ was the same for both groups. H.C.Jones

^{1865.} OXYGEN AND CARBON DIOXIDE TENSIONS AS FACTORS IN RESPIRATION AFTER APNOEA FROM HYPERVENTILATION. K.Sugioka, D.A.Davis, M. Hinternhoff, R.L.McKnight and D.C.Grosskreutz: *Anesthesiology*, 1962, 23, 776-782 (Dept. Surg., Univ. N. Carolina Sch. Med., Chapel Hill., N.C., U.S.A.) Hyperventilation results in increased arterial O₂ tension while arterial CO₂ tension falls to very low levels. The resumption of respiration following the apnoea of hyperventilation occurs when the pCO₂ drops to low levels and at low PCO₂ and is independent of the CO₂ tension at that time. Dangerous levels of hypo-oxia may occur during apnoea after hyperventilation with gas mixtures containing 20-25% O₂ if respiratory assistance is not given in the interval between the onset of apnoea and the resumption of respiration. A.A.Zimmerman

^{1866.} EVIDENCE THAT PCO₂ OF MIXED VENOUS BLOOD IS NOT REGULATOR OF VENTILATION DURING EXERCISE. W.F.Storey and J.Butler: *J. appl. Physiol.*, 1963, 18, 345-348 (Cardiovasc. Res. Inst., Univ. California Med. Sch., San Francisco, Calif., U.S.A.) Patients with intracardiac left-right shunts showed increased ventilation during exercise even when pulmonary arterial blood showed no rise in PCO₂. H.C.Jones

^{1867.} EFFECT OF CO₂ ON HYPERVENTILATION INDUCED BY VIBRATION. W.A.Young, D.B.Shaw, L.J. Buckles, J.S.Outerbridge, C.E.Reeves and J.C.Truman: *J. appl. Physiol.*, 1963, 18, 349-352 (Cardioresp. Serv. McGill Univ., Montreal, Canada) Hyperventilation which occurred in human subjects during passive whole-body vibration, was not increased further by the addition of CO₂ to the inspired air. It is concluded that observed differences between subjects in their responses to vibration are not due to differences in sensitivity to CO₂. H.C.Jones

^{1868.} EFFECT OF CORTICOTROPIN ON EXHALED CARBON DIOXIDE OF MICE. W.L.Miller and J.J.Krake:

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Endocrinology, 1963, 72, 518-522 (Met. Dis. Res., Upjohn Co., Kalamazoo, Mich., U.S.A.) A commercial ACTH prep, increased the amount of expired CO₂ from mice. Corticosterone did not have this effect. The response was not seen after treatment of the ACTH with NaOH or H₂O₂ and was restored after reactivation with cysteine. H.C.Jones

1869. SOLUBILITY OF CO₂ IN SERUM FROM 15-38°. W.H.Austin, E.Lacombe, P.W.Rand and M.Chatterjee: J.appl.Physiol., 1963, 18, 301-304 (Cardiol.Dept., Maine Med.Center, Portland, Maine, U.S.A.) Measurements of the solubility of CO₂ in serum from 15-38° resulted in different values from those based on water solubility. New solubility factors and pK values have been calc. for the solubility of CO₂ in serum. H.C.Jones

1870. BLOOD O₂ SATURATION DETERMINED SPECTROPHOTOMETRICALLY. W.Falholt: Scand. J. clin. Lab. Invest., 1963, 15, 67-72 (Dept.Clin.Biochem., City and County Hosp., Viborg, Denmark) A simpler method is described for the determination of blood O₂ satn*. Comparison of the results with those obtained by Van Slyke analysis, gave a regression line $y = 1^*204x - 1^*76$, y being the spectrophotometric results, x the Van Slyke results. S.D. of the difference between double analyses was 0*53%. K.Jones

1871. EFFECTS OF ACIDOSIS AND ALKALOSIS ON RESISTANCE OF MICE TO HYPO-OXIA. I.Nordin and L. Lundholm: Acta pharmacol., Kbh., 1962, 19, 356-364 (Pept.Pharmacol., Univ.Gothenburg, Sweden) 0*135-0*27mg.HCl/g. mouse inj.s.c. substantially increased the animals* resistance of hypo-oxia and they tolerated a greater reduction in their O₂ consumption than control animals. 0*63 mg.NaHCO₃/g.mouse had the reverse effect. R.S.Tonks

HEART

1872. SIMPLE METHOD OF KEEPING THE HEART f AUVE¹ AND FUNCTIONING OUTSIDE OF THE BODY FOR PROLONGED PERIODS. F.Robicsek, P.W.Sanger and F.H.Taylor: Surgery, 1963, 53, 525-530 (Dept. Thoracic Surg., Charlotte Mem. Hosp., Charlotte, N.C., U.S.A.) Dogs' hearts have been kept 'alive' outside the body for as long as 16 hr. This was done by ligation of all vessels except the aorta and the pulmonary artery and vein. The aorta was connected to a buffer soln. reservoir placed 1 m. above the heart and the pulmonary vessels were taken out with the heart and lungs entire. Blood leaving the heart by the aorta circulated around the cardiac blood vascular system and mixed also with the reservoir. The blood from the right ventricle remained unimpeded in its course through the lungs and back to the heart. Every 4 hr. the excised prep, being kept at 35-37°, 15 ml. of a 25% glucose soln. with 5 I.U. insulin and 20 mg. heparin were added to the blood. D.N.Wheatley

1873. IN VITRO STUDIES ON SINGLE BEATING RAT HEART CELLS. I. GROWTH AND ORGANISATION. n. INTERCELLULAR COMMUNICATION. L.Harary and B.Farley: Exp. Cell Res., 1963, 29, 451-465, 466-

474 (Dept. Biophys., Sch. Med., Univ. California, Los Angeles, Calif., U.S.A.) I. Single beating cell which continued to beat up to 40 days were prep, from young rat heart. Two types of cells were seen; independent leading cells which beat spontaneously, and following cells which beat only upon contact with beating cells*. Single independently beating cells grew into synchronous! beating nets of cells and eventually developed into beating fibres. The process of differentiation was accompanied by loss of striation and cessation of beating.

II. Cells beating at an independent rate became synchronous upon physical contact, indicating that the com* munication of rate of beating was through protoplasmic contact. The rate of beating was determined by the fastest beating cell. Despite the superimposed rate, each cell retained potentially its own inherent rate of beating* K.Jones

1874. RATE OF RESTITUTION AND SELF-REGULATION OF CONTRACTILITY IN MAMMALIAN HEART MUSCLE. V.Kruta and P.Bravený: Nature, Lond., 1963, 197, 905-906 (Dept. Physiol., Fac. Med., UnV Brno, Czechoslovakia) Expt. on guinea-pig atrium, suggest that the velocity of contractility restitution, wh# follows the premature beat, is increased, while a longer interval causes a decrease in the rate of restitution. The fact that activation, besides triggering the contractile mechanism, modifies the rate of contractility restitution* and with it the strength of contraction according to the length of the preceding interval, may be of definite physiol. significance in a muscle adapted for rhythmic activity, allowing for self-regulation. CM.Lewis

1875. ELECTRICAL ACTIVITY OF ATRIOVENTRICULA* CONDUCTING TISSUE OF TOAD, STUDIED BY MINUTE SUCTION ELECTRODE. T.Kanno: Jap. J. Physiol., 1963, 13, 97-111 (Dept. Physiol., Fac. Mej Univ. Tokyo, Japan) The features of A-V potenti^ of isolated toad's heart were different from those of the atrium and ventricle, as recorded with a suction electr^ The propagation of excitation in the A-V pathway was uniform and the conduction velocity was low. The uitf form conduction through the pathway was well maintain even when the A-V interval was prolonged at low teillP* But increase in driving rate changed the uniform conduction into a decremental conduction. K.Jones

1876. INFLUENCE OF POTASSIUM AND CALCIUM O\$, BEHAVIOUR OF ISOLATED RAT ATRIA. R.R.Paradisi Proc. Soc. exp. Biol., N.Y., 1963, 112, 483-486 (V* Pharmacol., Med. Sch., Univ. S. California, Los Angeles, Calif., U.S.A.). Rat atria were isolated in Krebs-Ringer bicarbonate medium at 30° and were tr| sed with 95% O₂:5% CO₂. The K concn. was 6mM and after immersion in this concn. the atrial K and water $\frac{d}{dt}$ tent was not changed as compared with freshly isolated atria, even after stimm. at 200stim./min. In K-free medium there was a 57-4% reduction in K content of the atria at this stimm. after 2 hr. After 20 min. in ** medium the atria showed idiopathic rhythm and gre*tet contractile force with some fibrillation. The behavi^ self-stimulating atria under these conditions was deter* mined. There was a temporary, adrenaline-sensitive* increase in rate of contraction followed by a slow rate when adrenaline had no effect. The rate had a direct , relationship to the Ca concn. D.N.Wheatley

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1877. EFFECTS OF GLUCOGENIC AMINO ACIDS ON FROG'S HEART. H. B.P.Chakravorti, A.C.Katki and S.S.Bandodkar: Ann. Biochem., 1963, 23, 139-144 (Grant Med. Coll., Bombay, India) Effects of 3 Stocogenic amino acids on frog's heart were compared. His escape phenomenon was observed when frog's heart Was perfused continuously with Ringer's soln. containing glutamic acid. Aspartic acid and histidine did not show such effect, although glutamic acid is one of the metabolic products of both. The site and mode of action of "te amino acids, especially glutamic acid, are discussed.

KJones

1878. UPTAKE AND METABOLISM OF TRITIATED NORADRENALINE IN THE ISOLATED CANINE HEART. C.A.Chidsey, RX.Kahler, L.L.Kelminson and E.Braunwald: Circulat. Res., 1963, 12, 220-227 (Cardiol. Branch, Nat. Heart Inst., Bethesda, Md., U.S.A.) ¹³⁷noradrenaline was infused into the blood-perfused Elated dog heart. Uptake was 74% in a single passage, ¹³⁷its subsequent spontaneous release was largely (39 to °Y%) as normetanephrine. Tyramine caused an increased release of unmetabolised noradrenaline. R.E.Moore

1879. EFFECT OF SPLENECTOMY ON CARDIOVASCULAR RESPONSE TO INJECTED METHYLCELLULOSE. C.E.Hall and O.Hall: Proc. Soc. exp. Biol., N.Y., 1962, 111, 153-156 (Carter Physiol. Lab., Univ. Texas Med. Branch, Galveston, Tex., U.S.A.) ¹³⁷Pleurectomised methylcellulose-treated rats developed significant cardiac hypertrophy compared with similarly seated intact animals. This is interpreted as reflecting increased damage caused by methylcellulose in animals deprived of one of the organs most concerned with removal. M.M.Shapland

1880. NUCLEIC ACID STUDIES IN EXPERIMENTAL CARDIOMEGLY. R-G.Sumner and H.D.McIntosh: Circulat. Res., 1963, 12, 170-175 (Dept. Med., Duke Univ. Med. Center, Durham, N.C., U.S.A.) Cardiac enlargement was induced in growing rats via the ¹³⁷emia of an Fe and Cu deficient diet (cow's milk). Total RNA and protein contents and the RNA:DNA ratio Dif greater in the enlarged hearts than in controls, but inf. tent and RNA concn. were not changed. It is "ferred that the myocardial cells enlarge. R.E.Moore

1881. LEFT VENTRICULAR OXYGEN UTILISATION IN INTACT DOGS : EFFECT OF SYSTEMIC HAEMOGYNYMATIC FACTORS. W.A.Neill, H.J.Levine, R.J. Gagman and R.Gorlin: Circulat. Res., 1963, 12, 163-169 (Med. Clin., Peter Bent Brigham Hosp., Boston, Mass. #1 u.s.A.) ¹³⁷O₂ uptake was linearly related to the product of mean systolic aortic pressure and systolic ejection period per min. in dogs under a variety of anaesthetics. R.E.Moore

1882. VARIATIONS IN SPONTANEOUS MOVEMENT, CARDIAC FREQUENCY AND RESPIRATORY FREQUENCY DURING SLEEP UNDER INFLUENCE OF VARIOUS STATES OF FATIGUE. G.Schaff, C.Marbach and J.J. Vogt: C.R.Soc. Biol., Paris, 1962, 156, 1517-1522 (Lab. de Physiol. appliquée, Fac. Méd., Strasbourg, France) There was no correlation between spontane-

ous movement, cardiac freq. and respiratory rate of *d* subjects, recorded continuously for 8 hr. during sleep. Spontaneous movement was weak during the early hr. of sleep but increased progressively towards morning. There was a decrease in cardiac and respiratory rate. Lack of sleep on previous nights decreased the early spontaneous movements but was without effect on heart and respiratory rate. Neither muscular work or a varying temp, during the previous day influenced the 3 parameters under study during sleep. (French) M.A.Price

1883. EFFECTS OF ALCOHOL AND COFFEE ON CARDIAC FREQUENCY, AND RESPIRATORY FREQUENCY DURING SLEEP. C.Marbach, G.Schaff and M.T. Schwertz: C.R. Soc. Biol., Paris, 1962, 156, 1522-1525 (Lab. de Physiol. appliquée, Fac. Méd., Strasbourg, France) In *d* subjects the effect of alcohol taken previously was to increase cardiac freq. during sleep. This increase was marked during the first half of the night. The respiratory rate was slightly increased throughout the period of sleep. Caffeine decreased cardiac freq. during sleep with a greater decrease during the second half of the night. There was no apparent effect on respiratory rate. (French) M.A.Price

1884. SLOWING OF HEART AT BEGINNING OF EXERCISE. F.N.Craig and E.G.Cummings: J. appl. Physiol., 1963, 18, 353-356 (Appl. Physiol. Branch, U.S. Army Chem. Res. Lab., Army Chem. Center, Md., U.S.A.) At the beginning of exercise at 18° an increase in heart rate was observed, but at 3° or after atropine injn. either a smaller increase, no change, or a decrease in heart rate was observed. H.C.Joies

1885. INCO-ORDINATION OF CARDIAC CONTRACTION IN CLINICAL CONDITIONS; AS JUDGED BY THE BALLISTOCARDIOGRAM AND THE PULSE DERIVATIVE. L.Starr and S.Ogawa: Amer. J. med. Sci., 1962, 244, 663-680 (Dept. Therapeut. Res., Univ. Pennsylvania Med. Sch., Philadelphia, Pa., U.S.A.) Simult. records of the first time deriv. of the pulse and of the ultra low-freq. b.c.g. permit a detailed analysis of abnormal myocardial dynamics. They also give information on peripheral circulation since it is possible to determine pulse wave velocity and rate of fall of the pressure during diastole. E.E.Hobbiger

1886. FUNCTION OF NORMAL AND HYPERTRPHIED HEARTS DURING PERfusion OF A MAIN CORONARY ARTERY WITH UNSATURATED BLOOD OR COLLOIDAL ISOTONIC SOLUTIONS AT SYSTEMIC PRESSURES. P.C.Petropoulos: Amer. Heart J., 1963, 65, 514-524 (Presbyterian Med. Center, San Francisco, Calif., U.S.A.) In acute occlusion of the ant. descending coronary artery ventricular fibrillation did not occur when the distal part of the artery was perfused for periods of 30 min. at systemic pressure with heparinised donor blood obtained from the right atrium of donor dogs (rate: 4 ml./min.) or with dextran soln. Ventricular fibrillation occurred in all animals when venous blood was given at low pressures of approx. 20 mm. Hg. In expt. on dog hearts hypertrophied as the result of an aorto-left atrial shunt there was also no ventricular fibrillation when the distal part of the cut coronary artery was perfused with venous blood at systemic pressure. P.F.Meyer

1887. CARDIAC DEFIBRILLATION WITH INTRACARDIAC INJECTION OF KC1. G.Friese, E.Nusser and H.Dengler: Z.Kreisl.-Foisch., 1963, 52, 152-163 (Med. Univ.

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Clin., (Ludolf-Krehl Clin.), Heidelberg, Germany) KCl, 30-40 mg./kg. inj. into the right atrium, terminated ventricular fibrillation induced electrically in anaesthetised cats; spontaneous conversion was an unlikely explanation as ventricular fibrillation was allowed to continue for several min. during which external cardiac massage was employed. The mean time interval before sinus rhythm was restored was 5 min. 27 sec. Only occasionally was it possible to defibrillate the heart with intracardiac adrenaline. Intracardiac procain amide stopped ventricular fibrillation but caused subsequent cardiac arrest which proved resistant to treatment.

(German) P.F. Meyer

1888. PATHOGENESIS OF ATRIAL INFARCTION. EXPERIMENTAL DATA. Cl.Chappel and D.S.Kahn: Amer. J. Path., 1962, 41, 455-463 (Ayerst Res. Lab., St. Mary's Mem. Hosp., Montreal, Canada) Rats fed normal or various salt diets with or without DOCA were inj. s.c. with isopropylnoradrenaline. A K deficient diet and pretreatment with DOCA both intensified the development of ventricular infarcts. The factors operating in the development of expt. atrial infarction are discussed. D.C.Scott

1889. QUANTITATION OF VALVULAR INSUFFICIENCY IN MAN BY ANGIOCARDIOGRAPHY. H.Sandler, H.T. Dodge, R.E.Hay and C.E.Rackley: Amer. Heart J., 1963, 65, 501-513 (Med. Serv., V.A. Hosp., Seattle, Wash., U.S.A.) A quant. estimate of regurgitant flow in valvular heart disease was obtained in 37 patients by comparing left ventricular stroke vol. calc. from biplane angiograms of the left ventricle with forward flow measured with the Fick or dye diln. method. Regurgitant flow 3-4 times the forward flow was found in patients with severe valvular incompetence. In 15 subjects, aortic or mitral valve orifice sizes as calc. from these data agreed closely with findings at operation or post-mortem examination. P.F. Meyer

1890. FIRST DERIVATIVE OF BRACHIAL PULSE. NORMAL STANDARDS AND ABNORMALITIES ENCOUNTERED IN HEART DISEASE. L.Starr and S.Ogawa: Amer. Heart J., 1963, 65, 482-494 (Dept. Therap. Res., Univ. Pennsylvania Sch. Med., Philadelphia, Pa., U.S.A.) The first deriv. of the brachial pulse was electrically recorded in 68 healthy subjects and in 107 patients. The pattern in health and disease is described. P.F.Meyer

1891. RELATIONSHIP BETWEEN FRACTIONS OF Q-T INTERVAL. E.Simonson, L.D.Cady, jun. and M.Woodbury: J. appl. Physiol., 1963, 18, 402-404 (Physiol. Hyg. Lab., Minnesota Univ., Minneapolis, Minn., U.S.A.) The regressions and correlations between the R-R, Q-T and QRS intervals, the S-T segment duration and T wave duration were determined in human subjects using a computer analysis. The regressions of all intervals were linear, the correlation of the R-R and Q-T interval was significant with all but the QRS interval and the contributing factor to the slope of the Q-T interval against heart rate was the length of the S-T segment. H.C.Jones

1892. FREQUENCY COMPONENTS AND POSITIONAL CHANGES IN ELECTROCARDIOGRAM OF ADULT RAT. E.T.Angelakos and P.Bernardini: J. appl. Physiol., 1963, 18, 261-263 (Physiol. Dept., Boston Univ. Med. Sch., Boston, Mass., U.S.A.) The QRS wave of the e.c.g. of rats was analysed and it was found that it could

be represented by sine wave freq. of 50-400 c/s. The QRS axis was sensitive to positional changes.

H.C.Jones

1893. EFFECTS OF HAEMODIALYSIS AND OF GLUCOSE-INSULIN ADMINISTRATION ON PLASMA POTASSIUM AND ON THE ELECTROCARDIOGRAM. B.Surawicz, A.S.Kunin and E.A.H.Sims: Circulat. Res., 1963, 12, 145-151 (Dept. Med., Univ. Vermont Coll. Med., Burlington, Vt., U.S.A.) Plasma K concn. in dogs under halothane was reduced the same amount by both procedures, and the e.c.g. changes were similar. R.E.Moore

1894. ELECTROCARDIOGRAPHS ANALYSIS BY A COMPUTER SYSTEM. C.A.Caceres: Arch. intern. Med., 1963, 111, 196-202 (Instrumentation Unit, Heart Dis. Control Program, Washington, D.C., U.S.A.)

E.E.Hobbiger

CIRCULATORY SYSTEM

1895. RHEOLOGY OF BLOOD AND FLOW IN THE MICROCIRCULATION. E.W.Merrill, E.R.Gilliland, G.Cokelet, H.Shin, A.Britten and R.E.Wells, jun.: J. appl. Physiol., 1963, 18, 255-260 (Dept. Chem. Eng., M.I.T., Cambridge, Mass., U.S.A.) The yield stress and stress-shear rate function of whole blood have been measured in a Couette type viscometer. The data obtained fit the Casson equation and the yield stress calc. from the equation equalled the measured yield stress within $\pm 10\%$. The yield stress was independent of temp. H.C.Jones

1896. NEW METHOD FOR INDIRECT RECORDING OF ARTERIAL PRESSURE IN UNANAESTHETISED RATS. B.Korol and W.McShane: J. appl. Physiol., 1963, 18, 437-439 (Microbiol. Dept., Med. Res. Lab., Chas. Pfizer and Co. Inc., Groton, Conn., U.S.A.) Mean arterial pressure in unanaesthetised rats has been measured using venous occlusion and an infants' ear-piece oximeter which measures the entrance of arterial blood. When measurements were compared with direct recordings in unanaesthetised rats they were found to be 8-10 mm. Hg lower using the oximeter. H.C.Jones

1897. METHODS OF ALTERING CIRCULATORY DYNAMICS TO IMPROVE ROENTGEN EXAMINATION OF THE CARDIOVASCULAR SYSTEM. B.Nordenström: Amer. J. Roentgenol., 1963, 89, 233-253 (Dept. Thoracic Radiol., Karolinska Sjukhuset, Stockholm, Sweden) A review. 38 ref. D.E.Evans

1898. SERVOANALYSIS OF CAROTID SINUS REFLEX EFFECTS ON PERIPHERAL RESISTANCE. A.M.Scher and A.C.Young: Circulat. Res., 1963, 12, 152-162 (Dept. Physiol. and Biophys., Univ. Washington Sch. Med., Seattle, Wash., U.S.A.) The isolated perfused carotid sinus of dogs and cats under chloralose was subjected to pressure changes. Systemic pressure responses varied according to the level of carotid pressur^{**} in the most sensitive carotid pressure range up to 8-fold (dogs) or 14-fold (cats) changes in systemic pressure occurred. R.E. Moore

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1899. MECHANISM OF ARTERIAL PRESSURE OSCILLATIONS CAUSED BY COMPRESSING CEREBRAL ARTERY. K.Sagawa: Jap. J. Physiol., 1963, 13, 1-13 (Dept. Physiol., Yokohama Univ. Sch. Med., Yokohama, Japan) The addition of a side pressure of ISO-tonic character on the carotid artery elicited sustained oscillations in the mean arterial pressure level of dogs, by recording the cerebral perfusion pressure and the cerebral blood flow simult., the roles of the Starling's resistance used to add side pressure were demonstrated. The expt. results are interpreted to reveal the feedback nature of arterial pressure oscillation elicited by adding toe side pressure upon the cerebral arterial pressure.

K.Jones

1900. EFFECTS OF STARVATION ON CARDIOVASCULAR SYSTEM OF TOE CHICKEN. J.A.Vogel and P.D.Sturkie: Proc. Soc. exp. Biol., N.Y., 1963, 112, 111-113 (Physiol. Sect., Rutgers Univ., New Brunswick, N.J., U.S.A.) White Leghorns were used to demonstrate the effect of starvation on cardiac behaviour. Animals were starved for 8 days and then many facets of their cardiophysiol. were investigated. Heart rate, systolic b.p. and body wt. all fell in almost linear fashion, if the animals were handled there was an enhancement of the heart rate almost to the normal (unstarved) value.

D.N.Wheatley

1901. VASCULAR SMOOTH MUSCLE: DUAL EFFECT OF CALCIUM. D.F.Bohr: Science, 1963, 139, 597-599 (Dept. Physiol., Univ. Michigan, Ann Arbor Mich., U.S.A.) The first part of the contractile response of helical strips of rabbit aorta to adrenaline is suppressed by elevation of Ca concn.; the second is potentiated. This suggests that the rate-limiting factor P* the former is membrane excitability (depressed by greased Ca), while that for the latter is the role that ?: Plays in coupling membrane excitation with the development of tension by the contractile protein (a function that is augmented by increased Ca). G.M.Lewis

1902. PREFERENTIAL SITES OF ATHEROMA AND HAEMODYNAMICS IN CURVES AND DIVISIONS OF VESSELS. K.Dropmann: Z.Kreisl.-Forsch., 1963, 52, 171-183 (Med. Univ. Clin., Munster-Westfalen, K.Germany) Considerations of pressure and flow relationships which obtain when streams divide and the to $\Delta^{10\%}$ in size and in the angle between them lead to suggestion that atherosomatous changes are likely to 4 $\Delta^{10\%}$ in the part of the arterial wall over which hydrostatic pressure is minimal.

(German) P.E. Meyer
PROPERTIES OF
NORMAL AND VARICOSE
STUDIED IN
Scand. J. cli

E.Arenander:
5, 37-44 (Dept.
Pharmacol., Univ. Goteborg, Sweden)

Varicose veins showed reduced contractility and extensibility compared with normal veins under various U&T conditions. This reduced contractility and extension of varicose veins are suggested to be amibuttle histol. demonstrable degeneration of the muscular and elastic components of the vessel wall. K.Jones

1903. CARDIOVASCULAR STUDIES ON COPPER-DEFICIT SWINE, n. MECHANICAL PROPERTIES OF AORTA. W.F.Coulson and W.H.Cames: Lab. Invest., 1962, 11, 1316-1 Salt La extension
behaviour of transverse loops of aorta from control and Cu-deficient swine was examined. The latter showed a 4-fold

tensile strength decrease probably due to alterations in elastin and collagen or the pattern of their mutual insertion.

A.M.Mackay

1905. RELEASE OF A THROMBOPLASTIC SUBSTANCE FROM ARTERIAL WALLS BY ADRENALINE. T.Shimamoto and T.Ishioka: Circulat. Res., 1963, 12, 138-144 (Dept. Clin. Physiol. and Med., Tokyo Med. and Dental Univ., Japan) Rabbit aortae were perfused and the perfusate tested for thromboplastic activity by its effect on the Ca clotting time of citrated plasma. Clotting time was prolonged by adrenaline in certain doses but not by noradrenaline, and the adrenaline effect was prevented by nialamide in vivo. R.E.Moore

1906. COMPARATIVE STUDY OF EFFECT OF ADRENALINE AND NORADRENALINE ON CARDIOVASCULAR SYSTEM OF TURTLE, ALLIGATOR, CHICKEN AND OPOSSUM. T.K.Akers and C.N.Peiss: Proc. Soc. exp. Biol., N.Y., 1963, 112, 396-399 (Dept. Physiol., Stritch Med. Sch., Loyola Univ., Chicago, 111, U.S.A.)

Cardiovascular responses of turtles, alligators, chickens and opossums were compared with i.v. injn. of adrenaline and noradrenaline. The duration of response to noradrenaline was longer in the opossum than to adrenaline and it is suggested that there is no sp. enzyme system to degrade noradrenaline whilst there is one for adrenaline. The opposite is true in the case of the chicken and the respective substances are believed to be the neurotransmitters in the animals concerned. D.N.Wheatley

1907. INFLUENCE OF INTRAVASCULAR PRESSURE ON VASCULAR RESPONSE TO ADRENALINE. E.Aschheim, B.W.Zweifach and M.B.Engelberg: Proc. Soc. exp. Biol., N.Y., 1962, 111, 238-241 (Dept. Path., N.Y. Univ. Med. Center, N.Y., U.S.A.) The vasoconstrictor effect of adrenaline on the isolated perfused rabbit ear varied with the perfusion pressure. The drop in flow caused by a given dose was a const. fraction of the original value, suggesting that tension developed by vascular smooth muscle depends on the initial stretch.

M.M.Shapland

1908. VASCULAR RESPONSES PRODUCED BY HISTAMINE BY ION TRANSFER. D.L.Abramson, S.Tuck, jun., A.M.Zayas, T.M.Donatello, L.S.W.Chu and R.E. Mitchell: J. appl. Physiol., 1963, 18, 305-310 (Dept. Phys. Med., Univ. Illinois Med. Coll., Chicago, 111, U.S.A.) Administration of histamine by ion transfer through the skin of the hand or forearm resulted in an increase in blood flow to these parts. Vasodilation also occurred in the opposite forearm and flushing of the face and neck was seen.

H.C.Jones

1909. NEUROGENIC COMPONENT OF CHRONIC RENAL HYPERTENSION. J.W.McCubbin and I.H.Page: Science, 1963, 139, 210-215 (Res. Div., Cleveland Clin. Fdn., Cleveland, Ohio, U.S.A.) Infusion of angiotensin or renin into dogs affects the sympathetic nervous system so that response to any drug that depends for its action on release of noradrenaline at the myoneural junction is increased. The direct vasoconstrictor action of angiotensin is not an essential part of the enhanced response. In dogs with acute and chronic expt. renal hypertension, the pressor response to tyramine was enhanced. The ability of angiotensin to intensify the effect of normal neurogenic vasomotor activity, together with an upward reset of the carotid sinus buffer mechanism may account for the neurogenic component of renal hypertension.

G.M.Lewis

PHYSIOLOGY

1910. NATURE OF ARTERIAL HYPERTENSION. LH.Page: Arch, intern. Med., 1963, 111, 103-115 (Res. Div., Cleveland Clin. Fdn., Cleveland, Ohio, U.S.A.) A critical survey. 20 ref. E.E.Hobbiger

1911. USE OF CORONARY CINE-ARTERIOGRAPHY FOR ESTIMATION OF RELATIVE FLOW IN THE ANTERIOR DESCENDING CORONARY ARTERY IN DOGS AFTER EXPERIMENTAL SURGICAL CONSTRICTION. W.H. Sewell: Amer. J. Roentgenol., 1963, 89, 261-268 (V.A. Hosp., Oteen, N.C., U.S.A.) A radio-opaque catheter was passed from the carotid or femoral artery to the aortic bulb, and the tip positioned under fluoroscopic observation so that its jet impinged upon the orifice of the coronary artery. From observation of the width of the shadow and its rate of travel, changes in rate of flow could be calc. D.E.Evans

1912. PHASIC AND MEAN BLOOD FLOW IN CANINE SEPTAL ARTERY AND AN ESTIMATE OF SYSTOLIC RESISTANCE IN DEEP MYOCARDIAL VESSELS. R.W. Eckstein, T.W.Moir and T.E. Driscoll: Circulat. Res., 1963, 12, 203-211 (Dept. Med., Western Res. Univ. Sch. Med., Cleveland, Ohio, U.S.A.) Flow was monitored (orifice meter) and adjustable clamps placed on the pulmonary artery or aorta in dogs under morphine-chloralose with open chests. Elevation of right ventricular pressure increased the back-flow in early systole and reduced the mid-systolic forward flow. Pressures much in excess of aortic were required to cause forward flow in mid-systole when right ventricular pressure was high. Some 16% of the common left coronary flow entered the septal artery. R.E.Moore

1913. THEBESIAN DRAINAGE OF THE SEPTAL ARTERY. T.W.Moir, R.W.Eckstein and T.E.Driscoll: Circulat. Res., 1963, 12, 212-219 (Dept. Med., Western Res. Univ. Sch. Med., Cleveland, Ohio, U.S.A.) [ISIfl-albumin was inj. into the septal artery of dogs with open chests under morphine-pentobarbital. Diln. curves from various sampling points indicated that 80% of the flow in this artery (and hence about 13% of left coronary artery flow) drains directly into the right ventricle. R.E.Moore

1914. PHYSIOLOGICAL ROLE OF CORONARY CONSTRICCTOR FIBRES. I. EFFECT OF CORONARY VASOMOTORS ON SYSTEMIC BLOOD PRESSURE. II. ROLE OF CORONARY VASOMOTORS IN METABOLIC ADAPTATION OF CORONARIES. M.Szentiványi and Ajuhász-Nagy: Quart. J. exp. Physiol., 1963, 48, 93-104, 105-116 (Physiol. Inst., Med. Univ., Debrecen, Hungary)

The coronary constrictor fibres of dogs under morphine-chloralose anaesthesia were found to be tonically active. The activity was increased by clamping the common carotids. A reflex fall in b.p. was seen when coronary constriction was increased, and this did not occur after vagotomy.

II. In dogs under morphine-chloralose anaesthesia the metabolic adaptation of the coronaries measured by the hyperaemic response, was increased by clamping the common carotids. This effect was abolished by blocking the coronary vasomotor pathways. It is suggested that constrictor nerve tone is important for the metabolic adaptation of the coronaries. H.C.Jones

1915. EFFECTS OF RESPIRATION ON AORTIC PRESSURE AND FLOW. R.Shabetai, N.O.Fowler and M.Gueron: Amer. Heart J., 1963, 65, 525-533 (Cardiac Lab., Cincinnati Gen. Hosp., Cincinnati, Ohio, U.S.A.)

In control animals, respiratory changes in aortic pressure were attributable to an inspirator/ decrease in left ventricular stroke vol., and transmission of the inspirator fall in intra-thoracic pressure into the aorta. During induced cardiac tamponade the increase in the inspiratoiy decline of aortic pressure (pulsus paradoxus) was caused by a greater fall in left ventricular stroke vol. and not by a decrease in peripheral arterial resistance or greater decline in intrathoracic pressure. During tracheal obstruction the exaggerated inspiratory decline in aortic pressure was caused by increased fluctuations in intra-thoracic pressure and not by greater inspiratory fall in left ventricular stroke vol. The phase relationship between aortic and pulmonary arterial pressures was related to the slope of the intrapleural pressure as it climbed from the bottom of inspiration to its expiratory value. P.F. Meyer

1916. PULMONARY CAPILLARY BLOOD VOLUME IN DOG: EFFECTS OF 5-HYDROXYTRYPTAMINE. R.C. Young, H.Nagano, T.R.Vaughan, jun. and N.C.Staufr J. appl. Physiol., 1963, 18, 264-268 (Cardiovasc. Re* Inst., Univ. California Med. Sch., San Francisco, Calif., U.S.A.) Changes in pulmonary capillary vol. were estimated from changes in pulmonary diffusing capacity for CO in anaesthetised dogs. 5HT administra* tion resulted in increases in pulmonary capillary blood vol. and it is concluded that 5HT causes pulmonary ven^ constriction. H .C Jones

1917. EFFECT OF ALVEOLAR HYPO-OXIA ON ZONAL DISTRIBUTION OF PULMONARY BLOOD FLOW. K.T.* Fowler and J.Read: J. appl. Physiol., 1963, 18, 244' 250 (Med. Dept., Univ., Sydney, Australia) Redistribut. of pulmonary blood flow was studied by means * cardiogenic oscillations in expired gas tensions after in' due tion of alveolar hypo-oxia. In some subjects there was no vascular response but in others there was a respo^ consisting of preferential lower zone vasoconstriction. H.C.Jones J

1918. EVIDENCE FOR PULMONARY VENOCOMSTRICTM IN BRISKET DISEASE. H.Kuida, TJ.Tsagaris and H^' Hecht: Circulat. Res., 1963, 12, 182-189 (Dept. Int. Med., Univ. Utah Coll. Med., Salt Lake City, Utah, U.S.A.) The acute disease, a syndrome of pulmonary hypertension and heart failure in cattle COD' sequent upon exposure to high altitude, was associated with an increased pressure gradient between a pulmonary artery wedged catheter and the left ventricle at the end of diastole in some animals. R.E.Moore

1919. CARDIOGENIC OSCILLATIONS AS INDEX OF PULMONARY BLOOD FLOW DISTRIBUTION. K.T.PJ lerand J.Read: J. appl. Physiol., 1963, 18, 233-24J (Med. Dept., Univ., Sydney, Australia) A relating ship has been developed between the amplitude of cat^ genic oscillations in expired gas tensions and the ratio of blood flows through the upper and lower zones of &L erect human lung. The amplitude of the oscillations P^ been measured and the ratio of upper to lower zone W^ flow determined with a reproducibility of ± 20%. H.C.Jone*

1920. BALANCE OF BLOOD FLOW AND GAS EXCHANj DURING PARTIAL HEART-LUNG BYPASS. M.A.H. and P.M.Galletti: J. appl. Physiol., 1963, 18, 251 254 (Physiol. Dept., Emory Univ., Atlanta, Ga., U.S.A.) During partial heart-lung bypass an increas in the extracorporeal blood flow results in a proportional decrease in pulmonary blood flow, thus the total tissue

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penus is not significantly different from normal. The decrease in pulmonary blood flow is accompanied by a less marked decrease in pulmonary ventilation.

H.C.Jones

1921. PRESSOR EFFECT OF INCREASED CEREBROSPINAL FLUID PRESSURE AND VERTEBRAL ARTERY OCCLUSION WITH AND WITHOUT ANAESTHESIA. C.J. Dickinson and J.W.McCubbin: *Circulat. Res.*, 1963, 12, 190-202 (Res. Div., Cleveland Clin. Fdn., Cleveland, Ohio, U.S.A.) Increasing the c.s.f. pressure in dogs (intraventricular cannula) was associated with systemic pressor responses which were slow to establish (i-2 min.) and slow to accommodate. Pentobarbital reduced the response. R.E.Moore

1922. ARTERIAL BLOOD SUPPLY TO CAT DIAPHRAGM WITH A NOTE ON VENOUS DRAINAGE. T.J.Biscoe and A.Bucknell: *Quart. J. exp. Physiol.*, 1963, 48, 27-33 (War Dept., Chem. Def. Exp. Est., Porton Down, Salisbury, Wilts., England) The blood supply to the diaphragm of cats has been shown to arise from 3 main sources: the 8th-13th intercostal arteries, the internal mammary arteries and the abdominal aorta. Individual variations were often seen. The venous blood drains into the intercostal veins, the internal mammary vein, and the inf. vena cava. H.C.Jones

1923. EFFECT OF ETHYL ALCOHOL UPON SPLANCHNIC HAEMODYNAMICS. S.M.Horvath and P.W.Willard: *Proc. Soc. exp. Biol.*, N.Y., 1962, 111, 295-298 (Dept. Phys. Educ., Univ. California, Coleta, Calif., U.S.A.) No significant change was observed in splanchnic blood flow during or after alcohol infusion although metabolic studies indicate hepatic depression. M.M.Shapland

1924. PORTAL VEIN LIGATION IN MICE; ^ T A L HYPERTENSION, COLLATERAL CIRCULATION AND BLOOD FLOW. A.W.Cheever and K.S.Warren: *J.appl. Physiol.*, 1963, 18, 405-407 (Parasitic Dis. Lab., N.I.H., Bethesda, Md., U.S.A.) A technique is described for partial and complete portal ligation. Collateral circulation was well developed 3 days after ligation. There was an initial ^ in Portal b.p. which eventually returned to normal and die hepatic blood flow was not significantly different from control after 3 days. H.C.Jones

1925. RENAL VASOCONSTRICTION INDUCED IN DOG BY OCCLUSION OF THE PORTAL VEIN. H.Umarch and M.Tanche: *C.R. Soc. Biol.*, Paris, 1962, J56, 1438-1440 (List. Physiol., ^ c. Med., Lyon, France) Occlusion of the portal vein in spinal dog faulted in vasoconstriction of the Perfused kidney in g. This effect was not obtained when the splanchnic vein were sectioned. The vasoconstriction occurred ^ w/ distension of the mesenteric vascular bed & * " n stimn. of nerve endings in the regioi of & e "Sature. (French) M^Price

1926. LOCAL REGULATION OF EFFECTIVE BLOOD FLOW IN MUSCLE. C.Hyman, R.L.Paldino and E. Zimmermann: *Circulat. Res.*, 1963, 12, 176-181 (Dept. Physiol., Univ. S. California Sch. Med., Los Angeles, Calif., U.S.A.) Microclearance of water from the rat spinotrapezius and macroclearance of ^ from the rabbit gastrocnemius were used as indicators of "active" blood flow. In almost all e*pt,ja forced Nation of blood flow by temporary occlusion or by

local heating was followed by an exact quant, repayment of the deficit or excess. R.E.Moore

NERVOUS SYSTEM

1927. PERIODIC NATURE OF SPONTANEOUS PERIPHERAL NERVOUS SYSTEM ACTIVITY. A.A.Alexander, R.Roessler and N.S.Greenfield: *Nature*, Lond., 1963, 197, 1169-1170 (Wisconsin Psychiat. Inst., Univ. Wisconsin, Madison, Wis., U.S.A.)

Spontaneous rhythmic activity in peripheral physiol. systems was investigated by means of a variance spectrum analysis of resting levels of the psycho-galvanic response, finger blood vol., heart rate and e.m.g. The findings are discussed in relation to the hypothesis of individual stereotypy. GM Lewis

1928. SOME PROPERTIES OF CONDUCTANCE CHANGES AT THE END-PLATE MEMBRANE DURING THE ACTION OF ACETYLCHOLINE. N.Takeuchi: *J. Physiol.*, Lond., 1963, 167, 128-140 (Dept. Physiol., Univ. Utah Coll. Med., Salt Lake City, Utah, U.S.A.)

By use of the electroporation application of ACh at an end-plate of frog's sartorius the reversal membrane potential of the ACh potential was investigated in various ionic concn. of the soln. The reversal potential depended on the outside concn. of Na and K, but not on Cl⁻ in wide range of concn. changes. The relations between the reversal potential and the external concn. of Na or K suggest that the ratio of Na and K conductance of the end-plate membrane produced by ACh is altered by the external concn. of K. *

1929. EFFECTS OF CALCIUM ON CONDUCTANCE CHANGE OF TOE END-PLATE MEMBRANE DURING TOE ACTION OF TRANSMITTER. N.Takeuchi: *J. Physiol.*, Lond., 1963, 167, 141-155 (Dept. Physiol., Univ. Utah Coll. Med., Salt Lake City, Utah, U.S.A.)

In the end-plate of frog's sartorius an increase in external Ca concn., [CSLIQ], changed the reversal potential of end-plate current to the neg. side. Increasing [Ca]_o changed slopes of the relationships between the reversal potential and the external concn. of Na or K. In hi^h [Ca]_o a weak localised shortening was observed around the tip of ACh pipette accompanied with the small ACh potential. The clamping current through an end-plate produced by ACh suggests that increasing [Ca]Q reduces the Na conductance with little or no effect on K conductance and the end-plate membrane may become slightly permeable to Ca ion by the ACh action. *

1930. EFFECT OF X-RAYS ON ELECTRICAL PROPERTIES OF MAMMALIAN NERVE AND MUSCLE. N.Allen and J.G.Nicholls: *Proc. Roy. Soc. B.*, 1963, 157, 536-

561 (Univ. Lab. Physiol., Oxford, England) Irradiation of isolated rat phrenic-diaphragm prep, by 70-150 kr X-rays irreversibly blocks neuromuscular transmission. The block is not accompanied by any change in the size of action or resting potentials, membrane const, or miniature potentials recorded with intracellular electrodes, or in the size of action potentials recorded in the nerve. Records made at the motor end plate showed that the cause of the block is a 'presynaptic' failure of impulse

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propagation in the i.m. part of the nerve, possibly by depolarisation of points where the axons branch.

G.M.Lewis

1931. BEADING PHENOMENA OF MAMMALIAN MYELINATED NERVE FIBRES. S.Ochs: *Science*, 1963, 139, 559-560 (Dept. Physiol., Indiana Univ. Med. Center, Indianapolis, Ind., U.S.A.) Fresh nerves from rabbits and rats, when subjected to a small stretch, show a beading phenomenon in which the larger fibres appear as a series of dilations and constrictions at intervals of 40-75 μ . The effect is reversed quickly on relaxation of the nerve and is not an artifact of the special technique used to show the phenomenon.

G.M.Lewis

1932. CONDUCTION VELOCITY AND RESIDUAL LATENCY IN THE HUMAN ULNAR NERVE AND THE EFFECTS ON THEM OF ETHYL ALCOHOL. M.D.Low, J.V.Basmajian and C.M.Lyons: *Amer. J. med. Sci.*, 1962, 244, 721-730 (Dept. Anat., Queen's Univ., Kingston, Ont., Canada) When the blood alcohol level rises above 100 mg./100 ml., neuromuscular transmission is facilitated. The degree of facilitation is directly related to the blood alcohol level. E.E.Hobbiger

1933. PORPHYRIA AND NEURONAL DYSFUNCTION. G.W.Holt: *Amer. J. med. Sci.*, 1963, 145, 95-108 (1829 High St., Denver, Colo., U.S.A.) A review, illustrated by case reports. 55 ref. E.E.Hobbiger

1934. ACTIVITY OF FUSIMOTOR FIBRES INNERVATING MUSCLE SPINDLES IN THE INTERCOSTAL MUSCLES OF THE CAT. T.A.Seais: *Nature*, Lond., 1963, 197, 1013-1014 (Dept. Physiol., Australian Nat. Univ., Canberra, Australia) Recordings were made in cats of the efferent discharges present in more than 60 isolated filaments that innervated either the external or internal intercostal muscles. Spikes of 2 distinct sizes with distinct patterns of discharge were observed, correlating with expiratory and inspiratory phasing of activity. The activity of motor units was correlated with the large spikes so that the small spikes must arise in fusimotor fibres. Inhalation of CO₂ enhances and hyperventilation abolishes the periodic discharges. It is concluded that intercostal muscle spindles are regulated through their fusimotor fibres by a central control.

G.M.Lewis

1935. EFFECT OF OESTRADIOL ON SPINAL CORD CONVULSION IN DEVELOPING RATS. A.Vemadakis and P.S.Timiras: *Nature*, Lond., 1963, 197, 906 (Dept. Physiol., Univ. California, Berkeley, Calif., U.S.A.) 1 mg./kg. oestradiol was administered to rats daily from the 8th to 11th day after birth and spinal cord convulsions elicited at 12 and 21 days after birth. Oestradiol treatment significantly decreased the duration of flexion and increased the reflex excitability of the spinal cord.

G.M.Lewis

1936. EFFECTS OF STIMULATION OF CEREBELLAR AND THALAMIC NUCLEI UPON SPINAL a MOTONEURONES OF CAT. K.Sasaki and T.Tanaka: *Jap. J. Physiol.*, 1963, 13, 64-83 (Dept. Physiol., Fac. Med., Univ., Kyoto, Japan) The cerebellar control over the spinal function was analysed by testing the effect on the spinal monosynaptic reflex and by recording intracellular potentials from a-motoneurones in lumbar segments of cat. The stimulating effects of the ventral-lat. nucleus of the thalamus on the a-motoneurones were also examined-

K.Jones

1937. SYNAPTIC TRANSMISSION AT SUPERIOR CERVICAL GANGLION RE-INNERNATED BY PHRENIC NERVE F.Alonso-deFlorida, R.Zapata, L.Ramirez and E.Kabela: *Life Sci.*, 1963, No.3, 163-169 (Dept. de Fisiol., Escuela de Med., U.N.A.M., Ciudad Univ., Mexico, D.F.) The action potential of the sup. cervical ganglion of cat was usually simple, the component waves, when composite, varying among different ganglia. There was a one-to-one relationship between input and output volleys, convergence, recruitment, prolonged facilitation and fatigue. But quant. differences between normal and re-innervated ganglia were observed. K.Jones

1938. ROLE AND ORIGIN OF NORADRENALINE IN THE SUPERIOR CERVICAL GANGLION. H.Reinert: *J. Physiol.*, Lond., 1963, 167, 18-29 (Pharmacol. Dept., Pfizer Ltd., Sandwich, Kent, England) Noradrenaline was detected in the outflow of isolated perfused normal and denervated ganglia of cats, its concn. ranging from 2-16 mfig./ml. After orthodromic and antidromic stimn. of normal and antidromic stimn. of denervated ganglia an increase of noradrenaline in the outflow is observed. Repeated administration of MAO inhibitors increases the noradrenaline content of ganglia of rabbits but the height of the evoked action potential recorded in vitro remains unchanged. After reserpine the evoked ganglionic action potential increases gradually; identical increases occur, however, in control expt., and no correlation was found between the degree of amine depletion and the potentiation of action potential after reserpine. The progressive increase of the action potential was absent, however, when recording was done in vitro (rabbits) or when dehydration in vivo was prevented by continuous infusion of saline soln. (cats). Noradrenaline released from ganglia originates from the posV ganglionic adrenergic neurones and under physiol. conditions this noradrenaline does not affect the release of ACh or its action on the subsynaptic soma membrane. *

1939. SOME PROPERTIES OF AFFERENT PATHWAY IN FROG CORNEAL REFLEX. K.Kornacker: *Exp. Neurol.*, 1963, 7, 224-239 (Dept. Biol. and Res. Lab. Electron. ics, M.I.T., Cambridge, Mass., U.S.A.) The sped'ficity of the stimulus of the corneal reflex in the frog w^{as} examined by recording from the medulla oblongata at the level of the sixth nerve nucleus. P.W.Nathan

1940. EYE-CENTERING AND VESTIBULO-OCULAR REFLEX IN MAN. G.H.Begbie: *J. theoret. Biol.*, 1963 4, 215-222 (Dept. Physiol., Univ., Edinburgh, Scotland) .The vestibulo-ocular reflex is considered as the manifestation of a control system which tends to keep the eyes centered in the head. An equation is derived to describe the behaviour of the system in the absence of vision.

C.F.Blane

1941. EFFECT OF UNILATERAL EYE REMOVAL ON CHOLINESTERASE ACTIVITY OF OPTIC TECTUM & ADULT FROGS. A.Hess: *Anat. Rec.*, 1961, 140, 2» 305 (Dept. Anat., Univ. Sch. Med., St. Louis, Mo., U.S.A.) Removal of one eye in adult frogs causes * reduction in the neuropil in the superficial tectal layer* of the contralat. side, but the 2 halves of the brain can't not be differentiated from each other after cholinesterase⁶ staining. It is concluded that the cholinesterase is pro^{bly}ably located in the neurones.

F.Beck

1942. INFLUENCE OF MICRO-ELECTRODES ON NEUR^A DISCHARGE PATTERNS IN THE AUDITORY SYSTEM*

P.E.Stopp and I.C.Whitfield: J. Physiol. Lond., 1963, 167, 169-180 (Neurocommunication Res. Unit., Univ. Birmingham, England) Records were made from single units in the trapezoid body of the cat while simultaneously a test electrode was inserted into the corresponding coeruleus nucleus. Changes in the spontaneous firing rate were observed which averaged about 20% ($p < 0.01$)¹⁾. Such changes might be either increases or decreases according to the position of the test electrode. There was in general no relation between the stimulus freq. for the test electrode response and that for the recording electrode response, nor did existing grid current make any effect. So that the effect appears to be a non-sp. one due simply to the presence of the electrode in the nuclear mass.

W43. MIDBRAIN RETICULAR INFLUENCES UPON SINGLE NEURONES IN LATERAL GENICULATE NUCLEUS.

T.Ogawa: Science, 1963, 139, 343-344 (Dept. Physiol., Univ. Sydney, Australia) Study of the effect of electrical stimm. of the cat midbrain reticular formation upon patterns of discharge of single lat. geniculate neurones was studied using a 256-channel sealer analyser. Stim. increased the rate of spontaneous discharge of geniculate neurones and enhanced their ability to respond to intermittent light. G.M.Lewis

1944. ACTION OF BLOOD PRESSURE ON ASCENDING RETICULAR ACTIVATING SYSTEM WITH SPECIAL REFERENCE TO ADRENALINE-INDUCED E.E.G.

AROUSAL. W.Baust, H.Niemczyk and J-Vieth: Electroenceph. clin. Neurophysiol., 1963, 15, 63-78 (Physiol. Inst., Univ., Heidelberg, Germany) In cats rise of b.p., following adrenaline, vasopressin or mechanical induction, was accompanied by arousal. When b.p. was held const. during adrenaline inj. arousal was delayed and of shorter duration. Local infusion of saline into mesencephalic reticular formation also caused arousal. The b.p. rise is the predominant factor in so-called adrenaline-arousal. C.B.B.Downman

1945. OESTRADIOL: EVIDENCE FOR ITS DIRECT EFFECT ON HYPOTHALAMIC NEURONES. R.F.M.Newton: Science, 1963, 139, 223-224 (Dept. Biol. Princeton Univ., Princeton, N.J., U.S.A.)

¹⁾Plantation of oestradiol directly into the arcuate nucleus of the hypothalamus of rats causes a decrease in the number of the nucleoplasm of the neurones, to 20-30%. Plants in the mammillary nucleus caused similar effects. These changes were accompanied by atrophy. Return to that earned by hypophysectomy of the ovaries and uterus of the rat and testes and accessory glands suggested that these hypothalamic neurones are 30-40% sensitive to circulating oestrogen, which may decrease synthesis of some humoral factors. G.M.Lewis

1946. HYPOTHALAMIC TEMPERATURE IN CAT DURING READING AND SLEEP. T.Adams: Science, 1963, 139, 610 (Dept. Physiol., Univ. Washington Sch. Med., Seattle, U.S.A.)

Ant. hypothalamic temp. 38.5°C in unanaesthetised cats resting at air temp. 20-22°C. Chronically implanted thermistor bead. Fresh cold milk (5%) caused an immediate drop in hypothalamic temp., and a period of 10-15 min. at body temp. During sleep is approx. 1°C lower and characterised by widely varying, slow freq. oscillations, compared with the higher, more precisely controlled temp. when awake. G.M.Lewis

1947. HYPOTHALAMIC STIMULATION AND ASCORBIC ACID CONTENT OF ENDOCRINE GLANDS OF THE ALBINO RAT. J.Snyder and S.A.D* Angelo: Proc. Soc. exp. Biol., N.Y., 1963, 112, 1-4 (Daniel Baugh Inst. Anat., Jefferson Med. Coll., Philadelphia, Pa., U.S.A.) Electrical stimm. of the pre-optic and supra-optic regions of the hypothalamus caused adrenal hypertrophy but did not affect the ascorbic acid level in the ant. pituitary. The onset of oestrus was delayed. No change in ascorbic acid level was found in the adenohypophysis of rats rendered persistently in oestrus by rostral hypothalamus electrocautery previously. D.N.Wheatley

1948. INFLUENCE OF TEMPERATURE ON BALANCE BETWEEN EXCITATORY AND INHIBITORY CEREBRAL SYSTEMS. A CONTRIBUTION TO THE CAUDATE-HYPOTHALAMIC ANTAGONISM. M.Kawakami and E.Gellhom: Electroenceph. clin. Neurophysiol., 1963, 15, 230-237 (Lab. Neurophysiol., Univ. Minnesota, Minneapolis, Minn., U.S.A.)

Recording electrical activity of exposed cortex in immobilised cats, with and without high-freq. lesions in post. hypothalamus, the effect of changes of body temp. (37-25°) was observed on spontaneous spindles and on those induced by caudate stimm. Falling temp. affects both types of spindle similarly but the changes are absent with hypothalamic lesions or with Dial-urethane anaesthesia. Falling body temp. affects tonic hypothalamic activity. C.B.B.Downman

1949. MIDBRAIN COURSE OF DESCENDING PATHWAYS MEDIATING SHAM RAGE BEHAVIOUR. G.Carli, A. Malliani and A.Zanchetti: Exp. Neurol., 1963, 7, 210-223 (Inst. Patol. Med., Univ. Siena, Italy)

In thalamic cats the lat. hypothalamus was stim. electrically to induce sham rage behaviour; the effect of various lesions on this behaviour was observed. P.W.Nathan

1950. THALAMIC MECHANISMS INVOLVED IN CORTICAL DESYNCHRONISATION AND RECRUITING RESPONSES. J.D.Schlag and F.Chaillet: Electroenceph. clin. Neurophysiol., 1963, 15, 39-62 (Dept. Anat., Sch. Med., Univ. California, Los Angeles, Calif., U.S.A.)

In flaxedil-immobilised or encéphale isolé cats, mesencephalic transection prevented e.g. arousal from stimm. of intralaminar and midline thalamic nuclei, and cortical recruiting responses could not be blocked. Partial interruption at meso-diencephalic junction sparing tegmental reticular system, and also other transverse and longitudinal lesions had the same results. C.B.B.Downman

1951. EXCITABILITY CHANGES IN NON-SPECIFIC THALAMIC NUCLEI DURING CORTICAL SPREADING DEPRESSION IN THE RAT. J.Bures, O.Buresová, T. Weiss and E.Fifková: Electroenceph. clin. Neurophysiol., 1963, 15, 73-83 (Inst. Physiol., Czechoslovak Acad. Sci., Prague, Czechoslovakia)

Firing rate of non-sp. thalamic units was recorded during unilateral spreading depression of cortex in curarised unanaesthetised, or anaesthetised, rats. Without anaesthetic or with chloralose there was lateralisation of effect, but with Dial effect was bilat. Recruiting responses from the non-sp. thalamus are reduced by spreading depression in the overlying cortex. Findings indicate descending cortical influence on non-sp. thalamic regions. C.B.B.Downman

1952. ELECTROPHYSIOLOGICAL STUDIES OF SUB-CORTICAL-CORTICAL RELATIONS IN MAN. E.M. Housepian and D.P.Purpura: Electroenceph. clin.

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Neurophysiol., 1963, 15, 20-28 (Dept. Neurol. Surg., College Physn. and Surgn., Columbia Univ., New York, N.Y., U.S.A.) In dyskinetic patients, low freq. stimn. of non-sp. thalamic projection system caused recruiting responses. These could be distinguished from augmenting responses evoked by stimn. of sp. thalamo-cortical paths, and from capsular, radiation, and striatal activation. Non-sp. nuclear stimn. also caused increase of tremor and arousal, while sp. relay stimn. did not. C.B.B.Downman

1953. HIPPOCAMPAL ABLATION AND PASSIVE AVOIDANCE. R.L.Isaacson and W.O.Wickelgren: *Science*, 1962, 138, 1104-1106 (Dept. Psychol., Univ. Michigan, Ann Arbor, Mich., U.S.A.) Rats were trained to enter a small food compartment, when hungry, for a food reward, then given an electric shock when eating. Rats with cortical lesions would not enter the box subsequently for several days, but this avoidance reaction was very slight and transient with animals with bilat. hippocampal ablation. G.M.Lewis

1954. 'CAUDATE-INDUCED' CORTICAL POTENTIALS. COMPARISON BETWEEN MONKEY AND CAT. S.Goldring, L.U.Anthony, P.E.Stohr and J.L.O'Leary: *Science*, 1963, 139, 772 (Beaumont-May Inst. Neurol., Washington Univ. Sch. Med., St. Louis, Miss., U.S.A.) In the monkey, caudate stimn. never produced cortical responses, and only activation of the internal capsule evoked the potential complex which has been attributed to caudate stimn. in the cat. G.M.Lewis

1955. UNIT ACTIVITY IN TEMPORAL CORTEX DURING AMYGDALOID SEIZURES IN CATS. S.Yamamoto: *Electroenceph. clin. Neurophysiol.*, 1963, 15, 221-229 (Dept. Neurol. Neurosurg., McGill Univ., Montreal, Canada) Immobilised cats with minimal thiopentone showed activity of units in ectosylvian and sylvian cortices following amygdaloid stimn. This was accompanied by electrocorticographic pattern of arousal, especially in auditory area. 56.8% of units showed increase of spontaneous activity, 27.4% showed no change, while 15.8% showed reduced activity; these changes were usually sustained during the stimn. Amygdaloid stimn. temporarily depressed click responses though unit responses were facilitated. C.B.B.JDownman

1956. PARTICIPATION OF CORTICAL SENSORY AREAS IN THE ELABORATION OF EXTRAPYRAMIDAL MOTOR RESPONSES. P.Ascher, Djassik-Gerechenfeld and P. Buser: *Electroenceph. clin. Neurophysiol.*, 1963, 15, 246-264 (Lab. Neurophysiol. Comp., Fac. Sci., Paris, France) In cats under chloralose anaesthesia, the generalised jerks occurring on abrupt visual acoustic or somaesthetic stimn. are accompanied by long-latency discharges in lumbo-sacral ventral roots (L.6, L.7, S.1). These persist after bilat. ablation of motor cortex or interruption of both bulbar pyramids. They may be considered essentially extrapyramidal. (French) C.B.B.Downman

1957. EFFECT OF SENSORY STIMULATION UPON MINOR TREMORS IN MAN. T.Ozaki, K.Sato, T. Awazu, K.Mimura, N.Honda, S.Teramoto and K. Kitajima: *J&pJ.Physiol.*, 1963, 13, 24-32 (2nd Dept. Physiol., Nagasaki Univ. Sch. Med., Nagasaki, Japan) The effects of rhythmic or random photic and sonic stimn. on minor tremor [MT] in human body surface were studied. From the expt. data, it is suggested that the central process of the neuromuscular system such as

augmentation and inhibn. might be represented respectively by the increase and decrease of driven MT during various sensory stimn. K.Jones

1958. FUNCTIONAL ROLE OF CORTICAL ACOUSTIC AREAS IN EXCITATORY AND INHIBITORY PROCESSES IN ACOUSTIC CONDITIONED REFLEX. M.Tanaka: *Jap. J. Physiol.*, 1963, 13, 33-53 (Dept. Physiol., Fac. Med., Kyoto Univ., Japan) In dogs whose cortical acoustic areas or sub-areas were bilat. removed, the pos. cond. refl. as excitatory processes were essentially unimpaired. From this and other data, it is suggested that the excitatory process in the acoustic cond. refl. can be compensated by remaining cortical areas or subcortical centres. However, for the satisfactory fulfilment of the inhibitory process, the presence of the acoustic area was indispensable. K Jones

1959. RETICULAR MODIFICATION OF SOMATO-SENSORY CORTICAL RECOVERY FUNCTION. M.Schwartz and CShagass: *Electroenceph. clin. Neurophysiol.*, 1963, 15, 265-271 (Psychiat. Dept., State Univ. Iowa, Iowa City, Iowa, U.S.A.) In gallamine-immobilised cats somatosensory cortical recovery of evoked activity on peripheral nerve stimn. was estimated by the conditioning-test stimulus pair technique Mesencephalic reticular formation stimn. speeded recover by an effect on the thalamic relay. These appear to be 2 reticular mechanisms each affecting different portions of the recovery curve. Change of response amplitude is at least partially independent of mechanisms of early recovery effects. C.B.B.Downman

1960. RESPONSE ARREST ASSOCIATED WITH CORTICOFUGAL PROJECTION OF CHEMICALLY INDUCED LOCAL SEIZURE DISCHARGE. D.E.Fleming: *Electroenceph. clin. Neurophysiol.*, 1963, 15, 84-90 (Div. Neurol., Univ. Utah Coll. Med., Salt Lake City, Utah, U.S.A.) Cats with chronic indwelling cortical and subcortical electrodes and ventricular catheter were trained to give flexion response to repetitive click stimn* ACh-induced seizure abolished the conditioned response only when there was corticofugal discharge to subcortical reticular system, whereas conditioned breathing changes were unaffected. C.B.B.Downman

1961. ELECTROCORTICAL ACTIVITY IN THE RAT X-IRRADIATED DURING EARLY DEVELOPMENT. M.B.H. B.G.Clendinnen and J.T.Eayrs: *Electroenceph. clin. Neurophysiol.*, 1963, 15, 91-104 (Dept. Anat., Med. Sch., Edgbaston, Birmingham, England) X-irradiation of foetal rats caused disorganisation of development of cortex and of corpus callosum. Accompanying changes in electro-cortical activity were related to the structural changes but were less than expected. Recruiting responses were relatively little affected, and the role of thalamo-cortical integration in aspects of spontaneous activity is discussed. C.B.B.Downman

1962. COMPARISON OF EFFECTS OF ELECTROCORTICAL ACTIVITY OF GENERAL BODY COOLING AND LOCM COOLING OF SURFACE OF BRAIN. L.J.Bindman, O& Lippold and J.W.T.Redfearn: *Electroenceph. clin. Neurophysiol.*, 1963, 15, 238-245 (Dept. Physiol., Univ. Coll., London, England) In anaesthetised rat[†] cortex was locally cooled by surface pool of cooled fluid[‡] applied to an exposed region. Cooling the somatosensory cortex increased size of second pos. and neg. waves of evoked potential. Background activity decreased and

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cortical surface became more neg. Effects reversed on warming. Local cooling increases excitation within cortex, possibly by altered synaptic activity.

C.B.B.Downman

1963. EFFECT OF TELENCEPHALIC ABLATIONS ON AMPLITUDE OF POTENTIALS IN THE CENTRE MEDIAN EVOKED BY SOMATIC STIMULATION. M.Meulders, J.Mission, J.Colle and D.Albe-Fessard: *Electroenceph. clin. Neurophysiol.*, 1963, 15, 29-38 (Centre d'Etudes Physiol. Nerveuse, 4 Av. Gordon Bennett, Paris, France) Evoked potentials in centre median [CM] following somatic stimn. are greatly increased in amplitude when the cat passes from waking into chloralose anaesthesia. After wide telencephalic ablations the CM response is large and unaffected by chloralose. In the awake or thalamic cat, but not the chloralosed cat, external stimn. and midbrain reticular stimn. cause reduction of CM response.

(French) C.B.B.Downman

1964. DEXINHIBITION AFTER PREFRONTAL LESIONS AS A FUNCTION OF DURATION OF INTERTRIAL INTERVALS. S.Brutkowski and J.Dabrowska: *Science*, 1963, 139, 505-506 (Dept. Neurophysiol., Nencki Inst. Expt. Biol., Warsaw, Poland) Dogs were trained preoperatively in both pos. and inhibitory cond. food refl. on a schedule of either a 15 sec. or 1 min. intertrial interval. After lesions had been made in the piedial surface of the prefrontal cortex, errors of disinhibn. occurred in both schedules and in association with an increased 'drive' for food. In contrast, lesions of the dorsolat. prefrontal cortex produced the disinhibn. syndrome only in the group tested at short intervals and no increased food-directed activity was noted. The Quality of disinhibn. in prefrontal animals evidently depends on the placement of the lesion. G.M.Lewis

1965. INTRACELLULAR POTENTIAL DURING ELECTRICALLY INDUCED SEIZURES. M.Sawa, N.Maruyama and S.Kaji: *Electroenceph. clin. Neurophysiol.*, 1963, 15, 209-220 (Brain Res. Inst., Univ. Sch. Med., Niigata, Japan) In barbiturate-anaesthetised cats, mtra-cellular potentials were recorded in motor cortex and hippocampus, during and after surface electrical stimn. Single shock caused a depolarising wave in the neurones, followed by hyperpolarisation. Repetitive fmn. at high freq. and intensity caused progressive Prolongation of depolarising wave with temporal summation of successive waves, the hyperpolarisation progressively decreasing. Finally neurones remained in sustained depolarisation. After cessation of stimn. sustained depolarisation continued with periodic fluctuations with current waves in corticogram. In late seizure, depolarisation diminished and hyperpolarisation reappeared.

C.B.B.Downman

1966. UNITARY ANALYSIS OF 'PROJECTED' EPILEPTIFORM DISCHARGES. C.Ajmone Maisan: *Electroenceph. clin. Neurophysiol.*, 1963, 15, 197-208 (E.E.G. and Clin. Neurophysiol., Nat. Inst. Neurol. & Blindness, Bethesda, Md., U.S.A.) In acute SJJ's a ¹⁸MTT barbiturated or cereau isole cats, local Penicillin or strychnine was used to set up epileptogenic CFI. J's differed from projected epileptic Process by substantially fewer units being activated and (2) firing pattern seldom showing high freq. bursts of spikes. Discussion is related to similar events in clinical e.e.g.

C.B.B.Downman

1967. A STUDY OF ABDOMINAL AURA. A STUDY OF ABDOMINAL SENSATIONS OCCURRING IN EPILEPSY AND PRODUCED BY DEPTH STIMULATION. J.M. Van

Buren: *Electroenceph. clin. Neurophysiol.*, 1963, 15, 1-19 (Branch Surg. Neurol., Nat. Inst. Neurol. Dis. and Blindness, N.I.H., Bethesda, Md., U.S.A.) In 100 cases of abdominal aura the sensation was referred to the midline epigastrium, sometimes rising. Associated symptoms were sensory, psychical and autonomic, tending to be distributed to body or proximal extremities. Medial temporal, basal ganglia and centrum medianum stimn. caused sensations similar to the aurae. During the spontaneous or elicited sensation balloon recording showed no change, or rarely inhibn. of gastric movement.

C.B.B.Downman

1968. LOCALISATION OF FOCAL BRAIN LESIONS BY ELECTROENCEPHALOGRAPHY. N.P.Bechtereva, I.V. Vvedenskaia, Y.V.Dubikaitis, T.S.Stepanova, B.S. Ovnatanov and V.V.Usov: *Electroenceph. clin. Neurophysiol.*, 1963, 15, 177-196 (A.L.Polenov Neurosurg. Inst., Leningrad, U.S.S.R.) Summary of experience in the Electrophysiol. Lab. of the Institute. In addition to conventional photic stimn., trigger photic stimn. and a test based on adaptation to darkness and drowsiness are useful. E.e.g. analysis includes auto- and cross-correlations of ranges of values within the e.e.g., and electroencephaloscopy may be helpful with electrocorticography in case of operation.

C.B.B.Downman

1969. AROUSAL EFFECTS ON EVOKED ACTIVITY IN A 'NON-SENSORY' SYSTEM. G.P.Frommer and R.B. Livingston: *Science*, 1963, 139, 502-504 (Lab. Neurobiol., N.I. Mental Hlth., Bethesda, Md., U.S.A.) Responses from motor cortex evoked by cerebellar stimn. have been recorded with chronically implanted electrodes from cats in different states of arousal. The response, which in the waking cat consists of a short latency biphasic component followed by one or more slower waves, was attenuated or abolished completely in association with e.e.g. and behavioural signs of decreased arousal. In contrast, responses in primary somatosensory cortex evoked by stimulating the bulbar trigeminal nucleus were enhanced during periods of decreased alertness.

G.M.Lewis

1970. EFFECTS OF UNILATERAL LESIONS IN SENSORI-MOTOR CORTEX ON MANIPULATION BY CATS. E.Forward, J.M.Warren and K.Hara: *J. comp. physiol. Psychol.*, 1962, 55, 1130-1135 (Stanford Univ., Calif., U.S.A.) Unilat. lesions were made in the sensori-motor cortex of 10 cats, which were tested pre- and post-operatively, together with a control group, on 3 manipulation tests and post-operatively only on a fourth test. The results showed transient spasticity, loss of placing reaction, sensory impairment and abnormal posturing, but no gross defects in locomotion.

J.R.Broome

1971. FUNCTION OF PREFRONTAL CORTEX IN TIMING BEHAVIOUR OF MONKEYS. J.S.Stamm: *Exp. Neurol.* 1963, 7, 87-97 (Queens Coll., Flushing, N.Y., U.S.JU Three groups of monkeys - with prefrontal lobectomy, cingulectomy, and normal controls, were trained in tests of delayed response. The cingulectomised monkeys and those with prefrontal lobectomies showed no impairment in response rates and in developing timing responses. The frontal lobes are not essential to the inhibn. of responses, recent memory, or temporal patterning of behaviour.

P.W.Nathan

1972. MANIFESTATIONS OF 'ACTIVATED' SLEEP IN THE RAT. J.E.Swisher: *Science*, 1962, 138, 1110 (Dept. Psychol., Univ. Florida, Gainesville, Fla., U.S.A.) A sleep phase similar to feline 'activated' sleep occurs regularly in normally sleeping rats, the e.e.g.

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differing from the waking of 'activated*' pattern in being dominated by 6-8% waves. The rats tend to undergo shifts in muscle tone, occasionally of considerable magnitude.

G.M.Lewis

1973. SLEEP BEHAVIOUR ELICITED BY ELECTRICAL STIMULATION OF CORTICAL AND SUBCORTICAL STRUCTURES IN THE CAT. P.L.Parmeggiani: *Helv. physiol. pharmacol. Acta*, 1962, 20, 347-376 (Inst. Physiol., Univ. Zürich, Switzerland)

Electrical stimulation of 541 sites in the caudate nucleus, hypothalamus, mesencephalon, mamillary bodies and adjacent structures produced sleep in 35%. In the caudate nucleus and the mamillary bodies, sleep was induced in 81-85%. Stimn. of the central grey matter of the mesencephalon did not produce sleep. The hippocampus is particularly associated with a first phase of restless prep. for sleep, the caudate nucleus with a second phase of light sleep with unchanged respiration, and the thalamus with a third stage of deep sleep with slowed respiration.

V.Eisen

1974. EXTREME SPINDLES: A CORRELATION OF ELECTROCORTICOGRAM SLEEP PATTERN WITH MENTAL RETARDATION. E.L.Gibbs and F.J.V.Gibbs: *Science*, 1962, 138, 1106-1107 (Neuropsychiat.Inst., CollMed., Univ.Illinois, Chicago, 111, U.S.A.) An electrocorticogram abnormality is described which is relatively common among children below 12 yr. who are mentally retarded, but is not correlated with epilepsy or cerebral palsy. This pattern consists of exaggerated spindles which are of higher voltage and more continuously present than in normal persons.

CM.Lewis

1975. ELECTROENCEPHALOGRAPHIC PATTERNS RESEMBLING THOSE OF SLEEP IN CERTAIN COMATOSE STATES AFTER INJURIES TO THE HEAD. G.E.Chatranian, L.E.White and D.Daly: *Electroenceph. clin. Neurophysiol.*, 1963, 15, 272-280 (Sect. Neurol., Mayo Clin., Rochester, Minn., U.S.A.) After severe head injuries followed by coma which evolved into stuporous or semi-comatose states resembling sleep, patients had an e.e.g. of sleep pattern with 14/sec. spindles, vertex sharp waves and K complexes. The electroclinical pattern may reflect transient and, since the clinical course was favourable, reversible derangement of midbrain reticular function.

C.B.B.Downman

1976. PROBLEM OF PERIODICITY OF THE ELECTRO-ENCEPHALOGRAM: STUDIES IN THE CAT. M.A.B. Brazier: *Electroenceph. clin. Neurophysiol.*, 1963, 15, 287-298 (Brain Res. Inst., Los Angeles, Calif., U.S.A.) In cats with chronically implanted electrodes electrical activity in different regions of cortex and of deep structures, e.g. lat. geniculate and sup. colliculus, have been related by auto- and cross-correlation. Strongest and most persistent rhythm was found in motor cortex, less in somatosensory and austr. suprasylvian, but rhythm was conspicuously absent in sp. visual and auditory areas. The periodic rhythms are most marked in those areas showing most conspicuous recruiting response, and may be dependent on the mechanism of these responses and of barbiturate spindle. Barbiturates probably remove an inhibitory component to uncover a suppressed rhythm. Impairment of consciousness evokes a slow 5 to 6/sec. rhythm throughout the brain.

C.B.B.Downman

1977. E.E.G. IN SIMULATED STRESSES OF SPACE FLIGHT WITH SPECIAL REFERENCE TO PROBLEMS OF VIBRATION. W.R.Adey, W.D.Winters, R.T.Kado and

M.R.Delucchi: *Electroenceph. clin. Neurophysiol.*, 1963, 15, 305-320 (Space Biol. Lab., Brain Res. Inst., Univ. California, Los Angeles, Calif., U.S.A.)

Cortical and subcortical electrical activity was recorded in macaques with chronic indwelling electrodes during body shaking over 5 to 40 c/s up to 2 g peak acceleration. Driving of brain rhythms at shaking freq. was noted in midbrain reticular formation, centrum medianum, visual cortex and hippocampal system. This was reduced by pentobarbital anaesthesia, was max. at 9-15/sec. and was at half-freq. from 15-20/sec. Performance in behaviour tests was reduced.

C.B.B.Downman

1978. INFLUENCE OF OCULAR MUSCLES UPON PHOTIC HABITUATION IN MAN. E.Carcfa-Austt, A.Vanzulli, J.Bogacz and R.Rodríguez-Barrios: *Electroenceph. clin. Neurophysiol.*, 1963, 15, 281-286 (Lab. Neurofisiol., Inst. Neurol., Hosp. Clínicas, Fac. Med., Montevideo, Uruguay)

Visual evoked response was recorded off the scalp, in subjects with controlled pupil size, to light flash in one eye. The response progressives decreased with habituation, the same changes being observed with eyes open or closed. Patients with congenital aniridia or complete ocular paralysis showed similar changes. In man pre-receptor elements do not participate decisively in the habituation waning of response.

C.B.B.Downman

1979. RELATION OF SIMPLE RESPONSE TIME TO BRAIN-WAVE FREQUENCY AND THE EFFECTS OF AGE. W.V. Surwill: *Electroenceph. clin. Neurophysiol.*, 1963, 15, 105-114 (Gerontol. Br., Nat. Heart Inst., N.I.H., Bethesda, Md., U.S.A.) Reaction time and average

period of e.e.g. within this time, were determined in 1^{oo} subjects of age 28 to 99 yr. A correlation coeff. of 0.72 was not affected by age. While there was a highly significant correlation between age and average period of e.e.g., there was a low but significant correlation between average reaction time and age. E.e.g. freq. change is basis of age-slowness of response time, and brain-wave cycle is basic time unit of response program*
ming of c.n.s.

C.B.B.Downman

1980. E.E.G. CHANGES DURING AND AFTER 14 DAYS OF PERCEPTUAL DEPRIVATION. J.P.Zubek, G.Welch and M.G.Saunders: *Science*, 1963, 139, 490-492 (Dept. Psychol., Univ. Manitoba, Winnipeg, Canada)

A progressive decrease in freq. in the a. range was observed during 14 day exposure of 3 human subjects to unpatterned light and white noise. The e.e.g. records were still abnormal 1 week later and long-lasting motivation^ losses were observed.

CM.Lewis

1981. APPLICATION OF PHASE DETECTION AND AVE& AGING TECHNIQUES IN COMPUTER ANALYSIS OF E.E.G. RECORDS IN CAT. W.R.Adey and D.O.Walter: *Exp. Neurol.*, 1963, 7, 18fe-209 (Dept. Anat. Physiol. Brain Res. Inst., U.C.L.A., Los Angeles, Calif., U.S.A.)

The e.e.g. records from the hippocampal system and midbrain reticular forms of cats picked up by implanted electrodes during the learning situation, were analysed by computing techniques.

P.W.Nathan

1982. EPENDYMAL CILIA: DISTRIBUTION AND A TIVITY IN THE ADULT HUMAN BRAIN. W.C.Worthington, jun. and R.S.Cathcart, III: *Science*, 1963, 13³, 221-222 (Med. Coll. South Carolina, Charleston, S.^ U.S.A.) Examination of about 200 samples of the ^ ependymal lining of adult human brains post-mortem reveals widespread distribution of cilia, which were

observed in motion in some cases. A local mechanism for rapid movement of the cs.f. is therefore present.

C.M.Lewis

1983. HISTOGENESIS OF THE CEREBRAL CORTEX.

M.Berry and J.T.Eayrs: *Nature*, Lond., 1963, 197, 984-985 (Dept. Anat., Univ. Birmingham, England) The histogenesis of layers of the cerebral cortex has been studied in rats of various gestational ages exposed to X-irradiation damage. The findings imply that cells destined to form the phylogenetically older infra-granular layers appear before those giving rise to the more recently acquired superficial laminae. G.M.Lewis

1984. WATER CONTENT OF IMMATURE RAT BRAIN

FOLLOWING CEREBRAL ANOXIA AND ISCHAEMIA.
R.G.SpectDr: *Brit. J. exp. Path.*, 1962, 43, 472-479 (Paediat. Res. Unit, Guy's Hosp. Med. Sch., London, England) In young Wistar rats more than 10 days or a unilat. ligation of common carotid artery, with anoxia caused by N₂ inhalation, resulted in cerebral oedema. Bilat. common carotid arterial ligation alone also caused oedema. In rats less than 10 days old oedema could not be produced by these means. D.L.Gardner

1985. NATURE OF ACh-LIKE ACTIVITY RELEASED

FROM BRAIN IN VIVO. J.C.Szerb: *Nature*, Lond., 1963, 197, 1016-1017 (Dept. Pharmacol., Dalhousie Univ., Halifax, Nova Scotia, Canada) The area of max. evoked potentials in the cat somatosensory cortex was perfused while the contralat. forepaw was continuously stim. The activity of the extracts on leech muscle and b.p. of the eviscerated cat gave evidence of the presence of considerable amounts of ACh and traces of Y~butyrobetaine. This was confirmed by chromatography of the perfusates. CM.Lewis

1986. AUGMENTATION OF O₂ CONSUMPTION OF RAT

BRAIN IN VITRO BY VARIOUS CARBOHYDRATE INTERMEDIATES. A.Livingstone, C.H.Williams and F.W.Barnes, jun.: *Proc. Soc. exp. Biol.*, N.Y., 1962, 111, 75-78 (Psychophysiol. Res. Lab., V.A. Hosp., Perry Point, Md., U.S.A.) In vitro respiratory rate of rat brain is enhanced by citrate ion in dextrose and Krebs'-Ringer PO₄ buffer. Of the Krebs cycle intermediates tested as substrates individually, only lactate in Krebs-Ringer PO₄ maintained brain respiration better than dextrose. M.M.Shapland

1987. RELATION BETWEEN MYELINATION AND BINDING OF SODIUM AND POTASSIUM IN RAT BRAIN.
J.W.Wagner and B.Garoutte: *Proc. Soc. exp. Biol.*, N.Y., 1963, H2, 42-46 (Dept. Anat., Univ. California, San Francisco Med.Center, San Francisco,

In U.S.A.) By dialysing brain homogenates of 149 Evans rats which had received i.p. injn. of 24Na tta--K¹² n^r. Previously, the rate of binding of these cers was used as an indication of the uptake of Na and K during this period. About 3% of the Na and K was bound to not be dialysed in a period of 2 hr. There was J in g. of labelled Na or K in the brains of neonatal rats wet from weeks onwards the amount of bound fol. increased. The development of myelination was followed in frozen sections of the brains stained with Ptoxert's method. The increase in myelination and the passive binding of Na and K in the brains of growing frogs concurrently. D.N. Vidyarthy

SENSE ORGANS

1988. EYE MOVEMENTS IN MAN DURING WAKEFULNESS AND SLEEP. M.Jeannerod and J.Mouret: *C.R. Soc. Biol.*, Paris, 1962, 156, 1407-1410 (List. Physiol., Fac. Méd., Lyon, France) Electro-oculograms of human subjects were recorded during wake and sleep. During wakefulness the angular velocity of potential variations of the eye was 125°/sec. With the eyes closed the angular velocity was 65°/sec. and during the rhombencephalic phase of sleep 73°/sec. Statistical analysis of the results allowed the rapid movements during observation to be distinguished from movements during the phase of sleep. (French) M.A. Price

1989. INFLUENCE OF HEAD POSITION ON CENTRAL NYSTAGMUS IN RABBITS. J.Gutman, M.Chaimovitz and F.Bergmann: *Exp. Neurol.*, 1963, 7, 240-245 (Dept. Pharmacol., Hebrew Univ., Jerusalem, Israel) Tilting of the head, which by itself does not produce nystagmus, enhances central nystagmus. Tilting to the side to which the rapid phase of the nystagmus goes, increases the nystagmus. P.W.Nathan

1990. SELF-MAINTAINED VISUAL STIMULATION IN MONKEYS AFTER LONG-TERM VISUAL DEPRIVATION.

R.H.Wendt, D.F.Lindsley, W.R.Adey and S.S.Fox: *Science*, 1963, 139, 336-338 (Dept. Anat., Univ. California, Los Angeles, Calif., U.S.A.) Newborn monkeys reared in darkness for 16 months except for daily 1 hr. periods of exposure to unpatterned light were allowed to press a lever to obtain unpatterned light. The animals showed apparently insatiable responding, at rates extremely high compared with normal animals.

CM.Lewis

1991. PHASE SHIFTS IN THE HUMAN RETINA. F.Verhaegen: *Nature*, Lond., 1962, 197, 998-999 (Naturkundig. Lab., Univ. Amsterdam, Holland) Models based on diffusion and recombination of photochem. decomposition products inside the receptor cells of the human retina are consistent with a considerable amount of expt. data on reasonable adjustment of a few parameters. CM.Lewis

1992. SELECTIVE SENSITIVITY TO DIRECTION OF MOVEMENT INGANGLION CELLS OF THE RABBIT RETINA. H.B.Barlow and R.M.Hill: *Science*, 1963, 139, 412-414 (Sch. Optometry, Univ. California, Berkeley, Calif., U.S.A.) Expt. on single retinal units of the rabbit show that some cells respond to movement of a stimulus in 1 direction only. The same directional selectivity holds over the whole receptive field but the selected direction differs in different cells. The discharge is almost uninfluenced by the intensity of the stimulus spot, or by whether the spot is black or white.

G.M.Lewis

1993. AFTER EFFECT OF SEEN MOTION WITH A STABILISED RETINAL IMAGE. R.W.Sekuler and L.Ganz: *Science*, 1963, 139, 419-420 (Dept. Psychol., Brown Univ., Providence, R.I., U.S.A.) Prolonged inspection of uniformly moving contours affects differentially the luminance threshold for the detection of test contours as a function of their direction of motion. The results support an explanation of motion after-effect on the basis of direction-sp. cortical adaptation. G.M.Lewis

1994. THE EFFECT OF SODIUM ION CONCENTRATION ON THE ELECTRORETINOGRAM OF THE ISOLATED RETINA OF THE FROG. D.I.Hamasaki: *J. Physiol.*,

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Lond., 1963, 167, 156-168 (Physiol. Lab., Univ., Cambridge, England) The e.r.g. of the isolated retina of the frog was completely abolished when 95% of the Na in the Ringer soln. was replaced by choline or sucrose. The reduction in the e.r.g. with partial replacement of Na by choline was linearly related to the log. of the [NaT] in the test soln. The evidence suggests that the receptors were the structures mainly affected by the expt. procedures, and that during excitation there is a movement of Na into the receptors. The e.r.g. decreased when the retina was placed in K-free Ringer soln. *

1995. SCOTOPIC SPECTRAL SENSITIVITY IN THE MONKEY. D.S.Bough and A.M.Schrier: Science, 1963, 139, 493-494 (Hunter Lab. Psychol., Brown Univ., Providence, R.I., U.S.A.) The dark-adapted abs. threshold as a function of stimulus wavelength has been determined in rhesus monkeys. The monkeys' relative sensitivity was slightly higher than that of humans in the long wavelength portion of the spectrum.

C.M.Lewis

1996. BINASAL HEMIANOPIA AS AN EARLY STAGE IN BINOCULAR COLOUR RIVALRY. H.F.Crovitz and D.B. Lipscomb: Science, 1963, 139, 596-597 (V.A. Hosp., Durham, N.C., U.S.A.) A method is described by which an apparent binasal hemianopia can be established in colour fields; this can be maintained through changes in the spatial characteristics in the colour field which remains bipartite, without fusion of the colours or suppression of one eye.

G.M.Lewis

1997. NEUROPHYSIOLOGY OF AUDITION IN BATS.
I. INTENSITY AND FREQUENCY PARAMETERS.
H. TEMPORAL PARAMETERS. I. DIRECTIONAL LOCALISATION AND BINAURAL INTERACTION.
IV. RESISTANCE TO INTERFERENCE. A.D.Grinnell: J. Physiol., Lond., 1963, 167, 38-66, 67-96, 97-113, 114-127 (Biol. Labs., Harvard Univ., Cambridge, Mass., U.S.A.)

I. The effects of stimulus intensity and freq. on single unit and evoked potential auditory responses have been studied in the post. colliculi and more peripheral nuclei of the bats Myotis lucifugus and Plecotus townsendii. Evoked potential latencies were similar to those in cats, but changed less with change in intensity. In general, an increase in stimulus intensity led to an increase in response amplitude or firing rate. Above 40 or 50 db re threshold, however, responses frequently levelled off or fell in amplitude, sometimes disappearing altogether. Responses are present throughout the freq. range of the emitted orientation pulses, with thresholds down to ± 5 dbre $0^{\circ}0002$ dyne/cm.² at "best" freq.: around 40 kc in Myotis, 15 to 35 and 55-65 kc in Plecotus. Highest effective freq. were 150-200 kc in Myotis, 110-120 kc in Plecotus. Many single units had high intensity as well as low intensity thresholds. The post. colliculus exhibited dorso-ventral tonotopic localisation. Differential intensity and freq. discrimination was very accurate. Changes as small as $0^{\circ}2$ to $0^{\circ}5$ db in intensity or $0^{\circ}05\%$ in freq. have caused changes in response.

II. The effects of interval between stimuli and stimulus duration on evoked potential and single unit auditory responses were studied in the auditory nerve (Ni), a second order level (N2), the post. colliculus (N4), and the auditory cortex of the bats M. lucifugus and P. townsendii. At Ni, recovery of response to the second of 2 identical sound puffs was similar to that described in cats, but unlike the behaviour in cats, recovery was faster at N2 than at Ni, and still faster at N4, where 100% recovery was reached in 2 msec, on the

average. Recovery was much slower at the cortex. At N4 the second response often exceeds the first in size. This facilitation was found only with stimuli of 40 kc or higher freq. and was greater within 40 db of threshold than at higher intensities. Single units frequently fired to a second stimulus within $0^{\circ}5$ to 1 msec, and displayed as much as 20 db greater sensitivity to the second of 2 identical stimuli at intervals down to 1 or 2 msec. Other units were capable of accurately measuring the interval between stimuli. Stimulus duration markedly affected threshold and latency of some units. Recovery of N4 was shown to be only 50 to 75% reduced when the first pulse of a pair, 1 to 2 msec, apart, was 40 or 50 db more intense than the first. Moreover, when pulses are shorter than 3 to 5 msec, were used, a silent period between stimuli of $0^{\circ}5$ to $0^{\circ}8$ msec, was sufficient for 50% or greater recovery, regardless of stimulus intensity.

in. The effects of angle of incidence of an acoustic signal on evoked potential and single unit responses in the auditory nerve (Ni) and the posterior colliculus (N4) were studied in the bats M. lucifugus and P. townsendii. 'Directionality' on the horizontal plane is very similar in the 2 spp. Change in threshold with angle is much greater above than below 40 kc in Myotis, 50 kc in Plecotus. Despite die mixing of input from both ears to the colliculus, N4 is more directional than Ni. The average difference in threshold for Ni between angles of greatest and least sensitivity is about 34 db in both spp.; for N4 the average difference is 38-40 db with extremes up to 68 db. Two forms of binaural interaction appear to causing this enhancement of angular acuity. Single units are sometimes restricted to very small sectors from which they can be successfully stim. Changes in threshold of $0^{\circ}5$ to 9 db/degree have been observed. These evidences of sensitivity to changes in angle, taken with the apparent ability to detect intensity differences of $0^{\circ}5$ db or less, are theoretically sufficient to explain localisation to within 1° in the horizontal plane.

IV. Auditory evoked potentials and single unit responses in the auditory nerve (Ni) and the post. colliculus (N4) of the bats M. lucifugus and P. townsendii have & studied in a search for neural mechanisms by which a * > can recognise echoes of its own cries in the presence of other bats or background noise. Pulse duration, i nes¹ freq. and repetition rate are all analysed by the bat auditory system, suggesting that pulse recognition is possib¹! Moreover, the freq. of an initial sound is briefly Q-^.* msec.) 'coded' into the auditory system as a sensitisation to a similar sound. Resistance to interference by ther¹ noise is shown to be explainable by sharp tuning and sensitisation of portions of the auditory system, by the inherent directionality of either ear, and by binaural & actions reducing the effects of noise in the ear toward which a signal is arriving from an angle of slight sensitivity while the noise arrives from an angle of greater ^ sensitivity. The reduction of masking effect due to binaural interaction can be as much as 20 or 30 db and appears sufficient to account for the ability of Plecotus to detect wires in an intense broadband noise. ".*

1998. SIGNAL DETECTION IN THE RAT. M.H.Hack¹ Science, 1963, 139, 758-760 (Dept. Otolaryngology¹ New York Univ. Sch. Med., N.Y., U.S.A.) In an auditory detection expt., rats were run at fixed sound pressure levels, and their responses partitioned so that operating characteristics could be constructed. Meas¹ of detectability were calc. from the operating characteristics; these are a function of sound pressure levels, & rising as sound levels rise. G.M.Lewis

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1999. PERCEPTION OF ULTRASOUND. A.V.Haeff and C.Knox: *Science*, 1963, 139, 590-592 (Acoustica Associates Inc., Los Angeles, Calif., U.S.A.) Ultrasonic vibrations can be perceived as audible sounds between 8 and 9 kc/sec. when a piezoelectric transducer is pressed against certain areas of the human body.

G.M.Lewis

2000. PRELIMINARY STUDY OF SOME HEALTH HAZARDS IN THE PLASMA JET PROCESS. D.E.Hickish and P.J.R.Challen: *Brit. J. industr. Med.*, 1963, 20, 95-99 (Occup.Hyg.Serv., Slough, Bucks, England) The noise emitted by the jet was of the order 80 to 90 db over a wide range of freq. Three volunteers exposed to the noise for 1 hr. showed a mean shift of auditory threshold of 19 db at 4000 c/s, the loss being greater at higher freq., and persisting in one subject for 48 hr. Air samples taken within 4 ft. of the jet showed NO₂ concn. ^UP to 9-6 p.p.m. D.E.Evans

2001. STIMULATING EFFECTIVENESS OF CATIONS AND ANIONS ON CHEMORECEPTORS IN FROG TONGUE. S.Yamashita: *Jap. J. Physiol.*, 1963, 13, 54-63 (Dept. Physiol., Univ. Med. Sch., Kumamoto, Japan) Cations showed stronger stimulatory strength than anions, as measured by recording the integrated response of the glossopharyngeal nerve. The order of effectiveness was NH₄>K>Cs>Na>Li for monovalent ions of 1/2 M, and Ca>Sr>Mg>Ba for divalent cations of 1/64 M. In the anion series no remarkable difference in the response magnitude was observed. K.Jones

2002. TASTE PREFERENCES FOR SODIUM SALTS BY ADRENALECTOMISED RATS. M.Nachman: *J. comp. Physiol. Psychol.*, 1962, 55, 1124-1129 (Univ. California, Riverside, Calif., U.S.A.) Adrenalectomised and control rats were given a single 10 min. test preference between solns. of 5 different Na salts and non-Na salt. Both the adrenalectomised animals and J?Perated rats made Na-deficient by the use of a reacted diet showed an immediate preference for all the salts. It was concluded that this preference is based on drive-reducing. J.R.Brock

2003. INCREASED SENSITIVITY OF TASTE AND SMELL IN CYSTIC FIBROSIS. R.I.Henkin and G.F.Powell: *Science*, 1962, 138, 1107-1108 (Nat. Inst. Mental Hlth., Bethesda, Md., U.S.A) patients with cystic fibrosis showed that taste and smell were accompanied by a sensitivity to taste and smell substances in soln. at concn. much higher than those at which the substances are detected by normal persons. These abnormal thresholds were affected by the administration of carbon dioxide. C.B.B.Downman

2004. ELECTRICAL ACTIVITY OF THE OLFACTORY SYSTEM. F.P.Gault and R.N.Leaton: *Electroenceph. & Neurophysiol.*, 1963, 15, 299-304 (Dept. Psychol., New Haven, Conn., U.S.A.) In cats using indwelling electrodes electrical activity of nasal air flow. The slow potentials were necessary for the bursts of 40/sec. activity, increased both slow potentials and bursts. Activity in basolateral amygdala occurred only, but bilaterally, when there was a 40/sec. activity in the amygdala. C.B.B.Downman

2005. OLFACTORY THRESHOLD TECHNIQUE WITH NITROGEN DILUTION OF n-BUTANE AND GAS CHROMATOGRAPHY. R.A.Schneider, J.P.Costiloe, A.Vega and S.Wolf: *J. appl. Physiol.*, 1963, 18, 414-417 (Med. Dept., Univ. Med. Center, Oklahoma City, Oklahoma, U.S.A.) A technique is described for measuring the olfactory threshold of each side of the nose independently for n-butane in N₂. The subject sits in an air-conditioned room and the gases are applied through a nasal tip. The rate of flow and duration of the stimulus can be accurately controlled and are important in threshold determinations. The threshold gas concn. is determined by gas chromatography. H.C.Jones

DIGESTIVE SYSTEM

2006. CHOLINE ACETYLASE IN NORMAL AND DENERVATED SALIVARY GLANDS. I.Nordenfelt: *Quart. J. exp. Physiol.*, 1963, 48, 67-79 (A.R.C. Inst. Animal Physiol., Babraham, Cambridge, England) Chronic preganglionic parasympathetic denervation of the submaxillary gland of cats and rabbits reduced the choline acetylase activity of the gland to half that of the control gland. Post-ganglionic denervation of the submaxillary and parotid glands greatly reduced the choline acetylase activity. H.C.Jones

2007. RUMEN FUNCTION IN THE CAMEL. V.J.Williams: *Nature*, Lond., 1963, 197, 1221 (Dept. Physiol., Univ. New England, Armidale, N.S.W., Australia) The rumen contents of camels were low in N but high in volatile fatty acids. Unlike sheep and cattle, quite satisfactory rumen function could be maintained on a high roughage, low N₂ diet. G.M.Lewis

2008. A PERMANENT RAT GASTRIC FISTULA. S.A. Komaiov, S.P.Bralow and E.Boyd: *Proc. Soc. expt. Biol.*, N.Y., 1963, 112, 451-453 (Fels Res. Inst., Temple Univ. Med. Sch., Philadelphia, Pa., U.S.A.) A Pavlov type cannula is described for chronic gastric fistula in the rat. It produces no ill effects on the rat and is suitable for the study of interdigestive phase secretion. D.N.Williams

2009. TUBELESS GASTRIC ANALYSIS BY DYE TECHNIQUE. V.M.Smith, D.L.Abramson and R.P. Mallari: *Amer. J. med. Sci.*, 1962, 244, 749-755 (Dept. Med., Univ. Maryland Sch. Med., Baltimore)

2010. TUBELESS GASTRIC ANALYSIS BY DYE TECHNIQUE. V.M.Smith, D.L.Abramson and R.P. Mallari: *Amer. J. med. Sci.*, 1962, 244, 749-755 (Dept. Med., Univ. Maryland Sch. Med., Baltimore) The tubeless dye consists of a small ball of Methylene Blue covered by a thin rubber sheet and tied with catgut. When the pill is swallowed, the catgut is dissolved by stomach HCl. The dye is then absorbed and excreted in urine which takes on a blue-green colour. A pos. test was found in 98% of subjects with normal gastric secretion but a neg. test proved to be inconclusive. E.Hobbs

2011. RADIO-PHARMACOLOGICAL INVESTIGATION OF MODE OF ACTION OF α- AND β- RECEPTORS IN CARDIA OF RABBITS. H.J.Bohmig, F.v.Ocke and Ta? J.I. Ch: *Z. Ges. exp. Med.*, 1963, 136, 432-455 (Pharm. Inst., Univ. Vienna, Austria) The effect of adrenaline (1 µg./kg.) and N-isopropylnoradrenalin (0.3 µg./kg.) on cardiospasm induced by bilateral vagotomy was studied in rabbits radiologically, using

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image intensifier fluoroscopy and cinematography (12-16 frames/sec.) to observe the passage of contrast medium through the cardia. Both adrenaline and isopropylnoradrenaline had a spasmolytic effect, but whereas adrenaline caused sphincter relaxation, isopropylnoradrenaline re-established normal opening and closing rhythm of the cardia. The differences between adrenaline and isopropylnoradrenaline effects are explained by the site of action which in the former is believed to be predominantly α-receptors and in the latter purely β-receptors.

(German) P.F. Meyer

2011. EFFECT OF ADRENALECTOMY ON MITOTIC PROLIFERATION OF GASTRIC EPITHELIUM. R.H.Clark and B.L.Baker: Proc. Soc. exp. Biol., N.Y., 1962, 111, 311-315 (Dept. Anat., Univ. Michigan Med.

Sch., Ann Arbor, Mich., U.S.A.) Circadian periodicity in the mitotic activity of surface and mucous neck cells of the gastric mucosa of rats persisted after adrenalectomy. Significant increase in mitotic index of surface cells during both day and night and of mucous neck cells during the night only was also observed.

M.M.Shapland

2012. EFFECT ON STOMACH OF RAT OF ADMINISTRATION OF α-CHYMOTRYPSIN. H.Pellet: C.R. Soc. Biol., Paris, 1962, 156, 1428-1430 (Lab. Méd. exp., Fac. Méd., Lyon, France) Ingestion of 12-18 mg./kg. α-chymotrypsin for 15 days by rats resulted in the appearance of lesions in the stomach if the stomach pH was kept alk. by NaHCO₃ administration. Repeated injn. of 25-226 mg./kg. α-chymotrypsin resulted in lesions. The proportion of stomach lesions was not increased by acidification of the stomach contents. No peritoneal lesions were seen.

(French) M.A.Price

2013. INCIDENCE OF GASTRIC ULCERS IN SWINE.

T.W.Perry, A.A.Jimenez, J.E.Shively, T.M.Curtin, R.A.Pickett and W.M.Beeson: Science, 1963, 139, 349-350 (Dept. Anim. Sci., Purdue Univ., Lafayette, Ind., U.S.A.) Pigs fed heat-treated corn in the diet showed a 39% mortality from oesophagogastric ulcers, and excessive cornification and erosion of the stratified squamous mucosa. Treatment with thiamine, vit. B12, lysine or fish meal did not alleviate the condition. G.M.Lewis

2014. BLOOD PEPSIN DETERMINATIONS IN GASTRITIS.

M. de los Santos, W.R.Thayer, jun. and H.M.Spiro: Yale J. Biol. Med., 1963, 35, 353-360 (Dept. Int. Med., Yale Univ. Sch. Med., New Haven, Conn., U.S.A.) Blood pepsin determinations and gastric biopsies were carried out in 203 patients. In patients with normal gastric mucosa, blood pepsin was normal or elevated. In patients with biopsy-proven chronic superficial gastritis all blood pepsin levels were normal or elevated. In patients with atrophic gastritis or gastric atrophy blood pepsin levels were below normal. It is suggested this test might be useful as a screening test for patients with gastric atrophy who are likely to be cancer-prone.

J.B.Parish

2015. PROTEIN-LOSING GASTROENTEROPATHY. L.P. O'Meallie: Amer. J. med. Sci., 1963, 245, 109-116 (Dept. Med., Tulane Univ. Sch. Med., New Orleans, La., U.S.A.) A review. III references.

E.E.Hobbiger

2016. EFFECT OF ENTERICALLY SUPPLIED OXYGEN ON A DEVASCULARIZED LOOP OF ILEUM. B.Gottfried, N. Molomut and J.Patti: Surgery, 1963, 53, 484-489 (Waldemar Med. Res. Fdn., Port Washington, N.Y., U.S.A.) The histology of the ileum of rats has been studied after ligation, devascularisation and O₂ infusion.

The degenerative effects found under anoxic conditions could be prevented by O₂ infusion, i.e. the ileum was capable of O₂ uptake.

D.N.Wheatley

2017. ABSORPTION BY AN IN VITRO PREPARATION OF DOG INTESTINAL MUCOSA. A.Hakim, R.G.Lester and N.Lifson: J. appl. Physiol., 1963, 18, 409-413 (Physiol. Dept., Univ. Med. Sch., Minneapolis, Minn., U.S.A.) Pieces of dog intestinal mucosa consisting epithelium and lamina propria only, have been mounted and studied in vitro for absorption prop. The prep, transported water from Ringer soln. in the presence of glucose absorbed water against an osmotic gradient, transported glucose up a concn. gradient and took up Cl⁻ against a concn. gradient.

H.C. Jones

2018. GLUCOSE, AMINO ACID AND UREA INSORPTION FROM CANINE INTESTINE. J.H.Annegers: Proc. Soc. exp. Biol., N.Y., 1962, 111, 388-390 (Dept. Physiol., Northwestern Univ. Med. Sch., Chicago, 111, U.S.A.) Glucose and glycine insorption rates increased curvilinear when 20 to 280 mM concn. of each was perfused through isolated bowel loops in unanaesthetised dogs. Urea insorption exceeded glucose and glycine but tended to decrease as total osmolarity of perfusate increased. Glycine and urea interfered with glucose insorption when each V* substituted for NaCl, glucose similarly reduced glycine insorption.

M.M.Shapland

2019. FAT ABSORPTION FROM HUMAN GASTROINTESTINAL TRACT IN PATIENTS UNDERGOING TELE-THERAPY. R.J.Reeves, A.P.Sanders, K.W.Sharpe, J. Thorne and J.K.Sley: Amer. J. Roentgenol., 1963, 122-126 (Dept. Radiol., Duke Univ. Med. Center, Durham, N.Carolina, U.S.A.) Patients undergoing radiation to the lower abdomen, whether by conventional roentgen therapy or by ⁶⁰Co, showed malabsorption of glyceroltrioleate and oleic acid, but the effect occurred more frequently in the group undergoing 60Co treating.

D.E.Evans

2020. TRANSPORT OF POTASSIUM IONS IN RAT INTESTINE. A.Gilman, E.Koelle and F.M.Ritchie: Nature, Lond., 1963, 197, 1210-1211 (Dept. Pharmacol., Einstein Coll. Med., New York, N.Y., U.S.A.) Measurements of K concn. on both sides of the cellular barrier between mucosa and serosa in rat ileum and jejunum together with determinations of the transcellular potential indicate that the total electrochemical potential of K is same on both sides of the epithelial membrane. Transport of K is a passive process.

G-M.Lewis

2021. GASTROINTESTINAL SITES OF ABSORPTION AND ENDOGENOUS SECRETION OF CALCIUM AND PHOSPHOROUS IN DAIRY CALVES. P.T.Chandler and R.G.Cragle: Proc. Soc. exp. Biol., N.Y., 1962, 111, 431-434 (Agric. Res. Lab., Uxbridge, Tennessee, Oak Ridge, Tenn., U.S.A.) Using ¹⁴⁴Ce as an indicator, secretion of P into the rumen and omasum and absorption of Ca and P from the abomasum have been demonstrated. The sites of Ca absorption are not always associated with P secretion. Appreciable secretions of Ca and P were observed in the lower tract and were not balanced. W. equal absorption.

M.M.Shapland

2022. MUCOSAL ADSORPTION AND ABSORPTION OF VITAMIN B12 IN THE INTESTINE OF THE RAT. K. Okuda: Proc. Soc. exp. Biol., N.Y., 1962, 111, 323 (Dept. Med., Yamaguchi Med. Coll., Ube, Japan) Using the rat intestinal loop technique, it was denied that a large % of a physiol. dose of [60Co]vit. B12

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adsorbed to the mucosal surface in the presence of rat intrinsic factor [IF] at a faster rate than it was without IF, and EDTA markedly inhib. this in vivo adsorption. Two kinds of surface adsorption were involved, a physiol. Phase involving IF and a nonabsorptive P^{1**@^M.M.S.}

2023. BINDING OF VITAMIN B12 BY INTRINSIC FACTOR AND INTESTINAL ABSORPTION. K.Okuda: Clin. chim. Acta, 1962, 7, 780-787 (Dept. Med., Yamaguchi Med. Coll., Ube, Japan) The relationship between absorption-enhancing activity and binding power of intrinsic factor [IF] for vit. B12 was studied by the "intestinal loop" technique. IF activity was demonstrated in all the vit. B₁₂-binding effluents, but in none without binding power. Absorption of [⁶⁰Co]vit. B12 was much greater when it was bound to the source of IF at the time it was given, than when it was in free form. The vit.B12 binding power of the extract was heat-labile, and reduction in binding power resulted in proportional loss of activity. It is thought likely that the IF mol. has another active site besides the one for B12-binding, and this is also heat-labile. V.M.Wootton

2024. TECHNIQUE OF SPATIAL SEPARATION OF PANCREATIC AND BILE SECRETIONS IN ^T - RJ^*®¹¹: C.R. Soc. Biol., Paris, 1962, 156, 1421-1424 (Cun. Med. A, Hôp. Edouard Herriot, Lyon, France)

Transplantation of the bile and pancreatic duet, and anastomosis of the oesophagus and duodenum allow a reflux of pancreatic and gastric secretions in the oesophagus in rat. In 12 of 13 animals lesions of the oesophagus occurred. In animals with the stomach removed reflux of pancreatic secretions induced lesions of the oesophagus in 19 of 26 tests. Reflux of bile secretions resulted in esophageal lesions in 7 of 25 animals. (French) M.A. Price

2025. ACTION OF COMMERCIAL P¹PARA¹ON⁵ OF SECRETIN ON EXTERNAL PANCREATIC SECRETION OF THE RAT. C.Debray, C.VaiUe. U e L a g , C.Roze and M.Souchard: J. Physiol., Pans, 1962, 156, 549-577 (Cun. d'Hydrol. et de ClimatoL. Hôp. fcchat, Paris, France) Composition and method determining the potency of prep. of secretin according to their source, are reviewed. Five of these prep. have been studied in the rat anaesthetised with ^J ^P¹reative fee* on respiration as well as on heart rate. Similarities in actions have been shown, together V ^ S ^ activity. It is proposed that ap. « S S est ed. S ^ardbesYtup; the necessary catena are suggested. (French) A.Angel

2026. EARLY AND LATE OEDEMA OF PANCREAS. J.E.Hobbs, H.Lclhlak, S.Gogolcwska, Z.Wojas, WjSzy^chowski and J.Wycfotkowska: Bull. Acad. pol. bci., 1963, 11, 99-103 (Inst. Physiol., Lodz Pol. Acad. sci., Poland) Progressive blood hyperosmolality was produced in chloralose-anaesthetised dogs by means of 8h, const. rate, glucose infusions, sometimes with insulin. In some expt. phenomena of transudation in pancreas, peritoneal sac and parotid gland do not rise progressively but display 2 peaks of intensity. The first appears at blood sugar of approx. 1000 mg./100 ml., the 2nd at 3000 mg./100 ml. They are separated by an intermediary period during which, in spite of rising osmality, transudation phenomena disappear partially or even sometimes completely. J.E.Hobbs

2027. T OF INTRADUCTAL OR INTRAVASCULAR RADRENALINE INFUSION ON DEVELOPMENT OF

ACUTE HAEMORRHAGIC PANCREATITIS. N.T.McPhedran and S.B.Lee: Surgery, 1963, 53, 490-494 (Toronto Gen. Hosp., Toronto, Ont., Canada)

A variety of treatments of dogs with noradrenaline and urecholine via various routes have been performed to induce vascular spasms in the pancreas. The role played by pancreatic ischaemia in acute haemorrhagic pancreatitis was studied by this method. These treatments caused only 18% lethal cases due to acute haemorrhagic pancreatitis.

D.N.Wheatley

OVER AND BILE

2028. PERfusion OF THE ISOLATED LIVER. METHOD AND EXPERIMENTAL APPLICATIONS. F.Jeunet and LQuitt: J. Physiol., Paris, 1962, 54, 625-636 (Med.-chem. Inst., Buhlstrasse, Berne, Switzerland)

A detailed description of the perfusion technique using a heart-lung apparatus together with the results obtained with this prep. is given. (French) A.Angel

2029. INFLUENCE OF CORPUS STRIATUM UPON ELECTRICAL POTENTIALS OF LIVER. E.A.Spiegel, E.G. Szekely and A.R.Kiby: Exp. Neurol., 1963, 7, 246-257 (Dept. Exp. Neurol., Temple Univ. Med. Centre, Philadelphia, Pa., U.S.A.) The effect of stimn. of the caudate nucleus, hypothalamus, midbrain te&orientum, splanchnic nerve, or vagus nerve upon the liver was studied in cats using d.c. potentials of the liver surface [LP] as an indicator. Stimn. of these areas or of the splanchnic nerve induced a gradual increase of the pos. LP. In agreement with the assumption that the influence of the caudate nucleus and of the hypothalamus upon the liver is part of the central temp. regulation, it was found that the rise in LP was accompanied by an elevation of the liver temp. P.W.Nathan

2030. CELLULAR RESPONSE TO PARTIAL HEPATECTOMY. N.R.Klinman and E.J.Erslev: Proc. Soc. exp. Biol., N.Y., 1963, 112, 338-340 (Cardeza Fdn., Jefferson Med. Coll., Philadelphia, Pa., U.S.A.) [3H]thymidine was used to tag the DNA of partially hepatectomised rat liver cells. They were subsequently partially hepatectomised again and a count made of the liver cells which contained [³H]thymidine and also of the % of these cells in mitosis. The results show that it is the liver parenchymal cells which proliferate in regeneration. The regeneration is not due to the increased mitotic activity of a stem line. D.N.Wheatley

2031. EFFECT OF OESTRADIOL INJECTIONS UPON CHICKEN LIVER NUCLEI RIBONUCLEIC ACID POLYMERASE. J.D.Weill, S.Busch, P.Chambon and P. Mandel: Biochem. biophys. Res. Comm., 1963, 10, 122 (Inst. Chimie Biol., Fac. Méd., Strasbourg, France) Inj. of oestradiol caused an increase in levels of chicken liver nuclei RNA polymerase which was apparent as early as 24 hr. after the first inj. B.Ketterer

2032. EFFECT OF DUODENAL PERfusion OF GLUCOSE ON LIVER STORES, INSULIN ACTIVITY IN SERUM AND RATE OF DISAPPEARANCE OF RADIOACTIVE GLUCOSE IN THE ANAESTHETISED DOG. J.R.M. Franckson, R.Bellens, Y-Amould, P.Mainguet and

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V.Conard: Arch. int. Pharmacodyn., 1963, 142, 286-287 (Lab. Expt. Med., Free Univ., Brussels, Belgium) After duodenal infusion of glucose, hyperglycaemia and hyperinsulinaemia caused a fall in glucose production and an increase in its metabolism. (French) T.J.Sullivan

2033. INFLUENCE OF PREVIOUS FEEDING WITH A HIGH-FAT DIET IN LIVER STEATOSIS PRODUCED BY ACUTE STARVATION OR GROWTH HORMONE IN MICE. T.Braun, P.Fabry and R.Petrasek: Experiientia, Basel, 1963, 19, 47-48 (Physiol. Dept., Inst. Human Nutr., Prague, Czechoslovakia) Fasting, or a single dose of growth hormone, or a combination of both stimuli, lead to a substantial rise of liver fat in mice previously fed a control diet. R.S.Tonks

2034. BILIARY EXCRETION IN THE RABBIT. II. RELATIONSHIP BETWEEN CHEMICAL STRUCTURE OF CERTAIN NATURAL OR SYNTHETIC PENTACYCLIC TRITERPENES AND THEIR ICTEROGENIC ACTIVITY. PART I. THE SUBSTITUENTS ON CARBON ATOMS 3,17,22 AND 24. J.M.M.Brown, C.Rimington and B.C.Sawyer: Proc. Roy. Soc. B., 1963, 157, 473-491 (Dept. Physiol., Onderstepoort Vet. Res. Lab., Pretoria, S. Africa) The icterogenic activity in the rabbit of 4 new agents in the oleanane and 24-noroleanane series is shown to be based on the presence of a β -equatorially orientated hydroxyl group at C3 or a hydroxyl at C24 and a $22\bar{\beta}$ -angeloyl side chain on the triterpene mol. CM.Lewis

2035. DIETARY FATTY ACIDS AND PLASMA ALKALINE PHOSPHATASE [AP] AFTER BILE DUCT LIGATION. O.Butendorf: Proc. Soc. exp. Biol., N.Y., 1962, 111, 409-412 (Ben May Lab. Cancer Res., Univ. Chicago, 111., U.S.A.) Ligation of common bile duct caused a 3-fold increase in plasma AP in rats fed a diet containing unsat. fatty acid (oleic acid) but not in rats fed the same diet containing no oleic acid. Similar expt. with dogs caused a 60-fold increase in animals fed on a diet with or without unsat. fatty acids. M.M.Shapland

KIDNEY AND URINE

2036. QUANTITATIVE ESTIMATION OF VARIATION AMONG HUMAN RENAL GLOMERULI. R.L.Abrams, L.E.Lipkin and G.R.Hennigar: Lab. Invest., 1963, 12, 69-76 (Pathol. Dept., Coll. Med., State Univ., N.Y., U.S.A.) An analysis of variance among glomeruli from a single human kidney was performed to establish statistical parameters serving to characterise the kidney. A.M.Mackay

2037. EFFECT OF HYPOPHYSECTOMY, ADRENALECTOMY AND ACTH ADMINISTRATION ON COMPENSATORY RENAL HYPERTROPHY IN RATS. T.Astarabadi: Quart. J. exp. Physiol., 1963, 48, 80-84 (Physiol. Dept., Edinburgh Univ., Scotland) Compensatory renal hypertrophy in rats was unaffected by adrenalectomy but was absent in hypophysectomised animals. Administration of ACTH did not produce hypertrophy in hypophysectomised rats. H.C.Jones

2038. EFFECT OF GROWTH AND LACTOGENIC HORMONES ON RENAL COMPENSATORY HYPERTROPHY IN HYPOPHYSECTOMISED RATS. T.Asfarabadi:

Quart. J. exp. Physiol., 1963, 48, 85-92 (Physiol. Dept., Edinburgh Univ., Scotland) Administration of growth hormone to hypophysectomised rats after removal of 1 kidney was followed by partial compensatory renal hypertrophy. Prolactin treatment did not have this effect. It is suggested that growth hormone is not the only pituitary factor involved in this phenomenon. H.C.Jones

2039. INTERRELATIONSHIP OF HYPO-OXIA, ERYTHROPOIETIN AND THE RENAL JUXTAGLOMERULAR CELL. B.Goldfarb and L.Tobian: Proc. Soc. exp. Biol., N.Y. 1962, 111, 510-511 (Dept. Med., Univ. Minnesota Hosp., Minneapolis, Minn., U.S.A.) Rats were subjected to hypo-oxia without hypovolaemia by being kept at 0.5 atm. pressure for 12 hr. At the end of this period there was no change in the granularity of the H_{if}juxtaglomerular cells such as is associated with increased serum erythropoietin levels. M.M.Shapland

2040. RENAL CLEARANCE IN UN ANAESTHETISED GUINEA PIG: DEPRESSION OF INULIN CLEARANCE BY CREATININE. I.Oyen and J.W.Boylan: Proc. Soc. exp. Biol., N.Y., 1962, 111, 253-257 (Dept. Physiol* Univ. Buffalo Sch. Med., Buffalo, N.Y., U.S.A.) Inulin and urea clearances were consistently reduced by, prior administration of creatinine. M.M.Shapland

2041. RENAL EFFECTS OF RENIN IN NORMAL AND BUFFER-NERVE SECTIONED DOGS. F. del Greco, A.C.Corcoran and L.H.Page: Proc. Soc. exp. Biol., N.Y., 1962, 111, 3-7 (Res. Div., Cleveland Clin. Fdn., Cleveland, Ohio, U.S.A.) Buffer-nerve sectioned dogs (section of carotid sinuses and aortic depressor nerves) are more sensitive than normal dogs to & diuretic action of renin. M.M.Shapland

2042. DIURETIC ACTIVITY OF THREE PRIMARY FRACTIONS OF TOTAL NON-DIALYSABLE SOLIDS [TNDS] FROM HUMAN URINE. J.M.Little, E.A.Argall and W.Brooks: Proc. Soc. exp. Biol., N.Y., 1962, 111, 316-320 (Dept. Physiol., Wake Forest Coll.-Winston-Salem, N.C., U.S.A.) TNDS of normal human urine, partially fractionated by ultrafiltration & veronal buffer extraction, produced a significant increase in urine flow when administered to dogs i.v. and i.p. M.M.Shapland

2043. INFLUENCE OF MASSAGE OF SEMINAL VESICLES AND AMPULLAE AND OF COITUS ON WATER DIURESIS OF RAM. G.Peeters and M.Debackere: J. J. Endocr., 1963, 26, 249-258 (Dept. Physiol., Vet. & Univ., Ghent, Belgium) In hydrated rams with fistulated bladder massage of the seminal vesicles and, ampullae per rectum resulted in an inhibn. of water diuresis. A similar but weaker response was observed after coitus in some trials. These anti-diuretic effects could be matched by i.v. injn. of ftiysiolog. amounts of pituitary ADH. C_B 1a e

2044. DISTRIBUTION AND EXCRETION OF [^{14}C]AMINONUCLEOSIDE [PA] IN NORMAL AND NEPHROTIC RATS. C.S.Alexander, H.T.Nagasawa and J.W.Filbin: Proc. Soc. exp. Biol., N.Y., 1962, 111, 521-526 (Med. and R¹⁴tope. Serv., V.A. Hosp., Minneapolis, Minn., U.S.A.) In the 8 hr. following injn. of [^{14}C]PA, the normal rat excreted 65-70% of the dose in the urine, the kidney only contained 0-25%. Nephrotic rats excreted much less PA in the urine, the fact being attributed to retention in the characteristically increased body water pool. M.M.Shapland

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² 45. MECHANISM OF EXCRETION OF UREA BY KIDNEY IN RABBIT. D.R.Drury, M.C.Almen and K.W.Ballard: Proc.Soc. exp. Biol., N.Y., 1962, 111, 123-125 (Dept. Physiol., Sch. Med., Univ. Southern California, Los Angeles, Calif., U.S.A.) In free flow expt. most of the urea excreted in the urine was filtered in the glomerulus. Prevention of urine flow for 2 min. caused urea to be transferred between blood and tubular fluid.

M.M.Shapland

2046. ISOLATION, IDENTIFICATION AND QUANTITATION OF TESTOSTERONE IN URINE OF NORMAL ADULTS AND IN PATIENTS WITH ENDOCRINE DISORDERS. A.M.Camacho and C.J.Migeon: J. clin. Endocr., 1963, 23, 301-305 (Dept. Pediat., Johns Hopkins Univ. Sch. Med., Baltimore, Md., U.S.A.)

K.Jones

² 47. INFLUENCE OF GLUCOCORTICOGENS AND ACTH CORTICOTROPHIC HORMONE ON OUTPUT OF HUMAN URINARY TRYPSIN INHIBITOR [AND HYALURONIDASE INHIBITOR]. H.J.Faervang: Acta Pharmacol., Kbh., 1962, 19, 293-304 (Biol. Inst., Carlsberg Fdn., Copenhagen, Denmark) Increased concn. of glucocorticosteroids increase the output of trypsin inhibitor. The sensitivity of the function to a given glucocorticosteroid shows large individual variations.

R.S.Tonks

² 48. URINARY EXCRETION OF VANILLYL-MANDELIC ACID IN DIFFERENT HUMAN POPULATIONS. J.G. Henrotte, G.Libotte and A.Dresse: Arch. int. Pharmacodyn., 1963, 142, 282-285 (Pathol. and Gen. Therapeutics Lab., Leon-Frederic Inst. Physiol., Liege Univ., Liege, Belgium) Urinary excretion of the acid was greater in poor, undernourished Indians than in other, better nourished human groups. There was a relationship between urinary content and the body wt. and cube of the height in the populations studied. (French) T.J.Sullivan

² 49. PARAPLEGIC DOGS: URINARY BLADDER EVACUATION WITH DIRECT ELECTRIC STIMULATION. A.Kantrowitz and M.Schamaun: Science, 1962, 138, 115-116 (Surg. Res. Lab., Maimonides Hosp., Brooklyn, N.Y., U.S.A.) Stimulation of the detrusor muscle implanted electrodes increased intravesical pressure markedly in both normal dogs and those with section of the lumbar spinal cord. The urine bladder completely emptied by this method for up to weeks post-operatively. Later, residual urine even after progressively higher voltages were applied.

G.M.Lewis

ENDOCRINE GLANDS

² 50. METHYLATION OF NORADRENALINE IN ADRENAL GLAND. J.-F.Cier and L.Peyrin: J. Physiol., Paris, 1962, 54, 537-547 (Inst. Physiol., Fac. Med., Lyon, France) Unlabelled or [¹⁴C]noradrenaline was added to homogenates of dog adrenal tissue. Adrenaline formed was shown firstly by the difference in adrenaline concentration in the mixture measured fluorimetrically by the hydroxylindole method, before and after incubation of the mixture for 1 hr. at 37°; and secondly by the presence of radioactive adrenauine in the incubated mixture. (French)

AJWSB»

2051. TISSUE LEVELS OF NORADRENALINE AND ADRENALINE IN HAEMORRHAGIC SHOCK. B.Coleman and V.V. Glaviano: Science, 1963, 139, 54 (Dept. Physiol., Stritch Sch. Med., Loyola Univ., Chicago, Ill., U.S.A.)

Severe depletion of endogenous noradrenaline was observed in the brain, heart, liver and spleen of rabbits suffering from haemorrhagic shock, although the adrenaline content of these tissues was significantly elevated above those in controls. Skeletal muscle showed no alteration in the level of these compounds.

G.M.Lewis

2052. TISSUE CATECHOLAMINES IN CHRONIC RENAL HYPERTENSION. A.F. de Schaepdryver, A.C.Taquin, P.Bernard and C.Heymans: Arch. int. Pharmacodyn., 1963, 142, 260-266 (J.F. Heymans Inst. Pharmacol., Ghent Univ., Belgium) Expt. renal hypertension is induced in rats by tying ligatures around the poles of one kidney and removing the other kidney 7-10 days later. After 8-12 weeks catecholamine contents of brain, heart, spleen, liver, kidneys, muscle and adrenals do not differ from those of control animals.

S.E.Smith

2053. ELEVATION OF PLASMA ADRENALINE LEVELS PRODUCED BY GLUCAGON IN VIVO. E.J.Sarcione, N.Back, J.E.Sokal, B.Mehlman and E.Knoblock: Endocrinology, 1963, 72, 523-526 (Med. Div., Roswell Park Mem. Inst., N.Y. State Dept. Hlth., Washington, D.C., U.S.A.) A single glucagon injn. in anaesthetised dogs resulted in a rise in plasma glucose, lactate, and adrenaline levels. A 10 min. glucagon infusion resulted in an increase in adrenaline and noradrenaline in adrenal vein blood.

H.C.Joae

2054. WEIGHT OF HUMAN ADRENAL GLAND AND EFFECT OF PREPARATIONS OF CORTICOTROPIN OF DIFFERENT PURITY ON WEIGHT AND MORPHOLOGY OF HUMAN ADRENAL GLAND. G.P.Studzinski, D.C.F. Hay and T.Symington: J. clin. Endocr., 1963, 23, 248-254 (Jefferson Med. Coll., Philadelphia, Pa., U.S.A.) Purified ACTH prep. lost most of their ability to cause an increase in adrenal wt., to stimulate mitotic activity in the cortex and to cause lipid depletion of the cells of zona fasciculata. Purification appeared to remove a pituitary substance which potentiates ACTH action.

K.Jones

2055. INFLUENCE OF EPITHELIAL CELLS OF KIDNEY JUXTAGLOMERULAR APPARATUS ON STRUCTURE AND FUNCTION OF THE ZONA GLOMERULOSA OF THE ADRENAL CORTEX. M.Kohlhardt and D.Voth: Naturwissenschaften, 1963, 50, 2, 43-44 (Pathol. Inst., Univ., Mainz, Germany) Rats in metapiron adrenostasis were given angiotensin. Cellular activity in the zona glomerulosa increased after 30 min., together with activity in the kidney epithelium. This response to angiotensin, despite blockade of aldosterone production through the pituitary, indicates a direct connection between activity of the kidney and the adrenal cortex zona glomerulosa. (German) AJ.Wansbrough

2056. EFFECT OF ANGIOTENSIN II ON ADRENAL ASORBIC ACID. A.A.Carr and F.C.Barter: Proc. Soc. exp. Biol., N.Y., 1962, 111, 210-212 (Clin. Endocr. Branch, N.H.I., N.I.H., Bethesda, Md., U.S.A.) ACTH, but not angiotensin II, depletes adrenal ascorbic acid in hypophysectomised rats. This difference can be used to determine the presence of ACTH in fluids to stimulate steroidogenesis by the adrenal cortex.

M.M.Shr

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2057. CARDIOVASCULAR, HEPATIC AND RENAL LESIONS IN MICE RECEIVING CORTISONE, OESTRONE AND PROGESTERONE. A.D.Ashbum, W.Lane Williams and F.R.Cobb: *Yale J. BioLMed.*, 1963, 35, 329-340 (Dept. Anat., Univ. Mississippi Sch. Med., Jackson, Miss., U.S.A.) Youngd and ♀ mice were given daily s.c. injn. of cortisone acetate (2*5 mg. for 7 days), oestrone (1 mg. for 9 days), progesterone (1 mg. for 9 days), oestrone plus cortisone, or progesterone plus cortisone, and were killed 24 hr. later. Progesterone produced a slight increase in body wt. and oestrone a slight decrease. Cortisone produced inflammatory lesions in liver, kidneys and heart, which were not affected by the simult. administration of progesterone or oestrone. The combination of oestrone and cortisone produced cardiovascular damage in more than half the mice.

J.B.Parish

2058. EFFECT OF INJECTED CORTICOSTERONE ON THE RELEASE OF ACTH IN RATS EXPOSED TO ACUTE STRESS. J.R.Hodges and M.T.Jones: *J. Physiol.*, Lond., 1963, 167, 30-37 (Dept. Pharmacol., Royal Free Hosp. Sch. Med., London, England) Corticosterone was administered s.c. to rats in doses sufficient to raise the blood concn. of the steroid up to 4 times the max. level induced by stress. The animals were then subjected to the stress of sham adrenalectomy. Pretreatment with corticosterone did not diminish the further rise in corticosterone or the elevation in blood ACTH, and reduced only slightly the adrenal ascorbic acid depletion normally caused by the stress. Since the release of ACTH was not suppressed, it was considered that the secretion of the hormone is independent of changes in blood corticoid levels within the physiol. range. *

2059. MECHANISMS OF ACCUMULATION OF CORTICOSTERONE IN REGENERATING ADRENAL OF RAT DURING STRESS. B.Koch, C.Mialhe-Voloss and F. Stutinsky: *C.R. Soc. Biol.*, Paris, 1962, 156, 1503-1506 (Lab. Physiol., Fac. Sci., Strasbourg, France)

The total plasma and adrenal corticosterone level was similar in normal rats and rats in which the adrenal medulla had been destroyed. After stress the plasma level was similar in the 2 groups but the adrenal corticosterone level was higher in expt. animals. After unilat. adrenalectomy the adrenal concn. of corticosterone was equiv. to that in normal rats. (French) M. A. Price

2060. EFFECT OF HOUSING CONDITIONS AND SIMPLE EXPERIMENTAL PROCEDURES UPON CORTICOSTERONE LEVEL IN PLASMA OF RATS. A.M.Barrett and M.A.Stockham: *J. Endocr.*, 1962, 26, 97-105 (Dept. Pharmacol., Sch. Pharm., Brunswick Sq., London, England) Rats housed singly in undisturbed surroundings had plasma corticosterone level of 5*5 μ g./100 ml. Housing in groups of 20 and other forms of stress resulted in significantly higher levels, the response being evident within 15 min. of exposure to these stresses.

G.F.Blanc

2061. CORTISOL METABOLISM IN CASE OF HYPERTENSIVE FORM OF CONGENITAL ADRENAL HYPERPLASIA: DEMONSTRATION OF ABSENCE OF 110-DEHYDROXYLATION. J.W.Reynolds and R.A.Ulstrom: *J. clin. Endocr.*, 1963, 23, 191-196 (Dept. Pediat., Univ. Minnesota Med. Sch., Minneapolis, Minn., U.S.A.) High excretion of 11-deoxy-C₂₁-OH steroids did not result from metabolic transformation of cortisol or its metabolites, in a te-³clcortisol administered patient. The cortisol secretion rates indicated max. endogenous ACTH stimn. of the patient's adrenal glands under control conditions.

K. Jones

2062. STIMULATION OF SECRETION OF INSULIN BY ATP. J.L.R.Candela and M.C.Garcia-Femandez: *Nature*, Lond., 1963, 197, 1210 (Inst. 'G.Maranon' Velazquez 138, Madrid, Spain) Injn. of 10⁻²M ATP i.v. into rats stim. secretion of insulin, as evidenced by a greater plasma insulin effect and the increase of the glucose uptake of the diaphragm and of the epididymal fat. Hydrolysed ATP had no effect. G.M.Lewis

2063. DEGRADATION OF INSULIN BY TISSUE EXTRACTS OF NORMAL AND NEUROTIC RATS. H.L.Wildberger, H.T.Ricketts and L.Kegut: *Proc. Soc. exp. Biol.*, N.Y., 1963, 112, 168-170 (Dept. Med., Univ. Chicago, 111, U.S.A.) Sprague-Dawley rats were treated with nephrotoxic rabbit serum to induce nephritis. The insulin degrading capacity of homogenates from inflamed kidneys, liver and diaphragm was measured in 2 ways; cryst. insulin was incubated with the homogenates and the resulting mixture was inj. into animals to see the effect on blood sugar content as compared with the control. The other method was to follow the degradation by using [131]insulin. It was shown by both methods that the nephrotic kidney homogenates were less active than normal kidney homogenates in degrading insulin.

D.N.Wheatley

2064. DETERMINATION OF PLASMA INSULIN-LIKE ACTIVITY, USING HYPOPHYSECTOMISED-ADRENALECTOMISED RAT. K.Kosaka, T.Ide, N. Kuzaya and T.Kuzuya: *Endocrinology*, 1963, 72, 552', 562 (3rd Dept. Int. Med., Med. Fac., Univ. Tokyo, Japan) A method has been devised for the in vivo assay of plasma insulin in hypophysectomised-adrenalectomised rats. From injn. of test samples a regression line was plotted against log dose of standard insulin soln. The validity of the method was confirmed using [131]-insulin injn. 'Anti-insulin' hormones did not affect the assay.

H.C.Jones

2065. REGULATION BY CALCIUM OF PARATHYROID GROWTH AND SECRETION IN VITRO. L.G.Raisz: *Nature*, Lond., 1963, 197, 1115-1116 (Dept. Pharmacol., Univ. Rochester Sch. Med., Rochester, N.Y., U.S.A.) Parathyroid glands from chick embryos and rats were cultured in vitro. Increasing Ca concn. in the medium decreased the cytoplasmic vol. and reduced ttf no. of mitoses in chick embryo material. At low Ca concn., cytoplasmic growth was stim. The release of parathyroid hormone was tested by the bone-resorbing activity in cultures of rat embryonic bone labelled with 45 Ca. Low Ca stim. and high Ca depressed secretion of parathyroid hormone. Alterations in Mg or phosphate concn. did not produce these effects. CM.Lewis

2066. INFLUENCE OF PARATHYROIDS ON COMPOSITE OF RAT MILK. J.Neuenschwander and R.V.Talmage: *Proc. Soc. exp. Biol.*, N.Y.; 1963, 112, 297-299 (Biol. Dept., Rice Univ., Houston, Tex., U.S.A.) Parathyroidectomy of young Holtzman albino rats increased the total milk solids when the Ca level in the plasma was lower than in the controls. This effect cou^{nt} be abolished by keeping the rats on a high Ca diet or by preventing them from suckling their litters.

D.N.Wheatley

2067. FAILURE OF ANTERIOR HYPOTHALAMIC LESIO* TO PREVENT EITHER PITUITARY REACTIONS TO CASTRATION OR INHIBITION OF SUCH REACTION* BY OESTROGEN TREATMENT. E.M.Bogdanov: *Bio*crinology*, 1963, 72, 638-642 (Anat. Dept., Indian* Univ. Med. Sch., Indianapolis, Ind., U.S.A.)

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oestradiol administration was used to inhibit the cellular reactions of the pituitary to castration in rats. The presence or absence of a portion of the hypothalamus previously reported to be essential for the inhibn. of gonadotrophin secretion by gonad steroids, did not influence the action of oestradiol.

H.C.Jones

2068. CORRELATION BETWEEN TIME ELAPSED AFTER THYROIDECTOMY AND ACID PHOSPHATASE ACTIVITY IN RAT ADENOHYPOPHYSIS. V.Kmentová and V.Schreiber: *Folia biol., Praha*, 1963, 9, 68-71 (Lab. Endocrinol. Metab., Charles Univ., Prague, Czechoslovakia) Rats were thyroidectomised and killed 1, 14, 21 and 35 days after the operation. The wt. of Jte adenohypophysis increases with time during this period from 2.36 mg.% after 1 day to 3.13 mg.% at 14 days, declining again to 2.78 mg.% at 35 days. At the same time the relative and abs. acid phosphatase activities of the adenohypophysis both increased by about 100%. M.S.Laverack

2069. HAEMAGGLUTINATION-INHIBITION TECHNIQUE FOR ESTIMATING HUMAN GROWTH HORMONE. P.J. O'Connor and L.G.Skinner: *J. Endocr.*, 1963, 26, 219-231 (Paterson Res. Labs., Christie Hosp., Manchester, England) A haemagglutination-inhibiting technique described for the immunoassay of human growth hormone. This was considered satisfactory within the limitations described and gave the mean value of 261 ± 23 μ U/l. for 6 normal adult sera. CF.Blane

2070. STANDARDISATION OF BIOLOGICAL ACTIVITY OF HUMAN PITUITARY INTERSTITIAL CELL STIMULATING HORMONE [ICSH] IN TERMS OF HUMAN CHORIONIC GONADOTROPHIN. A.J.Lostroh, P.G. Squire and C.H.Li: *J. Endocr.*, 1963, 26, 215-218 (Hormone Res. Lab., Univ. California, Berkeley, Calif., U.S.A.) Conditions are reported under which comparison of the ICSH potency of a new homogeneous 3rd - from human pituitary tissue is made with HCG. An? Ind Prostate test in hypophysectomised dth rats o^{ne} a little interstitial cell repair test in hypophysectomised *^{as}e both applicable. CF.Blane

***^o7i: EFFECT OF ACUTE STRESS ON PITUITARY GLAND. I. CHANGES IN BLOOD AND PITUITARY ACTH CONCENTRATIONS.** J.Vernikos-Danellis. **II. ACTION OF ETHIONINE ON STRESS-INDUCED ACTH RELEASE.** B.H.Marks and J.Vernikos-Danellis. **III. ENDOCRINE GLAND BLOOD FLOW.** H.Goldman. **IV. UPTAKE OF SERINE-1-14C INTO ACTH.** D.Jacobowitz, B.H.Marks and J.Vernikos-Danellis: *Endocrinology*, 1963, 72, 574-581, 582-587, 588-591, 592-597 (Pharmacol. Lab., Ohio State Univ. Med. Coll., Columbus, Ohio) Expt. on the changes in pituitary ACTH concn. in rats subject to various stresses, suggest that the ability of the gland to release ACTH after stress depends on its ability to synthesise ACTH at that time.

II. Ethionine administration suppressed the release of pituitary ACTH following stress in rats. The effect was antagonised by methionine administration. The resting pituitary ACTH content was unaltered but the stress-induced rise following adrenalectomy was prevented by ethionine.

III. Ether stress increased the blood flow in the ant. pituitary and thyroid gland in female rats; post, pituitary, adrenal gland and median eminence flows were not affected. Adrenalectomised rats had elevated ant.

pituitary blood flows and following stress the blood flow in both the ant. and post, pituitary increased but that of the thyroid did not.

IV. Stress increased the uptake of [$I\text{-}^{14}\text{C}$]serine into the glacial acetic acid extract of the ant. pituitary. The radioactive material was identified as ACTH.

H.C.Jones

2072. PROLACTIN SECRETION IN VITRO: EFFECTS OF THYROID HORMONES AND INSULIN. C.S.Nicoll and J.Meites: *Endocrinology*, 1963, 72, 544-551 (Michigan State Univ., Physiol. Dept., East Lansing, Mich., U.S.A.) The presence of thyroxine and triiodothyronine in the medium of rat ant. pituitary gland cultures resulted in a higher prolactin level in the medium. Neither substance had any effect on the pigeon crop response to prolactin. The presence of insulin was not essential for prolactin secretion.

H.C.Jones

2073. EFFECT OF OESTROGEN ADMINISTRATION IN VIVO ON PROLACTIN RELEASE BY RAT PITUITARY IN VITRO. A.Ratner, P.Talwalker and J.Meites: *Proc. Soc. exp. Biol., N.Y.*, 1963, 112, 12-15 (Dept. Physiol., Michigan State Univ., East Lansing, Mich., U.S.A.) Oestrogen (oestradiol benzoate) administered to Sprague-Dawley rats for 6 days at a dosage of 50 μ g in sesame oil caused increase in the ant. pituitaries of 47% in size, an increase of prolactin content of 187% and in vitro incubation of the ant. pituitaries resulted in a 96% increment of prolactin over controls which received only sesame oil.

D.N.Wheatley

2074. METHOD FOR DETECTION AND ESTIMATION OF SMALL AMOUNTS OF ARGinine-VASOTOCIN.

P.J.Bentley: *J. Endocr.*, 1963, 26, 295-296 (Dept. Pharmacol., Univ. Bristol, England) An assay procedure for arginine-vasotocin is described utilising the natriferic effect on the frog-bladder prep. Responses are obtained with 0.1 mU/ml. soln. of the octapeptide.

CF.Blane

2075. DISSOCIATION BETWEEN THE CONTENT OF VASOPRESSIN AND NEUROSECRETORY MATERIAL IN RAT NEUROHYPOPHYSIS. A.M.Moses, T.F.Leveque, M.Giambattista and C.W.Lloyd: *J. Endocr.*, 1963, 26, 273-278 (V.A. Hosp., State Univ. New York, Syracuse, N.Y., U.S.A.) A decrease in the amount of neurohypophyseal neurosecretory material occurred in rats stressed by s.c. injn. of formalin over a period when vasopressin content remained const. In view of this apparent dissociation it is suggested that the neurosecretory material is a precursor or carrier for hormones of the neurohypophysis.

CF.Blane

2076. RELEASE OF ANTIDIURETIC HORMONE DUE TO COMMON CAROTID OCCLUSION AND ITS RELATION WITH VAGUS NERVE. S.Usami, B.Peric and S.Chien: *Proc. Soc. exp. Biol., N.Y.*, 1962, 111, 189-193 (Dept. Physiol., Coll. Physns. Surg., Columbia Univ., N.Y., U.S.A.) Occlusion of common carotid arteries caused elevation of plasma ADH concn. only if vagus nerves had been previously sectioned.

M.M.Shapland

2077. REFLEX NATURE OF RELEASE OF ANTIDIURETIC HORMONE UPON COMMON CAROTID SINUSES IN VAGOTOMISED DOGS. S.Chien, B.Peric, T.N.Ji, S.J. ff, T. W. T. S. S. Col. mb. Unk.

N.Y., U.S.A.) In vagotomised dogs there was no increase in plasma ADH concn. following: (a) common carotid occlusion if the carotid sinuses had been sectioned or (b) occlusion of external and internal carotid arteries above the bifurcation.

M.M.Shapland

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- 2078. EXTERIORATION OF THYROID GLAND AND MEASUREMENT OF ITS FUNCTION.** LRJalconer: J. Endocr., 1963, 26, 241-247 (Dept. Agric. Chem., Waite Agric. Res. Inst., Univ., Adelaide, Australia) A technique is described for transplantation of a thyroid lobe to below the neck skin of the ewe in continuity with a carotid artery-jugular vein loop. Blood samples taken from the jugular vein showed that secretory function in such exteriorised glands remains normal. G.F.Blane
- 2079. AMINO ACID- ^{14}C INCORPORATION INTO PROTEIN BY THYROID GLAND SLICES: EFFECTS OF THYROTROPHIC HORMONE INJECTIONS AND OF HYPOPHYSECTOMY.** E.Raghupathy, W.Tong and I.L. Chaikoff: Endocrinology, 1963, 72, 620-625 (Physiol. Dept., Univ. Calif., Berkeley, Calif., U.S.A.) Injn. of TSH increased the incorporation of [^{14}C]amino acids into protein by slices of guinea-pig thyroid gland. Hypophysecomy reduced the incorporation of [^{14}C]leucine into protein and TSH administration reversed the effect. H.C.Jones
- 2080. ACTION OF POTASSIUM THIOCYANATE ON THYROID METABOLISM IN RATS.** P.Blanquet, G. Meyniel, M.Croizet and M. Le Dain: C.R. Soc. Biol., Paris, 1962, 156, 1380-1383 (Lab. Physique, nucléaire, Fac. Méd., Bordeaux, France) Rats received injn. of 20 mg./day KCNS for 15 days. There was a decrease in the fixation rate of ^{131}I 1 hr. after the final injn. compared with normal animals. In animals receiving ^{131}I 24 hr. after the final injn. the fixation rate was similar to that of normal animals. There was a decreased rate of formation of thyroid hormones. In animals receiving a single dose of KCNS there was a linear relationship between KCNS concn. and the level of circulating hormones containing ^{131}I . (French) M.A.Price
- 2081. ACTION OF 6 n-PROPYLTHIOURACIL ON THYROID METABOLISM OF RAT.** P.Blanquet, G.Meyniel, M.CrDizet and M. Le Dain: C.R. Soc. Biol., Paris, 1962, 156, 1386-1389 (Lab. Physique nucléaire, Fac. Méd., Bordeaux, France) Rats received injn. of $^{2\pm 5.5}$ mg. 6 n-propylthiouracil during 8 days followed by ^{131}I . They were killed after 3-48 hr. I fixation did not exceed 3%, and 90% of this remained in the mineral state. The org. I⁻ content of the blood decreased during the 8 days but the total thyroid hormone level in the blood increased after 24 hr. to above the level in normal animals. In animals receiving a single dose of propylthiouracil the circulating org. I⁻ level was lower than in the first group. There was no secondary increase in the hormone level in the blood. (French) M.A.Price
- 2082. ACTION OF n-BUTYL 3, 5-DIODO-4-HYDROXYBENZOATE [IHB] ON THYROID METABOLISM IN THE RAT.** P.Blanquet, M.Croizet, G.Meyniel and M. Le Dain: C.R. Soc. Biol., Paris, 1962, 156, 1391-1398 (Lab. Physique nucléaire, Fac. Méd., Bordeaux, France) In rats receiving 10 mg. IHB followed by ^{131}I , there was an increase in the level of thyroid hormones in the blood and a decrease in circulating org. I⁻. These levels returned to normal after 72 hr. A second group of rats received 5-20 mg. IHB followed by ^{131}I 6-340 hr. later and were sacrificed 24 hr. after iodine injn. For a dose of 5 mg. the thyroid hormone level returned to normal after 160 hr. and the circulating hormone level returned to normal after 250 hr. (French) M.A. Price
- 2083. EFFECT OF HYPERTONIC SALINE INJECTIONS ON SECRETION OF THYROID HORMONES IN RABBITS AND**

- GUINEA-PIGS.** G.Feuer: Nature, Land., 1963, 197, 1176-1177 (Dept. Biochem., Inst. Psychiat., Univ., London, England) Acute stimn. of die neural lobe by administration of hypertonic NaCl soln., resulting in a relative deprivation of water in normal animals, led to an increased output of thyroxine in the circulation. The latter effect reached a max. 2-6 hr. after injn. of NaCl. J.R.Sargent
- 2084. DIPHASIC SEASONAL VARIATION OF SERUM PROTEIN-BOUND IODINE LEVEL.** G.Watanabe, M. Uematsu and K.Jiorii: J. clin. Endocr., 1963, 23, 383-386 (Dept. Hyg., Univ. Niigata Sch. Med., Japan) Levels of serum PBI in men and women varied similarly in the form of diphasic seasonal variations. The reduced level of serum PBI in winter and summer months is attributed to more rapid metabolism of the thyroid hormone in peripheral tissues without an immediate increase in the rate of its release from the gland. K Jones

- 2085. INFLUENCE OF L-TREODOOTHYRONINE ON STEROID HORMONE METABOLISM; STUDIES IN PATIENT WITH ADRENAL HYPERPLASIA (CUSHING* SYNDROME).** NJ.Gold and J.F.Crigler: J. clin. Endocr., 1963, 23, 156-166 (Dept. Pediat., Harvard Med. Sch., Boston, Mass., U.S.A.) K Jones

- 2086. EFFECT OF ALTERED THYROID FUNCTION UPON STEROID CIRCADIAN RHYTHMS IN MAN.** M.M.Martin, D.H.Mintz and H.Tamagaki: J. clin. Endocr., 1963, 23, 242-247 (Dept. Med. Georgetown Univ., Washington, D.C., U.S.A.) K Jones

- 2087. BLOOD THYROTROPIN LEVELS IN THYROTOKIC PATIENTS BEFORE AND AFTER HYPOPHYSECTOMY.** S.A. D'Angela: J. clin. Endocr., 1963, 23, 229-234 (Daniel Baugh Inst. Anat., Jefferson Med. Coll., Philadelphia, Pa., U.S.A.) Circulating TSH titres were measured in 5 patients with Graves' disease in whom thyroid function persisted at normal or supranormal* levels after total hypophysecomy. Hyperplasia and hypersecretion of the thyroid in this disease are not primarily attributable to change in TSH levels in the circulation. K Jones

- 2088. PARALLEL ASSAYS OF THYROTROPHIN, LONG-ACTING THYROID STIMULATOR AND EXOPHTHALMOS-PRODUCING SUBSTANCES IN SOME ENDOCRINE DISORDERS.** B.L.Pimstone, R.Hoffenberg and E.Black: J. clin. Endocr., 1963, 23, 336-345 (Dept. Med., Univ. Cape Town, South Africa). K Jones

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- 2089. EFFECT OF DIETHYLSTILBOESTROL, ACTH AND CORTISONE ON BODY AND ACCESSORY SEX ORGAN WEIGHTS IN HYPOPHYSECTOMISED RATS.** D.W. Snair: Toxicol. appl. Pharm., 1963, 5, 168-175 (Food and Drug Labs., Dept. Nat. Hlth. and Welfare, Ottawa, Canada) Hypophysectomised adult rats were treated with diethylstilboestrol, ACTH or cortisone. The oestrogen prevented the atrophy of the accessory organs (1) and caused a loss of body wt. (2), but had no effect on the wt. of the adrenal gland (3). ACTH was without effect on (1) and increased (3); the latter effect w

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not modified by the oestrogen. Cortisone reduced (2) but had no effect on (1) and (3); the first effect was enhanced by the oestrogen.

E.E.Hobbiger

2090. SEX DIFFERENCES IN GROWTH OF RATS, AND THEIR MODIFICATION BY A SINGLE INJECTION OF TESTOSTERONE PROPIONATE SHORTLY AFTER BIRTH. H.E.Swanson and J.J.Van der Werff ten Bosch: *J. Endocr.*, 1963, 26, 197-207 (Dept. Clin. Endocr., Univ., Leiden, Netherlands) The single s.c. dose of 0.5 mg. testosterone given on days 2 or 5 after birth had detrimental effects on the subsequent sexual development bothd and ? rats. Overall growth rate increased in \$ and decreased inc? so treated. CF.Blane

2091. GONAD-BRAIN RELATIONSHIP: PRECOCIOUS BRAIN MATURATION AFTER OESTRADIOL IN RATS. L.M.Heim and P.S.Timiras: *Endocrinology*, 1963, 72, 598-606 (Physiol. Dept., California Univ., Berkeley, Calif., U.S.A.) Brain maturation was measured in rats by electroshock seizure patterns. Oestradiol administration to newborn rats resulted in the seizure pattern appearing earlier. Other effects of oestradiol observed were the inhibn. of growth, pituitary hypertrophy, and ovary and thymus atrophy. H.C.Jones

2092. INFLUENCE OF PREGNANCY AND CORTISONE TREATMENT ON BROWN ADIPOSE TISSUE IN BATS. R.A.Sims, R.Allen and S.E.Sulkia: *Proc. Soc. exp. Biol.*, N.Y., 1962, 111, 455-458 (Dept. Microbiol., Univ. Texas Southwestern Med. Sch., Dallas, Tex., V.S.A.) Lipid accumulation in the brown fat cells begins in early pregnancy reaching a max. level late in the gestation period. During and shortly after parturition tissue is essentially depleted of lipid, but 2 weeks after delivery lipid can be found again. Cortisone treatment of non-gravid bats causes lipid accumulation similar to that found in the pregnant animal. M.M.Shapland

2093. EFFECT OF MONTH OF CALVING ON THE GESTATION PERIOD OF INDIAN CATTLE. S.S.Prahu: *J. anim. Morph. Physiol.*, 1961, 8, 35-41 (Indian Vet. JteS/Inst., Izatnagar, U.P., India) Analysis of 9645 cows from various farms and breeds showed that those calving in September, October, November and December had shorter gestations than those calving in February months. This may be because the former get good feeding during the second half of pregnancy. C.D.Putnam

2094. EFFECT OF GEOGRAPHICAL LOCATION, SEX OF CALF AND PARITY OF THE GESTATION PERIOD OF CERTAIN INDIAN CATTLE BREEDS. S.S.Prahu, S.Mukherjee and S.N.Chatterjee: *J. anim. Morph. Physiol.*, 1961, 8, 22-34 (Indian Vet. Res. Inst., Izatnagar, U.P., & U.P.) Within 5 Indian cattle breeds there were significant differences in the duration of pregnancy at different farms, probably due to genetic impurity of the original source, and the use of bulls of unknown pedigree. In all breeds d calves were carried for longer than * calves. C.D.Putnam

2095. CORTISOL AND CORTISONE IN SALIVA OF PREGNANT WOMEN. M.S.Greaves and H.F.West: *J. Endocr.*, 1963, 26, 189-195 (Rheumatism Res. Unit, Nether Edge Hospt. - P. Sheffield, England) Raised levels of cortisol and cortisone were found in the saliva of women in the third trimester of pregnancy. Since there is evidence that these steroids were in the bound state suggested that the temporary remissions of

rheumatoid conditions which sometimes occur during pregnancy may be attributed to the high levels of corticoids in the connective tissues.

CF.Blane

2096. VAGINAL CORNIFICATION IN PERSISTENT-OESTROUS MICE. N.Takasugi: *Endocrinology*, 1963, 72, 607-619 (Zool. Dept., Univ. California, Berkeley, Calif., U.S.A.) Ovariectomy alone and with adrenalectomy or hypophysectomy did not prevent vaginal cornification in persistent oestrous mice. Antihistamine treatment or transplantation of the vagina into other mice also had no effect on cornification in many cases, and steroid hormone treatment only prevented cornification in some cases.

H.C.Jones

2097. INFLUENCE OF INDUCTION OF BREEDING ACTIVITY IN ANOESTROUS SHEEP ON LEVELS OF SOME CHEMICAL CONSTITUENTS OF UTERINE WASHINGS. R.B.Heap, D.M.Allen and G.E.Lamming: *J. Reprod. Fertil.*, 1963, 5, 209-215 (Nottingham Univ. Sch. Agric, Sutton Bonington, Loughborough, England) All of 10 maiden anoestrous sheep ovulated in response to injn. of progesterone and pregnant mares' serum though only 3 showed behavioural oestrous. Eleven lactating sheep treated similarly all ovulated but only 2 showed behavioural oestrous. Uterine washings from these 2 groups showed no difference in Na, K, PO₄, N₂ or carbohydrate content. Only the level of P was significantly different in the 2 groups and was greater in the lactating sheep than in maiden sheep at induced oestrous and 10 days later. The results are discussed in relation to differences in fertility between the 2 groups at the first induced oestrous cycle.

H.E.HJones

2098. INDUCED OESTRUS IN ANOESTROUS EWES BY USE OF PROGESTOGENS AND FOLUCE-STIMULATING HORMONE. V.G.Puisel and E.F.Graham: *J. anim. Sci.*, 1962, 21, 132-136 (Univ. Minnesota, Minneapolis, Minn., U.S.A.) Pretreatment of anoestrous ewes by daily injn. of progesterone (10 mg. cryst. in maize oil) over periods of 9-19 days, followed after 48 hr. (preferably 24 hr.) by injn. of FSH (15-50 mg.) produced oestrus in 91% and ovulation in 98% of cases in 3 days. The progesterone pretreatment was replaced satisfactorily by oral administration of 6-methyl-17-acetoxy-progesterone (10-60 mg.) daily for 12 days followed by FSH within 48 hr. This was 80% effective within 48 hr. (FSH alone was 18% effective). A single injn. of 17-hydroxyprogesterone-17-caproate (125 mg.) and a 25 mg. injn. of FSH after 12 days induced oestrus in 3 of 4 ewes treated, shorter intervals (10-8 days) between the injns. gave less satisfactory results.

A.G.Pollard

2099. EFFECT OF AUTOTRANSPLANTATION OF THYROID GLAND ON ONSET OF OESTRUS IN FERRETS. W.A.Marshall: *J. Endocr.*, 1963, 26, 279-285 (Dept. Anat., Univ. Birmingham, England) Denervation and transplantation of the thyroid gland to the deep surface of the rectus abdominis muscle had no effect on the normal onset of oestrus or the oestrus response to artificial lighting.

CF.Blane

2100. QUANTIFICATION OF THE OESTROUS CYCLE OF THE WHITE MOUSE. F.A.Lints, A.N.Mouravieff and F.E.Merckx: *Arch. biol. liège*, 1962, 73, 311-316 (Lab. Gen. Genet., Nat. Centre Radiobiol. and Genet., Inst. Agric., Univ., Heverle, Louvain, Belgium) A quantification of the oestrous cycle of the mouse has been attempted by counting the nucleated epithelial cells,

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cornified cells and w.b.c. in mouse vaginal smears. The relative β of the 3 types of cell characterise the stages of the oestrous cycle. It is suggested that the modification of these β offers a possible means of measuring the effects of physiol. treatment or of genetic variation.

(French) R.J.Walker

2101. ANTISERUM INHIBITION OF THE OESTROUS CYCLE IN NORMAL RATS. W.P.Young, R.Nasser and T.Hayashida: Nature, Lond., 1963, 197, 1117 (Dept. Anat., Univ. California Med. Center, San Francisco, Calif., U.S.A.) A prelim. report showing that a sp. rabbit antiserum to purified sheep pituitary ICSH can inhibit the oestrous cycle in adult tf rats. CM.Lewis

2102. INFLUENCE OF THE OESTROUS CYCLE AND OVARIECTOMY ON PHOSPHOLIPID CONTENT OF THE PINEAL GLAND IN THE RAT. J.Zweens: Nature, Lond., 1963, 197, 1114-1115 (Dept. Anat., State Univ. Groningen, Netherlands) In ♀ rats, the phospholipid content of the pineal gland decreases with age, and is linked with the oestrous cycle, being lowest just before ovulation and max. at di-oestrous. Ovariectomy causes an increase in phospholipids of the pineal gland. CM.Lewis

2103. GENITAL EFFECTS IN RAT OF POST-NATAL ADMINISTRATION OF ANDROGEN AND OESTROGEN. REACTIONS OF OVARY GRAFTED UNDER THE SPLENIC CAPSULE. G.Mayer and AJ.Thevenot-Duluc: C.R. Soc. Biol., Paris, 1962, 156, 1377-1378 (Lab. d'Histol., Fac. Méd., Bordeaux, France) Young rats received injn. of 500 /jg. oestradiol benzoate on the 1st and 4th day after birth. Others received 2-5 mg. testosterone propionate on the 4th day. After 4 months spontaneous ovulation and formation of corpora lutea was absent in ♀ rats of both groups. In cf rats from both groups there were testicular lesions. The ovary of rats receiving either oestradiol or testosterone which was grafted under the splenic capsule at 3 months, with ablation of the other ovary, contained numerous corpora lutea.

(French) M.A. Price

2104. EFFECTS OF ABLATION OF SUBMAXILLARY GLAND IN GUINEA-PIGS. IE. CHANGE OF FOLLICULAR FLUID AND ORIGIN OF ABERRANT OVARIAN FOLLICLES. K.Suzuki: Cytologia, 1961, 26, 468-474 (Shakujii Inst., Tokyo Med. Coll., Japan) Submaxillarictomised guinea-pigs showed abnormalities of ovarian follicular and tissue fluids in that these were coagulated and adherent to the ova, which began to degenerate. It is suggested that the submaxillary gland secretes an anti-coagulation enzyme. Coagulation appears to account for the high no. of binuclear ova (due to ooplasm fusion) and biovular follicles, and thus high twin no., in treated females. C.A.Stace

2105. DEVELOPMENT OF A FEEDBACK MECHANISM BETWEEN OVARY AND DIENCEPHALIC-HYPOPHYSEAL SYSTEM IN RAT. J.Presl, LHorsky, M.Henzl and J. Jirásek: J. Endocr., 1963, 26, 287-294 (Inst. for Care of Mother and Child, Prague, Czechoslovakia) The gonadotrophic activity and histol. structure of the anti-pituitary lobe were determined in rats 21 days following ovariectomy at intervals up to 50 days from birth. Evidence was obtained that the ovary-pituitary feedback was operative very early in post-natal life. CF.Blane

2106. OVARY OF 13-LINES GROUND SQUIRREL (CITELLUS TRIDECEMLINEATUS MITCHELL) AFTER ADRENALECTOMY. I.Chester Jones and I.W.Henderson: J. Endocr., 1963, 26, 265-272 (Dept.Zool., Sheffield

Univ., England) Female ground squirrels (*Citellus tridecemlineatus*) adrenalectomised in anoestrus remained healthy and developed no electrolyte disturbances in the 5 weeks of study. Cellular differentiation within or near to the ovaries of these animals, of a type not found in this vicinity in normal squirrels, was tentatively identified as being adrenocortical. CF.Blane

2107. INDUCTION OF LIMITED MULTIPLE OVULATIONS IN CATTLE. E.Schilling and W.Holm: J. Reprod. Fertil., 1963, 5, 281-284 (Max-Planck-Inst. ftr Tierzucht.und TierernShrung, Mariensee, Trenthorst, W.Germany) Prelim. comm. H.E.HJones

2108. SUPEROVULATION IN IMMATURE RAT FOLLOWING TREATMENT WITH PREGNANT MARES' SERUM [PMS] ALONE AND INHIBITION OF PMS-INDUCED OVULATION. MJCZarrow and D.L.Quinn: J. Endocr. 1963, 26, 181-188 (Dept. Biol. Studies, Purdue Univ., Lafayette, Ind., U.S.A.) Treatment with PMS alone was found to be sufficient to induce superovulation. Hypophysectomy virtually abolished this response as also did administration to intact rats of substances which interfere with neural transmission. Although combined PMS and HCG treatment would cause superovulation in the hypophysectomised animals this combination was rather less effective than PMS alone in intact rats. CF.Blane

2109. EFFECT OF HYPOTHYROIDISM, DIET AND LITTER SIZE ON SUPEROVULATION IN MOUSE AND RAT. E.D.Wilson, M.N.Runner and M-X.Zarrow: J. Reprod. Fertil., 1963, 5, 233-238 (Biol. Dept., Houston State Teachers Coll., Huntsville, Tex., U.S.A.) Litter size in mice influences the body growth of the young under normal conditions, on inadequate diet and under propylthiouracil [PTU] treatment. The larger litter size of 7 showed poorer growth than litters of 4, and the latte* developed larger ovaries when treated with PTU. There was no difference in the no. of ova released in the mice under different conditions of diet, PTU treatment and litter size. Increasing dosages of PTU caused a decrease in body wt. and in ova release in the rat. H.E.HJones

2110. COITAL BLOCK TO SUPEROVULATION IN HAMSTER. G.S.Greenwald: J. Reprod. Fertil., 1963, 5, 216-224 (Obstet. Gynaec. Dept., Kansas City, Kans., U.S.A.) Hamsters inj. with 60 I.U. pregnant mares serum [PMS] on day 1 of the oestrous cycle will ovulate 60 to 70 ova if they are isolated from ♂. If ? treated similarly are placed with males on day 2 or 3 coitus ta** place resulting in pseudopregnancy and the animals do not ovulate. If mating occurs late on day 3 ovulation occurs, presumably because the corpora lutea of the j previous ovulation regress at about this time. Animals Ig with 6 I.U. PMS plus 5 mg. progesterone on day 1 and W isolated from ♂ fail to ovulate, duplicating the effects * coitus. The results also indicate that the ovulation of ¹ follicles matured by PMS is due to endogenous gonadotro* phins rather than to the luteinising component of the P¹ prep. H.E.HJones

2111. VARIATION IN PROGESTERONE CONTENT OF BOVINE CORPUS LUTEUM OF THE OESTROUS CYCLE. S.E.Mares, R.G.Zimbleman and L.E.Casida: J. anim. Sci., 1962, 21, 266-271 (Univ. Wisconsin, Madisⁿ, Wis., U.S.A.) Corpora lutea from virgin heifers were examined at 2-day intervals from 3-19 days after oestrus. From 7-17 days the concn. and content of P¹ of progestrone increases, the concn. of 4-pregniene-20³-oij¹, one increased up to the 15th day and thereafter declif¹

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Free cholesterol concn. followed a course similar to that of the progestogens for 15 days but continued to increase subsequently. Concn. of RNA and DNA did not change significantly but the ratio, RNA/DNA decreased significantly over the 17 days. The wt. of corpora lutea changed little during 17 days but diminished subsequently; % dry matter in the tissue increased. The functional activity of the corpora lutea appeared to increase for approx. 15 days and then to decline. A.G.Pollard

2112. FAILURE OF TRANSIENT PROGESTERONE DEPRIVATION TO INDUCE OVA IMPLANTATION IN OVARIECTOMISED RATS. E.F.Nutting and R.K.Meyer: Proc. Soc. exp. Biol., N.Y., 1962, 111, 372-375 (Dept. Zool., Univ. Wisconsin, Madison, Wis., U.S.A.) Delay in ova implantation in rats ovariectomised on day 9 of pregnancy in response to daily injn. of progesterone was not affected by its temporary withdrawal on day 9, * and 10 or 13. Nidation was induced in the same animals shortly after beginning daily injn. of oestrone in combination with progesterone. M.M.Shapland

2113. NEW FACTOR ASSOCIATED WITH IMPLANTATION OF MOUSE EGG. I.B.Wilson: J. Reprod. Fertil., 1963, 5, 285-286 (Zool. Dept., Univ. Coll. N. Wales, Bangor, N. Wales) Prelim. comm. H.E.H.Jones

2114. RECORDING OF BIOELECTRICAL ACTIVITIES OF INTACT CHICK EMBRYOS IN OVO. A.Terzin, N.R. Jec and N.J.Bokonjic: Brit. J. exp. Path., 1963, 44, 88-100 (Inst. Virol., Med. Fac., Sarajevo, Yugoslavia) Technique is described for recording bioelectrical potentials from chick embryos by attaching electrodes through holes drilled in shell. Age accounts for differences in records which are divided into main categories: motion-current waves and pulse-waves. Effects of mump virus infection and of cooling are described. D.L.Gardner

2115. EFFECT OF TOTAL THYROIDECTOMY IN RABBIT FOETUS ON FOETAL CHOLESTEROL METABOLISM. J.G.Bearne and T.R.E.Pilkington: Nature, Lond., 1963, J97, 1302-1303 (Dept Anat., Middlesex Hosp. Med. Sch., London, England) A new technique for extracting the thyroid gland of rabbit foetuses is described and does not interfere with their ability to swallow amniotic fluid. After thyroidectomy on the 23rd day of intrauterine life, foetuses were recovered by Caesarean section on the 29th day, compared with their littermates. * *the serum cholesterol was measured* M.L.wis raised.

2116. ROLE OF VARIATIONS IN TOTAL GONADAL STEROIDS AND CORTICOSTEROIDS IN THE APPEARANCE OF DECIDUAL REACTIONS IN RAT. P.Burm ^G.Mayer: C.R. Soc. Biol., Paris, 1962, 156, 170-172 (Lab. d'Histo., Fac. Méd., Bordeaux, France) Administration of 1-5 ug./day oestradiol to rats receiving injn. of 2-5 fig/day progesterone resulted in the appearance of spontaneous decidual reactions. Traumatic decidual reactions could be induced in rats receiving oestradiol and progesterone, after adrenalectomy. Administration of com. J.D. deoxycorticosterone resulted in decreased development of traumatic decidua in adrenalectomised rats. (French) M.A.Price

2117. CURTAILMENT OF UTEROTROPHIC ACTION OF OESTROGEN BY IMPAIRED HISTAMINE LIBERATION IN ALLOXAN-DIABETIC RAT: REVERSAL BY II N

AND BY ADRENALECTOMY. D.D.Fowler, C.M.SzegO and S.J.Sloan: Endocrinology, 1963, 72, 626-637 (Zool. Dept., Univ. California, Los Angeles, Calif., U.S.A.) The action of oestrogen on the uterus of rats was inhib. in alloxan diabetic animals and this action was reversed by insulin treatment and adrenalectomy. The action of oestrogen was dependent on the release of uterine histamine which is deficient in alloxan diabetic animals. H. Jones

2118. IN VIVO STUDY OF VARIATIONS IN SENSITIVITY OF RAT UTERUS POST-PARTUM. J.M.Gueme: C.R. Soc. Biol., Paris, 1962, 156, 1500-1503 (Lab. Physiol. generale, Fac. Sci., Strasbourg, France) The sensitivity of the post-partum uterus of rat to oxytocin was decreased by hypophysectomy, adrenalectomy, ovariectomy, ovariectomy and adrenalectomy or partial pancreatectomy. Ablation of the post-hypophysis did not modify uterine sensitivity. (French) M.A. Price

2119. MELANOPHORE-EXPANDING SUBSTANCE FROM HUMAN PLACENTA. L.N.Karkun and D.P.Sen: Ann. Biochem., 1963, 23, 81-90 (Central Drug Inst., Lucknow, India) Extracts from human placenta showed some melanophore-expanding activity. The active substance seemed to be heat-stable, but alkali-labile. The time-response curve simulated that of human and ox pituitary melanophore-stimulating hormone, but the dose-response line did not. K. Jones

2120. SOME EFFECTS OF DENERVATING AND TRANSPLANTING MAMMARY GLANDS. J.L.Linzell: Quart. J. exp. Physiol., 1963, 48, 34-60 (A.R.C/Inst. Anim. Physiol., Babraham, Cambridge, England) Mammary glands of goats transplanted to the neck in one stage and therefore denervated showed normal functioning. When glands were transplanted to other animals the milk yield fell off rapidly after the first day. Glands transplanted in 2 stages grew less well than glands transplanted in 1 stage. The milk-ejection reflex appears to be relatively unimportant in goats. H.C.Jones

2121. MILK SECRETION IN RABBIT INDUCED BY INJECTION OF 5HT IN THE REGION OF THE HYPOTHALAMUS. R.Keyl, J.C.Czyba, C.Arnaud and H. Gueyffier: C.R. Soc. Biol., Paris, 1962, 156, 1414-1415 (Chaire d'Histo., Fac. Méd., Lyon, France) Non-pregnant rabbits received a daily injn. of 10 mg. 5HT for a week. 7 out of 12 rabbits showed milk secretion during the 2nd to 4th day of treatment. A similar result has been obtained by injn. of reserpine. (French) MJV .Price

2122. INFLUENCE OF THE METHOD OF ISOLATING URINARY GONADOTROPHINS ON THEIR BIOLOGICAL ACTIVITY. R.Vanden Driessche and M.J.Hans-Berteau: Arch. int. Phannacodyn., 1963, 142, 268-270 (Pharmacol. Lab., Free Univ., Brussels, Belgium) The proportions of FSH and LH in urinary gonadotrophin extracts varied according to the extraction technique employed. (French) T.J.Sullivan

2123. VASCULAR AND EX TRAVASCULAR RADIOACTIVITY AFTER INJECTION OF [6,7-3H]OESTRADIOL IN HUMAN BEING. M.R.Malinow, J.A.Mogulevsky, B.Lema and G.E.Bur: J. clin. Endocr., 1963, 23, 306-310 (Inst. Physiol., Med. Sch., Buenos Aires, Argentina) Radioautography was performed in most tissues from 4 terminal patients inj. shortly before death with [6, 7-3H]oestradiol. The hormone and/or its



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- metabolites were widely distributed throughout the body. K.Jones
2124. 2-METHCXYOESTRONE AS OESTROGEN METABOLITE IN HUMAN SUBJECT. P.Hobkirk and M.N.Ussen: *J. clin. Endocr.*, 1963, 23, 274-278 (Univ. Med. Clin. Gen. Hosp., Montreal, Canada) During the last 20-30 weeks of pregnancy, the level of 2-methoxyoestrone in the urine of 4 subjects ranges from 25 fig./24 hr. to 1 mg./24 hr. The behaviour of 2-methoxyoestrone is attributed to demethylation to form 2-hydroxy steroids. K.Jones
2125. OESTROGEN EXCRETION AS AN INDEX OF PLACENTAL FUNCTION. J.W.Greene, jun., J.C. Touchstone and H.Fields: *Araer. J. med. Sci.*, 1962, 244, 756-762 (Dept. Obstet., Univ. Pittsburgh Sch. Med., Philadelphia, Pa., U.S.A.) Review. 46 ref. E.E.Hobbiger
2126. FURTHER STUDIES ON EFFECTS OF OESTROGENS AND ANTI-OESTROGENS ON EARLY PREGNANCY IN MICE. L.Martin, R.I.Cox and C.W.Emmens: *J. Reprod. Fertil.*, 1963, 5, 239-247 (Vet. Physiol. Dept., Univ. Sydney, N.S.W., Australia) A no. of synthetic anti-oestrogens were shown to interrupt early pregnancy in mice, though it is not clear whether they do so by reason of their anti-oestrogenic or pro-oestrogenic activities since both prop. correlated with the ability of the compounds to interrupt pregnancy. An expt. which involved the simult. administration of dimethylstilboestrol and oestradiol failed to clarify the situation. H.E.HJones
2127. OESTROGEN ANTAGONISM: A COMPARISON OF EFFECTS OF VARIOUS ANTI-OESTROGENS ADMINISTERED SEPARATELY AND AS MIXTURES WITH OESTROGEN. R.A.Edgren, I.P.Weinberg and T.G.B. Cochran: *Endocrinology*, 1963, 72, 665-666. Administration of a series of anti-oestrogens, together with oestrogen to spayed mice had the same effect whether given mixed with the oestrogen or when the 2 substances were given separately. H.C.Jones
2128. METABOLISM OF [4-¹⁴C]PROGESTERONE IN YOUNG AND ELDERLY MEN. L.P.Romanoff, C.W. Morris, P.Welch, M.P.Grace and CPincus: *J. clin. Endocr.*, 1963, 23, 286-292 (Worcester Fdn. Expt. Biol., Shrewsbury, Mass., U.S.A.) The excretion of pregnanediol and the secretion rate of progesterone expressed as mg./day or as mg./g. creatinine were significantly less in elderly than in young subjects. The contrast between the age-related changes observed in progesterone and cortisol metabolism is discussed. K.Jones
2129. AN ANTI-ANDROGEN ASSAY USING THE CASTRATED MOUSE. R.I.Dorfman: *Proc. Soc. exp. Biol.*, N.Y., 1962, 111, 441-443 (Worcester Fdn. Expt. Biol., Shrewsbury, Mass., U.S.A.) Anti-androgen assay, using the testosterone stim. castrated immature mouse employing the end-points of wt. of seminal vesicle and prostate, is reproducible and possesses better sensitivity than the method using the castrated rat. M.M.Shapland
2130. ASSAY OF S.C. INJECTED ANDROGENS IN CASTRATED RAT. R.I.Dorfman and A.S.Dorfman: *Acta endocr.*, Khb., 1963, 42, 245-253 (Worcester Fdn. Expt. Biol., Shrewsbury, Mass., U.S.A.) The wt. of the seminal vesicles, ventral prostate and levator ani have been used as end-points in an assay for androgens using s.c. injn. of castrated rats. The X values of precision were < 25% for the organ wt. and the sensi-

tivity of testosterone was 0.6 mg. inj. s.c. and daily for 10 days. Esterification increased the activity of testosterone whilst oxidation decreased it. Relative potencies of several androgens are given. H.B.Waynforth

2131. EFFECTS OF ABLATION OF SUBMAXILLARY GLAND IN GUINEA-PIGS. IV. CAUSE OF DETERIORATION OF THE TUBULES IN THE TESTES. K.Suzu^W
Cytologia, 1961, 26, 475-479 (Shakujii List., Tokyo Med. Coll., Japan) Submaxillaryectomised guinea-pigs showed coagulation of intercellular substances in the testes which is thought to cause the deterioration of the testicular tubules. The atrophy of the germ-cells also noted may similarly be due to coagulation in the germinal epithelium. It appears that the submaxillary gland secretes a testicular anticoagulation enzyme. C.A.Stace

2132. EFFECT OF THYROXINE ON MATURATION OF TESTES AND PROSTATE GLAND OF THE RAT. G.B. Talbert: *Proc. Soc. exp. Biol.*, N.Y., 1962, 111, 290-292 (Downstate Med. Center, State Univ. N.Y.i Brooklyn, N.Y., U.S.A.) Maintenance of elevated thyroxine levels from birth to 36 days accelerates the maturation of seminiferous epithelium of the testes but at the same time reduces the rate of increase in wt. of the testes and the ventral prostate gland. M.M.Shapland

2133. TERMINAL FORMATION OF URETHRAL PLUGS IN MALE MICE. J.P.Rapp: *Proc. Soc. exp. Biol.*, N.Y., 1962, 111, 243-245 (Penrose Res. Lab., Zool. Soc. of Philadelphia, Pa., U.S.A.) Urethral plug* of coagulated seminal fluid produced when mice are killed by ether inhalation but not when killed by s.c. injn. of Na pentobarbital, are not a natural cause of urinary obstruction. M.M*Shapland

2134. SPERMICIDAL EFFECTS STUDIED WITH PHOTOGRAPHIC METHOD: EFFECT OF SODIUM FLUORIDE. P.E.Lindahl and K.Wedin: *Exp. Cell Res.*, 1963, 29, 242-260 (Inst. Zoophysiol., Univ., Uppsala, Sweden) Assuming that sperm motility was blocked with F" by & hbn. of an enzyme involved in the motile mechanism curves relating probability of retained motility to time^e were adapted to expt. found points. The course of these curves were determined by 3 parameters, via. m, the no. of mol. in the cell of the relevant enzyme sensitive to F"; n, the no. of mol. of this kind which had to be inactivated before the cell stopped moving; and k, a rate const. Under all conditions, m remained the same, n varying with sperm, k increased with temp., and rose proportionately with the F" concn. K.Jones

2135. EVALUATION OF THE SPERMATOZOA AND SEMINAL PLASMA OF THE INFERTILE MALE. D.C. Tweed: *Cleveland clin. Quart.*, 1963, 30, 30-38. (Dept. Clin. Path., Cleveland Clin., Ohio, U.S.A.) Wide variations in the amount of DNA were found in spermatozoa from infertile men. The hormones, enzymes and other compounds present in seminal plasma* are reviewed and their possible relationship to infertility discussed. The role of immune phenomena are also considered, i.e. auto-immunity in the cf or Ag-Ab lespos^{V*} in the ? G.M.Le^{wls}

2136. CONTROLLING AND RECORDING RATES OF FREEZING AND DEFROSTING OF HUMAN SEMEN. M.Freund and J.Wiederman: *J. appl. Physiol.*, *⁹⁶³, 18, 407-409 (Physiol. Dept., N.Y. Med. Coll., and 5th Ave. Hosp., New York, N.Y., U.S.A.)

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Apparatus is described in which human semen has been frozen and defrosted over a wide range of rates. Freezing and thawing runs are repeatable and enable the effect of other variables to be studied. H. Clones

2137. QUESTIONABLE PROTECTION BY INTRACELLULAR GLYCEROL DURING FREEZING AND THAWING. J.K.Sherman: J. ceU. comp. Physiol., 1963, 61, 67-84 (Dept. Anat., Univ. Arkansas Sch. Med., Little Rock, Ark., U.S.A.) Evidence is presented that

suggests that the site of action of glycerol during freezing and thawing of unfertilised mouse eggs and bull spermatozoa is extracellular, and that intracellular glycerol is in fact detrimental to these cells. G.M.Lewis

2138. THE STIRRING OF THE MEDIUM BY BULL SPERMATOZOA. AJ.Reynolds and Lord Rothschild: Proc. Roy. Soc. B., 1963, 157, 461-472 (Cavendish Lab., Univ. Cambridge, England) The rate of respiration of bull spermatozoa is not increased by agitaton of the VIO or 1/5 suspensions. It was shown by expt. using a "aaometric flask of special shape that me sperm suspensions increase the effective diffusion coeff. of O₂ in medium by 900%. Photomicrographic studies confirmed the hypothesis that this was due to short-range Order in suspens? by attraction of the sp? This effect is decreased by reduction in temp, or sperm density. G.M.Lewis

2139. EFFECT OF pH ON SWIMMING-RATEOF BULL SPERMATOZOA. D.Tampion ^ ^ ^ J f ^ J. 49-200 (Physiol. Dept., Berks., England) The swimming rate of bull spermatozoa was measured microscopically when 10000 cells/ μ l. were in a medium of 0.014M phosphate at several pH levels. At pH 6.5 and 7.5 the results were the same as for unbuffered saline soln. At pH 8.5 swimming rate was initially improved but after 1 hr. the spermatozoa were swimming more slowly and fewer were surviving than in any other medium.

The significance of these results in relation to the swimming of spermatozoa in the Y tract is discussed.

H.E.H.Jones

2140. SWIMMING RATE OF BULL SPERMATOZOA IN VARIOUS MEDIA AND EFFECT OF DILUTION. D. Tampion and R. A .Gibbons: J. Reprod. Fertil., 1963, 5, 259-275 (Physiol. Dept.. N.I.R.D.. Shinfield, Reading, Berks., England)

The swimming rate of bull spermatozoa was measured by direct observation at a diln. of 20000 spermatozoa/Vl. in various media. Motility was maintained better in seminal fluid from die ejaculate that provided the cells than in physiol. saline, though the rate was not so good. 'Sperm extract' or Baker's medium gave slightly higher rates than saline. The cells swam more slowly in cow's cervical mucous than in any other medium and it was not possible to show any dependence of swimming rate on the concn. of the mucous. About 1/2 of the spermatozoa which had swum into the mucous were non-motile at the end of 1 hr. at all diln. If spermatozoa swum through a strip of mucous into saline the mean rate and freq. distribution of rates in the saline resembled those of controls directly dil. in saline much more than they resembled the figures for swimming rates in mucous. It was concluded that mucous does not have a 'selecting' effect on the swimming rate of spermatozoa. H. E. H. Jones

2141. OBSERVATIONS ON MAMMALIAN ACROSOME: EXPERIMENTAL REMOVAL OF ACROSOMES FROM RAM AND BULL SPERMATOZOA. R.R.Hathaway and E.F.Hartree: J. Reprod. Fertil., 1963, 5, 225-232 (Biol. Chem. Dept., Med. Coll., Univ. Utah, Salt Lake City, Utah, U.S.A.) Staining by Giemsa or PA-Schiff showed that 0.0125 N NaOH dissolved the acrosomes from washed spermatozoa, and that they could be detached as such from spermatozoa by 1.5 mM cetyl-trimethylammonium bromide or by shaking with glass beads. N₂ and sugar determinations on extracts from spermatozoa confirmed the removal of material from the cells. Release of hyaluronidase from the treated spermatozoa was also observed. Ram sperm extracts contain 4 Ag all similar to Ag in ram seminal plasma in double diffusion agar plates. The antisera were also capable of sperm aggln. H.E.H. Jones

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2142. EFFECTS OF SOME METABOLIC INHIBITORS ON THE ROCKING RESPONSE OF A HEMILEUCINE MOTH. AJD.Blest and T.S.Collectt: Behaviour. 1963, 20, 207-220 (Dept. Zool., University Coll., London, England)

The rocking response by Automeris cinerea gradually wanes at 2⁷. Waning is accelerated by injn. of DNP and Na azide, except when moths have walked before rocking. When rocking is infrequent, waning only occurs just before knockdown. The response recovers after rest. High doses of cyanide induced convulsions, lower doses slightly delayed waning. J.R.Cockbain

2143. TASTE BY TOUCH: SOME PRELIMINARY EXPERIMENTS WITH OCTOPUS. MJ.Wells: J. exp. Biol., 1963, 40, 187-193 (Dept Zool., Univ., Cambridge, England) Twelve Octopus vulgaris were taught to discriminate by touch between porous objects soaked in soln. of substances in sea water. They can detect HCl, sucrose and quinine in sea water in concn. at least 100 times as dilute as the human tongue is capable of detecting in distilled water. The function of the "olfactory" organ and the use Octopus makes of its chemotactile sense are discussed. AJ.Martin

2144. INHIBITION OF QUEEN REARING BY QUEEN HONEY-BEES (APIS MELLIFERA L.) OF DIFFERENT AGES. C.G.Butler and P.N.Paton: Proc. roy. ent. Soc. Lond. A, 1962, 37, 114-116 (Rothamsted Expt. Stn., Harpenden, Herts., England) Young virgin queens of the sp. A. mellifera L. are less able to inhibit queen rearing by workers than older mated laying queens, not due to lack of 9-oxodecanoic acid but probably to shortage of some 'inhibitory scent'. Although at first the heads contain little 9-oxodecanoic acid, the amount increases from 5-10 days of age and remains high until the bees are old or about to be superseded or swarm. D.M.S.Perkins

2145. QUEEN CELL CONSTRUCTION IN HONEY BEE (APIS MELLIFERA L.) COLONIES HEADED BY QUEENS WITHOUT MANDIBULAR GLANDS [MG]. N.E.Gary and R.A.Morse: Proc. roy. ent. Soc. Lond. A, 1962, 37, 76-78 (Dept. Ent., Cornell Univ., Ithaca, N.Y., U.S.A.) Queens of the sp. A. mellifera L. without MG retain much of their capacity to inhibit queen rearing. Removal of a queen's MG did not appear to influence her rate of oviposition nor the foraging behaviour of her workers. D.M.S.Perkins

2146. SOME PHYSIOLOGICAL AND ECOLOGICAL ASPECTS OF LOCUST PHASES. F.O.Jubrecht: Trans, roy. ent. Soc. Lond., 1962, 114, 335-375 (Lab. d'Evol. des Êtres Organisés, Paris, France) Locusta migratoria, Nomadacris septemfasciata and Schistocerca gregaria were studied for the effect of crowding or isolating parents on the survival of unfed hatchlings. D.M.S.Perkins

2147. LYSERGIC ACID DIETHYLAMIDE [LSD-25]. XXXHI. EFFECT ON SURFACING BEHAVIOUR OF THE CARP AND POSSIBLE APPLICATION TO GAME CONSERVATION AND SURVIVAL KITS. H.A.Abramson, H.H.Gettner, M.P.Hewitt and G.Dean: J. Psychol., 1961, 52, 445-455 (Long Island Biol. Assocn., Cold Spring Harbor, N.Y., U.S.A.) Although 1800 compounds force-fed to carp have not produced directed movements, LSD-25 and (+)-lysergic acid ethylamide (LAE-32) caused surfacing behaviour. Carp up to 2 lb.

in wt. responded to the same concn. as Siamese fighting fish weighing only 1 g. CD Putnam

2148. THE RESPONSE OF THE FERAL PIGEON WHEN OFFERED ACTIVE INGREDIENTS OF COMMERCIAL REPELLENTS IN SOLN. CJ.Duncan: Ann. appl. Biol* 1963, 51, 127-134 (Dept. Zool., Univ., Liverpool, England) Caged pigeons were given different concn of repellent soln. in place of drinking water. The pigeon showed a high degree of discrimination, markedly rejecting JB-naphthol soln. It is suggested that some commercial repellents operate by irritant action rather than by i true gustatory repellency. J.R.Cockbain

2149. FLIGHT ENERGY AND ESTIMATED FLIGHT RANGES OF SOME MIGRATORY BIRDS. E.P.Odum, CE.Connell and H.L.Stoddard: Ibis, 1963, 105A, 515-527: Auk, 1961, 78, 515-527. Three classes of migrants are considered in relation to fat deposition : short-range migrants that become moderately obese, but begin migration before peak deposition; short-range migrants that attain moderate obesity but begin migration after the peak deposition levels have been reached; long-range migrants that become extremely obese just prior to long flights. Measured lipid levels and estimated flight ranges are presented for samples of birds (totalling 853 individuals of 15 spp.) killed during nocturnal migration at a Gulf coast TV tower in Florida, or collected from premigratory aggregations at inland loc&ities. Ibis

2150. ERYTHROCYTE ANTIGEN GENOTYPE AND BEHAVIOURAL TRAITS IN CHICKEN. J.Bennett, A.B. Woodruff, R.A.Anderson and W.E.Briles: Life Sci., 1962, No.12, 663-667 (Dept. Biol. Sci., N. Illinois Univ., DeKalb, 111, U.S.A.) Prelim. results wi# White Leghorn hens indicate that the B and C blood gff systems are involved in social dominance patterns and affect performance in simple choice learning in a T-maze. K.Jone*

2151. PLACEBO EFFECT IN THE RAT. RJ^ermstein-'' Science, 1962, 138, 677-678 (Psychol. Lab., HaV* Univ., Cambridge, Mass., U.S.A.) Scopolamine hydrobromide disrupts the learned behaviour of rats in * predictable manner. Physiol. saline mimics to some extent the effect of the drug when the 2 substances are inj. alternately. This placebo effect appears to be an J stance of simple Pavlovian conditioning. G.M.Lewis

2152. CHOLINERGIC TRACING OF A CENTRAL NEURAL CIRCUIT UNDERLYING THE THIRST DRIVE. A.E. Fisher and J.N.Coury: Science. 1962. 138, 691-699 (Dept. Psychol., Univ. Pittsburgh, Pa., U.S.A.) Cholinergic stimm. of any of a no. of interrelated limbic and diencephalic structures in the rat increases water intake. It is postulated that a generalised Papez circuit mediates the thirst drive, that the circuit is specifically and functionally sensitive to cholinergic action, and that the other primary drives depend on closely parallel neural circuits partitioned both structurally and biochem. C M.Lewis

2153. IS MEMORY A MATTER OF ENZYME INDUC^ C.E.Smith: Science, 1962, 138, 889-890 (San V? State Coll., Sa Jose, Calif., U.S.A.) Evidence ^ discussed which supports the hypothesis that the basis of memory lies in an increase in the concn. of enzymes ^ associated with transmitter substances, as a long-lag^ effect of stimn. GM^leve*

2154. DETECTION THEORY APPLIED TO ABSOLUTE SENSITIVITY OF SENSORY SYSTEMS. E.Eijkman and AJ.H.Vendrick: *Biophys. J.*, 1963, 3, 65-78 (Dept. Med. Phys., Univ. Nijmegen, Netherlands) Expt. data, mainly obtained from touch and warmth senses, is shown to fit a decision model more closely than a threshold model. The expt. suggest that an internal noise exists, which is a neural activity indistinguishable from the neural activity caused by small stimuli, and additive to these. For touch, the relationship between stimulus and neural activity is non-linear. D.Crathorn

2155. STRAIN DIFFERENCES IN ACTIVITY, EMOTIONALITY, BODY WEIGHT AND SUSCEPTIBILITY TO STRESS-INDUCED STOMACH LESIONS. J.O.Sines: *J. genet. Psychol.*, 1962, 101, 209-217 (Dept. Psychiat., Univ. Missouri Sch. Med., Columbia, Mo., U.S.A.) ^Pen-field behaviour and susceptibility to immobilisation-induced stomach lesions were studied in d and Y of 5 strains of laboratory rats. Strain differences were observed particularly in the d. The incidence of stomach lesions was pos. related to the amount of activity and defecation in the open field. J.R.Broome

2156. EFFECT OF TETANUS ON THE PARENTAL BEHAVIOUR IN THE RAT. A.A.Fedinec: *Nature*, Lond., 1963, 197, 497-498 (Dept. Anat., Univ.Tennessee Med. Unit, Memphis, Tenn., U.S.A.) Parental behaviour in ♀ rats as evidenced by nest building, licking ♀; vulva, cleaning of the new-born, eating of the afterbirth, retrieving, nursing and suckling, was greatly affected by injn. of 3 MLD tetanus toxin before parturition. CM.Lewis

2157. EFFECT OF BILATERAL SYLVIAN GYRUS ABLATIONS ON AUDITORY CONDITIONING IN DOGS. H.Chorazyna and L.Stepien: *Bull. Acad. pol. Sci.*, 1963, 11, 43-45 (Dept. Neurophysiol., Nencki Inst. Exp. Biol., Polish Acad. Sci., Poland) Results showed that when compound stimuli were used sylvian syn might not be indispensable for solving a task. Differentiation was not impaired by sylvian ablation. J.E.Hobbs

2158. EFFECTS OF STIMULUS VARIATION ON SEXUAL SATIATION IN THE MALE RAT. A.E.Fisher: *J. comp. Physiol. Psychol.*, 1962, 55, 614-620 (Univ. Pittsburgh, Pa., U.S.A.) The effect of ? stimulus change J*? sexual satiation in the d rat has been studied. During j^aticm tests in which ? were systematically changed, f^ats doubled or tripled capacity measures obtained with an^le * • T*¹⁶ data are Pertinent to theories of sexual n^ arousal-adaption neural mechanisms and to the valid assessment of sexual capacity in normative and physiol. intervention studies. LS.Scholes

2159. DISTRIBUTION AND SPECIFICITY OF GAMMA MOTONEURON CONDITIONED RESPONSES. LS.Buch-WaW, D.Beatty and E.Eldred: *Exp. Neurol.*, 1962, 6, 24-537 (Dept. Anat., Sch. Med., Univ. California, Los Angeles, Calif., U.S.A.) The activity of y ^cent units in the lumbar ventral roots was investigated in cats during conditioning procedures in which the conditioned stimulus was compared with an unconditioned stimulus. Conditioned discharges of the y motoneurons be unaccompanied by discharge of the a motoneurons. It was found that the V fibres to muscles in the Jpn. it was found that the one trained took part in the condition^ other than the one trained took part in the conditioned response. These followed a definite pattern and were not part of a known sp. activation of Y activity. P.W.Nathan

2160. SELF MAINTAINED SENSORY INPUT AND SENSORY DEPRIVATION IN MONKEYS. S.S.Fox: *J. comp. physiol. Psychol.*, 1962, 55, 438-444 (Univ. Michigan, Ann Arbor, Mich., U.S.A.) A series of 2 expt. are reported designed to quantify behaviour leading to the maintenance of stimulus input levels, and investigate the effect of sensory deprivation on such behaviour. J.Scholes

EXPERIMENTAL PSYCHOLOGY

2161. REACTIVE INHIBITION IN THE PARAMECIUM. S.J.Lachman and J.M.Havlena: *J. comp. physiol. Psychol.*, 1962, 55, 972-973 (Wayne State Univ., Detroit, Mich., U.S.A.) 1000 *Paramecium caudatum* were studied in mazes etched in glass-mounted paraffin plates and having from 1 to 9 right turns preceding a T choice point. In most cases the distribution of right and left turns approximated to chance expectancy, which does not support the concept of reactive inhibn. J.R.Broome

2162. ATTEMPT AT CLASSICAL CONDITIONING IN THE PLANARIAN. E.S.Halas, R.L.James and CS.Knutson: *J. comp. physiol. Psychol.*, 1962, 55, 969-971 (Univ. N. Dakota, Grand Forks, N. Dak., U.S.A.) Expt. with planaria (*Dugesia tigrina*) using light as a conditioned stimulus and electric shock as an unconditioned stimulus, gave results similar to those obtained by Thompson and McConnell, which indicated that classical "conditioning could be established in planaria. An interpretation in terms of reflex sensitisation is suggested. J.R.Broome

2163. VISUAL DISCRIMINATION OF SHAPE BY OCTOPUS: SQUARES AND CROSSES. N.S.Sutherland: *J. comp. physiol. Psychol.*, 1962, 55, 939-943 (Oxford Univ., U.S.A.) Octopuses, *Octopus vulgaris* Lamark, were trained to discriminate between a square and a cross and then given transfer tests with 27 other shapes. The results indicated that one of the main ways in which octopuses analyse shapes is by counting the total length of thin segments present, weighting horizontally oriented segments most heavily and oblique segments least heavily. J.R.Broome

2164. DISCRIMINATION AND GENERALISATION ON A DIMENSION OF STIMULUS DIFFERENCE. W.K.Honig and R.W.Day: *Science*, 1962, 138, 29-31 (Dept.Psychol. Denison Univ., Granville, Ohio, U.S.A.) Four pigeons were trained to peck at one key when 2 identical monochromatic stimuli were displayed, and at another key when the stimuli were displayed with a wavelength difference of 40 m/i. With stimulus combinations ranging from 0 to 70 mu in a generalization test, key preference was a function of the degree of difference between the stimuli. G.M.Lewis

2165. THE OCCURRENCE OF CORRECTING BEHAVIOUR IN VARIOUS INSECTS. H.Dingle: *Ecology*, 1962, 43, 727-728 (Dept. Zool., Univ. Michigan, Ann Arbor, Mich., U.S.A.) Insects were tested on a causeway with a compulsory 90° turn, and a second, optional, correcting turn. Six spp. showed correcting behaviour, whilst 3 others, including 2 ant. spp., did not. Correcting behaviour may be an adaptation to a sp. habitat. J.R.Cockbain

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appear to be systematically related to goal responding during extinction. J.R.Broome

2192. RELATIVE EFFECTS OF FORCED REWARD AND FORCED NON-REWARD DURING WIDELY SPACED SUCCESSIVE DISCRIMINATION REVERSAL. K.N. Clayton: *J. comp. physiol. Psychol.*, 1962, 55, 992-997 (Vanderbilt Univ., Tenn., U.S.A.) Rats forced at different stages of practice in a T-maze to make incorrect responses were compared with others forced to make correct responses or given free trials. No intraproblem improvement of main effects due to the forcing variable were found on any comparison. J.R.Broome

2193. PARTIAL-REINFORCEMENT EXTINCTION EFFECT FOLLOWING DIFFERENT AMOUNTS OF TRADnHGIL W.E.Bacon: *J. comp. physiol. Psychol.*, 1962, 55, 998-1003 (Johns Hopkins Univ., Baltimore, Md., U.S.A.) Extinction running speeds in an alleyway were obtained from rats which were given different no. of acquisition trials and different % of reinforcement. When resistance to extinction is defined as mean extinction running speed, the results supported Grant and Schipper's hypothesis that reinforcement and discrimination operate in a partial-reinforcement situation. If resistance is defined as the rate of decrease in running speed during extinction the results do not appear to support this theory. J.R.Broome

2194. EXTINCTION AS A FUNCTION OF PARTIAL REINFORCEMENT AND OVERTRENING. C.McCain, P.Lee and N.Powell: *J. comp. physiol. Psychol.*, 1962, 55, 1004-1006. Rats were trained in a straight alley maze using 50% random partial reinforcement. The animals given 200 acquisition trials prior to extinction extinguished more rapidly than those given 60 acquisition trials. J.R.Broome

2195. EFFECT OF EARLY EXPOSURE TO PHOTIC STIMULATION ON BRIGHTNESS DISCRIMINATION AND EXPLORATORY BEHAVIOUR. M.R. D'Amato and H. Jagoda: *J. genet. Psychol.*, 1962, 101, 267-271 (Dept. Psychol., 1962, 101, 267-271 (Dept. Psychol., New York Univ., N.Y., U.S.A.) Albino and pigmented rats were raised in breeding cages with either very dim illumination or with relatively bright illumination. The results of a modified open field test and a brightness discrimination test in a Y-maze showed that early experience with moderate illumination levels can reduce the neg. phototropism of young adult albino and pigmented rats. J.R.Broome

2196. CAT'S ABILITY TO DISCRIMINATE OBLIQUE RECTANGLES. N.S.Sutherland: *Science*, 1963, 139, 209-210 (Inst. Expt. Psychol., Oxford Univ., England) Cats being trained to discriminate between 2 oblique rectangles, one at 45° die other at 135° to the horizontal, performed as well as those being trained with horizontal and vertical rectangles. The ability of a tp. to discriminate rectangles in different orientations may depend on the relative no. of cells in the visual system having receptive fields in each orientation. G.M.Lewis

2197. CONCURRENT CONDITIONING OF BAR PRESS AND SALIVATION RESPONSES. W.Kintsch and R.S. White: *J. comp. physiol. Psychol.*, 1962, 55, 963-968 (Univ. Missouri, Mo., U.S.A.) Expt. on surgically prep, dogs using fixed-interval, fixed-ratio and purely 'temporal' reinforcement schedules showed

parallelism in general between bar-pressing and salivation. Under certain conditions, however, no such parallelism occurs. J.R.Broome

2198. FORM GENERALISATION IN THE INFANT MONKEY. R.R.Zimmermann: *J. comp. physiol. Psychol.*, 1962, 55, 918-923 (Univ. Wisconsin, Madison, Wis., U.S.A.) Infant rhesus monkeys learned a single torn" discrimination problem and were then tested for generalisation on a large variety of visual stimuli. Significant and consistent responses were shown to new pairs of form stimuli which maintained physical resemblance to the original stimulus pair. J.R.Broome

2199. EFFECTS OF SOCIAL RESTRICTION ON THE BEHAVIOUR OF RHESUS MONKEYS. IE. DOMINANCE TESTS. W.A.Mason: *J. comp. physiol. Psychol.*, 1961, 54, 694-699 (Yerkes Lab. Primate Biol., Orange Park, Fla., U.S.A.) Pairs from a group of 6 wild caught monkeys showed stable dominance relationships before the introduction of food competition tests [FCT]. These changed little during testing, and fighting, which was infrequent, was only initiated by dominant monkeys. In a group of 6 laboratory-reared monkeys, dominance relationships during FCT were unstable. Fighting occurred frequently during the tests, and both dominant and subordinate monkeys fought. C.D.Putnam

2200. EFFECT OF FRUSTRATION ON THENON-NUTRITIVE SUCKING [NNS] OF THE INFANT RHESUS MONKEY. L.S.Benjamin: *J. comp. physiol. Psychol.*, 1961, 54, 700-703 (Psychol. Dept., Univ. Wisconsin, Madison, Wis., U.S.A.) Infant rhesus monkeys 'frustrated' by having to wait for 250 sec. before a transparent partition between them and food was raised showed more NNS (i.e. of various parts of the bow than controls. C.D.Putnam

2201. EFFECTS OF AGE AND PREVIOUS TRAINING ON PATTERNED-STRINGS [P-S] PERFORMANCE OF RHESUS MONKEYS. W.A.Mason and H.F.Harlow: *J. comp. physiol. Psychol.*, 1961, 54, 704-709 (Psychol. Dept., Univ. Wisconsin, Madison, Wis., U.S.A.) The efficiency with which 81 rhesus monkeys solved P^k problems improved with advancing age and practice, all younger monkeys showing a consistent tendency to choose the wrong string if the strings were crossed. In general the results indicate that the perceptual capabilities of these monkeys are not fully developed at 1 yr. of age, and probably not evdn at puberty. C.D.Putnam**

2202. EARLY BEHAVIOUR PATTERNS IN RHESUS MONKEYS. J.B.Mowbray and T.E.Cadell: *J. comp. physiol. Psychol.*, 1962, 55, 350-357 (Univ. Wisconsin, Madison, Wis., U.S.A.) Fifteen rhesus monkeys were tested from birth to the 25th day of age as to consistency, and mean time of appearance and disappearance of 10 behaviour patterns related to nursing and maintenance of contact with the mother. J.Scholes

2203. SEX AND RADIATION AS FACTORS IN LEARNINg PERFORMANCE BY RHESUS MONKEYS ON A SERI^o OF DOT DISCRIMINATION PROBLEMS. A.A.McDowell and W.Lynn Brown: *J. genet. Psychol.*, 1962, 101, 273-278 (Dept. Psychol., Univ. Texas, Austin, Tex., U.S.A.) Male and female rhesus monkeys which had previously been exposed to varying dosages nuclear radiation were tested on 5 dot-discriminatio^o problems. Errors increased as the diam. of the black o

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decreased. On the 2 most difficult only, the increase in errors was greater in *d* than *y*, and also, with increasing relative radiation dosage there were fewer errors as the *<Ham.* of the black dot decreased. J.R.Broome

2204. EFFECTS OF AGE AND STIMULUS CONDITIONS ON THE EMOTIONAL RESPONSES OF RHESUS MONKEYS: RESPONSES TO COMPLEX STIMULI. S.Bernstein and W.A.Mason: *J. genet. Psychol.*, 1962, 101, 279-298 (Dept. Psychol., Univ. Wisconsin, Madison, Wis., U.S.A.) Immature rhesus monkeys were given stimulus objects comprising complex, intermediate and simple stimuli. The total emotion score always increased from the simple to the complex stimulus conditions. Development of emotional responsiveness in the Moratory-reared rhesus monkey is described. J.R.Broome

2205. EFFECTS OF STIMULUS-RESPONSE ISOLATION ON PRIMATE-PATTERN DISCRIMINATION LEARNING. M.J.Otteson, C.L.Sheridan and D.R.Meyer: *J. comp. Physiol. Psychol.*, 1962, 55, 935-938 (Ohio State Univ., Columbus, Ohio, U.S.A.) Monkeys trained to discriminate between visual patterns under conditions of substantial separation of the stimuli and responses, *performed* better when there was an opaque panel present in front of the manipulanda from the corresponding stimuli. J.R.Broome

2206. INTERSENSORY FACILITATION OF LEARNING SETS IN NORMAL AND BRAIN-OPERATED MONKEYS. M.Wilson and W.A.Wilson, jun.: *J. comp. physiol. psychol.*, 1962, 55, 931-934 (Bryn Mawr Coll., Bryn Mawr, Pa., U.S.A.) Eight cynomolgus monkeys, 4 with post, parietal lesions, were given 75 visual and 75 tactual object discriminations. Previous tactual experience facilitated learning-set formation in the normal animals, but with visual learning-set formation and showed no facilitation in prior tactual experience. J.R.Broome

2207. TEMPORAL FACTORS IN PATTERN DISCRIMINATION BY MONKEYS. A.J.Riopelle and R.G.Addison: *J. comp. physiol. Psychol.*, 1962, 55, 935-942 (Dept. Primatol., Orange Park, Fla., U.S.A.) The performance of rhesus monkeys in discrimination learning differed only in form improved as the stimulus duration increased to approx. 1 sec. Patterns differing in form and colour were more discriminative than those differing only in form. A 2-sec. interval between stimuli was effective as a 1-sec. interval, but a 4-sec. interval produced a decrease in performance. J.R.Broome

2208. FORMATION OF LEARNING SETS IN YOUNG GORILLA. G.J.Fischer: *J. comp. physiol. Psychol.*, 1962, 55, 943-955 (Univ. Oklahoma, Norman, Okla., U.S.A.) Two gorillas, aged and a ? approx. 18 months old, given discrimination problems, appeared to be more advanced than rhesus macaques at a comparable developmental level in learning-set formation. J.R.Broome

2209. CORNELL INDEX AND SOCIAL DEPENDENCY. J.U. Gladfelter, H.W.Martin, R.X.Leon and S.B.May: *J. Rep. Col. Med.*, 1963, 21, 12-15. Results of the Cornell Index and interview indicated that well over half of the white carried by who are dependent upon community resources for economic support, had an emotional disturbance adding to their incapacity for vocational which operated against their vocational and social rehabilitation by present modes.

AJ.Martin

2210. LOGICAL ANALYSIS OF ANIMAL COMMUNICATION. P.Marler: *J. theoret. Biol.*, 1961, 1, 295-317 (Univ. California, Dept. Zool., Berkeley, Calif., U.S.A.) This analysis based upon classifications of human communication by Cherry and Morris, emphasises that a direct comparison between man and animals is misleading. The types of signals and the responses to them are examined. This analytical approach may help to clarify the effects of natural selection upon the evolution of signals. J.A.Dawson

2211. LEARNING AND ELECTRICAL SELF-STIMULATION *OF RABBITS* *P. A. Deutsch:* *J. theoret. Biol.*, 1963, 4, 1-14 (Stanford Univ., Palo Alto, Calif., U.S.A.) A theory of learning is applied to the phenomena of electrical self-stimn. of the brain. Expt. in rats found to verify this theory are also described. G.F.Blane

SPECIES STUDIES

2212. DIPTERA SWARMING HIGH ABOVE THE FOREST SIKS.?" GANDA. WITH SPECIAL REFERENCE TO TABANIDAE. P.S.Corbet and A.J.Iaddow: *Trans. roy. Ent. Soc. Lond.*, 1962, 114, 267-284 (Entebbe, Uganda) Several mosquito spp. swarmed at sunset and the behaviour of *Mansonia auritis* is described. At dawn, cf of 4 Tabanid spp. appeared. *Tabanus thoracicus*, *Chrysops centurionis*, *Hinea jacoti* and *T. insignis*, in that order; their swarming and hovering behaviour is described. All spp. swarmed at a well-defined time probably in response to low light intensity. D.M.S.Perki

2213. OBSERVATIONS ON THE DEVELOPMENTAL AND PREDATORY HABIT OF TWO REDUVIID HETEROPTERA, RHINOCORIS CARMEUTA STAL AND PIATYMERIS RHADAMANTHUS GERST. J.S.Edwards: *Proc. roy. ent. Soc. Lond. A*, 1962, 37, 89-98 (Biol. Lab., Western Res. Univ., Cleveland, Ohio, U.S.A.) Methods for the culture of both spp. (*R. carmelita* Stal and *P. rhadamanthus* Gerst) are given and observations on their life cycle described. Arousal is often by visual stimuli but sometimes by air movements. The behaviour from arousal to the catching of prey and injn. of saliva described. Factors affecting penetration of stylets into the prey are discussed. D.M.S.Perki

2214. COMPARISON OF THE RESPONSE TO AGGRESSIVE BEHAVIOUR IN TWO SPECIES OF ANT, FORMICA FUSCA AND FORMICA SANGUINEA. D. W. S. S. Anim. Behav., 1963, 11, 164-171 (Dept. Physiol. Marischal Coll., Aberdeen, Scotland) Differences between the spp. (*F. fusca* and *F. sanguinea*) with respect to escape activity, responses and aggression described in relation to their adaptive significance.

2215. HIGH ENERGY SOUND ASSOCIATION IN THE DOLPHIN. M.C.Caldwell, R.M.J.S. 23f D.K.Caldwell: *Science*, 1962, 138, 907-908 (U.S.A.) A loud, sharp, cracking sound is produced by *Dolphins* *the basis*

G.M.Lewis

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- 2216. DISPLAY PATTERNS OF TROPICAL AMERICAN 'NINE PRIMARIED' SONGBIRDS. I. CHLOROSPINGUS.** M.Moynihan: *Ibis*, 1963, 105A, 131; *Auk*, 1962, 79, 310-344. The first of a series on the behaviour of tropical American finches, tanageis and honeycreepers, dealing with the bush-tanageis *C. ophthalmicus* and *C. pileatus*. Illustrated by the author's characteristic sketches with a diagram showing the probable relative strengths of attack and escape tendencies in typical performances of hostile displays by *C. ophthalmicus*. *Ibis*
- 2217. BEHAVIOUR OF HOUSE MARTINS DELICHON U. URBICA (L.), TO THEIR PREDATORS.** E.A.Lind: *Ibis*, 1963, 105A, 131; *Ann. Zool. Soc., 'Vanamo'*, 1962, 23, 1-38. The behaviour of breeding Finnish House Martins *Delichon urbica* to various predators is described. Alarm-calling to test models was more frequent in small than in large colonies. Expt. with models of the Great Grey Shrike *Lanius excubitor* showed strong reactions to supernormally large models; the models were recognised by their black parts. (German) *Ibis*
- 2218. AGONISTIC BEHAVIOUR IN THE HOUSE FINCH. I. ANNUAL CYCLE AND DISPLAY PATTERNS.** W.L. Thompson: *Ibis*, 1963, 105A, 131; *Condor*, 1960, 62, 245-271. The agonistic behaviour of *Carpodacus mexicanus* is described with an emphasis on aggression and dominance relations. Birds reach their peak of aggressiveness in early spring when they are pairing. Common forms of hostile behaviour are the head-forward display and the supplanting attack, which may lead to combat, but this appears to be rare. *Ibis*
- 2219. ON THE BREEDING BEHAVIOUR OF THE COCK-OF-THE-ROCK(AVES, RUPICOLA RUPICOLA).** E.T. Gilliard: *Ibis*, 1963, 105A, 279; *Bull. Amer. Mus. Nat. Hist.*, 1962, 124, 35-68. Observations on <S Cock-of-the-rock behaviour were made at several display arenas in British Guiana. It is suggested that arena behaviour is at least in part related to nest-building. The Cock-of-the-rock is regarded as being related to the cotingas rather than the manakins. *Ibis*
- 2220. QUANTITATIVE STUDY OF PARENTAL BEHAVIOUR IN THE BENGALI FINCH.** E.Eisner: Behaviour, 1963, 20, 134-206 (Dept. Zool. and Comp. Anat., Oxford, England) A detailed account is given of the parental behaviour while the young are in the nest. On a quantitative basis the behaviour is very variable, both between individuals and between the same individual with different broods, and affects the survival of chicks. These variations are analysed and possible causes are suggested. J.R.Cockbain
- 2221. AGONISTIC BEHAVIOUR IN THE HOUSE FINCH. II. FACTORS IN AGGRESSIVENESS AND SOCIALITY.** W.L.Thompson: *Ibis*, 1963, 105A, 131; *Condor*, 1960, 62, 378-402. Peaks of aggressive behaviour in *Carpodacus mexicanus* occur in the early spring, in mid-summer and in the late autumn. The increase in total aggressiveness of groups of birds during the breeding season is due to an increase in the aggressiveness of a few individuals (*d'*) rather than of the groups as a whole. The rise of *d* aggressiveness is related to the defence of the mate and the territory. *Ibis*
- 2222. SONG DEVELOPMENT IN HAND-RAISED OREGON JUNCOS.** P.Marler, M.J.Creith and M.Tamura: *Ibis*, 1963, 105A, 131; *Auk*, 1962, 79, 12-30. Eight hand-raised *Junco oreganus* were hand-reared in varying

degrees of acoustic isolation each developing several <*s*-types. Their songs were somewhat longer than those of wild birds, with fewer, longer syllables, and more variable. However, there was appreciable overlap, so that each tamed* had at least one 'wild-type*' song. Some abnormal songs developed from imitations of other spp. The birds raised in a rich auditory environment had more song types and a more elaborate syllable structure, derived not from imitations but from unspecific stimulation to improvise. Vocal inventiveness is established as a significant factor in the development of song in this species

Ibis

- 2223. SUMMER CREPUSCULAR FLIGHTS OF AMERICA'S WOODCOCKS IN CENTRAL MASSACHUSETTS.** W_c Sheldon: *Ibis*, 1963, 105A, 131; *Wilson Bull.*, 19_c 73, 126-139. Study of the summer behaviour of *Philohela minor* based on the capture of 746 in mist net. Factors prompting evening flights are suggested, with evidence pointing to food as the most important. *Ibis*

- 2224. INTERSPECIFIC PREENING INVITATION DISPLAY OF PARASITIC COWBIRDS.** R.K.Selander and C.J.* Rue: *Ibis*, 1963, 105, 131; *Auk*, 1961, 78, 473-5 Detailed observations on the display which solicits heterospecific preening from a variety of spp., in the Brown-headed Cowbird *Molothrus ater*. A similar preening invitation display was seen in captive Red-eyed Cowbirds *Tanganyius aengeli*. Avian appeasement displays are discussed, and it is suggested that the interspecific display of parasitic cowbirds is an adaptation for parasitism, functioning to decrease the probability of attack by individuals of host spp. by decreasing their aggressive tendencies.

Ibis

- 2225. BREEDING BEHAVIOUR OF YELLOW-BELLIED SAPSUCKERS.** L.Kilham: *Ibis*, 1963, 105A, 127; *Auk*, 1962, 79, 31-43. Observations on wild and captive *Phryiacus varius* dealt with under the headings: m[^] communication, early breeding behaviour, incubation⁰¹ and the rearing of the young, family life after leaving¹ nest, migration, arrival on the breeding grounds, observations² on captive sapsuckers and comparisons with other woodpeckers. ibis

- 2226. THE GEOGRAPHICAL VARIATION OF BEHAVIOUR PATTERNS.** E. Curio: *Ibis*, 1963, 105A, 129; *Vogelwelt*, 1961, 82, 33-48. The two races of Pied Flycatcher *Ficedula h. hypoleuca* and *F. h. iberiae* differ from each other in many behaviour patterns, with one exception these differences cannot be interpreted as adaptations to the environment. They are comparable to the differences found between species of *Ficedula*. The author gives other examples of racial differences of behaviour in reptiles and batrachians. He concludes that genes have a pleiotropic effect on both structure and behaviour and that behaviour differences will be found between taxonomic units of every level even when environments do not differ. (German) *Ibis*

- 2227. PECKING OF LAUGHING GULL CHICKS AT MODELS OF THE PARENTAL HEAD.** J.P.Hailman: *Ibis*, 1963, 105A, 130; *Auk*, 1962, 79, 89-98. Another study on the pecking responses of young Laysan Gulls, in which flat cardboard models were presented to chicks of various ages. From these preliminary expts., it appears that the parental bill, not the food itself, is the most important visual stimulus eliciting the chick's pecking. The long, narrow proportions and the pointed tip of the bill enhance its value as a stimulus, and the presence of the head improves the

stimulus value of the bill.' Comparison is made with other studies and 'it is suggested that the best comparative study would involve comparisons of the ontogenetic development of pecking behaviour'. Ibis

2228. THE BEHAVIOUR OF LOVEBIRDS. W.C.Dilger: Ibis, 1963, 105A, 129; Sci. American, 1962, 206, A 89-98. A further, attractively presented account of the important work in progress on the behaviour of Agapornis at Cornell University. The paper deals largely with the evolution of certain patterns in this group, e.g., itch-sidling, squeak-twittering, displacement scratches, courtship-feeding, pre-copulatory behaviour of the Sj. display fighting, cavity defence, mobbing and nest-building. A final section describes the nest-material gathering of hybrid *A. roseicollis* x *A. fischeri*, the parent forms of which respectively carry material in the contour feathers (mainly) and the bill. The hybrids inherited both patterns and at first acted in a confused manner, but, after a learning period came to carry material largely in the tanner of *A. fischeri*, 'the number of irrelevant and appropriate activities' decreasing. Ibis

2229. BOBOLINK MIGRATORY PATHWAYS AND THEIR EXPERIMENTAL ANALYSIS UNDER NIGHT SKIES. W.J. Hamilton: Ibis, 1963, 105A, 132; Auk, 1962, 29, 208-233. An expt. analysis of the orientation of Dolichonyx oryzivorus, a transequatorial, night migrant of the New World. It is suggested that the sp. can determine direction by some feature of the clear night sky, probably stars, with the aid of an 'internal dock'. Ibis

2230. THE DEVELOPMENT OF VISUAL DISCRIMINATION PATTERNS IN THE CROUCHING REACTIONS OF NESTING GRACKLES. G.B.Schaller and J.T.Emlen: Ibis, 1963, 105A, 280; Auk, 1961, 78, 125-137. Nestlings of *Quiscalus versicolor* responded by crouching to visual stimuli before the maturation of pattern vision. They did not crouch to visual stimuli until two or three days after pattern vision had been acquired. Expt. withdrawal of nestlings from nests for one or two days produced a parable delay of the acquisition of crouching to mechanical stimuli, but when extended into the visual lamination period it did postpone the onset of crouching. Models. Temporary blindf bidding of nestlings did not affect the maturation of crouching to mechanical stimuli. Given extended into the visual discrimination period it did not evoke any environmental factor, but is of biological, behaviouristic nature. Ibis

-ri OBSERVATIONS ON COLLECTIVE NIGHT SONGS OF PASSER DOMESTICUS L. R.Graczyk: in 1963, 105A, 279; Pr. Zool., 1961, 5, 241-245. The author's own observations on the mass-roosting of the English House Sparrow (*P. domesticus*) he concluded that collective lodging at night is not evoked by any environmental factor, but is of biological, behaviouristic nature. (Polish) Ibis

2232. NOTES ON THE BEHAVIOUR OF THREE COTINGIDAE. B.K.Snow: Ibis, 1963, 105A, 280; Auk, 1961, 78, 160-161. Field notes on the calls and behaviour of the White Bellbird *Procnias albida*, the Greenheart Bird *Guarulus cineraceus*, and the Canbird *Perissocephalus tricolor*. Figures show various postures of all three spp. Ibis

2233. ONTOGENY OF BEHAVIOUR IN THE GREY STARLING. N.Kuroda: Ibis, 1963, 105A, 279; Misc. Rept. Yamashina's Inst. Ornith. Zool., 1961, 3, 83-112.

Based on observations of a hand-reared Grey Starling *Sturnus cineraceus* chick, the development of more than 60 Amerent activities under 7 major categories, feeding behaviour, locomotor behaviour, vocalisation, etc. are described. The observed facts are interpreted according to Kortland's theory of ontogenetic integration of instinctive behaviour.

(Japanese, diagrams and summary in English) Ibis

GENERAL

2234. LEARNING IN FLATWORMS AND ANNELIDS. A.L. Jacobson: Ftychol. Bull., 1963, 60, 74-94 (Univ. Michigan, Ann Arbor, Mich., U.S.A.) Review. 74 ref.

J.R.Broome

2235. THREAT DISTANCE IN OVIGEROUS CRAYFISH.

F.D.Klopfer: J. comp. physiol. Psychol., 1961, 54, 710-712 (Psychol. Dept., Washington State Univ., Seattle, Wash., U.S.A.)

When ovigerous crayfish were confronted with 5 stimulus crayfish of varying size moving towards them, the distance at which they showed threat behaviour was directly related to the size of the other crayfish. Under red illumination this did not occur, showing that this relationship is visually mediated. There seemed to be an inverse relation between the size of the? and the distance at which they threatened.

C.D.Putnam

2236. TERRITORIAL BEHAVIOUR IN THE CICADA KILLER WASP SPHECIUS SPECIOSUS (DRURY) (HYMENOPTERA: SPICIDAE). LN.Lin: Behaviour, 1963, 20, 115-133 (255, East 7th St., Brooklyn 18, N.Y., U.S.A.)

Male wasps (*S. speciosus*) set up territories, mainly where emergence hole density is high, and defend them against intrusion by other d* and other insects. The territorial 'perch' is usually an emergence hole although a d" does not necessarily use his own. The wasps react by pursuing, overtaking, butting or grappling with intruders, depending on their behaviour. J.R.Cockbain

2237. ON THE BEHAVIOUR OF ALATE BEAN APHIDS

(*APHIS FABAE* SCOP.) AFTER LANDING IN HOST PLANTS AND NON-HOSTS. H.J.Miller: Ent. exp. Appl., 1962, 5, 189-210 (Inst. Pflanzenforschung Innsbruck, Deutscher Akad. Landwirtschaftswissen zu Berlin, Germany)

Host selection by bean aphids occurs only after alighting on young plants of beet, field beans, poppies, potatoes and white mustard. Behaviour after landing consisted of slow or fast walking, changes in walking and in probing, and nearly always flight recommended in a few min. 75% left non-host plants, mustard and potatoes, in 1/2 min., but on potential host plants 1/2 remained 4 min. on poppy and field beans and over 5 min. on beet.

(German, English summary) H.W.Spencer

2238. GENERAL OBSERVATIONS ON THE IMAGINAL ECDYSIS OF BLOWFLIES. C.B.Cottrell: Trans. Roy. Soc. Lond., 1962, 114, 317-333 (Univ. Coll. Rhodesia and Nyasaland, Salisbury, S. Rhodesia)

The relationships between the hardened areas of cuticle and the mechanical and sensory requirements for emergence and subsequent expansion are discussed. Ecdysis is described, including emergence from the puparium, and the behaviour during expansion. D.M.S.Perkins

ANIMAL BEHAVIOUR

2239. INFLUENCE OF SOME ENVIRONMENTAL FACTORS ON LEARNING AND AGGREGATION IN LOCUST HOPPERS. P.E.Ellis: *Anim. Behav.* 1963, 11, 142-151 (Anti-Locust Res. Centre, Princes' Gate, London, England) Hoppers of *Locusta migratoria migratoria* (R. and F.) and *Schistocerca gregaria* Forsk7 were used in a study of reactions to decoys in a physical environment with either even heating and lighting or with the decoy on a warmed spot on the floor. The importance of the results to field conditions is discussed.

Y.Spencer-Booth

2240. ASPECTS OF THE BEHAVIOUR OF THE MAGPIE GOOSE ANSERANAS SEMIPALMATA. S.Davies: *Ibis*, 1963, 105, 76-98 (Emmanuel Coll., Cambridge, England) Postures, action patterns and flock behaviour of *A. semiplanata* are described and illustrated.

Y.Spencer-Booth

2241. ANTIPHONAL SINGING IN BIRDS AS EVIDENCE FOR AVIAN AUDITORY REACTION TIME. W.H. Thorpe: *Nature*, Lond., 1963, 197, 774-776 (Sub. Dept. Anim. Behav., Madingley, Cambridge, England) The antiphonal singing of "d" and "Y" of some tropical birds is described; vocal elements in courtship serve for mutual recognition in dense undergrowth. A very short reaction time, 144 msec., was observed when one bird answered the first.

G.M.Lewis

2242. MIGRATION ACROSS THE SOUTHERN NORTH SEA STUDIED BY RADAR. IV. AUTUMN. D.Lack: *Ibis*, 1963, 105, 1-54 (Edward Grey Inst., Oxford, England) The results of a survey from August to November are described in detail and discussed.

Y.Spencer-Booth

2243. ORIENTATION TENDENCIES OF GULLS (*LARUS RIDIBUNDUS L.*) TRANSPORTED FROM THE BREEDING PLACE WHEN LAND- AND SKY-MARKS ARE EXCLUDED. K.Gerdes: *Ibis*, 1963, 105A, 132; Z. Wiss. Zool., 1962, 166, 352-410. Black-headed gulls caught on the nest were displaced up to 140 miles and put into a cylindrical cage either surrounded by a canvas palisade, which only allowed the bird to see the sky but not the sun, or in a few expt., in a room. The directions of the escape-reactions of the bird were observed and quantified in 2 different ways. About 40% of the escape reactions were in the 60° sector directed homewards, the expected % of random escapes being 17%. Escape in the 60° sector away from home (25%) was also significantly above random. No explanation is given for this phenomenon. The orientation was independent of distance. Large water surfaces not further away than 2 miles apparently had an attracting affect. Other local deviations remain unexplained. The efficiency of the orientation seems to be correlated to the changes in the altitude of equal-pressure surfaces in the higher atmosphere (as in the homing of pigeons, according to Wallraff).

(German)

2244. RESULTS OF BIRD-SONG ANALYSIS. G.Thielcke: *Ibis*, 1963, 105A, 131; J. Orn., 1961, 192, 285-300. A review of what has been achieved in studying, analysing and comprehending the vocalisations of birds. All the important discoveries - such as Nicolai's findings on song learning in the Bullfinch - are discussed and there is a full list of references to the works of others on this subject.

Ibis

2245. AGGRESSIVE NEGLECT AS A FACTOR IN INTER-SPECIFIC COMPETITION IN BIRDS. S.D.Ripley: *Ibis*, 1963, 105A, 280; *Auk*, 1961, 78, 366-371.

Field observations in the Moluccan Islands of E.Indonesia indicate that interspecific competition may involve a phenomenon in which the dominant, more aggressive

species maintains a reduced numerical ratio to a partiall competing species with which it is sympatric by its very aggression and consequent reduction in brood size or nest' ing success. Other possible examples are sought, and it is suggested that this phenomenon could occur in cases of interspecific territorialism under constricted conditions. Possible cases among aggressive species of waterfowl are considered.

Ibis

2246. TESTS OF THE POSSIBLE SOCIAL SIGNIFICANCE OF 'NONSENSE¹ ORIENTATION. G.V.T.Matthews:

Ibis, 1963, 105A, 281; Wildfowl Trust 13th Ann. Rep., 1962, 47-52. When released, groups of Mallard showed less deviation from a N.W. heading than single birds but groups tended to break up. Single birds released close to their roosting site still headed N.W. Flock re-assemble is not of significance in explaining *n* sense' orientation.

2247. RADAR EVIDENCE ON MIGRATORY ORIENTATIO^{*1}

D.Lack: *Ibis*, 1963, 105A, 132; *Brit. Birds*, 1962, 55, 139-158. Review of expt. on orientation and the role radar can play in studying migration. Various aspects of migration are discussed including drift, disorientation, the conditions when birds set out on migratory flip¹? reactions of diurnal migrants to coastlines, reversed mtt?² movements and redetermined movements. There is no evident that migrants flying high enough to be detected by radar allow for lat. drift.

2248. HOME RANGE AND HOMING EXPERIMENTS WITH THE ST. KILDA FIELD MOUSE. J.Morton Boyd: & <
zool. Soc. Lond., 1963, 140, 1-14 (12. Hope Tee., Edinburgh, Scotland) The ffeldmice (*Apodemus*, *sylvaticus sylvaticus* and *A. s. hirtensis*) of St. Olda cou home either uphill or downhill over distances of 1600 fc in probably less than 3 hr. Over greater distances fewer returned home, ? having a slightly stronger homing tnd encyan

D.N.Wheatley

2249. RADAR FILMS OF MIGRATION OVER EASTERN ENGLAND. E.Lack and E.Eastwood: *Ibis*, 1963, 105A, 281; *Brit. Birds*, 1962, 55, 388-414. The techn of filming a radar display are described. These films are important in showing the main types and directions of migration in eastern England. These as well as reversed migration, hard weather and disorientated movements are discussed in detail. Some reasons, such as the effect o* coastline, are given for birds changing direction in the middle of a migratory flight.

2250. CRITICAL PERIODS IN BEHAVIOURAL DEVELOPMENT. J.P.Scott: *Science*, 1962, 138, 949-958

(Jackson Mem. Lab., Bar Harbor, Maine, U.S.A.; Examination of data on the development of many sp¹gests that the period of life in which each new social, l²ationship is initiated is a critical one for the deterring t³ation of that relationship. The critical-period effects a⁴ more common in early life; the period for primary s⁵o⁶sation is also critical for other effects.

G.M.Lewi

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2251. VARYING EFFECTIVENESS OF DISTANT INTERMITTENT STIMULI FOR THE APPROACH RESPONSE IN THE DOMESTIC CHICK. F.V.Smith and M.W.Bird: *Anim. Behav.*, 1963, 11, 57-61 (Dept. Psychol., Univ., Durham, England) A rotating sector/disc and a flickering patch of light, when presented initially, tended to be approached about equally, but with repeated Presentation there was a marked decrement in response to *e light. The disc may be an intrinsically more attractive stimulus.

Y.Spencer-Booth

2252. ORIGIN AND EVOLUTION OF CALLS AND FACIAL EXPRESSIONS OF PRIMATES. R.J.Andrew: *Behaviour* 1963, 20, 1-109 (Dept. Zool., Yale Univ., New Haven, Conn., U.S.A.) Calls and expressions are dependent on contrasting stimuli, greater contrasts producing more intense calls. Vocalisation seems to have originated from the protective group of reflexes, namely, from the closure of the glottis, interacting with expiration. A systematic account is given of the calls and expression of the insectivore-primate stock. The evolution of the human language is considered. J.R.Cockbain

CYTOLOGY

CELL STRUCTURE AND CYTOCHEMISTRY

- 2253. E.M. OF EHRLICH ASCITIC CARCINOMA CELLS.** VJvI.Mitiushin: *Tsitologija*, 1962, 4, 506-510.

E.M. of the Ehrlich ascitic carcinoma cells showed that in spite of the loss, due to carcinomatous reproduction, of the original characteristics of the mouse mammary gland cell, the neoplastic cell remained a fairly compactly organised structure with a typical system of organelles. Nevertheless, it was not possible to reveal any systems or cell components which could be considered sp. for cancer cells. (Russian) BJ.Cooper

- 2254. EHRLICH ASCITES CELL NUCLEI. IV. DETERMINATION OF NAD PYROPHOSPHORYLASE ACTIVITY IN NUCLEI ISOLATED BY AN IMPROVED TECHNIQUE.** E.D.Hudack, D.E.Eros and D.O.Brummond:

Ex p. *Cell Res.*, 1963, 29, 343-348 (Sunny Acres Hosp., Cleveland, Ohio, U.S.A.) An improved isolation method increased the yield of Ehrlich ascites cell nuclei to 77%, and cytoplasmic contamination remained at the low level of 5%. The amount of the enzyme NAD pyrophosphorylase recovered in the nuclear fraction was 80% of that present in whole cells. The results are interpreted to indicate that this enzyme is situated for the most part, if not entirely, in the nucleus of the Ehrlich ascites cell. K Jones

- 2255. NUCLEOLUS OF THE CANCER CELL.** H.Busch, P.Byvoet and K.Smetana: *Cancer Res.*, 1963, 23, 313-339 (Dept. Pharmacol., Baylor Univ. Coll. Med., Houston, Tex., U.S.A.) Review. 425 ref.

B.M.Stevens

- 2256. ULTRASTRUCTURE OF NUCLEOLI AND CHROMOSOMES DURING THE EARLY STAGES OF LIVER REGENERATION AND CHANGES PRODUCED IN THESE STRUCTURES BY X-IRRADIATION.** J.M.G.Davis: *Phil. Trans. B.*, 1963, 246, 291-303 (Dept. Radiotherap. Univ., Cambridge, England) Rats were partially hepatectomised, and in one series X-irradiated at varying periods after the operation. Nucleoli found in regenerating liver cells are larger than those in normal cells; they contain fibrous elements, the nucleolonema fibres, surrounded by less-organised areas, the pars amorpha. Only nucleolonema fibres are found at 18 hr. after operation, the period when a-cytomembranes are being produced. The pars amorpha were later reformed. Mitotic stages in chr. have been recognised in E.M. studies. These appeared as strands about 1000 Å in diam. made up of thin fibres about 100 Å in diam. in early prophase. Later prophase chr. showed structures reminiscent of coiling, but this evidence later disappeared. Metaphase chr. were double. X-irradiation at small dose levels (450 r) caused no structural alterations in chr. at division, but nucleolar changes were seen. Larger doses (2000 r) caused fragmentation, and in telophase the nuclear membrane may reform around 2 partially separated chr. masses. M.S. Lave rack

- 2257. EFFECT OF PLASMOLYSIS AND DEPLASMOLYSIS ON NUCLEAR STRUCTURE.** V.Soran: *Tsitologija*, 1962, 4, 511-518. Low concn. of plasmolytics used in vivo on epidermis of *Calanthus nivalis* caused the nuclei to become granular and then reticular; high concn. caused the disappearance of nuclear structure, with homogenisation of the nucleus. Gradual deplasmolysis produced restoration of nuclear structure, but sudden

deplasmolysis usually caused nuclear homogenisation and subsequent cell destruction. Homogenisation appeared to be related to changes in the nucleoproteins and to nucleolar soln. The chem. characteristics of the plasmolytics, as well as their concn., seemed to be of importance. (Russian) BJ.Cooper

- 2258. CHROMOSOME FIBRES FROM AN INTERPHASE NUCLEUS.** J. Gall: *Science*, 1963, 139, 120-121 (Dept. Zool., Univ. Minnesota, Minneapolis, Minn., U.S.A.) R.b.c. of the newt, *Triturus*, were spread

on a water surface and picked up with carbon-coated grids for examination in the E.M. The identifiable nuclear material consists entirely of long fibres having a diam. of approx. 400-600 Å. Similar fibres have been seen in human and grasshopper chr. prep, in the same manner. G.M.Lewis

- 2259. RELATIONSHIP BETWEEN RNA SYNTHESIS AND LOOP STRUCTURE IN LAMPBRUSH CHROMOSOMES.**

M.Izawa, V.CAllfrey and A.E.Miisky: *Proc. nat. Acad. Sci. Wash.*, 1963, 49, 544-551 (Rockefeller Inst., New York, U.S.A.) RNA synthesis in lampbrush chr. of *Triturus viridescens* is DNA-dependent as judged by its sensitivity to actinomycin D. Chr. structure is intimately related to the capacity to synthesise RNA as evidenced by changes in loop morphology induced by different actinomycins and other agents (e.g. histones) which inhibit nuclear RNA synthesis. J.R.Sargent

- 2260. STUDIES ON THE MACRONUCLEUS Of PARAMECIUM AURELIA. I. (WITH A NOTE ON ULTRA-VIOLET MICROGRAPHY).** AJurand, CH.Bealean-M.R.Young: *J. Protozool.*, 1962, 9, 122-131 (Inst. Anim. Genet., Univ. Edinburgh, Scotland) E.M.

prep, of the macronucleus of *P. aurelia*, using both starve and growing organisms, the latter at timed stages following fission were studied. The effects of treatment with RNase, DNase and the silver-Feulgen reaction are described. The macronucleus contained a large no. of structures of 0-5 fi diam., consisting of an outer RNA-containing region and central elements containing DNA. It is suggested that these structures may be the sub-nuclei which have been postulated from genetic work. RJ.Walker

- 2261. PYRONINOPHIL GRANULES OF ISOLATED NUCLEI**

R.J.Salganik, I.I.Kiknadze, T.M.Morozova, LS.Gubenko and V.F.Drevich: *Tsitologija*, 1962, 4, 499-505. As a result of the effect of DNase on fractions of calf thymus nuclei isolated in isotonic saccharose, peculiar structures appeared, which were called pyroninophil granules. Under the conditions of the expt. the granules could only have come from the nuclei. They were 1*5-2-0 /i in diam., approx. half to one-third of the nuclear diam. Other characteristics are described. (Russian) BJ.Cooper

- 2262. INTRANUCLEAR AND INTRACYTOPLASMIC STRUCTURES OF RHODOTORULA GLUTINK AS REVEALED BY ELECTRON MICROGRAPHS OF SERIAL SECTIONS.** S.F.Ccaiti, T.R.Thyagarajan and HBN[#]Jlor: *Exp. Cell Res.*, 1963, 29, 235-241 (Dept. Mic[#]biol., Dartmouth Med. Sch., Hanover, N.H., U.S.A.)

The nucleus contained a prominent membrane-bounded structure which was tentatively identified as the nucleoplasm. The cytoplasm contained lipidal inclusions, mitochondria and intracytoplasmic membranes. Apparent connections between the mitochondria, plasma membrane, and nuclear membrane were observed. KJOn⁵

- 2263. STRUCTURE OF MITOCHONDRIAL MEMBRANES.** V.F.Mashanskii: *Tsitologija*, 1962, 4, 555-558. 771

foe basis of data in the literature and his own observations in the micro-organisation of various multi- and unicellular organisms the author concludes that the nature and dimensions of paired mitochondrial membranes are not & accord with SjOstrand's findings concerning the presence of a bilipid layer in the space between them. Each of the membranes which form the mitochondrial structure is formed of 2 osmophilic layers 20 Å thick, divided by a light space about 25 Å across. These membranes are compared with the lipoprotein complexes described in cytoplasmic membranes. (Russian) B.J.Cooper

2264. OBSERVATIONS ON MITOCHONDRIAL STRUCTURE. ANGULAR CONFIGURATIONS OF CRISTAE.

I.P.Revel, D.W.Fawcett and C.WJPhilpott: J. cell. 8tol., 1963, 16, 187-195 (Dept. Anat., Harvard Med. Sch., Boston, Mass., U.S.A.) Micrographs of lead-stained sections from tissues of several spp. fixed in OsO₄ PH 7-0-7-4, embedded in Epon were studied. The 2 membranes constituting a crista are frequently not parallel. Ridges occur on the membrane which in cross-section appear as sharp angulations. This is thought to be normal variation of the basic structural organisation of the mitochondrion which may reflect a periodic discontinuity in the membrane which in this respect differs from other cell membranes. P.Banow

2265. E.M. OF THE CORTEX OF THE EGG OF BARNEA CANDIDA (MOLLUSC BIVALVE), ITS EVOLUTION AT THE MOMENT OF FERTILISATION, MATURATION AND SEGMENTATION. JJ.Pasteels and E. de Harven: Arch. Biol., Liège, 1962, 73, 465-490 (Fac. Med., Univ. Brussels, Belgium) The unfertilised egg consists of microvilli regularly arranged in alternate rows, the distal 4/5 of these extensions are enclosed in a 2-layered chorion. Between the inner surface of the chorion and the egg's surface is a thin, 0.2-1 μ perivitelline layer. No morphol. changes occur at fertilisation. The localisation of the cortex expansion when the furrows appear can be determined due to the microvillar structures. These zones are small, a girdle of 1 μ width for the first Polar body and 3-5 μ wide for the first cleavage. From these zones, no cortical invagination has been found. (French) R.J.Walker

X/« E.M. - OP THE SPERMATOZOA OF A BIVALVE MOLLUSC, BARNEA CANDIDA. JJ.Pasteels and E. de Jjarven: Arch. Biol., Liège, 1962, 73, 445-463 (WW. Anat., Univ. Brussels, Belgium) The middle JS of the sperm contains 4 spherical mitochondrial whif disposed around 2 typical centrioles. The acro has a complex structure; a central fibrous tubule bounded by a thick reticulated envelope, but there is a rosomal body. It is suggested that this structure is associated with the role of the acrosome at fertilization. (French) R.J.Walker

2266. ULTRASTRUCTURE AND CYTOPLASMIC INTERRELATIONSHIPS OF AN AMNION CELL LINE (FERNANDES). J.J.Herdon, jun. and J.A.Whitaker: Tex. Rep. Kol. Med., 1963, 21, 43-56 (Univ. Texas S.W. Med., S.K Dallas, Tex., U.S.A.) The micro-morphology of amnion cells (strain Fernandes) in tissue culture was examined. These cells are unusual in having large cytoplasmic multivesicular bodies and a membrane-bound structure with concentric internal membranes. Relationships among these structures and their functional significance was explored. Predominance of RNP particles free in the cytoplasm was interpreted to mark this cell's adaption to free living existence. A.J.Martin

2268. FINE STRUCTURE OF COUNCILMAN BODIES IN LIVER OF ALUATTA SENICULUS SENICULUS L INFECTED WITH YELLOW FEVER VIRUS. E.Baruch, L. Carbonell and J.Weibel: Exp. CeU Res., 1963, 29, 50-53 (Dept. Virol. y Pathol., Inst. Venezolano de Invest. Cient., Caracas, Venezuela) Councilman bodies in hepatic cells of *A. s. seniculus*, naturally infected with yellow fever virus, showed no limiting membrane or internal vacuole membrane, as studied by E.M.

The bodies contained no lipid droplets or membranous components, and no yellow fever virus particles were found in them. It is concluded that their formation is not a direct consequence of the presence of viral particles. K.Jones

2269. CONTRAST BETWEEN OSMIUM-FIXED AND PERMANGANATE-FIXED TOAD SPINAL GANGLIA.

J.Rosenbluth: J. cell Biol., 1963, 16, 143-157 (Dept. Anat., Harvard Med. Sch., Boston, Mass., U.S.A.) Lumbar spinal ganglia removed from pithed living *Bufo marinus* were fixed in cold OsO₄ and KMnO₄ for 2 hr. OsO₄-fixed sections were stained with lead salts and the vesicles occurring in the satellite cells of peripheral nerve ganglia and at the surface of the dorsal root ganglion cells compared in micrographs obtained by the 2 methods. Small disconnected cytoplasmic globules occur in the sheaths of KMnO₄ fixed ganglia. Chains of vesicles appear near the plasma membrane of both the nervous and satellite cells in OsO₄ fixed material. This suggests that the plasma membrane invagination may disintegrate during OsO₄ fixation and cell cytoplasm break down in KMnO₄. The mechanism of these membrane reorganisations is discussed. P.Barrow

2270. SOME OBSERVATIONS ON FINE STRUCTURE OF SYMPATHETIC GANGLION OF BULLFROG. T.Yamamoto: J. cell Biol., 1963, 16, 159-170 (Dept. Anat., Hirosaki Univ., Sch. Med., Japan) Ganglia in the abdominal sympathetic trunk of *Rana catesbeiana* fixed in OsO₄ and KMnO₄ for 2 and 3 hr. were embedded in Epon or methacrylate. Thick sections were stained with PASchiff and toluidine and thin sections with uranyl acetate or lead soln. Sp. areas of cytoplasm in the superficial zone of the perikaryon are devoid of granulated endoplasmic reticulum but contain lead-staining granules of 200-400 Å diam. similar to glycogen granules. Cytoplasmic projections extending from the satellite cells around the root portions of the nerve process are described.

P.Barrow
2271. GOLGI ELEMENTS OF MOUSE HEPATIC CELLS EXAMINED REFRACTOMETRICALLY BY PHASE CONTRAST ILLUMINATION. S.Grzycki: Cytologia, 1961, 26, 294-300 (Dept. Histol. and Embryol. Med. Anat., Lublin, Poland) Thin unstained sections of albino mouse liver fixed in Helly's and Schaffer's fluids were examined in various media of known n under the phase contrast microscope. A composite picture was built up by examining cells mounted in media of successively higher n. The golgi elements varied in size, shape and location. They were usually near the nucleus, and consisted of vacuoles and smooth or crenated canaliculari. In binucleate cells the golgi material is not preferentially associated with one nucleus. The various appearances of the golgi material are thought to indicate its metabolic and structural changeability. C.A.Stace

2272. FINE STRUCTURE OF MYCOTA. IV. OCCURRENCE OF GOLGI DICTYOSOME IN FUNGUS NEOBULGARIA PURA (FT.) PETRAK. R.T.Moore and J.H.McAlear: J. cell Biol., 1963, 16, 131-141 (E.M. Lab., Univ.

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California, Berkeley, Calif., U.S.A.) The apothecia were prefixed in unbuffered 1% KMnO₄ for 9 min. followed by 2% OSO₄ and embedded in methacrylate. The Golgi organelle occurs in a fungus cell type of a supporting pseudo-tissue in which the nuclear membrane is discontinuous and appears to break down during cell division in a manner comparable to mitosis. Evidence indicates that the dictyosome originates from the outer membrane of the nuclei.

P.Barlow

2273. STRUCTURE OF PLANT CELLS WITH SPECIAL REFERENCE TO LOWER PLANTS. VI. STRUCTURE OF CHLOROPLASTS IN ALGAE. K.Ueda: *Cytologia*, 1961, 26, 344-358 (Bot. Inst., Nara Women's Univ., Nara, Japan) 25 spp. representing 9 major divisions of algae were examined with the E.M. Chloroplasts as such are absent in the Glauco phyta and Cyanophyta, although paired lamellae are present in the cells. Chloroplasts are present in the other groups, the lamellae being in groups of 2 (Rhodophyta), 4 (Euglenophyta, Phaeophyta, Pyrrhophyta and Chrysophyta) or arranged in grana (Charophyta, Chlorophyta). Pyrenoids, where present, could be classified into 5 types according to the relative positions of the assimilation products and lamellae to the pyrenoids.

C.A.Stace

2274. MECHANISM FOR PLANT CELLULAR MORPHOGENESIS. P.B.Green: *Science*, 1962, 138, 1404-1405 (Div. Biol., Univ. Pennsylvania, Philadelphia, Pa., U.S.A.) Polarised light studies with growing cells of *Nitella* and *Bryopsis* indicate that control of cell form resides in cytoplasmic elements near the growing side wall which have a long axis and form cellulose microfibrils at right angles to their length; these tend to become bonded laterally into a parallel array which can be disorganised by colchicine. These cytoplasmic elements therefore have several of the prop. of spindle fibres involved in cross wall formation.

G.M.Lewis

2275. E.M. OBSERVATIONS ON SACCHAROMYCES CEREVISIAE. J.K.Koehler, W.Bimbaum jun. and T.L. Hayes: *Cytologia*, 1961, 26, 301-308 (Radiation Lab., Univ. California, Berkeley, Calif., U.S.A.) Yeast was grown on various appropriate media and stained in KMnO₄ and uranyl acetate. In budding cells the nuclei were seen to be connected by a narrow bridge. Starved cells showed the fine structure more clearly and a nuclear membrane with pores, a plasma membrane with invaginations, and mitochondria with cristae were seen. Chr.-like bodies were found in the nucleus.

C.A.Stace

2276. E.M. OF TRICHOMONAS CRICETI. J.Chakraborty, N.N.D.Gupta and H.N.Jtey: *Cytologia*, 1961, 26, 320-326 (Biophys. Div., Saha Inst. Nuclear Phys., Calcutta, India) The flagellates, obtained from hamster caecum, were fixed in OSO₄. Various structural components were examined in some detail, notably the flagella and associated structures, the ant. flagellum having 9 peripheral and one central filaments. The nucleus and mitochondria are also described.

C.A.Stace

2277. SYNTHESIS AND MIGRATION OF PROTEINS IN CELLS OF EXOCRINE PANCREAS AS REVEALED BY SPECIFIC ACTIVITY DETERMINATION FROM RADIO-AUTOGRAPHS. H.Warshawsky, C.P.Leblond and B. Droz: *J. cell Biol.*, 1963, 16, 1-27 (Dept. Anat., McGill Univ., Montreal, Canada) Jtets were inj. i.p. with 2*5 jic/gm. body wt. DL-[4-5³H]leucine of sp. activity 29*1 mc/mM. The pancreas was removed 10 min.-30 days after injn. and fixed in Bouin's so In. Rela-

tive protein concn. was determined spectrophotometrically on Millon-treated sections and the radioactive concn. measured by the no. of silver grains per unit area on the autoradiographs. Proteins synthesised in the ergastoplasm accumulated in the Golgi zone, spread to the zymogen region and finally entered the excretory ducts. Turnover rates of 62*5 hr. and 4-7 min. demonstrated the existen of 2 classes of protein.

P.Barlow

2278. COMPARATIVE STUDY OF STAINING AND HTS". CHEMICAL REACTIONS OF COMPONENTS OF GOLG COMPLEX OF FIBROBLASTS AND ASCITES TUMOUR CELLS. S.Takagi, J.-ichi Kitada, H.Masuda and M. Tagawa: *Cytologia*, 1961, 26, 448-459 (Dept. Biol Univ. Osaka Prefecture, Sakai, Japan) The Golgi complex of fibroblasts consists of filaments and wider canalliculi which stain similarly and are thus thought to be different conditions of similar structures. In the turn cells only the undiluted filaments are found. In both ca the Golgi complex stains more similarly to mitochondri than to endoplasmic reticulum, as shown by a n.d. of dil ferent dyes. The Golgi components are always more slender than the mitochondria, and show some staining differences, as does the Golgi complex of the 2 types o cells. The Golgi complex is always close to the nucleu whilst the mitochondria are peripheral.

C.A.Stace

2279. CYTOCHEMICAL STUDY OF NUCLEIC ACIDS » PLANT CELLS. V. NUCLEIC ACIDS OF FEULGEN NEGATIVE PLANTS. M.R.Ishida: *Cytologia*, 1961, 26, 359-371 (Bot. Inst., Univ. Kyoto, Japan) Nud of Oscillatoria, Spirogyra and Marchantia vegetative ce were Feulgen-neg. when fresh or fixed, but appropriate treatment in all cases enabled DNA to be extracted and typified in vitro by its u.v. absorption curve and Dische and Feulgen reactions. The DNA and RNA cell content was quant. measured for the 3 organisms by means of P. deoxypentose, pentose and base determination separate*. Results from the different methods did not always agree. but average values in the 2 algae were comparable to * known DNA contents of several 'normal' organisms.

C.A.Stace

2280. CELLULAR ALTERATIONS IN THE MCH LINE Of CHINESE HAMSTER CELLS FOLLOWING INFECTION WITH HERPES SIMPLEX VIRUS. B.Hampar and S.A. Ellison: *Proc. nat. Acad. Sci. Wash.*, 1963, 49, 47⁴ 480 (Dept. Microbiol., Coll. Physn. and Surgn., Columbia Univ., N.Y., U.S.A.) The MCH system shows arrested mitosis when killing occurs following «K⁺ ment of cells with virus. Killing is manifested by mu⁰ pie chr. aberrations in colchicine-blocked metaphase cells. Permanent chr. alterations occur in cells cloned after infection but not when cells are seeded in large fl⁺ following infection.

J.R.Sargeff

NUCLEO-CYTOPLASMIC RELATIONS

2281. INTERRELATIONS BETWEEN MACRONUCLEUS CYTOPLASM IN THE GYMNSTOME CILIATE CHLAMYDODON PEDARIUS. M.Kaneda: *Cytolog*, 1961, 26, 408-418 (Biol. Inst., Coll. Gen. Educa Univ., Hiroshima, Japan) The macronucleus w^{id} vesicular and chromatic ends respectively, both w^{id} nucteoli, and the left and right sides also appear sone-

what different. It is speculated that the small vesicles or their precursors found just outside the nuclear membrane in old cells have passed from the nucleoplasm, which is connected to the cytoplasm through nuclear pores, and may be mitochondrial precursors. Also, collapsing nucleoli are seen connected to the nuclear membrane by a strand, and seem to produce material which aggregates in the cytoplasm as clusters of granules which are attacked by filaments to the nuclear membrane. The significance of this is discussed.

C.A.Stace

2282. INTERCELLULAR NUCLEAR TRANSFER IN MIXED CELL CULTURES IN VITRO. G.Barski and J.Belenradek, jun.: *Exp. Cell Res.*, 1963, 29, 102-111 (Lab. de Cult. de Tissus, Cillejuif (Seine), France)

Two cases of intercellular nuclear transfer were observed to cultures of mouse normal embryonic tissue and cells from a highly malignant mouse cell strain. In the first case, an interphasic nucleus penetrated into the cytoplasm of another cell which appeared to be in a blocked early metaphase stage. In the second case, the nuclear transfer occurred between 2 interphase cells. From the analysis of the movements of the involved cells and their organelles, it is concluded that the nucleus can participate in intercellular exchange which may visibly occur between cells of different histol. origin and between normal and malignant cells.

2283. «ffigM8S8ffisATMB»

SB. J.Bonner and R.C.Huang: *Canad. J. Bot.*, 1962, 40, 1487-1497 (California Inst. Technol., Div. Biol., Pasadena, Calif., U.S.A.)

A.Meany

NUCLEAR AND CELL DIVISION

2284. MEIOSIS IN THE MALE PERIPLANETA AMERICANA. M.R.Rajasekharasetty and C.V.Ramanamurdiy: *Nature*, Lond., 1963, 197, 1325-1326 (Dept. Zool., Univ. Mysore, India) Cytology off. america collected around Mysore city has been re-examined. Onias-maria were definitely seen through for a brief period. Most of the chr. were sub-metacentric, a few «cen.m.c. Gonial metaphases showed 33 chr.

CM.Lewis

2285. STRUCTURE OF CYTOPLASMIC BRIDGES IN DIVIDING SPERMATOCYTES OF ROOSTER. T.Nag-

k^lik^ci^mae mUStli? c?oplasm of the bridge at sp. stages of meiosis. The formation and significance of these cisternae are discussed.

F.Beck

2286. ROLE OF CYTOPLASM IN CYTOKINESIS. T.Ota: *Cytologia*, 1961, 26, 428-447 (Sugiyama Women's Coll. Nagoya, Japan) ££ ebud* of Tradescantia reflexa were centrifuged at 2000 rev/min. for 15 min. and the staminal + t n + H/* examined. Within 60 min. the displaced cytoplasm + spindle had returned to their original positions, centrifugation in prophase allowed the spindle to reorientate before cell-plate formation, but centrifugation in anaphase caused the cell-plate to form in the spindle equator *** **» ^d re-oriented. TM e ^ell-plate margins outside the spindle were bent towards the cell equator, fixing to this only when the spindle was re-

orientated. Spindle position is thought to be governed by an elaborate cytoplasmic system connected to the spindle envelope.

C.A.Stace

2287. ATPASE ACTIVITY OF MITOTIC APPARATUS OF SEA URCHIN EGGS. T.Miki: *Exp. Cell Res.* 1963, 29, 92-101 (Inst. Mol. Biol., Univ., Nagoya, Japan) The ATPase activity of mitotic apparatus, isolated from ethanol-treated sea urchin eggs, was 3 times as high as that of the cytoplasm on the N-base. The enzymic natures of ATPase are reported, and the high ATPase activity was localised histochem. in mitotic apparatus.

K.Jones

2288. TIME OF NUCLEAR DIVISION IN REGENERATING CELLS OF RIELLA HELICOPHYLLA AFTER A PERIOD OF DARKNESS. I.Karsten: *Naturwissenschaften*, 1963, 50, 50-51 (Inst. Develop. Physiol., Univ., KÖln, Germany) Nuclear division in tissue fragments was more frequent and occurred earlier after a long period of darkness than in those previously having a normal diurnal cycle.

(German) AJ.Wansbrough

2289. MITOTIC DYNAMICS OF FIRST CLEAVAGE DIVISIONS IN EGGS OF STURGEON (AT VARIOUS TEMPERATURES) AND OF TROUT. T.A.Dettlaff: *Exp. Cell Res.*, 1963, 29, 490-503 (Inst. Anim. Moiphol. Acad. Sci., Moscow, U.S.S.R.) Expt. data are presented on the dynamics of different mitotic phases at the second cleavage division in the eggs of Acipenser gildenstadtii colchicus V. Marti and of Salmo trutta morpha lacustris L. at different temp. The movement of sister chr. sets in cleavage varied at different mitotic phases, and the elongation of the spindle at anaphase proceeded in parallel to the movement of chr. and continued up to the beginning of telophase. Each mitotic phase was characterised by definite dimensions of the mitotic figure, anaphase and telophase showing a definite distance between sister chr. The significance of these and other findings is discussed in detail.

K.Jones

2290. RNA AND METAPHASE CHROMOSOME. LJF.La-Cour: *Exp. Cell Res.*, 1963, 29, 112-118 (Dept. Cell Biol., John Innes Inst., Bayfordbury, Herts., England) Metaphase chr. of die root meristem cells of Trillium cernuum contained RNA, as studied using p₃₂adenosine as a precursor. In Vicia faba, the nucleoli incorporated the labelled precursor during prophase and the labelled material aggregated on the chr. in the vicinity of the nucleolus when this disappeared in later stages of prophase.

K.Jones

2291. MITOTIC CYCLE OF ASCITES TUMOUR CELLS. R.Baserga: *Arch. Path.*, Chicago, 1963, 75, 156-161 (Dept. Pathol., N.W. Univ. Med. Sch., 111, U.S.A.)

The mitotic cycle of Ehrlich ascites tumour cells growing in the peritoneal cavity of 3 to 5 month old mice was studied by [3H]thymidine autoradiography. The cycle length was approx. 18 hr., 11 hr. of which is spent synthesizing DNA, 2 hr. in a rest phase, 4 hr. prophase and 1 hr. from metaphase to telophase. The % of dividing tumour cells decreased progressively with time after a single injn. of pHthymidine.

R.Mitchell

2292. AUTORADIOGRAPHIC STUDY OF CHROMATID DISTRIBUTION OF LABELLED DNA IN TWO TYPES OF MAMMALIAN CELLS IN VITRO. D.M.Prescott and M.A.Bender: *Exp. Cell Res.*, 1963, 29, 430-442 (Biol. Div., Oak Ridge Nat. Lab., Oak Ridge, Tenn., U.S.A.) The average generation time and the length

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of the G_1 , S and G_2 periods were determined for a line of Chinese hamster cells in vitro. The labelled DNA segregated according to a semi-conservative pattern, the freq. of sister chromatid exchanges being low. The same pattern of semiconservative segregation of DNA was found in human leucocytes in vitro. The results are discussed in reference to the current theories of chromatid segregation of DNA. K.Jones

2293. RENEWAL OF DIFFERENTIATED CELLS. S.R.Pelc: *Exp. Cell Res.*, 1963, 29, 194-198 (M.R.C., Biophys. Unit., King's Coll., London, England) [^3H].

Thymidine appeared to be incorporated into the DNA of cells of differentiated organs, especially the seminal vesicles of mice, at a rate equal to that found in dividing tissues or at a considerably lower rate. Comparison of labelling indices and mitotic indices showed that in many organs fewer cells divide than was expected from the no. of labelled cells. It is suggested that either all of the DNA or some part of the genetic material can be renewed without subsequent cell division. K. Jones

2294. ASYNCHRONY OF DNA SYNTHESIS IN CHROMOSOMES OF HUMAN DIPLOID CELLS. P.S.Mcorhead and V.Defendi: *J. cell Biol.*, 1963, 16, 202-209 (Wistar Inst. Anat. and Biol., Philadelphia, Pa., U.S.A.) Chr. replication of human diploid cells of fibroblastic type in long term cultivation was studied by exposure to PHlthydine of concn. 0.3-0.5 $\mu\text{g}/\text{ml}$. for 20 min. A cell generation of 18 hr. with a 7.7 hr. period of DNA synthesis and 3-6 hr. pre-mitotic rest period was recorded and it is concluded that the period of synthesis for any sp. site is only some fraction of this 7.7 hr. period. P.Barlow

2295. MOLECULAR SYNCHRONY AND SEQUENTIAL REPLICATION OF DNA IN E. COLI. T.Nagata: *Proc. nat. Acad. Sci. Wash.*, 1963, 49, 551-559 (Dept. ZooL, Columbia Univ., New York, U.S.A.) Chr. replication was studied in lysogenic strains of *E. coli* K-12 HFr and F'. One replication cycle of DNA corresponded to a synchronised cell generation. Kinetic studies of prophage duplication over one replication cycle of DNA showed that (a) the pattern of kinetics is strain sp. and that this is due to synchronisation, (b) sp. temp. of prophage duplication, expressed in terms of % increase of DNA, can be directly correlated with the known genetic linkage map. It is concluded that replication of chr. in *E. coli* K-12 is synchronised and sequential. J.R.Sargent

EFFECTS OF RADIATION AND CHEMICAL AGENTS

2296. CYTOLOGICAL ANALYSIS OF COLONIES DEVELOPED FROM MAMMALIAN CELLS IRRADIATED IN VITRO WITH X-RAYS. G.Colombo and G.Marin: *Exp. Cell Res.*, 1963, 29, 268-277 (Inst. Comp. Anat., Univ. Perugia, Italy) The relationship between X-ray induced reproductive death and blockage of cell division leading to giant cell formation was studied on a strain of mammalian cells grown in vitro. From the expt. results, it is concluded that giant cell formation and reproductive death could be ascribed to die same hereditabale damage, although some minor lethality appeared to be related to a different mechanism. K. Jones

2297. EFFECTS OF ULTRAVIOLET MICROBEAM IRRADIATIONS ON MITOSIS STUDIED IN TRADESCANTIA CELLS IN VIVO. B.Wada and K.Izutsu: *Cytologia*, 1961, 26, 480-491 (Biol. Inst., Univ. Shizuoka, Japan) U.v. irradiation with a microbeam 2 μ wide caused a no. of mitotic abnormalities in *Tradescantia* staminal hairs, notably spindle suppression and chr. stickiness. Irradiation of a very young polar cap completely suppressed spindle formation, but after irradiation at a later stage a half-spindle formed at the non-irradiated pole. In the latter case the chr. split but remained in a clump which was pushed to the irradiated pole by the developing phragmoplast. Two cells, one enucleate, were formed. Treatment at successively later stages produced a series of effects of varying degrees from the normal. C.A.Stace

2298. THE NARCOTIC SODIUM PENTOBARBITAL: A RAPID MITOSIS -DISTURBING EFFECT IN THE MOUSE. K.Setaia, B.Iindroos and A.Hujanen: *Natur wissenschaften*, 1963, 50, 45-46 (Path.-Anat. Inst., Univ. Helsinki, Finland) Effects of a single Na pentobarbital injn. of 2.5 mg. on chr. and mitotic aberration and nuclear degeneration in epidermal cells were assessed after 24 hr. in comparison with the effects of shaving, detergent application and carcinogen application. The no. of pathol. mitoses per 500 observed were in each case 15.9, 0, 10.5 and 41.7 from a total of 47000 mitotic analyses covering 5000 mice in each case. The significance for narcotic toxicity is discussed.

(German) A. J.Wansbrough

2299. SELECTIVE EFFECTS OF ACTINOMYCIN D ON INTRACELLULAR DISTRIBUTION OF RNA SYNTHESIS IN TISSUE CULTURE CELLS. R.P.Perry: *Exp. Cell Res.*, 1963, 29, 400-406 (Inst. Cancer Res., Philadelphia, Pa., U.S.A.) In tissue culture cells treated with low concn. of actinomycin D, the incorporation of [^3H]cytidine and pHliridine into nucleolar and cytoplasmic RNA was irreversibly suppressed, whereas the initial incorporation into the RNA of the extra-nucleolar (chromatin) portion of the nucleus was unaffected. The results were consistent with the hypothesis that the stable elements of ribosomal RNA are derived from the nucleolar region of the nucleus. K. Jones

2300. MITOSIS AND DIFFERENTIATION IN ROOTS TREATED WITH ACTINOMYCIN. A.K.Bal and P.R. Gross: *Science*, 1963, 139, 584-586 (Dept. Biol., Brown Univ., Providence, R.I., U.S.A.) Mitosis in root meristem of *Allium cepa* ceases after a delay of 36 hr. when exposed to $10 \mu\text{g}/\text{ml}$. actinomycin D. The block is reversible and occurs at interphase. Differentiation of provascular tissue is suppressed. Autoradiografl* of roots treated with pHliracil show that synthesis of RNA is blocked after mitosis fails. G.M.Lewis

CYTOGENETICS

2301. KARYOTYPIC ANALYSIS OF 83 CASES OF DOWNJ*: SYNDROME IN HARRIS COUNTY, TEXAS. T.Hayas[†]: *Tex. Rep. Biol. Med.*, 1963, 21, 28-36 (Univ. Texas M.D. Anderson Hosp., Houston, Tex., U.S.A.) 74 cases were identified as 21-trisomy, 3 had a D/G trans* location, 2 were 46/47 chr. mosaics, and 4 had norm*¹ karyopre. Those with normal karyotype, upon critic*¹ examination, proved to be not mongols. AJ.Martin

2302. MONGOLOID TWINS WITH TRBOMY OF CHROMOSOME NO. 21. M.Mikkelsen and J.C.Melchior: Acta Genet., Basel, 1962, 12, 164-171 (Aerobiol. Inst., 14 Tagensoej, Copenhagen, Denmark) A chr. study in a pair of apparently monozygotic ? twins. Cells were obtained from skin cultures and both twins had a model no. of 47 chr. with probable trisomy of No.21. D.B.Roberts
2303. TRANSLOCATION BETWEEN ACROCENTRIC CHROMOSOMES IN A 46-CHROMOSOME MONGOLOID AND HIS 45-CHROMOSOME MOTHER. JJ.Biesele, W.Schmid, Chi Hao Lee and P.M.Smith: Amer. J. hum. Genet., 1962, 14, 125-134 (Genet. Fdn., Univ. Texas, Austin, Tex., U.S.A.) An extra sub-*etacentric chr. in the complement of the 15 yr. old boy fc concluded to be a translocation chr. bearing most of the long arms of the missing long acrocentric 15 and the short acrocentric 21. The patient's mother, who was phenotypically normal had one 15 and one 21 chr. but in addition she had the 15/21 translocation chr. D.A.Jones
2304. TRISOMY OF CHROMOSOMES 13-15 AND 17-18: ITS ASSOCIATION WITH INFANTILE ARTERIOSCLEROSIS. R.L.Rosenfield, S.Breitbart, H.Isaacs, jun., H.D.Klevit and W.J.Mellman: Amer. J. med. Sci., 1962, 244, 763-779 (Children's Hosp., Philadelphia, Pa., U.S.A.) A description of two cases and review of the literature. 56 ref. E.E.Hobbiger
2305. ENLARGED SATELLITES AS FAMILIAL CHROMOSOME MARKER. H.L.Cooper and K.Hirschhorn: Amer. J. hum. Genet., 1962, 14, 107-124 (Nat. Inst. Dent. Res., Bethesda, Md., U.S.A.) Structural chr. variants involving enlarged satellites on chr. 13 and 22 were described for 2 human families. These variants are compatible with normal development and are inherited in an Mendelian manner. Linkage studies, using the enlarged satellites and various blood groups and serum factors could be a useful way of mapping human chr. D.A.Jones
2306. CHANGE OF HUMAN CHROMOSOME COUNT DISTRIBUTIONS WITH AGE: EVIDENCE FOR A SEX DIFFERENCE. P.A.Jacobs, M.Bunting, W.M.C.Brown, R.Phillips and H.Goldstein: Nature, Lond., 1963, 197, 1080-1081 (Western Gen. Hosp., Edinburgh, Scotland) Increases with age in the proportion of human aneuploid cells was due to mainly to loss of an Si chr. and in loss of an M chr., probably through divisional errors Solving the Y chr. in men and the X in women. G.M. Lewis
2307. CHROMOSOMES IN TOE HUMAN CANCER CELL TISSUE CULTURE LINE HUMAN EWDERMOID 2. C.Norrvyd and A.Fjelde: Cancer Res., 1963, 23, 197-200 (Inst. - Genet., Lund, Sweden) The line, which was en to continuous tissue culture since isolation in 1952-1953 to calf serum media, for the last 9 yr. as a monolayer trypsinised culture, had a hypertriploid stem-line and a variation of chr. no. between 69 and 81. & far 131-156 chr. and higher no. were also seen. 60 cells counted 3-9% were in the double stemline 6&K. 6 karyotypes were analysed. 3 marker chr. Ci 101 served, 1 8 subterminal seen in all cells and 2 chr. approx. half the size of No. 21 and 22. B.M.Stevens
- *³ ttV⁴ SUBLINE OF EHRLICH ASCITES TUMOUR: ERTRIPLOID. H.Tsukada, S.-C.J.Fu, R-Kato and Yerganian: Cytologia, 1961, 26, 419-422 (Cancer Inst. Med. Sch., Sapporo, Japan) Cytol., biol., and biochem. characteristics of the first triploid or near-

triploid subline of this tumour are given, and the karyotype morphology of hyperdiploid, hypertriploid and hypo-tetraploid sublines compared. The model chr. no. of these three are 45, 65 and 73. The hypertriploid is the most malignant of all Ehrlich ascites tumours. C.A.Stace

2309. NATURAL TRIPLODY IN SALAMANDERS RELATED TO AMBYSTOMA JEFFERSONIANUM. T.M.Uzzell, jun.: Science, 1963, 139, 113-115 (Museum Zool., Univ. Michigan, Ann Arbor, Mich., U.S.A.) Dimorphism in cell size, the inheritance of sex and the larval chr. counts indicate that there are distinct, continuing populations of triploid ? associated with certain populations of the 2 diploid spp. *A.jeffersonianum* and *A.laterale*. G.M.Lewis

2310. STUDIES ON CHROMOSOMES OF FIVE SPECIES OF COCCINELLIDAE (COLEOPTERA). U.Agarwal: Cytologia, 1961, 26, 285-293 (Div. Microbiol., Central Drug Res. Inst., Lucknow, India) Five spp. in the genera *Coccinella* ($2n = 20$), *Menochilus* ($2n = 20$) and *Epilachna* ($2n = 18$) were examined by suitably treated gonadal sections. The chr. no. 20 is modal for the Coleoptera, and lower no. are supposed to be derived from it by fusion or by loss of the minute Y chr. The spp. with $2n = 18$ have a large Y chr. and methods are discussed by which these (neo-XY) types might have evolved from those with $2n = 20$ and a minute Y (primitive-XY). CA.Stace

2311. NUCLEAR STRUCTURES IN THE ARANEINA. n. SEX CHROMOSOMES. I.I-Sokolov: Tsitologiya, 1962, 4, 617-625. Sex chr. were studied in approx. 20 spp. of Araneina. The predominant types of sex determination was $X1X2O$ (d^1). The sex. chr. of all the spp. studied were telocentric. At all stages of the spermatogenic cycle they consisted of 2 chromatids. There was total heterochromasia from the preleptotene period until the end of spermatogenesis. (Russian) BJ.Cooper

2312. A NEW CHROMOSOME NUMBER AND KARYOTYPE IN LYCORIS RADIIATA. S.Bose: Nature, Lond., 1963, 197, 1229-1230 (Blandy Expt. Farm, Univ. Virginia, Boyce, Va., U.S.A.) G.M.Lewis

2313. ANEUPLOIDS IN OAT VARIETAL POPULATIONS. J.B.Jiacker and R.Riley: Nature, Lond., 1963, 197, 924-925 (Plant Breeding Inst., Cambridge, England) Examination of the chr. constitutions of 3 populations of *Avena sativa* var. Sun II showed 1^*4 , 1^*9 and 1^*2^*0 aneuploidy. It is suggested that a complete series of monosomics could be assembled by screening varietal populations. CM.Lewis

2314. CYTOLOGY OF SOME MEMBERS OF THE FAMILY IRIDACEAE. A.K.Sharma and A.Sharma: Cytologia, 1961, 26, 274-284 (Bot. Dept., Calcutta Univ., India) The chr. morphology of 7 taxa in 4 genera was compared. Of several pretreatment chemicals used aesculin gave the best results. Aneuploidy and polyploidy were found to be frequent. On the basis of karyotype homologies it is suggested that the taxa examined belonging to *Babiana* ($2n=14$), to *Tigridia* ($2n=26$) and to *Tritonia* and *Moraea* ($2n=20, 40, 60$) form 3 distinct evolutionary lines, although one source of *Tritonia crocata* ($2n=22$) possessed an aberrant karyotype suggestive of the genus *Crocosmia*. CA.Stace

2315. STERILITY OF AN INDUCED AUTOTETRAPLOID OF CROTALARIA GOREENSIS. J.Bouharmont: Cytologia, 1961, 26, 253-267 (Inst. Camoy, Louvain, Belgium) Autotetraploids ($4n = 32$) were obtained by

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colchicine treatment, and were characterised by larger pollen grains, flowers and stomata. They were very largely sterile, and microsporogenesis, pollen tube growth, fertilisation and seed development was followed. In microsporogenesis quadrivalents were not numerous; univalents were frequent and became laggards which formed micronuclei in many cases. These meiotic irregularities accounted for abnormal pollen tube growth and embryo-sac development, and hence to the high degree of sterility. (French) CA.Stace

2316. INTERGENERIC HYBRIDS IN THE BOTHRIECHLOA ININAE. n. BOTHRIECHLOA AND CAPILLIPEDUM. J.M.J. de Wet, D.S.Borgaonkar and H.R.Chheda: Cytologia, 1961, 26, 268-273 (Dept. Bot. and Plant Pathol., Oklahoma State Univ., Stillwater, Okla., U.S.A.) Three strains of *B. intermedia* were used as \$ parents in crosses with *C.parviflorum* and *C.spicigerum*. All parents have $2n=40$ and are suggested to be segmental allotetraploids since some univalents may be found during microsporogenesis. Hybrids from all but one cross showed $2n=40$, and in most (but not all) cases the no. of bivalents was similar to that in the parent spp. Pairing may be autosynthetic, but close homology between the chr. of the 2 genera is suggested. One hybrid showed $2n=47$, with up to 21 bivalents: the extra chr. could have come from either parent. C.A.Stace

2317. CHROMOSOME ATLAS OF THE GENUS DACTYLIS. K.Jones, C.Carroll and M.Bonill: Cytologia, 1961, 26, 333-343 (Welsh Plant Breeding Stn., Aberystwyth, Wales) The distributions of plants with the three known levels of ploidy (diploids, tetraploids and hexaploids, $x=7$) are given, with a discussion of the evolutionary significance of the diploids. Some triploids are found where diploids and tetraploids occur together and these presumably produced the hexaploids, which are very rare. The chr. no. of 210 populations are given. Up to four B chr. may be present, mostly in diploids. C.A.Stace

2318. CYTOLOGY OF COCOS NUCIFERA AND ARECA CATECHU. A.Abraham, P.M.Mathew and CA.Ninan: Cytologia, 1961, 26, 327-332 (Univ. Kerala, Trivandrum, India) Male flowers were fixed in Camoy's fluid and the anthers stained in acetocarmine. Meiosis was followed in both spp. and found to be essentially the same ($n=16$). The known chr. no. of the tribes Coccoineae and Areceae are surveyed. CA.Stace

2319. KARYOTYPES IN FOUR DIPLOID SPECIES OF CHRYSANTHEMUM. R.Tanaka and N.Shimotomai: Cytologia, 1961, 26, 309-319 (Bot. Inst., Hiroshima Univ., Japan) Sixty clones of 4 spp. and one variety were found to have $2n=18$ in root-tips and pollen mother cells, but the 4 spp. were distinguishable on chr. size and morphology. Since the chr. of *C.Uneare* are larger than those of the other spp. and differ in that none are acrocentric this sp. is thought to be the most primitive. The smaller the chr. the fewer the pairs of satellited chr.: *C.Uneare* and *C.vulgare* have 3 pairs; *Crapestre* 2; and *Cnippionicum* one. CA.Stace

2320. NEW CYTOLOGICAL RESEARCHES ON THE MELASTOMATACEAE. CFavarger: Ber. sghweiz. bot. Ges., 1962, 72, 290-305 (Inst. Bot., Neuchatel, Switzerland) The chr. no. of 100 spp. collected in E.Africa and of 5 spp. from other sources is given. (French) M.Blandin

2321. TYPES OF POLYPLOIDISATION AND CHROMOSOME SET REDUCTION. V.K.Shcherbakov: Tsitologija, 1962, 4, 477-489. Study of a wide range of literature on the subject showed that polyploidisation of chr. sets can occur in 4 ways, which are described. Reduction of sets normally occurs in meiosis and sometimes takes place in somatic tissues by meiosis and by union of genomes. (Russian) BJ.Cooper

2322. STUDIES ON CYTOLOGY OF TWO SPECIES OF PHYMATODES. S.and N. Pal: Cytologia, 1961, 26, 460-467 (Dept. Bot., M.B.B. Coll., Agartala Tripura, India) Somatic nuclei were studied from root-tip squashes and meiotic chr. from young sporangia smears. $2n=72$, with 36 bivalents, in both *P.scholoperidila* and *P.nigrescens*. Tetrad formation was studied in both, and the chr. classed according to length and centromere position, when the 2 spp. could be distinguished. In *P.nigrescens* tetrad nuclei sometimes fused to give tetraploid nuclei which underwent 'secondary meiosis', this often being very irregular. C.A.Stace

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2323. TECHNIQUE FOR CHROMOSOME STUDY OF HUMAN BONE MARROW FIBROBLAST-LIKE CELLS. P.Fames, B.E.Barker and H.Fanger: Exp. Cell Res., 1963, 29, 86-91 (Dept. Pathol., Rhode Island Hosp., Providence, R.I., U.S.A.) KJones

2324. THE USE OF LACTO-PROPIONIC ORCEIN IN RAPID SQUASH METHODS FOR CHROMOSOME PREPARATIONS. A.F.Dyer: Stain Technol., 1963, 38, 85-9° - (Royal Bot. Garden, Edinburgh, Scotland) In general lacto-propionic orcein produces less cytoplasmic staining has a more rapid penetration and gives more uniform results than acetic orcein. It may be used on a wide range of materials. M J.Bell

2325. USE OF AGAR FOR OBTAINING CHROMOSOME PREPARATIONS. V.V.Teiskikh: Tsitologija, 1962, 4, 702. Description of a method involving a protective layer of agar on glass for making cells adhere to the glass during treatment with hypotonic soln. in the production of chr. prep. With this method there is marked swelling of the cells. After fixation the agar can be removed extremely easily. The method is suitable for work with aw cells in tissue culture. (Russian) B J.Cooper

2326. NUCLEOLAR PREPARATIONS FROM AMPHIBIAN EPITHELIAL CELLS. M.I.Betina: Tsitologija, 1962, 4, 703-704. Description of 7-stage method of exposing nucleoli in the epithelial cells of amphibian larvae. On the prep. so obtained it was easy to count the nucleoli in the nucleus. The method was used on the axolotl and a sp. of frog. Repeated total prep. of the fin were obtained, with differential staining of the chromatin in the interphase nuclei and nucleoli of the epithelial cells. (Russian) B J.Cooper

2327. ERRORS IN CYTOPHOTOMETRY. L.S.AgroSkin-Tsitologija, 1962, 4, 585-595. The single- and double-wave and scanning methods of photometry are compared. (Russian) BJ.Cooper

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2328. SEARCH FOR THE ESSENTIAL FACTORS OF CARCINOGENESIS. R.Wakonig-Varrtaja: Ann. N.Y.Acad. Sci., N.Y., 1963, 105, 1-24 (Dept. Obstet. and Gynecol., Queen Elizabeth Hosp., Woodville, S.Australia) A review in which attention is drawn to the evidence that neoplasia is basically an irreversible change inherited from cell to cell. In particular a mouse lymphoma with cells exhibiting an identifiable abnormal marker is described. A hypothesis of carcinogenesis is discussed assuming that a mutation, in the widest meaning eluding virus infections or activation, is the original neoplastic change. This mutation is assumed to impair permanently the function of one of the genes that regulate the mechanisms controlling growth of a cell.

P.N.Campbell

2329. NON-ADDITIONAL COMBINING ABILITIES. N.Gilbert: Genet. Res., 1963, 4, 65-73 (Biophys. Dept., Univ., Edinburgh, Scotland) A model based on the simultaneous estimation of 2 constants, additive and multiplicative, for each parents' contribution is found to describe Hel cross data!

J.Sneath

2330. FACTORIAL NOTATION OF A FIGURATE SERIES. H.-G.Hadley: Acta genet. Basel, 1962, 12, 178-190 (Hedley Mem. Clin., 1252 6th St., S.W., Washington, D.C., U.S.A.)

D.B.Roberts

MICRO-ORGANISMS

2331. "J₁" GENE CONTROLLED RADIATION SENSITIVITY P. C. LI. A. ORSCH, A. EDELMAN AND J. A. COHEN: Biophys. Acta, 1963, 68, 263-270 (Med. Inst., Berlin, FRG) The position of the determinant syn, which confers sensitivity to u.v. light, was shown by conjugation to be between the markers controlling xylose fermentation and streptomycin resistance in *J₁ coli* B. The fertility factor of an *E. coli* K 12 strain was transferred to an auxotroph of a radiation sensitive mutant of *E. coli* B (syn⁻). The resulting mutant was conjugated with *E. coli* C and the syn⁻ marker was thus transferred to that strain. syn⁻ strains differed from the wild type in their decreased ability to propagate u.v. inactivated bacteriophages T₁, T₃, T₇ and X! B.M.Stevens

2332. GENETIC AND BIOCHEMICAL ANALYSIS OF SECOND SITE REVERSION. D.R.Helinski and C.Yanofsky: J. biol. Chem., 1963, 238, 1043-1048 (Dept. Biol. Sci., Stanford Univ., Calif., U.S.A.) Genetic analysis of a partial revertant from an A-protein mutant strain, A46, of *E. coli* shows that reversion results from mutation at a site distinct from the A46 site. The A⁺ protein produced by this partial revertant differs from the wild-type protein in 2 amino acids. One of the amino acid changes, replacement of glycine by glutamic acid, is the same as the change characteristic of the A46 mutation. The other amino acid change, replacement of a tyrosine by a cysteine residue, results from the reversion, strain A46 carries only the second mutational change is indicated by appropriate crosses. This strain produces an

enzymically inactive A-protein which has the tyrosine to cysteine change, but not the glycine to glutamic acid change. J.N.Ashley

2333. SEQUENTIAL REPLICATION OF BACILLUS SUBTILIS CHROMOSOME. I. COMPARISON OF MARKER FREQUENCIES IN EXPONENTIAL AND STATIONARY GROWTH PHASES. H.Yoshikawa and N.Sueoka: Proc. nat. Acad. Sci. Wash., 1963, 49, 559-566 (Dept. Biol., Princeton Univ., N.J., U.S.A.) Relative frequency of genetic markers in the DNA of *B. subtilis* in exponential and stationary growth phases were compared using a transformation system. If the chromosome replication has polarity the freq. of each marker in the exponential phase should be a function of its location on the chr. Results indicate that such polarity exists in *B. subtilis*. A genetic map was constructed in which an adenine marker is located near the point of origin from which the chr. starts replicating and in which methionine and isoleucine markers are near the terminus. Chr. in stationary phase of growth are in completed form. J.R.Sargent

2334. ON THE NATURE OF COLICINOGENIC FACTORS: A REVIEW. P.Fredericq: J. theoret. Biol., 1963, 4, 159-165 (Univ. Liège, Rue des Bonnes-Villes, Belgium) Factors responsible for the production by certain bacteria of highly sp. antibiotic colicins are independent of the chromosomal material and bear a closer resemblance to phage and the F fertility agent. Colicinogenic factors are considered to be defective virulent phages which, although no longer capable of lysing the cell, retain the gene for lethal protein synthesis. CF.Blane

2335. INTERSPECIFIC RECOMBINATION IN STREPTOMYCES. M.Alacević: Nature, Lond., 1963, 197, 1323 (Dept. Microbiol., Univ. Zagreb, Yugoslavia) Recombination expt. have been carried out with nutritional mutants of *S. rimosus*, *S. eurofaciens* and *S. coelicolor*. Recombination rates ranged from 10⁶ to 10⁷ and were obtained in all the inter-sp. crosses examined. CM.Lewis

2336. MUTATIONS OF THE A MATING TYPE FACTOR IN COPRINUS LAGOPUS. P.R.Day: Genet. Res., 1963, 4, 55-64 (J. Innes Inst., Bayfordbury, Hertford, Herts., England) 10 A factor mutants and an unlinked A suppressor mutant, were isolated from fruit bodies formed by common A heterokaryons of *Coprinus lagopus*. The suppressor was recessive since stocks carrying it retained their A or B specificities when mated with wild-type testers. False clamps were formed. Fruit bodies formed by monokaryons carrying the suppressor mutant had pale gills bearing varying proportions of abnormal tetrads with less than 4 spores. The 10 A factor mutants lacked A mating-type specificity and formed false clamps, functional non-mutant sub-units were present in four and two A6 mutants which were recovered in tests for intra-factor recombinations in matings between mutants and wild-type using the pair of markers paba-1 and ad-8 in repulsion. No 8-sub-units were detected. The mutations involve one or both sub-units or are very close to them. J.Sneath

2337. A RELATIONSHIP BETWEEN ERGOSTEROL AND RESPIRATORY COMPETENCY IN YEAST. L.W.Parks and P.R.Starr: J. cell. comp. Physiol., 1962, 61, 61-65 (Dept. Microbiol., Oregon State Univ., Corvallis, Ore., U.S.A.) Conditions (metabolic inhibitors, metal ions, heat) which induce formation of respiratory mutants (petite) in *S. cerevisiae* also reduce sterol formation. Addition of ergosterol could reduce the formation

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of these mutants. A discussion of the various cytoh, enzymic and genetic reports on loss of respiration in yeast is made in die light of these findings. CM.Lewis

2338. METHYLENE BLUE AND TOLUIDINE BLUE INTERFERING WITH PRODUCTION OF RESPIRATION-DEFICIENT MUTANTS IN YEAST BY ACRIFLAVINE. S.Nagai: *Exp. Cell Res.*, 1963, 29, 82-85 (Fac. Sci., Nat. Women's Univ., Nara, Japan) Methylene Blue and Toluidine Blue, which were ineffective to produce respiration-deficient mutants of yeast, counteracted the effect of acriflavine in producing the mutants, while Magdala Red and Rhodamine B did not counteract acriflavine. K.Jones

2339. HETEROKARYON-INCOMPATIBILITY FACTOR INTERACTION IN TESTS BETWEEN NEUROSPORA MUTANTS. F.J.de Serres: *Science*, 1962, 138, 1342-1343 (Biol. Div., Oak Ridge Nat. Lab., Oak Ridge, Tenn., U.S.A.) Studies on presumably isogenic ad⁺; 3A and jid-3B mutants of *N.crassa* derived from die same wild-type strain have revealed that the neg. heterokaryon tests shown by certain pair-wise combinations can be attributed to interaction of incompatibility factor mutations. G.M.Lewis

2340. ON THE MECHANISM OF COMPLEMENTATION AT THE LEU 2 LOCUS OF NEUROSPORA. S.R.Gross: *Proc. nat. Acad. Sci. Wash.*, 1962, 48, 922-930 (Dept. Microbiol., Duke Univ., N.C., U.S.A.) The complementation map derived is linear, overlapping and continuous. Evidence presented indicates that the polypeptide determined by the leu-1 gene is one of at least two different peptide structural units of an enzyme which catalyses the isomerisation of 3 carboxy-j3-hydroxyisocaproate and (X-hydroxy-j3-carboxyisocaproate. The complementation behaviour of a group of leu-2 in combination with a leu-2 leu-3 double mutant is consistent with the notion that the isomerase is a mixed polymer consisting of at least two a and two g-chains. J.R.Sargent

2341. POLARISED NEGATIVE INTERFERENCE IN THE PABA 1 REGION OF ASPERGILLUS NIDULANS. O.H. Siddiqi and A.Putrament: *Genet. Res.*, 1963, 4, 12-20 (Dept. Genet., Univ. Glasgow, Scotland) 28 crosses involving 14 allelic paba mutants, in different combinations, showed that when the distance between the mutants is large, the additional exchanges on the distal side (relative to the contromere) greatly exceed those on the proximal side. As the interval between the mutants decreases this difference disappears. This may be due to a process which imposes a time sequence on recombination events; alternative explanations are discussed. J.Sneath

2342. GENETIC ANALYSIS OF CARBOHYDRATE UTILISATION IN ASPERGILLUS NIDULANS. C.F.Roberts: *J. gen. Microbiol.*, 1963, 31, 45-58 (Dept. Genet., Univ. Glasgow, Scotland) A new class of *A.nidulans* mutants, detected by their inability to utilise sp. carbohydrates as sole C source for growth, were isolated. All the mutants are recessive. Analysis of 27 mutants resulted in the description of 10 new loci concerned with carbohydrate utilisation which were allocated to linkage groups, and 6 were mapped meiotically. Two loci controlling lactose utilisation are not linked and neither are 5 loci controlling galactose utilisation. K.Brew

2343. NEW RESULTS ON THE MATING TYPES IN PARAMECIUM BURSARIA. R.W.Siegel: *Genet. Res.*, 1963, 4, 132-142 (Dept. Zool., Univ. California, Los Angeles, Calif., U.S.A.) Mating types I, II, m and IV are determined by sp. combination of dominant and recessive alleles at 2 unlinked loci. Genotypes A A BBL AABb, AaBB, AaBb form type I: aaBB and aaBb form type II • aabb"T5rms type m and AAbb and Aabb forms type IV. Exception to these rules occur in low freq. (2-3%) and can be explained by mutation of B to b or loss of the B locus. There is no evidence for autogamy in this sp. — J.Sneath

2344. MATING TYPE SUBSTANCES IN PARAMECIUM BURSARIA. L.W.Cohen and R.W.Siegel: *Genet. Res.*, 1963, 4, 143-150 (Dept. Zool., Univ. California, Los Angeles, Calif., U.S.A.) Conclusive evidence for the existence of 2 pairs of mating-type substances in *P.bursaria* first postulated by Metz (1954) is presented. Tp detached cilia from sexually reactive cells will agglutinate with cilia from intact Paramecia of the complementary mating type. Other particles do not adhere and the cilia carrying die sp. mating-type substances are found only on the ventro-lat. surface. Heat inactivation of substances A and a, B and b showed the former pair to be more heat labile. The substances appear to be present in the combinations AB, ab, Ab and ab. J.Sneath

2345. ACTION OF RIBONUCLEASE AND 8-AZAGUANINE ON MATE-KILLER PARAMECIUM. I.Gibson and G. Beale: *Genet. Res.*, 1963, 4, 42-54 (Inst. Animal Genet., Edinburgh, Scotland) Both RNase and 8-azaguanine affect the particles: RNase destroys or irreversibly inactivates the metagons but these are not affected by 8-azaguanine (although this substance possibly inhibits synthesis of new ones). RNase treatment and subsequent fission produced cells with no metagons, but resynthesis occurred between the 2nd and 3rd fissions # the dominant gene M2 was present. 8-Azaguanine destroyed mu particles immediately but not metagons already present. The separate existence of metagons & mu particles is confirmed and the fact that RNA is an essential constituent of metagons makes it more likely that these are normal intermediary products of gene action rather than gene relics*. J.Sneath

2346. MATE-KILLER (MU) PARTICLES IN PARAMECIUM AURELIA: FURTHER MATHEMATICAL MODELS FOR METAGON DISTRIBUTION. E.C.R.Reeve and G.I.S. Ross: *Genet. Res.*, 1963, 4, 158-161 (Inst. Animal Genet., Edinburgh, Scotland) Short note. ISneath

2347. NUCLEAR-CYTOPLASMIC INTERACTIONS IN RESPONSES OF AMOEBA PROTEUS AND AMOEBA DISCOIDES TO STREPTOMYCIN. R.J.Cole and J.F.Danielli: *Exp. Cell Res.*, 1963, 29, 199-206 (Dept. Biochem., Univ. Glasgow, Scotland) The growth rates of clones of various strains of *A.proteus* and of a single strain of *A.discoides*, in growth-limiting concn. of streptomycin, were measured. It is suggested that the mechanisms conferring higher levels of resistance on some strains of *A.discoides* are transmitted by either nuclear factors or cytoplasmic factors independently. On the other hand, the higher resistance of *A.discoides* is due to be determined by independent nuclear and cytoplasmic factors, the cytoplasmic system self-replicating. K.Jon

PLANT

2348. STUDIES ON THE USE OF MUTAGENIC AGENTS IN PLANT BREEDING. I. THE EFFECT OF SEED MOISTURE CONTENT ON SENSITIVITY TO X-RAYS IN *LUPINUS ANGUSTIFOLIUS*. C.M.Francis and J.S.Gladstones: Aust. J. agric. Res., 1963, 14, 12-19 (Inst. Agric, Univ. Australia, Nedlands, Australia)

Seeds were subjected to four X-ray doses at each of 12 moisture contents. Reduction of height, delay in flowering and reaction in mean seed yield per plant were measured as damage in *Xi* plants and were found to be highly correlated. Treatments used did not significantly affect survival. Sensitivity to X-rays increased with decreasing moisture content below 11-6ft seeds with $6\cdot1\cdot7\cdot6\cdot^*$ being 4 to 5 times as sensitive as those with $11\cdot6\cdot16\cdot^*$. Sensitivity again increased between $16\cdot0$ and $18\cdot1\cdot^*$.

R.L.Weston

2349. RESEARCH ON USE OF RADITION-INDUCED MUTATIONS IN CROP BREEDING IN JAPAN. T.Matsu-
suo and H.Yamaguchi: Euphytica, 1962, 11, 245-255
(Fac. Agric* Univ. Tokyo, Japan) $\text{tev}^{**}\text{f} \text{ jjj}^{\wedge} \text{ t}^*$

2350. MUTATION RESEARCH IN CANARY GRASS [*PHAL-ARIS CANARENSE* L.]. D.E.Bremer-Reinders: Euphyt-
ica, 1962, 11, 293-310 (Inst. Plant Breeding, Wag-
ingen, Netherlands) Irradiation of dry seeds with X-
rays (5000-20000 r) and neutrons suppressed both germina-
tion^b? and survival of seedlings according to dose. Degree
^fertility in the *Mi* generation decreased with X-ray.
*?e. but the influence was weaker in the *M₂* generation.
Chlorophyll and major morphol. mutants were plated
in the *M₂* generation. R.D.Butler

2351. PROGRESS OF INBREEDING IN A *IMREE-BWID*
POPULATION OF BARLEY. S.K.Jain and K.B.I.Jain:
Euphytica, 1962, 11, 229-232 (Div. Bot., Indian Agnc.
, Inst., New Delhi, India) Individual plant pro-
genies from *F₄*, *F₅* and *F₆* generations of intervanetal
crosses and 3 of their parents were used for comparing.
*f within-family variances. For plant height the van-
ence was not significantly higher than one in the
 F_1 , whereas in spike length there was an excess of
family variance in the *F₆* over the parent; This
excess^w attributed to a differential survival of hetero-
zygous progenies under selection despite some selection
against heterozygosity to marked

R \wedge X

2352. RESULTS OF ONE CYCLE OF RECURRENT SELECTION IN RYE. F.P.Ferwerda: Euphytica, 1962, 11, 221-
228 (Inst. Agric. Plant Breed., Wageningen, Nether-
lands) $\text{W} \text{ a } \text{ g } \text{ e } \text{ h } \text{ m } \text{ s }$
D.Burk

2353. BREEDING EXPERIMENTS ON SOUTH AFRICAN
PLANTS. IV. SELECTION FOR QUANTITATIVE CHAR-
ACTERS IN *SPARAXIS KER.* AND *BULBINELLA KUNTH.*
W.H.C. Z. Pflanzenz., 1962, 48, 360-371 (Fruit and
Techn. Res. Inst. Abt. Pflanzenz., Stellenbosch
Africa) Flower characters were investigated. Most
variation was found to be genetic, and selection
of arable characters should therefore be possible.

2354. AN INTERSPECIFIC CROSS IN *CUCURBITA*:
C.JUNDELLIANA BAILEY \times *C.MAXIMA DUCHESNE*.
H.Öpik (German, English summary)

- T.W.Whitaker: Euphytica, 1962, 11, 273-281 (Crops
Res. Div., Agric. Res. Serv., La Jolla, Calif., U.S.A.)
Mean pollen fertility for the *F₁*, *F₂* and the backcross to

C.Jundelliana was 17*6, 28*4 and 5*2% respectively; the
backcross to *C.maxima* being 65*9%. *C.Jundelliana* seems
to be dominant for most characters. R.D.Butler

2355. SPECIES HYBRIDISATION IN *TRIFOLIUM H.* IN-
VESTIGATING THE PREFERTILKATION BARRIERS TO
COMPATIBILITY. A.M.Evans: Euphytica, 1962, 11,
256-262 (Welsh Plant Breeding Str., Plas Gogerddan,
Aberystwyth, Wales) Pollen tube growth was slower
in intersp. than in intrasp. crosses although no failure of
pollen germination was observed. A parallel could be
drawn between the success of the pollen and the success
of vegetative grafting of the genotypes. R.D.Butler

2356. CONTRIBUTIONS ON THE GENETICS AND BREED-
ING OF TETRAPLOID SUPERBISSIMA PETUNIAS
(*PETUNIA* \times *HYDRIA VILON.* SUPERBISSIMA GROUP).
H.Seidel: ZJPflanzenz., 1962, 48, 327-359 (Inst.
Angewandte Genet., Tech. Hochschule, Hanover,
Germany) With colchicine treatment, homozygous
tetraploid large-flowered Petunias were produced artifi-
cially for the first time, and the inheritance of the large-
flowered character was analysed in detail. The inheritance
is of monofactorial dominant type. The gene *G* for large
flowers has a weakening effect on the plant, and *GG*
pollen is non-functional.

(German, English summary) H.Öpik

2357. MULTIPLE ALLELIC CONTROL OF CHLOROPHYLL
b LEVEL IN *ARABIDOPSIS THALIANA*. Y.Hirono and
"B.P.Redei: Nature, Lond., 1963, 197, 1324-1325
(Curtis Hall, Dept. Field Crops, Univ. Missouri, Col-
umbia, Mo., U.S.A.) In X-irradiation expt. a few
yellow-green mutants were obtained with reduced chloro-
phyll b; these comprised a series of alleles with fairly
normal fertility and mendelian inheritance. Chlorophyll
a was also reduced in these mutants. The chlorophyll b
"does not appear to play any role in starch synthesis but
may be involved in photo-oxidation. CM.Lewis

2358. SOMATIC INSTABILITY CAUSED BY A CYSTEINE-
SENSITIVE GENE IN *ARABIDOPSIS*. G.P.Redei: Science,
1963, 139, 767-769 (Dept. Field Crops, Univ. Missouri,
Columbia, Mo., U.S.A.) A recessive gene, immut-
ants, is responsible for abnormal chloroplast development,
which results in variegation. Somatic mutability is stim.,
though only functional disorder is involved. Cysteine and
low temp, favour normal function, while homocysteine
interferes with chloroplast development without adversely
affecting growth of the mutant. CM.Lewis

2359. HERITABILITY OF VARIATIONS IN OIL CONTENT
OF INDIVIDUAL CORN KERNELS. L.F.Bauman, T.F.
Conway and S.A.Watson: Science, 1963, 139, 498-
499 (Dept. Bot., Purdue Univ., Lafayette, Ind., U.S.A.)
Individual corn kernels from a selfed single-cross ear
ranged from 2-7 to 54% oil as determined by nuclear
magnetic resonance spectroscopy; this was significantly
correlated with the oil content of their progeny ears and
indicates that differences in oil content are heritable.

G.M.Lewis

2360. GENETIC AND ENVIRONMENTAL VARIATION:
EFFECTS ON PIGMENTS OF SELECTED MAIZE MU-
TANTS. L.B.J.Richardson, D.S.J.Tobertson and I.C.Ander-
son: Science, 1962, 138, 1333-1334 (Genet. Dept.,
Iowa State Univ., Ames, Iowa, U.S.A.) Three pastel
mutants of maize which were sensitive to temp, and the
offspring of 2 of these with allelic albino mutants were
studied under conditions of controlled light and temp. The
mutations do not affect the pigment levels equally and the
effects vary with the locus and the allelic combination.

G.M.Lewis

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2361. DIFFERENCES BETWEEN SMOOTH AND THREE TYPES OF WRINKLED PEAS. E.Kooistra: *Euphytica*, 1962, 11, 357-373 (List. Hort. Plant Breeding, Wageningen, Netherlands) Two new types of wrinkled peas are described. One resembles the old-established wrinkled pea in seed surface and the smooth pea in the appearance of the starch grains. Crosses between this and the old-established wrinkled pea results in the third type. All 4 peas differ in chem. composition. It is suggested that the factors *Ra* and *Rfc*, having different effects on starch synthesis, are responsible for the observed differences.
R.D.Butler

2362. HERITABLE NECROSIS OF RED STORAGE CABBAGE. M.Nieuwhof and D.Wiering: *Euphytica*, 1962, 11, 240-244 (Inst. Hort. Plant Breeding, Wageningen, Netherlands) Susceptibility depends on an incompletely recessive factor, *n*.
R.D.Butler

2363. EVOLUTION AND VARIATION IN TRILLIUM. VI. MIGRATION AMONG NATURAL POPULATIONS OF T.KAMTSCHATICUM ACROSS THE ISHIKARI DEPRESSIONS. T'rikuda V.YiHiraizumi, T.Narise and M.Kurabayashi. **VII. MIGRATION BETWEEN NORTHERN AND EASTERN POPULATION GROUPS OF T. KAMTSCHATICUM.** Y.Kozuka and M.Kurabayashi: *Evolution*, 1960, 14, 224-231, 232-237 (Biol. Sect. Women's Christian Coll., Tokyo, Japan) VI. Migrations were examined by comparative analysis of chr. composition in natural populations. Populations in the north were large in size and revealed interpopulation homogeneity. In the south, populations were small and high in intrapopulational homogeneity. The results of comparative examinations elucidated various modes of interactions between selection and random genetic drift in the course of migrations.

VII. Migrations between northern and eastern population groups of the spp. were examined by making analyses of chr. composition among populations distributed in north-eastern regions of Hokkaido. A fine cline was demonstrated along the coastline of the sea of Okhotsk. The cline is supposed to be maintained by a balance between selection and migration pressure in each of the populations, arranged in a row, from north-west to south-east along the coastline.
T.Pritchard

2364. THE BREEDING GROUP AND SEED STORAGE: A STUDY IN POPULATION DYNAMICS. C.Epling, H. Lewis and F.M.Ball: *Evolution*, 1960, 14, 238-255 (Univ. California, Los Angeles, Calif., U.S.J.V.)

The yearly freq. since 1941 of die blue and white flowered plants of *lithanus parrage*, a conspicuous annual of the Mojave desert, is reported. The data presented give no evidence of selection or of genetic drift, contrary to what was expected from the assumed differences in size of the breeding groups, after 17 yearly cycles during signal changes in the environment and drastic expansions and contractions of the population. This static is ascribed to protracted dormancy of seeds in the soil and their inherently different requirements for germination.
T.Pritchard

ANIMAL

2365. LACK OF EVIDENCE FOR CO-ADAPTATION IN CROSSES BETWEEN GEOGRAPHICAL RACES OF DROSOPHILA SUBOBSCURA COLL. A.M.McFarquhar and

F.W.Robertson: *Genet. Res.*, 1963, 4, 104-131 (Inst. Anim. Genet., Edinburgh* Scotland) The mean and variance of body size, development time and survival were recorded to the parent populations and the *i* and *H* of various crosses of flies collected at a no. of sites, some in Scotland, others from England, Denmark, Switzerland and Israel. They showed an initial difference in body size, those from the North were larger but *F1* and *F2* & & generations showed mid-parent values and no evidence of gene-environment interaction with respect to diet or temp. Between family variance of abdominal bristle no. of intra- and inter-population matings of the most widely separated populations showed no increase in the inter-population series. Lack of evidence for co-adaptation is discussed with respect to sp. showing co-adaptation.

J.Sneath

2366. ECOLOGICAL GENETICS OF GROWTH IN DROSOPHILA. VI. THE GENETIC CORRELATION BETWEEN THE DURATION OF THE LARVAL PERIOD AND BODY SIZE IN RELATION TO LARVAL DIET. F.W. Robertson: *Genet. Res.*, 1963, 4, 74-92 (List. Anim. Genet., Edinburgh, Scotland) There is a striking correlation between body size and larval period duration, when the diet is deficient in RNA (but when RNA is adequate there is very little). The critical changes in larval growth occur in the early 3rd instar and a 2nd stage thereafter. Lines selected for fast development on low RNA diet are especially sensitive to slight changes in nutrition. The pattern of larval development suggests a flexible system which is adapted to varying ecological conditions.
J.Sneath

2367. ORIGIN OF REPEATS IN DROSOPHILA CHROMOSOMES. H.Sлизинска: *Genet. Res.*, 1963, 4, 154-157 (Inst. Anim. Genet., Edinburgh, Scotland) *Sh<P* note.
J.Sneath

2368. SEX CHROMATIN AND GENE ACTION IN THE MAMMALIAN X-CHROMOSOME. M.F.Lyon: Amer. J. hum. Genet., 1962, 14, 135-148 (M.R.C. Radiobiol. Res., Unit, Harwell, Berks., England) All the sex-linked colour genes of the mouse, and all the autosomal colour genes translocated to the X-chr. that have been studied show a mottling effect in heterozygous. From these observations the hypothesis of inactivation of one of the X-chr. in ♀ mammals was suggested. Either of tot two X-chr. may be inactivated in different cells of the same animal, possibly forming the sex chromatin, early in development and this leads to mosaicism. The hypothesis could explain the viability of XXXXY individuals, assuming that only one X-chr. is active in each cell.

D.J. Jones

2369. ATTEMPTS TO TEST THE INACTIVE-X THEORY OF DOSAGE COMPENSATION IN MAMMALS. M.J. Lyon: *Genet. Res.*, 1963, 4, 93-103 (M.R.C. Radio-biol. Res. Unit., Harwell, Berks., England) Predictions on this theory concerning the phenotype of ♀ heterozygous for 2 non-allelic X-linked genes acting through the same cells were tested using the mutants dappled (*Mdp*) and flecked (*fd*), and chinchilla (*c^{ch}*) together and tabby (*tit*) and smoky (*Sm*). The prediction that only one of the Tx chr. is active in the somatic cells of ♀ mammals is confirmed. In *Str* +/+ Ta ?, tabby only in non-S_{tt} patches, while tit_{Str} Ta/F₁ Tit acted eq. in the Str ones.
J.Sneath

2370. STRIATED, A NEW SEX-LINKED GENE IN THE HOUSE MOUSE. R.J.S. Phillips: *Genet. Res.*, 1963, 4, 151-153 (M.R.C. Radiobiol. Res. Unit., Harwell, Berks., England) Short note.
J.Sneath

2371. GENETICS OF DEGENERATIVE JOINT DISEASE IN MICE. L.Sokoloff, L.B.Crittenden, R[^].Yamamoto and G.E.Jay, jun.: *Arthritis and Rheumatism*, 1962, 5, 531-546 (Nat. Inst. Arthr. and Metabol. Dis., Bethesda, Md., U.S.A.) D.G.Scott

2372. STUDIES IN TUBERCULOSIS USING GENETICALLY KNOWN MOUSE MATERIAL. THE SURVIVAL TIME OF TWO HOMOZYGOUS MOUSE STRAINS AND OF THEIR F₁-HYBRID. IV. Von A.Grumbach and H. Beer: *Acta Genet.*, Basel, 1962, 12, 103-116 (Inst. Med. Mikrobiol., Univ. Zurich, Glorastrasse 32, Zurich, Switzerland) Two homozygous groups of mice (Stark and Grinder) and the F₁-hybrid were infected with 2 strains of tuberculosis (H₃₇Rv and Vallée) and the time* of death recorded. There was no difference between Bte tuberculosis strains but the difference between the J^{sp} homozygous mouse strains was significant. The hybrids showed the resistance or susceptibility of the ♀ Parent and were unaffected by the ♂ parent. In the homozygous lines there was no significant sex difference.

(German, English summary) D.B.Roberts

2373. GENETIC STUDY OF INDUCED LUNG TUMOURS IN MICE. D.S.Falconer and J.L.Bloom: *Brit. J. Cancer*, 1962, 16, 665-685 (Inst. Anim. Genet., Edinburgh, Scotland) A statistical analysis was made of lung tumour yields produced in various strains of mice and their cross-bred deriv. by injn. of an aq. soln. of Jtethane. There was no sex-difference in tumour incidence in 2 random bred strains studied in detail and instance was equal from ♂ and ♀ parents. Environmental variance was estimated by a study of susceptibility in 6 inbred strains. Using this estimate it was concluded that the degree of genetic determination in the 2 random-bred strains was 82% and 88%. i.e. genetic differences among the individuals were responsible for 80-90% of the variation in susceptibility. DJ.lamer

2374. A SEARCH FOR HETOCOMPATIBILITY DIFFERENCES BETWEEN IRRADIATED SUBLINES OF INBRED MICE. J.Godfrey and A.G.Searle: *Genet. Res.*, 1963, 4, 21-29 (M.R.C. Radiobiol. Res. Unit, Harwell, Berks., England) 13 sublines of C3H inbred mice, **Pt in a 1 r/night γ radiation field for 12 generations and separated from each other by approx. 34 generations were tested for histocompatibility differences by the tail-graft technique. No homograft rejections occurred and there is no evidence for mutation at the histocompatibility loci. J.Sneath

2375. HAEMOGLOBIN INHERITANCE IN INBRED MOUSE STRAINS. II. GENETIC STUDIES. J.J.Hutton, J. Bishop, R[^]chweet and E.S.Russell: *Proc. nat. Acad. Sci. Wash.*, 1962, 48, 1718-1724 (Univ. Kentucky Coll. Med., Lexington, Ky., U.S.A.) Genetic studies using a tryptophan-containing peptide as marker for the α chain of C57BL Hb showed that this chain was linked to the albino locus and that the 2 g-chains of AKR(FL) re-8-H²ei¹⁰-ether and segregated as a unit from the C57BL chain. Using a histidine-containing peptide as marker for the β chain of FL Hb α- and β chains were found to segregate independently. The aberrant α-chain of FL is responsible for foetal anaemia found in mice of the FL strain. J.R.Sargent

2376. THE SPECIAL STATUS OF THE J BLOOD GROUP SYSTEM OF CATTLE. D.O.Schmid: *Z. Immun.-fiziol.* 1962, 124, 1W-114 (Inst. f. Blutgruppenforsch. Tierzuchtforschung. e.V. Munchen, Germany) Review. 44ref. (German) D.P.Winsunley

2377. TIME OF APPEARANCE OF ANTIGENIC FACTORS ON CATTLE ERYTHROCYTES. D.H.Shaw and W.H. Stone: *Proc. Soc. exp. Biol.*, N.Y., 1962, 111, 104-111 (Dept. Gen., Univ. Wisconsin, Madison, Wis., U.S.A.) Blood typing of cattle embryos of various

ages indicated that the different Ag factors that comprise a phenogroup of the B locus do not develop simult. in ontogeny and a particular factor develops at different ages depending upon the phenogroup in which it occurs.

M.M.Shapland

2378. HEREDITY OF RABBIT GAMMA GLOBULIN ISO-ANTIGENS. S.Dubiski, J.Rapacz and A.Dubiska: *Acta Genet.*, Basel, 1962, 12, 136-155 (Inst. Hematol., Waisaw ul Chocimska, Poland) Sera from a no. of rabbits were tested immunol. for six V-globulin iso-Ag, all 6 iso-Ag were found to be inherited. Analyses of the pedigrees showed at least 2 genetic systems for the iso-Ag AF and BDE. C appears to be independent of BDE and the possibility of its being correlated or even allelic to AF was discussed, as well as the possibility of B, D and E being allelic. In Polish White rabbits E was found to be correlated with sex; the possibility of sex linkage was discussed. J**iSev>><^/~~**. D.B.Roberts

2379. INHERITANCE OF SERUM TRANSFERRINS IN RHESUS MONKEYS. M.Goodman and R.C.Wolf: *Nature*, Lond., 1963, 197, 1128 (Wayne State Univ. Coll. Med., Detroit, Mich., U.S.A.) Study of the inheritance of transferrin phenotypes in a breeding colony of rhesus monkeys supported the hypothesis that an allelic series of genes at a single locus controls the variation of transferrin types, each gene being responsible for 4. particular transferrin and none having dominance over another. G.M.Lewis

2380. SERUM TRANSFERRIN POLYMORPHISM IN HORSES. D.O.Schmid: *Z. Immun.-Forsch.*, 1962, 124, 219-223 (Inst. Blutgruppenforsch., Tierzuchfoisch. e.V., Munchen, Germany) Starch gel electrophoresis has shown that there are 6 transferrin phenotypes in horses: AA, BB, CC and AB, AC, BC. The 3 alleles are named JJ^A, 2^B and H^C. 150 horses were examined.

(German) D.P.Winstanley

2381. MOLECULAR GENETICS OF AVIAN PROTEINS. II. CENTRAL AND STRUCTURAL GENES FOR EMBRYONIC AND ADULT HAEMOGLOBINS. C.Manwell, C.M.A.Baker, J.D.Roslansky and M.Foght: *Proc. nat. Acad. Sci. Wash.*, 1963, 49, 496-503 (Dept. Physics and Biophys., Univ. Illinois, Chicago, m., U.S.A.) Early embryo Hb differs electrophoretically, structurally and functionally from late embryo and adult Hb. Embryonic Hb synthesis ceases after 5 days in White Leghorn, New Hampshire and Columbia chick and after 6 days in other chick breeds. Adult Hb appears in turkeys after 8 days. In blackbird, adult and embryonic Hb are synthesised together from the start of erythropoiesis. The existence of genes which control when, or whether, adult and embryonic Hb are produced is postulated. J.R.Sargent

2382. THE FAMILIAL OCCURRENCE OF HYPERGAMMAGLOBULINAEMIA IN MINK. J.B.Jienson, J.R.Gorham and R.W.Leader: *Tex. Rep. Biol. Med.*, 1963, 21, 37-42 (Washington State Univ., Pullman, Wash., U.S.A.) 31 families of mink from a ranch on which Aleutian disease was enzootic were examined for hypergammaglobulinaemia. 45% of the offspring from affected dams had hypergammaglobulinaemia while 19*2% of the offspring from non-affected were diseased. Comparisons were made between the familiar occurrence, father-child

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relationships and possible pathogenic mechanisms reported for systemic L.E. and hypergammaglobulinaemia in mink.

A.J.Martin

2383. GENETIC CONTROL OF HAEMERYTHRIN SPECIFICITY IN A MARINE WORM. C.Manwell: Science, 1963, 139, 755-758 (Mol. Kol. Lab., Illinois Marine Biol. Assocn., Univ. Illinois, Urbana, Ill., U.S.A.)

A biochem. polymorphism of coelomic haemerythrin has been found in Golfingia gouldii; the electrophoretically different coelomic haemerythrins differ in their O₂ equilibria and by a single peptide in tryptic and chymotryptic 'fingerprints'. All individuals have the same vascular haemerythrin, electrophoretically different from the coelomic ones. In another sipunculid, Dendrostomum cymodoceae, the haemeiythrins have quite different 'fingerprints'. Thus the tissue-sp. haemerythrins appear to have a distinct genetic basis.

G.M.Lewis

2384. A REPORT ON THE CROSSES BETWEEN GASTEROSTEUS ACULEATUS L. WITH VARIOUS NUMBER OF DORSAL SPINES. T.Penczak: Naturwissenschaften, 1963, 50, 49 (Dept. Taxon.Zool., Univ., Lodz, Poland)

Four-spined sticklebacks were shown to be recessive phenotypes of the three-spined sp., and not a separate sp.

A.J.Wansbrough

2385. SELECTION IN NATURAL POPULATIONS: MERYCHIPPUS PRIMUS, A FOSSIL HORSE. L.van Valen: Nature, Lond., 1963, 197, 1181-1183 (Dept. Zool., University Coll., London, England).

G.M.Lewis

HUMAN

2386. INHIBITING EFFECT OF ABO INCOMPATIBILITY ON Rh IMMUNISATION IN PREGNANCY: STATISTICAL ANALYSIS OF 1742 FAMILIES. J.Reepmaker, L.E. Nijenhuis and J.J.Van Loghem: Amer. J. hum. Genet., 1962, 14, 185-198 (Central Lab. Netherlands, Red Cross Blood Transf. Serv., Amsterdam, Netherlands)

Evidence supporting the hypothesis that A or B Rh. pos. cells which pass through the placenta are eliminated by the anti-Aoranti-BisoAb of anO, Rh neg. mother, hence losing their capacity to stimulate Rh Ab formation was obtained.

D.A.Jones

2387. ABO BLOOD-GROUPS IN PAROTID AND SUB-MAXILLARY GLAND TUMOURS. R.H.Osborne and F.U. De George: Amer. J. hum. Genet., 1962, 14, 199 (Div. Prevent. Med., Sloan -Kettering Inst., Cancer Res., New York, U.S.A.) The relative freq. of ABO

blood-groups in different types of salivary gland tumours was analysed. It would seem that only mucinous tumours are associated with the ABO blood-group system. It was suggested that the association relates a genetic difference in the susceptibility of individuals of different blood groups to neoplastic changes involving the mucous-secreting elements of the glandular epithelium. An excess of salivary tumours occurred in group A people.

D.A.Jones

2388. QUANTITATIVE STUDIES ON HAPTOGLOBIN OF APPARENTLY HEALTHY ADULT MALE TWINS. P.S. Bayani-Sioson, J.Louch, H.E.Sutton, J.U.Nell, S.L. Home and H.Geishowitz: Amer. J. hum. Genet., 1962, 14, 210-219 (Dept. Human Genet., Univ. Michigan, Ann Arbor, Mich., U.S.A.) The ability of the 3 types

of haptoglobin (Hp 1-1, 2-1 and 2-2) to combine with HL has been estimated as $94 \pm 4^{\circ}4$ mg. Hb/100 ml. of serum containing haptoglobin for Hp 1-1, $86 \pm 2^{\circ}5$ mg./100 ml. for Hp 2-1 and $69 \pm 3^{\circ}0$ mg./100 ml. for Hp 2-2. Because there was a smaller variance of the mean difference between identical as opposed to fraternal twins a genetical component of the variation was concluded. The precise nature of the genetic control could not be determined from the data.

D.A.Jones

2389. HYPOHAPTOGLOBINAEMIA IN AN AMERICAN NEGRO FAMILY. A.J.Gottlieb, J.Ross, M.Greenberg and N.Wisch: Nature, Lond., 1963, 197, 1214-1215 (Dept. Haematol., Mount Sinai Hosp., New York, U.S.A.)

An American negro family is described in which hypohaptoglobinemia unrelated to haemolysis existed throughout an entire generation of offspring. The data indicate that genetically determined haptoglobin depression is not invariably associated with the Hp2m-1 phenotype.

G.M.Lewis

2390. CHRISTMAS FACTOR: DOSAGE COMPENSATION AND TOE PRODUCTION OF BLOOD COAGULATION FACTOR IX. O.Frota-Pessoa, E.L.Gomes and T.R. Calicchio: Science: 1963, 139, 348-349 (Lab. Hum. Genet., Univ. São Paulo, Brazil) The amount of factor DC (Christmas factor) for different genotypic class^C was determined by means of a variant of the thrombo-plastin generation test. The mean value for ? heterozygous for the Christmas gene was about half the mean value for normal d and homozygous ?, which were about equal, suggesting that one X chr. is inactive in ?.

C.M.Xe^h

2391. THE ANTIGEN C^w PRODUCED BY THE GENE COMPLEX C^wD-. P.Tippett, J.Gavin and R.Sanger: Vox-Sang., Basel, 1962, 7, 249-250 (Lister Inst., London, England) Most anti-C^w sera give weaker results wj C^wD- cells than with C^wDe. This may be qual. as well as quant, since some sera do not make the distinction*

R.MacAndrew

2392. SPORADIC CASES OF HAEMOPHILIA AND THE QUESTION OF A POSSIBLE SEX DIFFERENCE IN MUTATION RATES. K.Kosower, R.Christiansen and N.E. Morton: Amer. J. hum. Genet., 1962, 14, 159-166 (Dept. Med. Genet., Univ. Wisconsin, Madison, Wis., U.S.A.) Re-appraisal of the available data on the heritance and origin of haemophilia does not support the hypothesis that studies of sex-linked mutants in man reveal a deficiency of sporadic cases which could be due to a higher mutation rate in sperm than in eggs. The evidence suggests that the postgonial stages in man are extremely suitable and much of the spontaneous mutation occurs at this time.

D.A.Jofl^h

2393. URINARY g-AMINOISOBUTYRIC ACID [BAIB] # CREATION IN DOWN'S SYNDROME [MONGOLISM]* L.G.Lundin and K.-H.Gustavson: Acta genet. Baselt, 1962, 12, 156-163 (Inst. Med. Genet., V. Agstan Uppsala, Sweden) An increased urinary excretion of BAIB by individuals with Down's syndrome as compared with normal individuals. This increase is statistically significant. Possible explanations for this increased excretion are put forward.

D.B.Roberts

2394. GENETIC ASPECTS OF MENTAL RETARDATION. H.Zellweger: Arch. intern. Med., 1963, 111, 165-171 (Dept. Pediat., Univ. Hosp., Iowa City, Iowa, U.S.A.) Review. 77 ref.

E.E.Hobbiger

^{2395.} HUMAN CANCER: MENDELIAN INHERITANCE OR VERTICAL TRANSMISSION? P.R.J.Burch: *Nature*, Lond., 1963, 197, 1042-1045 (Dept. Med. Phys., Univ. Leeds, England) Consideration of statistics of human cancer mortality, particularly from the leukaemias, suggests that no oncogenic viral agent is transmitted from Parent to offspring. It is, however, considered that among the many aetiological factors in human carcinogenesis, there exists a genetic basis. 37 ref. G.M.Lewis

^{2396.} LATENT PORPHYRIA IN MEMBERS OF THE IMMEDIATE FAMILY OF A PATIENT WITH ACUTE INTERMITTENT PORPHYRIA. A.M.Taylor: *Cleveland clin. Quart.*, 1963, 30, 17-20 (Dept. Int. Med., Cleveland Clin., Ohio, U.S.A.) 11 members of the immediate family of a woman with acute intermittent porphyria were tested for 12-hr. urinary excretion of 6-aminolaevulinic acid, porphobilinogen and total porphyrins. The patients' mother and 3 brothers had elevated 6-aminolaevulinic acid. Although asymptomatic; it is thought that this indicates latent porphyria. G.M.Lewis

^{2397.} DEFECTIVE DEIODINATION OF L-[¹³¹I]DIODO-TYROSINE IN PATIENTS WITH SIMPLE GOITRE. T.Kusakabe and T.Miyake: *J. clin. Endocr.*, 1963, 73, 132-139 (Dept. Inter. Med., Univ. Med. Sch., Kyoto, Japan) The results of a study on the deiodination in patients suggested that a defect in deiodination of iodotyrosines in the periphery or throughout the body would be expected to produce simple goitre, and this defect is genetically determined. K.Jones

^{2398.} GENETICS OF SPHEROCYTOSIS. N.E.Morton, A.A. Mackinney, N.Kosower, R.F.Schilling and M.P.Gray: *Amer. J. hum. Genet.*, 1962, 14, 170-184 (Univ. Wisconsin Med. Sch., Madison, Wis., U.S.A.) Spherocytosis is a typical example of a rare dominant gene in man in that phenocopies, incomplete penetrance and incomplete ascertainment are all present and the trait may be ethnically heterogeneous. It has been possible to distinguish among some of these and to estimate prevalence (200 per million), mutation rate ($2\cdot2 \times 10^{-5}$) and proportion of sporadic cases ($0\cdot261 \pm 0\cdot099$). D.A.Jones

^{2399.} A REVISION OF THE PRINCIPLE IN STUTZ' AND ZIMMERMAN'S METHOD FOR THE CALCULATION OF THE PROBABILITY OF PATERNITY. M.Okajima: *Acta Genet.*, Basel, 1962, 12, 172-177 (Dept. Forensic Med., Juntendo Univ., Hongo, Tokyo, Japan). D.B.Roberts

^{2400.} ASSORTATIVE MATING AND FERTILITY. L.Beckman and R.Elston: *Acta. Genet.*, Basel, 1962, 12, 117-122 (Inst. Med. Genet., V.Agetan 24, Uppsala, Sweden) Assortative mating according to sibship size was studied in a sample of 477 married couples, from Uppsala. A highly significant correlation between mates was observed in the total sample but when correction for heterogeneity of age was made, the correlation was shown to be insignificant. It is doubtful whether assortative mating for fertility exists in European populations. D.B.Roberts

^{2401.} THEOREM ON THE GENETICS OF SOME CONGENITAL MALFORMATIONS. P.DeBellefeuille: *Acta Genet.*, Basel, 1962, 12, 123-135 (Dept. Paed., Univ. Ottawa, Canada) Considering a no. of congenital malformations a general theorem was devised in which the genetic portion, neomutational portion, dominance and penetrance was interrelated. Some of these congenital abnormalities were attributed to new mutations. Ionising radiation was cited as an example of mutagenic risk and an estimate of this risk was suggested. D.B.Roberts

^{2402.} EFFECT OF THE MUTATIONAL LOAD ON THE MORTALITY RATE IN MAN. H.Krieger and NJFreire-Maia: *Acta Genet.*, Basel, 1962, 12, 97-102 (Lab. Genet., Human Fac. Filosofia, Univ. Paraná, Curitiba Pr., Brazil) Three formulae are presented for the calculation of deaths in human populations due to the detrimental mutations revealed by increasing studies. They have been applied to data from Brazilian whites and negroes. The latter show a higher freq. of deaths due to this group of detrimental genes than the former. D.B.Roberts

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WATER RELATIONS

2403. RAPID CHANGES IN TRANSPERSION IN PLANTS.

H.Rufelt: *Nature*, Lond., 1963, 197, 985-986 (Inst. Plant Physiol., Univ. Uppsala, Sweden) Expt. on transpiration rates of excised tree leaves and of whole wheat plants indicate that hydroactive control of stomatal width is mediated by the water content of the cell walls rather than that of the whole leaf. G.M.Lewis

2404. MEASUREMENT OF MOISTURE BOUNDARY

LAYERS AND LEAF TRANSPERSION WITH A MICROWAVE REFRACTOMETER. D.M.Gates, M.J.Vetter and M.C.Thompson, jun.: *Nature*, Lond., 1963, 197, 1070-1072 (Nat. Bureau of Standards, Boulder Lab., Boulder, Colo., U.S.A.) A microwave refractometer provides a sensitive and responsive device for detecting the moisture concn. within a boundary layer near a moist surface. Changes in moisture concn. amounting to a variation of as little as 0.1% R.H. at 2^{ff} can be detected. Use of this device is exemplified by study of leaf transpiration. J.R.Sargent

2405. SOME EFFECTS OF TEMPERATURE ON TRANSPERSION. H.Rufelt, P.G.Jaivis and M.S.Jarvis: *Physiol. Plant*, 1963, 16, 177-185 (Inst. Physiol. Bot., Uppsala, Sweden) Transpiration and leaf temp. were measured simult. at varying light intensities. With open stomata transpiration was dependent on leaf temp. With closed or no stomata, the epidermis protected the leaf from temp-induced changes in transpiration. I.D.J.Phillips

2406.. WATER ABSORPTION BY THE AERIAL ORGANS OF PLANTS. Y.Vaadia and Y.Waisel: *Physiol. Plant*, 1963, 16, 44-51 (Negev Inst. Arid Zone Res., Beer-sheba, Israel) Tritiated water entered turgid sunflower and pine leaves faster than it entered water-stressed leaves. Entry was faster from a liquid than from sat. vapour, but in all cases was slower than predicted by the diffusion equation. Entry was slower into pine than into sunflower leaves. Transport out of the leaves was extremely slow. I.D.J.Phillips

2407. THE WATER RELATIONS OF TREE SEEDLINGS.

I. GROWTH AND WATER USE IN RELATION TO SOIL WATER POTENTIAL. II. TRANSPERSION IN RELATION TO SOIL WATER POTENTIAL. P.G.Jarvis and M.S.Jarvis: *Physiol. Plant*, 1963, 16, 215-235, 236-253 (Inst. Physiol. Bot., Uppsala, Sweden) I. The responses of aspen, birch, pine and spruce seedlings to increasing soil moisture-stress was compared. The criteria used were measurements of net assimilation rate, leaf area ratio, relative growth rate and root-shoot dry wt. ratio.

n. Transpiration rates of pine, spruce, birch and aspen seedlings growing in soil, were measured under various environmental conditions. Max. transpiration occurred in the first few hr. of illumination, followed by a fall to a relatively const. rate. Increased soil moisture stress reduced both max. and mean daily transpiration rates for all spp. tested. Pine was most sensitive in response to increasing soil moisture-stress, spruce least and birch and aspen intermediate. Previous growth under soil moisture-stress condition* caused reduced transpiration on transfer to soil of low moisture-stress. I.D.J.Phillips

2408. ON ELUCIDATION OF THE SPECIFIC WATER STATUS IN THE PROTOPLASM AND IN THE CELL WALL OF THE HIGHER PLANT, AND ITS MEASURE-

MENT. H.Walter: *Ber. dtsch. bot. Ges.*, 1963, 76, 40-71. A critical discussion of different concepts and methods of determination of the state of hydration of plant cells is presented. It is concluded that the best criterion is the hydrature, equivalent to the relative vapour pressure of water in the cells. This is conveniently calc. from the cryoscopically determined value of the osmotic pressure of expressed sap. (German) H.Optik

PERMEABILITY AND SOLUTE UPTAKE

2409. PERMEABILITY STUDIES ON CHLOROPLASTS FROM NITELLA. P^Altman, J.C.Forte and G.M.Forte: *Exp. Cell Res.*, 1963, 29, 504-514 (Dept. Biochem., Univ. South California, Los Angeles, Calif., U.S.A.) There was no apparent concn. gradient of Na and K between the cytoplasm and vacuole of *N. opaca*. The chloroplasts, however, excluded Na although K was present, and were not in equilibrium with the cytoplasm. The existence of a permselective membrane surrounding the chloroplasts was confirmed, which could be disrupted by freeze-thaw or sonication. A descriptive model for ion transport in *Nitella* is proposed. K Jones

2410. ON TOE UPTAKE OF STRONTIUM BY HIGHER PLANTS. A.L.Suchli: *Ber. schweiz. bot. Ges.*, 1962, 72, 147-197 (Bot. Inst., Univ. Basel, Switzerland)

Growth of *Zea mays* and *Pisum sativum* in culture soln* containing varying Sr concn. was studied. Sr proved toxic at around 1000 $\mu\text{g}/\text{ml}$. and 2000 $\mu\text{g}/\text{ml}$. to maize and peas, respectively. Sr uptake was most marked up to the 4th leaf stage and between flower and fruit formation. Seeds appeared capable of excluding Sr. In proportion to dry wt. of the plant, there was 3 times more Sr in maize than in peas. Ca and K affected Sr uptake. The mechanism of the Sr uptake is not yet clear.

(German) M.Blandif

2411. THE DISTRIBUTION OF CALCIUM IN CELLS OF THE ROOTS OF CARROT (DAUCUS CAROTA L.). D.N. Maynard and A.C.Gentile: *Physiol. Plant*, 1963, 15, 40-43 (Dept. Hort. and Bot., Univ. Massachusetts, Amherst, Mass., U.S.A.)

Distribution of Ca among sol. and paniculate fractions of carrot root cells was not influenced by the Ca concn. of culture medium, nor by treatment of tissue slices or homogenates with EDTA.

LDJPh

2412. FACTORS AFFECTING GROWTH OF MOLINIA CAERULEA ON CALCAREOUS SOIL. D.B.James: *J. Ecol.*, 1962, 50, 521-527 (Agric. Bot. Dept., Aberystwyth, Wales)

Pot expt. were carried out to investigate the inability of *Molinia* to grow on calcareous s&f. Normal growth occurred with added CaSO₄ but not with CaCO₃; with added CaCO₃ there was a low uptake by the plant, but this could be counteracted and normal growth produced by the addition of superphosphate. Neither high pH nor high Ca is therefore restrictive on *Molinia* soils, but the unavailability of P.

LH.Tallis

2413. AN EXPERIMENTAL APPROACH TO PART OF CALCICOLE PROBLEM. R.^Clymo: *J. Ecol.*, 1962, 50, 707-731 (Westfield Coll., London, England)

Field and water culture expt. on *Carex lepidocarpa* (calcicole) and *Cdemissa calcifuge* are described.

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found to be toxic to Clepidocarpa, and less so to Cdeggssia: C. lepidocarpa in addition required high CS/F. The natural habitats of the two spp. could be separated by a concn. of 1 p.p.m. $A1^3+$ and 30 p.p.m. Ca^{2+} . Apparently acted by preventing root division.

J.H.Tallis

2414. GROWTH OF SCHOENUS NIGRICANS ON BLANKET BOG PEATS. I. RESPONSE TO pH AND LEVEL OF POTASSIUM AND MAGNESIUM. D.J.Boatman: J. Ecol., 1962, 50, 823-832 (Bot. Dept., Hull, England)

Schoenus was grown in pots of Eriophorum peat at varying pH , Mg and pH . There was a marked response in Weld and in root development to pH between 3.8 and 4.5, and also when K was raised to the level of W.Irish peats where Schoenus occurs naturally ($0.5-0.6$ m.eq./100 g. dry Peat):

J M .Tallis

2415. A NITROGEN INDUCED CHLOROSIS IN LUPINS DUE TO IRON DEFICIENCY. S.J.P.K.Bezuidenhout and W.A.Roach: S.Afr. J. agric. Sci., 1962, 5, 669-670 (Coll. Agric., Univ. Stellenbosch, S.Africa). I.A.B.S.

2416. FURTHER STUDIES ON INDUCED APOGAMY IN PERNS. D.P.Whittier and T.A.Steeves: Canad. J. Bot., 1962, 40, 1525-1531 (Dept. Biol., Univ. Saskatchewan, Saskatoon, Sask., Canada) Apogamous sporophyte formation has been induced in 14 strains of 7 spp. of northern fern gametophytes. The gametophytes were supplied with suitable concn. of sugar in culture medium for certain lengths of time which resulted in the formation of apogamous sporophytes. Sucrose is more effective in inducing apogamy than glucose.

A. Meany

2417. PHYSIOLOGICAL STUDIES ON CALVATIA SPECIES. I. VITAMIN REQUIREMENTS. II. CARBON UTILISATION. M.Sedlmayr, E.S.Beneke and J. A. Stevens: Mycologia, 1961, 53, 98-108, 558-565 (Dept. Bot. Plant Path., Michigan State Univ., Mich., U.S.A.) Three strains of Calvatia gigantea and one of C. fragilis were found to be totally heterotrophic with respect to fine and autotrophic with respect to biotin, pyridoxine and inositol. A partial deficiency for an unidentified factor (n factors) in Bacto-peptone and Bacto-yeast extract was established.

III. Three strains of C. gigantea differed in their ability to utilise various carbohydrates as C sources. The C utilisation pattern for C. fragilis differed from that of C. gigantea.

J.G.Brown

PHOTOSYNTHESIS AND PHOTOSYNTHETIC PIGMENTS

2418. ROLE OF CHLOROPLAST FERREDOXIN IN THE ENERGY CONVERSION PROCESS OF PHOTOSYNTHESIS. K.Tagawa, H.Y.Tsujimoto and D.I.Arnon: Proc. nat. Acad. Sci. Wash., 1963, 49, 567-572 (Dept. Cell Physiol., Univ. California, Berkeley, Calif., U.S.A.) Ferredoxin was shown to stimulate an endogenous type of cyclic photophosphorylation in chloroplasts which proceeds anaerobically without added cofactors. The significance of this finding to present concepts of photosynthesis is discussed.

J.R.Saigent

2419. EFFECT OF PHOTOSYNTHESIS INHIBITORS ON OXYGEN EVOLUTION AND FLUORESCENCE OF ILLUMINATED CHLORELLA. G.Zweig, I.Tamis and E. Greenberg: Biochim. biophys. Acta, 1963, 66, 196-205 (Pesticide Res. Lab., Univ. California, Davis, Calif., U.S.A.) Inhibitors such as symmetrical triazines, substituted ureas and anilides stopped O₂ evolution and stim. fluorescence. Partial inhibn. expt. indicated that the 2 phenomena were inter-related. Cyanide inhibited O₂ evolution without affecting fluorescence intensity.

B.M.Stevens

2420. CONCENTRATION OF CARBON DIOXIDE INSIDE LEAVES. D.N.Moss and S.L.Rawlins: Nature, Lond., 1963, 197, 1320-1321 (Connecticut Agile. Expt. Sta., New Haven, Conn., U.S.A.) The intercellular concn. of CO₂ was measured in com plants during active photosynthesis using an i.r. gas analyser coupled with a potentiometer. The CO₂ concn. in the leaves depended on the concn. difference with the atm. and was affected by stomatal resistance.

G.M.Lewis

2421. POSSIBLE RELATIONSHIP BETWEEN PHOTOSYNTHESIS AND THE RISE IN RESPIRATION IN DISEASED LEAVES. K.J.Scott and R.M.Smillie: Nature, Lond., 1963, 197, 1319-1320 (Biol. Dept., Brookhaven Nat. Lab., Upton, N.Y., U.S.A.) In barley leaves infected with Erysiphe graminis var. hordei, photosynthesis decreases, chlorophyll content is reduced and aldolase and NADPH-diaphorase activities are diminished. The respiratory rate is about 3 times higher than normal, and activities of glucose 6-phosphate dehydrogenase and 6-phosphogluconate dehydrogenase are increased, although enolase, isocitrate dehydrogenase and NADH-cytochrome c reductase are not changed. In infected etiolated leaves, there is no increase in respiration or in the enzymes of the hexose monophosphate shunt. It is suggested that the increased respiration in infected green leaves is related to a loss in capacity to photoreduce NADP.

G.M.Lewis

2422. CHANGES IN TRANSPERSION AND PHOTOSYNTHETIC RATES OF VARIOUS LEAVES DURING TREATMENT WITH OZONATED HEXENE OR OZONE GAS. G.W.Todd and B.Prppst: Physiol. Plant, 1963, 16, 57-65 (Dept. Plant Biochem., Univ. California Citrus Expt. Sm., Riverside, Calif., U.S.A.) Both fumigants caused marked decreases in photosynthesis in bean, tomato and Coleus. Ozone fumigation reduced transpiration, but not to such an extent as that observed in photosynthetic rate measurements. Ozonated hexene reduced transpiration in bean only. Non-green parts of Coleus leaves showed increased respiration and decreased transpiration with ozonated hexene, but only the respiration effect was seen on ozone treatment.

I.D.J.Phillips

2423. THE ADAPTATION OF THE CARBON-14 METHOD FOR THE MEASUREMENT OF COCCOLITH PRODUCTION IN COCCOLITHUS HUXLEYI. E.Paasche: Physiol. Plant, 1963, 16, 186-200 (Dept. Bot., Westfield Coll., Univ. London, England) Several techniques were used to investigate the applicability of the ¹⁴C method in measurements of photosynthesis and coccolith production. It was found that the rate of coccolith production is closely related to that of photosynthesis.

I.D.J.Phillips

2424. CONVERSION OF PROTOCHLOROPHYLL IN ROOTS. L.O.Bjom: Physiol. Plant, 1963, 16, 142-150 (Dept. Plant Physiol., Lund, Sweden) Protochlorophyll of com roots was less light-sensitive than protochlorophyll

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of leaves. The time course of conversion deviates from the second order rate law, and the rate is not proportional to light intensity.

I.D.J.Phillips

RESPIRATION

2425. CO₂ PRODUCTION IN EARLY ANAEROBIOESIS.

E.W.Simon: J. exp. Bot., 1963, 14, 82-94 (Dept. Bot., Univ. Manchester, England) Slices of swede tissue placed under N₂ produced CO₂ and ethyl alcohol in equal amounts after an initial phase of about 1^{1/2} hr. During the initial phase some 2 μmol/g. fr. wt. of extra CO₂ is produced, which effect was not influenced by iodoacetate, fluoride, nor by concn. of DNP or aisenite which affect glycolysis. Slices incubated in air, but the presence of cyanide, also produced extra CO₂. A second burst of CO₂ was induced by treatment with Methylene Blue, NAD or NADP, or as a result of a short air exposure. Evidence from expt. with labelled sugars suggest that the extra CO₂ is ultimately derived from carbohydrate, via the oxidative decarboxylation of either pyruvate or 6-phosphogluconate.

I.D. J.Phillips

2426. UPID FORMATION IN CRYPTOCOCCUS TERRICOLUS. VI. EFFECT OF MALONATE ON RESPIRATION.

T.A.Pedersen: Physiol. Plant, 1963, 16, 167-176 (Dept. Microbiol., Agr. Coll., Norway, Vollebekk, Norway) O₂-uptake and CO₂-output were both sttoci by addition of 0.01 M malonate, together with a change of R.Q. from 0.73 to 1.54. The presence of a malonate decarboxylase was demonstrated, the activity of which was inhibited by DNP.

LDJ.Phillips

METABOISM

2427. PATHWAYS OF UTILISATION OF [¹⁴C]GLUCOSE AND [6-¹⁴C]GLUCOSE IN SLICES OF PEAS.

H.G. Wager: J. exp. Bot., 1963, 14, 63-81 (Low. Temp. Res. Stn., Cambridge, England) Slices of ripening seeds of pea (*Pisum sativum*) were supplied with the labelled glucose, and the sp. activities of the respired CO₂, pyruvate, and tricarboxylic acid cycle acids were determined, as well as that of individual C atoms of citrate and malate. An explanation for the distribution of label that was found is presented.

LDJ.Phillips

2428. INFLUENCE OF SOME CULTURAL CONDITIONS ON FUNGAL CELLULOSE PRODUCTION.

B.Norkrans: Physiol. Plant, 1963, 16, 11-19 (Dept. Microbiol., Royal Phann.Inst., Stockholm, Sweden) The activity of *Trichoderma viride* ex Fr. and various strains of *Collybia velutipes* (Curt ex Fr.) as cellulose producers were investigated in shake- and stationary-cultures, as well as in cultures of different vol. Data are given on mycelial production, extra-cellular protein release and cellulase activity, as disclosed in a turbimetric test.

I.D.J.Phillips

2429. FIXATION OF CO₂ BY CUSCUTA EPITHYMUM.

O.Ciferri and G.Poma: Life Sci., 1963, No.3, 158-162

(Iinst. Bot., Univ. Pavia, Italy) Expt. results are presented to show that ribulose-1,5-diphosphate carboxylase has little, if any, significance in the fixation of CO₂ by the tested sp. of *Cuscuta*.

K. Jones

2430. INCORPORATION OF P¹⁴CIPROLINE INTO TOE PROTEINS OF GROWING CELLS. I. EVIDENCE OF SYNTHESIS IN DIFFERENT PROTEINS AND CELLULAR COMPONENTS. R.J.Lyndon and F.C.Steward: J. exp. Bot., 1963, 14, 42-55 (Dept. Bot., Cornell Univ., Ithaca, N.Y., U.S.A.) [14C]Proline was supplied to aerated potato discs, in which cell division was occurring* and also to rapidly-growing potato and carrot explants. It was absorbed and incorporated into all the subcellular protein fractions examined including the electrophoretically distinguishable fractions of the sol. protein of the potato discs and explants. The ability of the different protein fractions to incorporate and convert the [¹⁴C]-proline was studied, and considered in terms of growth, cell division, and cell wall formation in rapidly growing tissue cultures.

I.D.J.Phillips

TRANSLOCATION

2431. TRANSLOCATION AND DISTRIBUTION OF MARKED ASSIMILATES. VI. THE DISTRIBUTION OF ¹⁴C ASSIMILATES IN LONG-TERM EXPERIMENTS.

R.Bachofen, and H.Wanner: VH. THE PART PLAYED BY FRUITS^ THE DISTRIBUTION OF SUBSTANCES IN THE PLANT^ R.Bachofen: Ber. schweiz. bot. Ges., 1962, 72, 272-279, 280-285 (Iinst. A Augemeine Bot., Univ. Zürich, Switzerland) *Phaseolus vulgaris* var. *nana* was used in leaf nutrition studies. Young leaves lost more assimilate in a shorter time than older leaves, but the remaining assimilates remained fixed whereas in older leaves more assimilates were finally lost, but over a greater time interval. 15 different plant spp. were studied. Leaf and fruit were fed with radioactive CO₂ and the distribution of the radioactivity examined 24 hr. later. Generally 20-55% had left the leaves, there was marked translocation from the fruits also, radioactive compounds moved largely to other fruits. (German)

M.Blandin

2432. SUGAR IN INTERCELLULAR SPACES OF WHITE MUSTARD ROOTS.

R.G.H.Cormack and P.Lemay*: exp. Bot., 1963, 14, 232-236 (Dept. Bot., Univ. Alberta, Canada) A method is described to test directly for translocated radioactive sugar in the apical stem of white mustard roots. Radioactivity was found in intercellular spaces and to a lesser degree in the intervening cell walls.

LDJPW

2433. TRANSLOCATION OF ¹⁴C-LABELLED PHOTOSYNTHATE IN THE SOYBEAN.

J.Moorby, M.Eberl, K. N.T.S.Evans: J. exp. Bot., 1963, 14, 210-220 (A.R. Radiol. Lab., Letcombe Regis, Wantage, Berks., England) The rate of accumulation of ¹⁴C and fructose const. illumination quickly became const. and remained so for several hr. The effects of stopping photosynthesis, of removing H₂, and of different light treatments were investigated.

LDJ-W

2434. MODEL FOR TRANSLOCATION OF PHOTOSYNTHATE IN SOYBEAN.

N.T.S.Evans, M.Ebert and

LMoorby: J. exp. Bot., 1963, 14, 221-231 (M.R.C. Expt. Radiopath. Res. Unit., Hammersmith Hosp., London, England) A theoretical consideration of transport of photosynthetically incorporated carbon in the soybean stem. Estimated translocation velocity was 60 cm./hr. and leakage of material from sieve tubes was $\approx 8\%/\text{cm.}$ of stem traversed. The effects of velocity distributions and delays in the translocation system are considered.

LD.J.Phillips

GROWTH AND DEVELOPMENT

(GENERAL)

2435. OSMOTIC EQUILIBRATION AND GROWTH OF SCENEDESMUS OBLIQUUS IN SALINE MEDIA. D.F. Wetherell: Physiol. Plant., 1963, 16, 82-91 (Dept. Bot., Univ. Connecticut, Storrs, Conn., U.S.A.) j * relative importance of ionic and osmotic stresses used by saline media were evaluated. Growth min. and carbohydrate accumulation in saline media greatly exceeded the effects of non-saline soln. of eqi! anicmc pressure.

LDJ.PhiUips

2436. ***** LIGHT INTENSITY - A USEFUL CONCEPT IN CORRELATING GROWTH RATES OF DENSE CULTURES OF MICRO ALGAE. Rabe and Benoit: Biotech. Bioeng., 1962, 4, 377-390 (Res. and Develop., General Dynamics/Electric Boats, Groton, Conn., U.S.A.) The concept of a mean effective light intensity, E , is introduced and procedures are developed for computing E for any culture vessel geometry and light intensity distribution.

R.H.Kimberlin

*⁷ EFFECT OF LIGHT INTENSITY ON STEM AND BUD GROWTH IN BROAD BEAN SEEDLINGS. R.D. Ur: J-exp. Bot., 1963, 14, 142-152 (Dept. Bot., Univ. Manchester, England) Final mean size, cell size of the 3 lower internodes, and of a leaflet of the 3 lower true leaves, were determined from seedlings grown in darkness or in light intensities of 0-1, 1, 10° or 1000 f.c.

I.D.J.Philips

2437. IMPPOSITION OF WET-HEATH VEGETATION IN SOTTEN TO AERATION OF GROUND-WATER AND SOIL. I. FIELD STUDIES OF GROUND-WATER AND SOIL AERATION IN SEVERAL COMMUNITIES. II. RESPONSE OF MOLINIA CAERULEA TO CONTROLLED CONDITIONS OF SOIL AERATION AND GROUND-WATER MOVEMENT. J.R.Webster: J. Ecol., 1962, 50, 618-639 (County Tech. Coll., King's Lynn, Norfolk, England) I. The distributions of Molinia caerulea, Myrica gale, Calluna vulgaris and Erica tetralix sites was found to be governed by the concn. of CO_2 and H_2S in the ground-water.

II. Molinia plants were grown in jars through which varying concn. of H_2S and $0-3\%$ CO_2 .

1% H_2S produced a significant decrease in growth. JJt-Tallis

2439. THE EFFECTS OF TEMPERATURE ON THE EARLY VEGETATIVE GROWTH OF PHALARIS CANARIENSIS L. AND P.TUBEROSA L. C.Surfield: Aust. J. agric. Res., 1963, 14, 165-179 (Div. Forest Products, C.S.I.R.O., S.Melbourne, Australia) P. canariensis and P.tuberosa were grown in pots outdoors and in greenhouses. Optimum temp. regime for dry wt. production did not correspond with that for tiller initiation. Tiller no. were highest when night temp. exceeded day temp. or approached optimum day temp. or where fluctuations between day and night temp. were large. P. canariensis outyielded P.tuberosa under optimum conditions. Temp. influenced leaf size and shape. Data are given for growth comparisons between the Australian commercial P. tuberosa and Algerian and Israeli strains under 6 temp. regimes. Controlled root temp. was found to influence leaf size, dry wt. production and tiller initiation in P.canariensis.

R.L.Weston

2440. STEM ELONGATION IN THE HOP. R.H.J.Roboign: Nature, Lond., 1963, 198, 102-103 (Hop. Res. Stn., Riwaka, Nelson, New Zealand) Expt. on the effect of temp. and light on stem elongation in the hop (Humulus lupulus) showed that providing the light intensity during a 14°5 hr. day was adequate, assimilates produced allowed the stem to elongate for the whole of the diurnal cycle at a rate determined by air temp. only; at too low light intensity, stem elongation slows down during the following night.

G.M.Lewis

2441. DISTRIBUTION OF PHOSPHATASES IN LEAF, STEM AND ROOT OF WHEAT PLANT DURING THE REPRODUCTIVE PERIOD. Y.Promekanon, G.K.Barat and N.B.Das: Indian J. exp. Biol., 1963, 1, 95-97 (Div. Soil Sci. and Agric. Chem., Indian Agric. R.s. Inst., New Delhi, India) The activities of glycerophosphatases in leaf, stem and root of the wheat have been determined. A continuous increase in 3' glycerophosphatase activity has been observed in the leaf and stem during the whole reproductive period; the activity of the enzyme is highest in the leaf and least in the root. Acid pyrophosphatase activity is highest in the stem during the pre-flowering stage. In the root, the activity of all the 3 phosphatases increases during the flowering stage and thereafter it decreases. A comparative study of the effect of foliar and soil applications of phosphatic fertiliser shows that the former method of application induces larger accumulation of phosphatases, particularly of 3'-glycerophosphatase, in the leaf. *

2442. FACTORS CONTROLLING EMBRYO GROWTH AND DEVELOPMENT IN BARLEY (HORDEUM VULGARE L.). J.J.La Croix, J.Naylor and E.N.Larter: Canad. J. Bot., 1962, 40, 1515-1523 (Crop Sci. Dept., Univ. Saskatchewan, Sask., Canada) Normal growth and development of barley proembryos occurred in excised intact florets, but not in ovaries from which lemmas and paleas were removed. In the absence of hulls, cells of proembryos markedly increased in size and DNA content but mitotic figures were rarely found. Sucrose did not promote cell division in such embryos. The promotive effect of lemma and palea on embryo growth was shown to depend on the intact vascular connection with the ovary. A.Meany

2443. ON IN VITRO CULTURE OF ZEA MAYS ROOTS. P.-E.Pilet and J.Bonhote: Ber. schweiz. bot. Ges., 1962, 72, 5-17 (Lab. Physiol. végét., Univ. Lausanne, Switzerland) Various techniques were employed in the culture of maize roots under sterile conditions. Prelim. growth studies are reported for isolated roots cultured in a

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liquid medium, roots formed at the expense of the coleoptile in solid and liquid media and roots formed from mesocotyls in a liquid medium. (French) M.Blandin

2444. CELL GROWTH AND STRUCTURE AND MECHANICAL PROPERTIES OF WALL IN INTERNODAL CELLS OF NITELLA OPACA. m. SPIRAL GROWTH AND CELL WALL STRUCTURE. M.C.Probine: J. exp. Bot., 1963, 14, 101-113 (Bot. Dept., Univ., Leeds, England)

The moduli necessary to describe the elastic behaviour of a material possessing the structure found earlier in *Nitella* internodal cells, are considered. It is pointed out that if the cell is regarded as a thin-walled cylinder built of a material possessing orthorhombic elastic symmetry, then there can be a coupling between shear and extension which will produce a torsional twist as the cylinder is pressurised. Expt. evidence is presented which suggests that this is the basic mechanism of spiral cell growth.

I.D.J.Fhillips

2445. CHEMICAL AND MECHANICAL STATE OF CELL WALL OF PEA ROOT TIPS. II. EFFECTS OF SOME METABOLIC CHANGES. A.P.Brown: J. exp. Bot.. 1963, 14, 114-131 (Dept. Bot., Univ. Edinburgh, Scotland)

The area covered by a tissue-squash prepared by a standard procedure following an acid treatment, was taken as a quant, inverse measure of the intercellular cohesion. Auxin and sucrose treatments resulted in a weakening of the acid-resistant cohesion, and thioglycollate impeded the increase in acid-resistant cohesion induced by anaerobiosis.

I.D. J.Phillips

2446. GROWTH IN VITRO OF ROOTS OF ACER RUBRUM L. AND EUCALYPTUS CAMALDULENSIS DEHN. E.P. B&chelard and B.B.Stowe: Physiol. Plant, 1963, 16, 20-30 (Forests Commission of Victoria, Australia)

Bonner's culture medium successfully supported growth of the main axes of *A. rubrum* roots by subculture through 8 passages over 31 weeks. Subculture of lat. root tips and segment cultures failed. The effects of sucrose concn., pH, glycine, indolebutyric acid and kinetin were noted. Supplementation with coconut milk was necessary for culture of *E. camaldulensis* roots, and yeast extract inhib. the beneficial effect of coconut milk.

I.D. J.Phillips

2447. GEOTROPIC STIMULATION: EFFECTS ON WOUND VESSEL DIFFERENTIATION. L.W.Roberts and D.E.Fosket: Science, 1962, 138, 1264-1265 (Dept. Biol. Sci., Univ. Idaho, Moscow, Idaho, U.S.A.)

Wounded excised shoots of *Coleus blumeni* (Benth.) were geotropically stim. by rotation on a klinostat at 3 rev./min. at right angles to the horizontal axis and placed alternately in inverted and upright positions at 24 hr. intervals. These treatments resulted in the differentiation of significantly greater no. of wound vessel members. The pattern of wound vessel formation was altered by rotation on the klinostat but remained unaffected by 24 hr. inversion.

G.M.Lewis

of the basipetal translocation of auxin were made from individual segments from the 2nd internode of *Coleus*, plants. It was confirmed that the endogenous concn. of IAA is controlled by a limitation of transport over the physiol. range of concn.

CM Lewis

2449. SOME EXPERIMENTS PERFORMED WITH ¹⁴C-EAA ON AUXIN TRANSPORT IN RELATION TO THE ROLE OF SODIUM GLYCOCHOLATE [Na-G]. Y.Vardar and RJDenizci: Ber. schweiz. bot. Ges., 1962, 72, 132-138 (Dept. Bot., Univ. Bomova, Izmir, Turkey)

T* validity of the conclusion drawn by Champignat and Pigeret (1957) concerning the blocking effect, by Na-G, on auxin transport was tested by using ¹⁴CIAA on *Ipomea* and *Helianthus* hypocotyls. Autoradiographic re* suits and quant, radioactivity measurements indicated that Na-G had no effect on auxin transport.

M.Blandin*

2450. THE EFFECTS OF FLAVONOID COMPOUNDS ON OXIDATIVE PHOSPHORYLATION AND ON THE ENZYMIC DESTRUCTION OF INDOLE ACETIC ACID. CStenlid: Physiol. Plant, 1963, 16, 110-120 (Inst. Plant Physiol., Royal Agr. Coll., Uppsala, Sweden)

Various flavonoids were found to effect the activity of pea-root IAA-oxidase. Depending on the structure and composition of the flavonoid, either promotion or inhibition of IAA-oxidase and effect on root elongation. Oxidative phosphorylation in cucumber hypocotyl mitochondria was inhib. by various types of flavonoid. An uncoupling en* was observed in the concn. range 1×10^{-5} - 3×10^{-4} M-

IJJJJWgf

2451. COMPARATIVE EFFECT OF 2,4-DICHLOROPHENXYACETIC ACID AND 0-INDOLYL ACETIC ACID ON THE GROWTH OF ROOT FRAGMENTS. P.E.Hjf.* M.Gaschen: Ber. schweiz. bot. Ges., 1962, 72, 1³y 146 (Lab. Physiol. veget., Univ. Lausanne, Switzerland)

IAA and 2,4-D inhib. the elongation of *culinaris* root tip fragments, 2,4-D being more active than IAA at equivalent molar concn. When both substances were tested together, the effects varied; there was antagonism when 2,4-D was present at low concn! whatever the IAA concn., but at higher 2,4-D concn^- effects tended to be additive. (French)

M.B.Fn^

2452. RESPONSES OF ASPEN ROOTS TO AUXIN-TYPE GROWTH SUBSTANCES APPLIED TO THE LEAVES. L.Eliasson: Physiol. Plant, 1963, 16, 207-214 (C.I. Forestry, Stockholm, Sweden)

Several synthetic auxins were found to disturb the normal pattern of root growth, following their application to the leaves. There was more effective translocation of auxin from recently matured leaves than from old ones.

I.D.J.Phillips

2453. EFFECTS OF 3-AMINO-1,2,4-TRIAZOLE ON SOME CHEMICAL CONSTITUENTS OF ZEA MAI. CCMcWhorter: Physiol. Plant. 1963, 16, 31-34*] (Crops. Res. Div., Agric. Serv., U.S.D.A. U.S.A.)

Treatment with the compound produced chlorotic &*, with an RJQ. of approx. 0-80. This tissue contained increased concn. of Mn, NH₃, total N, carbohydrates &*, amino acids. Protein content was reduced. Photoperiod influenced the concn. of protein, amino acids and NH₃ in treated tissues. Gaseous NH₃, and NH₃-fertilization increased herbicide toxicity.

I.D.J.Phillips

2454. EXPERIMENTS ON THE RELATIVE SUSCEPTIBILITY OF WEEDS TO AUXIN HERBICIDES. J.R.Hay: J. Bot., 1962, 40, 1401-1409 (Plant Res. InsU. Canada) Sections of stems of *Sitene cucubal*

GROWTH SUBSTANCES

2448. AUXIN IN COLEUS STEMS: LIMITATION OF TRANSPORT AT HIGHER CONCENTRATIONS. T.K. Scott and V.P.Jacobs: Science, 1963, 139, 589-590 (Div.BioL, Princeton Univ., NJ., U.S.JV.) Studies

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¹leopsis tetrahit and *Phaseolus vulgaris* were cultured in *Se3ia* contaEEg inorg. salts, sucrose, agar and the herbicides 2-methyl, 4-chlorophenoxyacetic acid, 2,4-D, or 2,4,5-trichlorophenoxypropionic acid. The auxins most effective as herbicides were also the most active in ²duc²*ng root formation and proliferation on stem sections of that sp. Response of the section to the herbicides decreased with maturity of the plant. Tissues appeared to have an inherent affinity for auxins with certain mol. characteristics.

A.Meany

²«5. INCREASE OF THE RESISTANCE ~~FRUIT~~ BY THE SEED TREATMENT WITH 2-CHLOROETHANOL IN SPINACH SEEDLINGS. T.Miyamoto: Naturwissenschaften, 1963, 50, 24 (Inst. Pflanzenbaukunst, Univ.essen, Germany). AJ.Wansbrough

²⁴⁵⁶ ACTIVITY OF GIBBERELLIN D^f ON TOE GERMINATION OF PHOTOSENSITIVE LETTUCE SEEDS. T.Ikuma and K.V.Thimann: Nature, Lond., 1963, 200, 1313-1314 (Biol. Lab., Harvard Univ., Cambridge, Mass., U.S.A.) Tests on the germination of lettuce seeds in the dark¹¹⁰ showed that the activity of gibberellin GA₃ + GA₇ was 10 times as ^{as} that of GA₃ and in ^{GA} 4. It was indicated some synergistic reaction between the two compounds. The action of gibberellin D^f was not re-initiated by far-red light, and it was concluded that it must be the primary one of the chem. reactions which result from the primary light reaction. CM.Lewis

? LEAVES OF POTATO (SOLANUM TUBerosum). A.W.Wheeler and E.C.Humphries: J. exp. Bot., 1963^

an an *w total gibberellin content, —u—- ^ detected in untreated plants. Following treatment with GA₃, the GA₃-nLi⁺ of plant decreased after 2 weeks and none was detectable after 5 weeks. Evidence is produced suggesting that GA_a was converted to another gibberellin by the treated tissues. GA₃ increased chlorophyll leaf, but increased leaf area more than proportional. I.D.J.Phillips

^{2458.} KINETIN-INDUCED FORMATION OF METO-PURPURES IN DARK CULTURES OF FERATODON PURPUREUS. A.Szwejkowska: J. exp. Bot., 1963, 14, 137-141 (Dep. Gen.-BOU Univ., Poznan, Poland) The effects of various concn. of kinetin on development of gametophytes⁹¹ were studied in light and dark. Under light, the embryos were induced to form by Wneun, the effect being slightly more marked in the light in darkness. I.D.J.Phillips

^{2459.} BIOLOGICAL EFFECTS OF KINETIN. EFFECTS KINETIN ON THE EWNGAHON. WATER UPTAKE AND OXYGEN UPTAKE OF ETIOLATED PEAS STEM SECTIONS. M.Katsumi: Physiol. Wanⁿ. V^{to}ka, 5? (Biol. Dept., International Christian Univ., Tokyo, Japan) Kinetin in presence or absence; of IAA inhibited elongation growth after 9 hr, whereas fresh wt. continued to increase. Pretreatment with kinetin or IAA followed by transfer to IAA or kinetin soln., respectively, gave a similar result to continuous IAA + kinetin treatment. Kinetin showed no antagonism with IAA nor with 1,4-dihydronaphthalic acid-1 in elongation tests. Kinetin inhibited O₂-uptake. The inhibitory effect of kinetin on elongation was not reversed by several substances tested. I.D.J.Phillips

2460. STIMULATION OF IN VITRO GROWTH OF HEUANTHUS TUBEROSUS L. BY EXTRACTS OF SKIMMIA JAPONICA THUNB. R.Garestler and LCChenieux: C.R. Soc. Biol., Paris, 1962, 156, 1477-1482 (Fac. Méd. Pharm., Tours, France) Explains of *H. tuberosus* were cultivated in the presence of an extract of leaves of *S. japonica*. Histol. sections of the tissue showed the presence of small areas of cellular proliferation. The cells undergoing mitosis were smaller than the normal parenchyma cells. (French) M.A.Price

2461. ACTION OF FRUITS OF AEGLA MARMELOS C. ON IN VITRO GROWTH OF TUBERS FROM HELIANTHUS TUBEROSUS L. R.Garestier, D.Pasty and J.Provansal: C.R. Soc. Biol., Paris, 1962, 156, 1482-1487 (Fac. Méd. Pharm., Tours, France) Aq. or methanolic extracts of the peel of *A. marmelos* fruits contained compounds which stim. active cellular proliferation of fragments of tuber of *H. tuberosus*, cultivated, in vitro. Histol. sections showed the presence of new areas of vascular and parenchymatous tissue which contained cells of small size. (French) M.A. Price

DEVELOPMENTAL EFFECTS OF LIGHT AND TEMPERATURE

2462. FLOWER FORMATION IN KALANCHOE BLOSSFELDIANA BY VERY SHORT PHOTOPERIODS UNDER LIGHT OF DIFFERENT QUALITY. H.Fredericq: Nature, Lond., 1963, 198, 101-102 (Lab. Plant Physiol., Univ. Ghent, Belgium) The relative effectiveness of different light sources in inducing floral initiation in *Kalanchoe* during very brief photoperiods was studied. A stimulating effect of red light and an inhibitory effect of far-red light are reported. G.M.Lewis

2463. ENVIRONMENTAL CONTROL OF FLOWERING IN DACTYLISGLomerata. D.M.Calder: Nature, Lond., 1963, 197, 882-883 (Welsh Plant Breeding Stn., Aberystwyth, Wales) It is suggested that *D. glomerata* passes through 3 developmental stages from germination; in the 1st, it is insensitive to environmental conditions which later induce flowering, in the 2nd, darkness is an essential factor for flower induction, and in the last period, it behaves as a typical long-day plant. G.M.Lewis

2464. IN VITRO CONTROL OF FLOWERING IN WOLFFIA MICROSCOPICA. S.CMaheshwad and O.S.Chauhan: Nature, Lond., 1963, 198, 99-100 (Dept. Bot., Univ. Delhi, India) 10⁻⁴ M EDTA induced flowering in cultures of *W. microscopica* regardless of the photoperiod. G.M.Lewis

2465. EFFECT OF TEMPERATURE AND DAY-LENGTH ON FLOWER INITIATION OF BRINFELSIA CALYCINA (HOOK)BENTH. O.M.Heide: Physiol. Plant., 1963, 16, 104-109 (Dept. Floriculture and Greenhouse Crops, Agr. Coll. Norway, Vollebekk, Norway) Optimal treatment for flowering was found to consist of 6 weeks of low temp. (9-12?) which also induced chlorosis of the leaves. I.D.J.Phillips

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2466. INTERACTIONS OF PHOTOPERIOD AND TEMPERATURE IN GROWTH AND DEVELOPMENT OF YOUNG TOMATO PLANTS. T.J.Ciistofferse: *Physiol. Plant. (Suppl.)*, 1963, 16, 1-98 (Earhart Plant Res. Lab., California Inst. Technol., Pasadena, Calif., U.S.A.)

A detailed study was made of the effects of various combinations of photoperiod, temp, and humidity on the growth and development of young tomato plants. Measurements were made of stem-elongation rate and the rate of increase in fresh and dry wt. Special attention was paid to the effects of environmental conditions upon flowering and the development of chlorotic leaves.

LDJ.Phillips

2467. POSSIBLE ROLE OF POLYSACCHARIDES IN FLORAL INDUCTION. J.Nitsan: *Nature, Lond.*, 1963, 198, 100-101 (Nat. and Univ. Inst. Agric., Rehovoth, Israel)

Vernalised rye seedlings contain larger amounts of polysaccharide than unvernalised seedlings. A macromol. polysaccharide material is synthesised in cocklebur leaves during the long day (non-inductive) conditions. It is proposed that plant polysaccharides may be associated with flowering in a way analogous to that between antigenic polysaccharides and morphogenesis.

G.M.Lewis

2468. INFLUENCE OF WATER CONTENT IN COURSE OF VERNALISATION OF RESPIRATION INTENSITY OF SEEDS AND FURTHER GENERATIVE DEVELOPMENT OF WINTER WHEAT. A.Markowski and K.Korlakowska: *Bull. Acad. pol. Sci.*, 1963, 11, 95-98 (Dept. Plant Physiol., Coll. Agric., Cracow, Poland) Only by complete satn. of seeds with water in course of vernalisation did plants grow. Vernalisation was weak in seeds with low water content owing to their diminished metabolism. Respiration intensity of spring and winter wheat is different.

J.E.Hobbs

2469. PARASITISM OF OLPIDIOPSIS INCRASSATA ON MEMBERS OF SAPROLEGNIACEAE. I. HOST RANGE AND EFFECTS OF LIGHT, TEMPERATURE AND STAGE OF HOST ON INFECTIVITY. M.K.Sliwinski: *Mycologia*, 1961, 53, 183-193 (Dept. Bot., Univ. N. Carolina, Chapel Hill, N.C., U.S.A.) Presence or absence of light does not affect the growth of host or parasite. At 6° growth of *O. incrassata* and the no. of resting bodies was very reduced. Infection of the host at 30° takes place only with difficulty. *O.incrassata* grown at 3(f will not infect a host, whilst degeneration of the infected host does not take place at this temp. Once zoosporangia or oogonia have been initiated *O. incrassata* seems unable to infect any Saprolegniaceous host.

J.G.Brown

ities did not inhibit growth, although lack of P or N did. Gemma-cup production was little affected by light intensity but there was a large temp. effect. LD J.PM1UI*

2471. CXIDATIVE PHOSPHORYLATION IN GERMINATE* LETTUCE SEEDS. S.Ulitzur and AJPoljakoff-Mayber: *J. exp. Bot.*, 1963, 14, 95-100 (Dept. Bot., Hebrew Univ., Jerusalem, Israel) Both thiourea and coumarin during in vitro expt. inhib. oxidative phosphorylation, but in vivo coumarin inhib. whereas thiourea under certain circumstances stim. Coumarin also decreased the P/O ratio.

I.D.J.Phillips*

2472. CHANGES IN THE ACTIVITIES OF CERTAIN OXIDISING ENZYMES DURING GERMINATION AND SEEDLING DEVELOPMENT OF PHASEOLUS MUNGO AND SORGHUM VULGARE. N.C.Gopalachari: *Indian J. expt. Biol.*, 1963, 1, 98-100 (Dept. Bot., Sri Venkateswara Univ. Coll., Tirupati, India) Quant. variations in² iron-porphyrin enzymes and 2 copper-containing enzym^ have been studied during the germination process and seedling development of *S. vulgare* and *P. mungo*. Peroxidase activity shows a regular, steep increase in all parts of *S. vulgare* and in roots and cotyledons of *P. mungo*. Polyphenol oxidase is low or absent initially, but increases rapidly to a nearly constant level by the 4th day of germination. Catalase activity exhibits a somewhat reciprocal relationship to that of polyphenol oxidase and peroxidase*. Ascorbic acid oxidase is absent in all parts of *S. vulgare* and in the cotyledons of *P. mungo*. It is, however, nle& initially in the embryos of *P. mungo* on the 2nd day of germination and drops sharply to a low level subsequently; The probable causes for these variations are discussed.

2473. METABOLISM OF FRUCTOSE POLYMERS IN PLANTS. II. EFFECT OF TEMPERATURE ON CARBOHYDRATE CHANGES AND MORPHOLOGY OF STORED TUBERS OF HELIANTHUS TUBEROSUS L. T.G.Jeffrey** and J.Edelman: *J. exp. Bot.*, 1963, 14, 56-62 (Dept. Plant Physiol., Imperial Coll. Sci. and Technol., London, England) Polarimetric studies showed a c& version of fructosan to oligosaccharides of a lower mol.* and associated increase in combined glucose content, ing emergence from dormancy. Low temp, accelerated and magnified this process, while storage at 20° depress^ it. Dormant buds apparently played no part in the prcx^ Storage at 20° caused sprouting of daughter tubers, but new plants did not develop, even after several months. Normal sprouting was induced by keeping the dormant, tubers at 2° for 7 weeks.

I.D.J.Phillips

2474. PHOTOPERIODIC-THERMAL INVESTIGATIONS OF PRE-GERMINATION OF SOLANUM TUBerosum. W.Rudorf and R.H.Rimpau: Z. Pflanzenz., 1963, 49, & 80 (Max-Planck-Inst. Ztichstungsf., Erwin-Baur-In^ KOLn-Vogelsang, Germany) Tubers from 11 varied; were stored from autumn till March in the dark at 6° abd, 90%R.H. They then received 25 days' treatment, combining temp. of 5° and 14-lfi\ and illumination of 0. K and 18 hr. per day at 100 Lux. It was found that the hdp temp, and light treatments increased subsequent yield considerably.

(German, English and French summary) H.OpiK

2475. GROWTH PROMOTING DERIVATIVES OF 5-HYDROXYBENZOFURAN. THE EFFECTS OF SELECTIVE DERIVATIVES ON GERMINATION AND SEEDLING GROWTH. CA.Giza and S.M.Siegel: *Physiol. Pl.* 1963, 16, 52-65 (Union Carbide Res. Inst., Tarrytown, N.Y., U.S.A.) Benzofuran, 2-methyl-3-carboxyl-

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hydroxybenzofuran and several of its deriv. stim. germination and seedling growth of turnip, rye and alfalfa.

LDJ.Phillips

²476. INFLUENCE OF CROP RESIDUE DECOMPOSITION PRODUCTS ON THE GERMINATION OF FUSARIUM SOLANI F. PHASEOLI CHLAMYDOSPORES IN SOIL. T.A.Tousson, Z.A.Patrick and W.C.Snyder: Nature, Lond., 1963, 197, 1314-1316 (Dept. Plant. Pathol., Univ. California, Berkeley, Calif., U.S.A.) Cold-water extracts from plant residues stim. germination of *F. solani* chlamydospores, some causing extensive growth of germ-tube hyphae, some producing lysis of the *VPhae* after initial stimn., and some having no obvious effect. G.M.Lewis

²477. STRUCTURE, GERMINATION AND PHYSIOLOGY OF MICROSCLEROTIA OF VERTICILLIUM ALBO-ATRUM. R.S.Gordee and C.L.Porter: Mycologia, 1961, 53, 171-182 (Lockheed-California Co., Burbank, Calif., U.S.A.) pH and the type of buffer used affected germination of microsclerotia. Germination % was highest in Sorensen's buffer and lowest in acetic acid-j^state buffer. Cadmium at 100 and 500 p.p.m. completely inhibited germination. Microsclerotia were found sciuweise. An R-0# of P_o, 54* Analys of cytoplasm of micro-DiWS followed Protein const.; whilst carbohydrate was dominant and was converted into lipid with advancing age. J.G.Brown

²478; STUDIES ON CALVATIA GIGANTEA. I. GERMINATION OF BASIDIOSPORES. G.S.Bulmer and E.S.Beneke: Mycologia, 1961, 53, 123-136 (Univ. Oklahoma Med. Sch., Oklahoma City, Okla., U.S.A.) Basidiospores of *C. gigantea* have been germinated in 6 different broth ^ia, and in malt extract agar inoc. with *Rhodotorula* *Siiiginosa* var. *sanguinea*. Riboflavin, thiamine, ino- Pyridoxine and biotin could not replace the effect of *R. sanguinea*. Germination % is very low and in ores from some sporophores nil. J.G.Brown

RADIATION EFFECTS

⁴⁷⁹L INFLUENCE OF WAVELENGTH ON THE LIGHT SPONSE OF EXCISED WHEAT ROOTS. L.O.Bjorn, Suzuki and J.Nilsson: Physiol. Plant, 1963, 16, 132-141 (Dept. Plant Physiol., Lund, Sweden) Light int.: * > * cell elongation and multiplication in excised thin roots - htbm. of multiplication occurred with light at 400 and df elongation with light at 430 and 650 nm. Chlorophyll formation was lower in red than in blue light. LDJ.Phillips

⁴⁸⁰& INTERACTION OF ULTRAVIOLET AND VISIBLE RADIATIONS ON THE GROWTH OF CELL AGGREGATES OF GINKGO POLLEN TISSUE. R.M.Klein: Physiol. Plant, 1963, 16, 73-81 (N.Y. Bot. Garden, N.Y.58, U.S.A.) Growth suppression by u.v. light was reversed by blue light and, to a lesser extent, by red light, Segregates were protected against the effects of u.v. exposure to blue or red light. I.DJ.Phillips

KINETIC REGULATION AND CONTROL OF GROWTH IN LIPIDS BY POLARISED LIGHT AND PARTIAL ILLUMINATION. H.Etzold and LJaffe: Exp. Cell Res.,

1963, 29, 188-193 (Bot. Inst., Erlangen, Germany) Spores of *E. arvense* which are known to germinate away from unilat. blue light, germinated parallel to the vibration place of polarised blue light, and, if partially illuminated, out of the shaded part of the cell. The intensity effect curves for both reactions were similar. It is suggested that both the orientation of growth by unilat. unpolarised light and the control of growth by the plane of polarised light are mediated by the same pigment mol. orientated parallel to the cell wall.

(German, English summary) K.Jones

^{2482.} VARIETY, DEVELOPMENTAL STAGE AND DOSE RATE IN IRRADIATION OF THE POTATO. P.B.Mathur: Nature, Lond., 1963, 198, 99 (Biol. Div., Atomic Energy Estab., Trombay, Bombay, India) The dose of y-rays and condition of irradiation for the prevention of sprouting of 2 varieties of potato were studied. G.M.Lewis

^{2483.} RECOVERY OF Y-IRRADIATED RHIZOPUS STOLONIFER SPORANGIOSPORES DURING AUTO-INHIBITION OF GERMINATION. N.F.Sommer, M.Creasy, RJ.Roman and E.C.Maxie: J. cell. comp. Physiol., 1963, 61, 93-98 (Dept. Pomology, Univ. California, Davis, Calif., U.S.A.) Many sporangiospores of *R.stolonifer* recovered from a normally lethal dose (500 kilorad) of Y-radiation if kept under conditions in which germination was inhib. for 2 or more days. Auto-inhibn. of germination was achieved by shaking a dense suspension (15-5 x 10⁶ spores/ml.) on a rotary shaker. G.M.Lewis

^{2484.} CHANGES IN CELLULAR PERMEABILITY OF DIFFERENT COATS OF ALLIUM CEPA L AFTER X-RAY IRRADIATION. V.Srb and B.Hluchovsky: Exp. Cell Res., 1963, 29, 261-267 (Dept. Biol., Charles Univ. Fac. Med., Hradec Kralove, Czechoslovakia) Ionising X-irradiation (1000 +44 r) affected the permeability of epidermal cells of all the 4 coats of onion, as studied by the plasmolytic method using 0.5 M KNO₃. Changes in the permeability of the individual coats in the course of 42 days following irradiation were irregular. It is suggested that the basic reaction of coats on electrolytic plasmolytic agents is the same, i.e. the onset of complete plasmolysis is always delayed as compared with the controls. K Jones

^{2485.} THE 'DIRECT' AND 'INDIRECT' EFFECTS OF IONISING RADIATION ON THE ALGA ZYGNEMA. J.Petrová: Folia biol., Praha, 1963, 9, 51-59 (Dept. Plant Physiol., Charles Univ., Prague, Czechoslovakia) Filaments of the alga *Zygnema* were irradiated evenly with β , X and γ rays. Type one reaction to such treatment was slow in onset, with temporary arrest of division and formation of permanent modifications. These changes were due to influencing the nucleus of the cells since irradiation of the cytoplasm during interphase had no effects. When non-irradiated cells were cultured on pre-irradiated agar a second action was seen. This was a rapid reaction, with considerable morphol. changes, and the death of lethally affected cells within 24 hr. These 2 distinct effects are termed 'direct*' and 'indirect'. M.S.Laverack

PLANT CONSTITUENTS

^{2486.} ON THE QUANTITATIVE MEASUREMENT OF PHOSPHATASE ACTIVITY IN NECTARIES. T.Cotti: Ber.

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schweiz. bot. Ges., 1962, 72, 306-331. Both nectaries and nectar were studied, using homogenates and intact tissue of Abutilon stria turn and Euphorbia pulcherrima in particular. Only the nectar of Impatiens holsti was TiF active. (German) MTBlandin

2487. TOXIC PRODUCTS IN GROUNDNUTS. D.E.M.

Moody and D.P.Moody: Nature, Lond., 1963, 198, 294-295 (85, Hampden Way, London, England)

G.M.Lewis

2488. FREE AMINO ACIDS IN THE ENDOSPERM OF THE DEVELOPING COCONUT (COCOS NUCIFERA). N.G. Baptist: J. exp. Bot., 1963, 14, 29-41 (Dept. Biochem., Univ. Ceylon, Columbo, Ceylon) A paper- and ion-exchange-chromatographic study of free amino acids in the sap flowing from the incised inflorescence, and in the liquid and solid endosperm of the coconut at various stages of development. I.D.J.Phillips

2489. THE OCCURRENCE OF RHODOXANTHIN IN RED-LEAVED SEEDLINGS OF AGATHIS AUSTRALIS SALISB. P.J.Peteison: J. exp. Bot., 1963, 14, 1-9 (Plant Chem. Div., D.S.I.R., Palmeiston North, New Zealand)

The absorption spectrum of a red carotenoid from leaves of red-pigmented A.australis seedlings was identical with that of ihodoxanthin from arils of Taxus baccata f.nit. Identical behaviour was also obtained in partitioning, chromatography and solubility tests. The concn. of the pigment in red-seedlings was approx. 25 times greater than in green seedlings, while the chlorophyll content in the former was half that of the latter.

LDJ.Phillips

2490. STUDIES ON FUSARIUM WILT OF BANANAS.

Vfl. DIFFERENTIATION OF CLONES BY CULTURAL INTERACTION AND VOLATILE SUBSTANCES. R.H. Stover: Canad. J. Bot., 1962, 40, 1467-1471 (Plant Pathol. Dept., Vining C. Dunlop Labs., Tropical Res. Dept. Tela Railroad Co., La Lima, Honduras) Cultural interaction between paired clones A and C and Foxysporum f. cubense on peptone dextrose agar was a reliable tool for identification of these clones. 'Odoratum*' and 'Inoderatum' clones (readily separated by smell on steamed rice) were subjected to gas chromatography. The 'Odoratum' cultivar was characterised by the production of volatile substances that differed from the 'Inoderatum' group both quant. and qual. A.Meany

MISCELLANEOUS

2491. EFFECT OF GRAFTING ON THE INCOMPATIBILITY RESPONSE OF OENOTHERA ORGANENSIS. A.Kivilaan and C.W.Chang: Nature, Lond., 1963, 197, 1130-1131 (Dept. Bot., Michigan State Univ., East Lansing, Mich., U.S.A.) A partial tolerance to normally incompatible pollen was temporally established in O. organensis by grafting. It is concluded that the incompatibility response involves both stylar and pollen factors since heterologous grafting of either parent diminishes the response. Since seed is not set following self-pollination of heterologously grafted plants (although pollen tubes grow to the carpel) a second barrier to self-fertilisation must exist.

G.

M.Lewis

2492. SPONTANEOUS ELECTRICAL ACTIVITY OF DIENAEA MUSCIPULA. N.M.Balotin and J.R.DiPalma: Science, 1962, 138, 1338-1339 (Dept. Pharmacol., Hahnemann Med. Coll., Philadelphia, Pa., U.S.A.)

Instillation of 4-6 drops of 5% saline in the leaf trap of D.muscipula Ellis causes the appearance of a series of spontaneous action potentials. Mechanical stimn. of the sensitive leaf hair elicits only a single response. The 2^{rh} saline or other salts in equiv. osmotic amounts cause a loss in wt. of the leaf. G.M.Lewis

2493. DECAY AND RECOVERY OF LUMINESCENT ABILITY IN GONYAULAX MONILATA. G.J.Plain and K.E.

•Plain: Nature, Lond., 1963, 197, 1124-1125 (Res. Dept., U.S.Naval Ordnance Test Stn., China Lake, Calif., U.S.A.) A mathematical model is proposed to describe the luminescent response of G. monilata to mechanical stimuli of 0-5 sec. duration at regular intervals. Good agreement with observed measurements was obtained.

2494. INCREASED ACTIVITY OF GLUCOSE 6-P-DIHYDROGENASE IN TOBACCO LEAVES AFFECTED BY PSEUDOMONAS TABACI. G.L.Farkas, L.Lovrekovich and Z.Klement: Naturwissenschaften, 1963, 50, 22-23 (Res. Inst., Plant Protection, Budapest, Hungary).

A.J.Wansbrough-Jones

2495. THE PHYSIOLOGY OF HOST-PARASITE RELATIONSHIPS. I. A CYTOPHOTOMETRIC STUDY OF THE DISTRIBUTION OF DNA AND RNA IN RUST-INFECTED LEAVES. H.S.Whitney, M. Shaw and J.M. Nay lor: Canad. J. Bot., 1962, 40, 1533-1544 (Dept. Biol., Saskatchewan, Saskatoon, Sask., Canada) Rust infection caused a decrease in the size of chloroplasts, increase in size followed by a collapse of the nuclei and an increase in the size of nucleoli in the mesophyll cells of wheat. These effects were more pronounced in the tissue below uredia. Cytophotometry of nuclei by the '2-wavelength' method after staining with Feulgen reagent showed that there was no increase in DNA of enlarged nuclei but there was a 60% decrease of the DNA origin present in the collapsed nuclei. Nucleolar enlargement was accompanied by a significant increase in RNA. T^ results are discussed.

A.Meany

2496. SIMPLE TECHNIQUE FOR INVESTIGATING STOMATAL FORMATION IN SCLEROTINIACEAE. C.Novelli and R.P.Korf: Mycologia, 1961, 53, 237-243 (Dept. Plant Path., Cornell Univ., Ithaca, N.Y., U.S.A.)

Cotton discs slightly less than 9 cm. in diam. and 7 mm. thick were placed in petri dishes and autoclaved for 30 min. at 15 lb. pressure. 50 ml. of sterile potato-dextrobroth was added to the sterile petri dish. The cotton was inoc. with a mycelial disc. Under these conditions typical stromata developed at temp. between 15 and 25°C.

J.G.Brown

2497. LABORATORY PROCEDURE FOR THE CULTIVATION AND FRUCTIFICATION OF SPECIES OF HERICIUM. J.A.Yurchenco and CH.Warren: Mycologia, 1961, 53, 566-574 (Wyeth Lab. Inc.; Radnor, Pa., U.S.A.) Partially decayed and intact dead limbs of maple trees 3-3.5 in. in diam. and 6 in. long, with the bark removed, were used. A well 4 in. deep and 2.5 in. in diam. was made in the wood, which was then immersed in a solid medium in a dessicator jar brought to a suitable $\text{H}_2\text{O}^{\text{TA}}$ content (100%) under partial vacuum. The well was packed with moist-enriched sawdust and the wood cylinder placed on supports inside a battery jar containing a little water and covered with a glass lid. Each unit was autoclaved and then inoculated. Diffused light and air circulation were provided. Using this method 4 out of 11 spp. of Hericium produced sporophores on partially decayed wood.

j G. Brown

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2498. BLUESTAIN IN BALSAM FIR. R.Pomerleau and D.E.Etheridge: *Mycologia*, 1961, 53, 155-170 (Forest Res. Lab., P.O. Box 35 (Sillery), Quebec, P.Q., Canada) Bluestain in balsam fir is ascribed to *J. Or. Igteiniella thujina* (Peck.) Optimum temp. for growth of *tungus* was found to be approx. 28°, being considerably reduced at 2'S⁸ and 32° and ceasing at 36°. Minimal moisture content for growth of *K. thujina* in wood is 5%. J.G.Brown

2499. STUDIES ON FUSARIUM WILT OF BANANAS. R. COMPETITIVE SAPROPHYTIC ABILITY OF F.OXYSPORUM F.CUBENSE. R.H.Stover: *Canad. J. Bot.*, 1962, 40, 1473-1481 (Plant Pathol. Dept., Vining C. DunlopLab., Tela Railroad Co., La Lima, Honduras) ~~added~~ populations of *F. oxysporum* f. *cubense* clone C colored a small proportion of banana leaf and root pieces in banana soil but was a weak competitor for these substrates? comparison with much lower indigenous populations of *F. gggkni* and *F. roseum*. Clone C was recovered from a 2% grass roots colonised in situ and was a predominant coloniser of portions of the decaying main roots of diseased banana plants. The results show that *F. oxysporum* f. *cubense* can take advantage of favourable micro-environments to successfully invade a small % of colonisable sites on roots and other substrates. A.Meany

2500. SELECTIVE ACTION OF FUNGUS-INHIBITORY PROPERTIES OF BALSAM FIR HEARTWOOD. D.E. Etheridge: *Canad. J. Bot.*, 1962, 40, 1459-1462 (Forest Res. Lab., P.O. Box 35, Sillery, Que., Canada) Heartwood of balsam fir has been found highly selective for *greumsanguinolentum* and other primary invaders of firs! This substrate possessed antifungal prop, hitherto suspected on the basis of tests with heat sterilised sapwood, was more active in heartwood, was substantially reduced by wet storage (1 hr. at 10(f), and is unaffected by dry storage (3 months at room temp.). The selective action did not depend upon the microbiol. condition of the wood. A.Meany

TECHNIQUES

2501. PREPARATION OF FREEZE-DRIED POWDERS OF PLANT TISSUES. AJ.Keys, F.S.Smith and F.V.Martin: *J. exp. Bot.*, 1963, 14, 10-13 (A.R.C. Unit Plant Physiol., Imperial Coll. Sci. and Technol., London, England) Apparatus is described for the prep. of freeze-dried powders from plant tissues. Tissue samples were ground in a high-speed mixer under liquid N₂. The resulting frozen powder was dried at -25° using anhydrous CaCl₂ at -25° as desiccant. I.D.J.Phillips

2502. GAMETOCIDAL ACTION OF DICHLOROACETIC ACID. Y.O.Kho and J.W.De Bruyn: *Euphytica*, 1962, 11, 287-292 (Inst. Hort. Plant Breeding, Wageningen, Netherlands) Temporary d sterility in *Antirrhinum majus nanum* L was induced by spraying with a 0.5% aq. soln. of sodium dichloroacetate on the appearance of the first flower buds. R.D.Butler

2503. METHACRYLATE AS AN EMBEDDING MEDIUM FOR WOODY TISSUES. G.P.Berlyn: *Stain Technol.*, 1963, 38, 23-28 (Sch. Forestry, Yale Univ., New Haven, Conn., U.S.A.) With this method infiltration is more rapid than with celloidin and thinner sections (6-30 v) can be cut. M J.Bell

2504. THE ROLE OF TANNINS IN NEUTRAL RED STAINING OF PINE LEAF VACUOLES. M.G.Boyer: *Stain Technol.*, 1963, 38, 117-120 (Forest Pathol. Lab., Maple, Ont., Canada) Examining various techniques for preserving and staining the vacuolar structure of leaf cells the author obtained highly satisfactory results using the vital stain, Neutral Red, on living material and on material fixed in Bouin's fluid or 10% buffered formalin. Further investigations indicated that water-sol. tannins were responsible for absorption of Neutral Red after treatment with formaldehyde and that ferric ions and phenols were essential to the reaction. M J.Bell

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CYTOLOGY

2505. FINE STRUCTURE OF THE ORAL APPARATUS OF THE GYMNOSTOME CILIATE CHLAMYDODON PEDARIUS. M.Kaneda: J. Protozool., 1962, 9, 188-195 (Biol. Inst., Coll. Gen. Eduen., Univ. Hiroshima, Japan) An E.M. study was made of the oral apparatus of *C. pedarius*. It is composed of a membranous system, a pharyngeal basket and pharyngeal tube. The membranous system consists of a membrane combining the pellicular and sub-pellicular membranes. Just beneath it is a layer of randomly intertwining filaments about 20 m/j in diam. The pharyngeal basket is composed of 11-13 triangular and long trichites, connected by filaments. Each of the long trichites consists of a bundle of about 700 filaments arranged in an almost hexagonal pattern, each filament being about 20 mjj in diam. The pharyngeal tube is composed of about 100 lamellae. The lamellae are about 40 m/j apart and have a diam. of about 30 m/j. It is suggested that each of the long trichites of the pharyngeal basket may originate from about 80 kinetosomes, and the lamellae of the pharyngeal tube and the membranous system from the sub-pellicular membrane.

R.J.Walker

2506. FINE STRUCTURE OF THE INTERPSEUDOTRACHEAL PAPILLAE OF THE BLOWFLY. J.R.Larsen: Science, 1963, 139, 347 (Plant Sci. Div., Univ. Wyoming, Laramie, Wyo., U.S.A.) E.M. studies of the inter-pseudotracheal papillae of *Phormia regina* revealed that each contains 4 nerve fibres encased in a cuticular sheath located in the lumen of the papilla inside the vacuole of trichogen cell.

G.M.Lewis

2507. ISOLATED POSTERIOR HALF OF ELECTROPLATE OF ELECTROPHORUS ELECTRICUS (L). D.F. De Almeida, G. De O. Castro, M.Miranda and C.Chagas: Exp. Cell Res., 1963, 29, 42-49 (Inst. Biofis., Univ. Brasil, Rio de Janeiro, Brazil) The post., or innervated, face of the electroplate of *E. electricus* was made up of small and large papillae, the latter being fewer and themselves constituted of small ones. Each small papilla had one nerve ending, but no particular zone or group of papillae on the post. surface could be identified as a functional unit. The distribution of AChase and succinate dehydrogenase was studied histochem. K Jones

2508. FINE STRUCTURE OF URINARY BLADDER OF TOAD, BUFO MARINUS. J.K.Choi: J. cell Biol., 1963, 16, 53-72 (Dept. Anat., Univ. Washington, Seattle, Wash., U.S.A.) The bladders were fixed in situ by injn. of the lumen with 2% OSO₄ in 0.1 collidine buffer at pH 7.5. Lead acetate and uranyl acetate stained sections of the ventral wall were studied in the E.M. and PA-Schiff stained sections in the light microscope. Four cell types were recognised in the epithelium including granular cells, mitochondria-rich cells, mucous and basal cells. The cell membranes, cell junctions and intracellular components are described and the structure of the sub-mucosa and the serosa. The transport of Na and H₂O across the bladder wall is discussed. P.Barrow

2509. FINE STRUCTURE OF 'FEATHER EPITHELIUM' IN DOVE, COLUMBA DOMESTICA. C.R.Leeson: Anat. Rec., 1961, 140, 359-366 (Dept. Anat., Dalhousie Univ., Halifax, N.S., Canada) The fine structure of the feather epithelium* of the nictitating membrane is described. Non-motile extensions of apical cells possess numerous irregular micro-villi, which themselves show

fibrillar borders. The findings are discussed in relation to previous histol. descriptions of the epithelium and it is concluded that the function is probably one of maintaining the surface of the cornea free of dust. F.Beck

METABOLISM

2510. STEROID REQUIREMENTS OF TRICHOMONADS. P.G.Lund and M.S.Shorb: J. Protozool., 1963, 9, 151-154 (Dept. Poultry Husbandry, Univ. Maryland, College Park, Md., U.S.A.) The steroid requirement of a Trypticase-requiring strain, SLT, of *Trichomonas gallinae* reared on a synthetic medium was cholesterol, 7-deS⁺ cholesterol, cholestanol, and to a lesser degree ergosterol, 3^oSitosterol and zymosterol acetate. Best growth was obtained with cholesterol. The purity of the steroid was checked by gas chromatography. Several compound^{*} were found to be inactive, including diethylstilboestrol¹, oestrone, dehydroepiandrosterone, progesterone, cords^{**} acetate and cholic acid. Precursors in cholesterol synthesis, acetate, mevalonic acid, mevalonic acid plus a liver extract and squalene were inactive in replacing cholesterol. Ciyst. fat sol. vitamins, carotene, vit. D₂, vit. D₃, vit. K₁ and vit. E acetate were inactive in replacing cholesterol. A *Trichomonas* sp. from the pig's nose utilises cholesterol, 7-dehydrocholesterol and impure g-sitosterol.

R.J.Walker

2511. UBIQUINONE IN FOUR GENERA OF PROTOZOA. C.Vakirtzi-Lemonias, G.W.Kidder and V.C.Dewey: Comp. Biochem. Physiol., 1963, 8, 331-334 (Biology Labs., Amherst Coll., Amherst, Mass., U.S.A.) Enzyme Q, ubiquinone [UQ₁] was isolated from several protozoan spp. *Tetrahymena pyriformis* possesses UQ₂ (8 isoprene units) at 0.65 μmole/g. dry wt. Flagellates *Crithidia fasciculata*, *Strigomemas oncophelti* and *Astasia klebsii* contain 0.23, 0.40 and 0.14 μmole/g. dry wt. of UQ₂ respectively. *Euglena gracilis* had previously been shown to contain UQ₈ (Fuller et al.), but *Astasia* contains UQ₉ so no taxonomic significance can be postulated on the occurrence of these compounds. M.S.Laverack

2512. A COMPARATIVE STUDY OF REDUCTIVE ACTIVITY OF W.B.C. OF RODENT AND HUMAN BLOOD. A.A. Yakaitis: Anat. Rec., 1961, 140, 367-373 (Dept. Anat., Univ. Michigan, Ann Arbor, Mich., U.S.A.) A comparative study was made of the reductase activity of w.b.c. of mice, guinea-pigs, rabbits and human blood following incubation at room temp. in a pipette with tetrazole I.N.T. The amount of activity was observed to vary between different spp. between w.b.c. and between different human donors. F.Beck

2513. PHYSIOLOGICO-CHEMICAL CHARACTERISTICS OF SPECIES FROM THE GENUS PAPIO. E.Bamann, ** Gebler and H.Forster: Hoppe-Seylers Z. physiol., 1963, 331, 64-66 (Inst. Pharm., Food Chem., Univ. Munich 2, Germany) Evidence is presented for classifying the genus *Papio* into subgenera. (German)

EMBRYOLOGY

2514. INDUCED AMOEBOID MOVEMENT IN EGGS OF SURF-CLAM *SPISULA SOUDISSIONA*. L.I.Rebhun: *Exp. Cell Res.*, 1963, 29, 593-602 (Dept. Biol., Princeton Univ., Princeton, NJ., U.S.A.) Amoeboid Movement induced in fertilised eggs of *Spisula*, was composed of 6 sp. types of motion; internal cyclosis, monopodial movement, multi-pseudopodial movement, rolling lobopod motions, twitches and shallow moving furrow formation. These phenomena appeared to arise from either contractile type processes in the external cell Jyeis or processes arising within the moving cytoplasm. It is speculated that these motions result from a dissociation of normally coordinated internal cycloic and surface contractile processes. K.Jones

2515. ACTION OF ALKYLATED AGENTS ON SEA URCHIN GAMETES. B.W.Jax, M.Pardington and H. Jackson: *Exp. Cell Res.*, 1963, 29, 137-143 (Dept. Expt. Chemotherapy, Christie Hosp., Manchester, England) The treatment of either sperm or eggs with *B*-ethyl methane sulphonate, reduced the rate of cleavage of eggs after fertilisation. Treatment of sperm or ova with isopropyl methane sulphonate did not produce any Cleavage delays. Tretamine acted on ova at low concn. Produce a marked increase of abnormalities which were probably due to polyspermic fertilisation. K.Jones

2516. CELLULAR BASIS OF MORPHOGENESIS IN SEA URCHIN EMBRYO: FORMATION OF COELOM, MOUTH AND PRIMARY PORE-CANAL. T.Gustafeon and L.Wolpert: *Exp. Cell Res.*, 1963, 29, 561-582 (Wenner-Gren Inst., Univ. Stockholm, Sweden) The cellular basis of the morphogenesis of the coelom, mouth and the Primary pore-canal in *Psammechinus miliaris* was studied by time-lapse cinematography. Be findings are described, and the relation between the cellular activities concerned and the postulated morphogenetic gradients discussed. It is concluded that a complex set of structures may arise from a succession of a few basic cellular events organised in a rather simple manner. K.Jones

2517. AGGREGATION OF CELLS ISOLATED FROM VEGETALBED AND ANIMALISED SEA URCHIN EMBRYOS. G.Giudice: *Experientia*, Basel, 1963, 19, 83-84 (Inst. Comp. Anat., Univ. Palermo, Italy) The altered pattern of differentiation is retained in the process of aggregation in chem. vegetalised or animated embryos. The possibility of changing the pattern of differentiation is very limited. R.S.Tonks

2518. ENERGY EXPENDITURE DURING EMBRYONIC DEVELOPMENT UNDER CONSTANT VERSUS VARIABLE TEMPERATURES (ONCOPELTUS FASCIATUS (DALLAS)). F.G.Richards and S.Suanfaksa: *Ent. exp. Appl.*, 1962, 5, 167-178 (Dept. Entom. and Econ. Zool., Univ. Minnesota, St. Paul, Minn., U.S.A.) Embryonic O₂ consumption rates measured in microrespirometers increased steadily regularly at 15, 17.5 and 25°. 0.009-0.018-0.095 and 0.031-0.215 μ O₂/egg/hr. i.e. $\frac{d}{dt} \ln \frac{O_2}{O_2}$ taken from 15° to 25° show a transitory overshoot in O₂ consumption rate which then descends to a const. temp. An unexpected large development delay around minimal temp. is improved even if kept at a short daily favourable temp. Consequently O₂ consumption rate and wt. loss (calc. from previous expt.) are less than at corresponding const. temp. H.W.Spencer

2519. OBSERVATIONS ON RATE OF GROWTH AND DISRUPTION OF MOULTING IN LARVAE AND PUPAE OF *TRIBOLIUM CASTANEUM* (HERBST) (COLEOPTERA, TENEBRIONIDAE) AT SUB-THRESHOLD TEMPERATURE. R.W.Howe: *Ent. exp. Appl.*, 1962, 5, 211-222 (Pest Infest. Lab., Slough, Bucks, England) The survival period of larvae and pupae just below development threshold and at some lower temp. was determined. Freshly-hatched larvae were kept individually in tubes in a desiccator at 10° RH. and at prescribed ages were transferred from 30 to 20, 17*, 15, 10 or 5*. Death where it occurred was mostly due to faulty moulting. Pupae from larvae at 20° reached adult stage then failed to cast pupal skins. The critical age for larvae at 20° was 8 days at 3(f). Early instar larvae and prepupal stages were most susceptible. The lowest successful temp. for development completion was just above 20°. H.W. Spencer

2520. TORSION OF TOE POST-ABDOMEN IN MALE *DIP* TERA. Md. Zaka-ur-Rab: *Naturwissenschaften* 1963, 50, 24-25 (Dept. Zool., Aligarh Muslim Univ., Aligarh, India). AJ.Wansbrough

2521. A STUDY ON THE MECHANISM OF CLEAVAGE IN THE AMPHIBIAN EGG. K.Dan and M.Kuno-Kojima: *J. exp. Biol.*, 1963, 40, 7-14 (Dept. BLol., Tokyo Metropolitan Univ., Tokyo, Japan) A cut made more than 1 mm. ahead of the tip of the cleavage furrow prevents its advancement in *Triturus pyrrhogaster* eggs. If the cut is less than 1 mm. ahead, the furrow is formed on the other side of the cut and it continues to advance. An excised piece of cortex can form a furrow and divide, as long as a furrow tip or its adjoining area is included in the piece. A.J. Martin

2522. THE ROLE OF THE ENTOBLAST IN TOE FORMATION OF TOE URODELE HEART. H.Amano and J. Fautrez: *Arch. Biol.*, Liège, 1962, 73, 193-204 (Lab. Human and Comp. Anat., Univ. Gand, Belgium) Following the removal of the entoblast from *Triturus pyrrhogaster* eggs at the neural stage, the heart fails to form. It is suggested that this failure is due to an inhibitory action of the dorsal chordomesoblast rather than to the suppression of an active influence from the entoblast. (French) R.J.Walker

2523. ANALYSIS OF TOE DEVELOPMENT OF TOE LIMBS OF AN EMBRYO URODELE AFTER PARTIAL EXOGASTRULATION. H.Amano: *Arch. Biol.*, Liège, 1962, 73, 205-223 (Lab. Human and Comp. Anat., Univ. Gand, Belgium) Caudal implantation and reduplication of the limb-buds of embryos of *Pleurodeles waltii*, *Triturus taeniatus* and *T. pyrrhogaster*, after partial exogastrulation was investigated using the colour-mark technique and by transplantation and explanation expt. From the results, it is concluded that the limb anlage must be pre-adapted before invagination at the late gastrula stage. (French) R.J.Walker

2524. DEVELOPMENT OF FEATHER KERATIN DURING EMBRYOGENESIS OF CHICK. E.Bell and Y.T.Thathachari: *J. cell Biol.*, 1963, 16, 215-223 (Dept. Biol., M.I.T., Cambridge, Mass., U.S.A.) The relationship of the synthesis and macromolecular organisation of feather keratin to cell differentiation was studied in feathers cut from the mid-dorsal region of White Leghorn embryos of 9-17 days. X-ray diffraction patterns of 14-day feathers are similar to the adult pattern and the development between 9-14 days incubation is described. Sections stained for -S-S groups and for keratin showed extensive -S-S bond

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formation occurring between the 13th-14th day. The results suggest that keratin develops on a lipid framework and becomes stabilised after the formation of H bonds and disulphide cross-links.

P.Barrow

effect may be due to a balance between a tendency toward continuation of development, and a tendency toward dedifferentiation, regression and reorganisation. The factors affecting this balance may include the extent of re-innervation or re-vascularisation of the transplant. The action of the 'apical organisation centre' under the conditions of transplantation are briefly discussed.

R.J.Walker

REGENERATION

2525. LIMITS OF TRANSPLANTATION TOLERANCE IN LARGE AMOEBAE. I. MICROFUSION STUDIES USING AMOEBA PROTEUS, PELOMYXA ILLINOISENSIS, AND THREE STRAINS OF PELOMYXA CAROLINENSIS.

E.W.Daniels: *J. Protozool.*, 1962, 9, 183-187 (Div. Biol. and Med. Res., Argonne Nat. Lab., Argonne, 111, U.S.A.) Protoplasm transferred to a multinucleate amoeba is tolerated if the donor and recipient portions are from the same animal, from different amoebae of a single clone, from different amoebae of the same sp. found in a given location, or different amoebae of the same sp. found in separate geographic areas. Interspecific or intergeneric transplantation of protoplasm is not tolerated and death follows. X-radiation increased the mean survival time of heterologous transplants in the case of supralethally X-irradiated recipient *A.Uinoisensis* and non-irradiated donor *P.narolinensis*. It is suggested that this indicates a limited therapeutic effect of non-irradiated protoplasm on supralethally irradiated recipients.

R.J.Walker

2526. REGENERATION IN SEVERED SPINAL CORD OF CHORDATE LARVAE OF PETROMYZON MARINUS.

E.Hibbard: *Exp. Neurol.*, 1963, 7, 175-185 (Lab. Perinatal Physiol., Nat. Inst. Hlth., Bethesda, Md., U.S.A.) Regeneration of nerve processes in the severed spinal cord of the chordate larval lamprey occurs with speed and perfection sometimes resulting in recovery of function in less than 20 days. No dense fibrous scar tissue is formed. Excessive proliferation of ependymal cells sometimes hinders the regenerative process.

P.W.Nathan

2527. ADDITIONAL EXPERIMENTS ON THE SELF-DIFFERENTIATION OF TRANSPLANTED WHOLE AND HALF FORE LIMB REGENERATES OF AMBYSTOMA MEXICANUM. JJaber: *Arch. Biol.*, Liège, 1962, 73, 369-378 (Hubrecht Lab., Intern. Embryol. Inst., Utrecht, Netherlands)

Transplantation expt. in axolotl larvae involving whole and half paddle-shaped fore-limb regenerates were used. The latter were obtained by removing the distal half of a 3 day regenerate. Several of the transplanted whole regenerates formed distinctly hypermorphic autopodia. In several expt. where the distal part of the transplant was removed, the transplants approached a qual. normal limb.

R.J.Walker

2528. A THRESHOLD EFFECT IN THE MORPHOGENETIC REALISATION OF TRANSPLANTED LIMB REGENERATES OF AMBYSTOMA MEXICANUM. J.Faber: *Arch. Biol.*, Liège, 1962, 73, 379-403 (Hubrecht Lab., Intern. Embryol. Inst., Utrecht, Netherlands)

In this paper results of expt. involving transplants of blastemata and regenerates from preceding papers were analysed using a semi-quant. method, with special reference to the development of the autopodium. The marked preference for low and high levels of morphogenetic realisation is explained in terms of a threshold effect. This threshold

2529. REGENERATION OF THE LIVER IN TRITURUS VIRIDESCENS. R.A.MacDonald, T.Guiney and R.Tank:

Proc. Soc. exp. Biol., N.Y., 1962, 111, 277-280 (Mallory Inst. Path., Boston City Hosp., Boston, Mass*, U.S.A.)

[³H]Thymidine and autoradiographs were used to quantitate DNA synthesis in detailed liver cell regeneration studies after partial hepatectomy. DNA synthesis began after 5 days, reached a peak at 10 days, fell by 20 days and rose to a 2nd peak at 105 days. Restoration of normal liver wt. was attained after 4 weeks.

M.M.Shapland.

OSMOREGULATION AND EXCRETION

2530. AMOEBA PROTEUS: STUDYING THE CONTRACTILE VACUOLE BY MICROPUNCTURE. B.Schmidf

Nielsen and C.R.Schrauger: *Science*, 1963, 139, 6°^b 607 (Dept. Zool., Duke Univ., Durham, N.C., U.S.A)

Direct measurements of freezing point depression of protoplasm and the fluid from the contractile vacuole showed that the former had an osmolarity ranging from 73-116 and the latter from 24 to 38. Explanations for the hypoosmolarity of the vacuole in relation to the protoplasm are discussed.

G.M.Lewis

2531. MECHANISMS OF SODIUM AND POTASSIUM REGULATION IN TETRAHYMENA PYRIFORMIS STRAIN

W. W. deW. Andms and A.C.Giese: *J. cell. comp.**¹ *Physiol.*, 1963, 61, 17-30 (Dept. Zool., Pomona Of

Stanford, Calif., U.S.A.) In *T. pyriformis*, 30°^f the intracellular K appears to be bound; exposure to *^w O₂ tension or treatment with iodoacetic acid, DNP or azide causes its loss. The remaining motile K is ^{probab} coupled with Na extrusion through a cyclic carrier mech- anism, which is unaffected by ouabain but related to temp.

G.M.Lewis

2532. BEGINNING OF THE ACCUMULATION OF VANADIUM DURING THE EARLY DEVELOPMENT OF THE ASCIDIAN PHALLUSIA MAMILLATA CUVIER. H.-J.

Bielig, K.Pfleger, W.Rummel and M. de Vincenti¹: *Nature*, Lond., 1963, 197, 1223-1224 (Max-Plane¹

Inst., Heidelberg, Germany) Uptake of vanadium by *P.mamillata* commences at the time of hatching *^j

rises at the appearance of swimming larvae. Uptake w decreased as the tail became absorbed.

CMLew

FEEDING AND DIGESTION

2533. NUCLEIC ACID DIGESTION AND MACRONUCLEUS FORM IN CANNIBAL BLEPHARISMA, NEW YORK

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VERSITY STRAIN. N.Tulchin and H.J.Iishfieldr J. Protozool., 1963, 9, 200-203 (Dept. Kol., Grad. Sch. Am and Sci. New York Univ., New York, N.Y., U.S.A.) **Cannibal giant Blepharisma undulans** (E.£.£.annus), grown in mass culture, showed increased no. of macronuclear lobes and greater variability in their size compared to bacteria-fed specimens. During the first 3-6 hr. of digestion, macronucleus and DNA disappeared from the food vacuoles, while during the last 1-2 hr. of digestion the food vacuole RNA content disappears. It is concluded that both DNA and RNA are digested and absorbed. R.J.Walker

2534. RHYTHMIC MOVEMENTS ON CORDYLOPHERA. J.Fulton: J. cell. comp. Physiol., 1963, 61, 39-51 (Rockefeller Inst. New York, U.S.A.) Time-lapse photography of colonies of the hydroid *Cordylophora canaliculata* shows peristaltic waves circulating nutrients which better the state of each hydranth and occur at intervals varying from 8-20 min. according to the nutritional state of the colony. A further series of rhythmic movements occur during the regeneration of hydranths in stem segments and tissue fragments. CM.Lewis

2535. DIGESTION OF STARCH IN TOE GUT OF OXYGENUS HYALINIPENNIS (COSTA) (HETEROPTERA: ARGAEIDAE). P.L.Bhamagar: Naturwissenschaften, 1963, 50, 24 (Dept. Zool., Univ. Delhi, India).

2536. THE SUGAR-FEEDING CYCLE IN A CAGE-PULATION OF MOSQUITOES. J.D.Gillet, AJ.Hadaway and P.S.Corbett: Ent. exp. Appl., 1962, 5, 223-232 (Ent. Res. Inst., Entebbe, Uganda, Africa) *Aedes aegypti* (L.) mosquitoes at $23 \pm 1^\circ$ and 70% R.H. were kept in cages in a room with a continuously lit 15W red lamp and normal equatorial day and night changes in light. Both sexes show 2 daily peaks of sugar-feeding comparable with field observations on nectar and dew-feeding in other spp. of mosquitoes. H.W.Spencer

2537. A DIFFERENTIAL GROWTH RESPONSE OF THE SINKING ELEMENTS OF THE FEMALE RICE MOTH TO ANTIBIOTIC SUPPLEMENTATION. D.Kianu: Nature, Lond., 1963, 197, 106-107 (Dept. Zooll. Univ. Jodhpur, India) Male rice moths (*Deuteracrona*) on 10% P-P²⁰² Penicillin feed supplements grew 10% heavier than their controls, & 6% heavier. Supplementation of the diet with terramycin caused 8% increase in wt. in cf and 3% in tf. Oleandomycin did not enhance growth of either sex. G.M.Lewis

2538. THE FOOD AND FEEDING HABITS OF TEAL ANAS CRECCA CRECCA L. PJ.Olney: Proc. zool. Soc. a., 1963, 140, 169-210 (Wildfowl Trust, Slimbridge, England). D.N.MILLER

NERVOUS SYSTEM

2539. MOVEMENT RECEPTORS IN BUCCINUM UNDULATUM. M.S.Laverack and D.F.Bailey: Comp.Biochem. Physiol., 1963, 8, 289-298 (Gatty Marine Lab., St Andrews, Fife, Scotland) Electrophysiol. investigation has been carried out on the mechanoreceptors in the body wall of the common whelk *Buccinum undatum*. The first 68 studied were those supplying the left antenna and siphonal regions. Tactile responses were obtained upon stimm. of very small discrete areas of the epidermis of the animal. Three types of mechanoreceptors have been seen. First a unit type that responded to active stretching occurred; second units that

were active upon both stretch and relaxation; and third a normally discharging unit that increased in freq. during stretch, followed by slow adaptation. Reflex nervous activity originating in the central nervous ganglia with a latency of 60-80 msec, after stimm. has also been described. M.S.Laverack

2540. A PULSATIN GANGLION IN THE OCTOPODA. J.S.Alexandrowicz: Proc. Roy. Soc. B., 1963, 157, 562-573 (Marine Biol. Assocn. Lab., Plymouth, England) Observations made on *Eledone cirrhosa* and *Octopus vulgaris* revealed the presence of a ganglion on one of the visceral nerves which contracts rhythmically with the same freq. as the blood circulation, due to contractions of a spherical body occupying nearly half its vol. This body may have neurosecretory prop.

G.M.Lewis

2541. THE NUMBER AND SIZES OF NERVE CELLS IN OCTOPUS. J.Z.Young: Proc. zool. Soc. Lond., 1963, 140, 229-254 (Dept. Anat. Univ. Coll., London, England) It has been calc. that there are some 500 million neurones in the ganglia and brain of the octopus. About 300 million of these are in the brachial ganglia. Large neurones are found in the main motor centres of the brain. Somewhat smaller cells are found in the supra-oesophageal basal lobes. The smallest neurones are found in the optic lobes and in the vertical and sub-frontal lobes. The optic lobes contain about 130 million neurones, the vertical lobe system about 30 million very small neurones which may have inhibitory actions. The tactile centres contain 6 million cells these being a great no. of the small cells found in the subfrontal lobes.

D.N.Wheatley

SENSE ORGANS

2542. LIGHT AND DARK-ADAPTATION IN TOE EYES OF SOME CEPHALOPODS. J.Z.Young: Proc. zool. Soc. Lond., 1963, 140, 255-272 (Dept. Anat., Univ. Coll., London, England) Dark-adapted retinae have the pigment cone, in the bases of the rhabdomes. In light-adapted retinae the pigment moves out distally but most slowly accumulates in the central region. In dark-adaptation the pigment is withdrawn from the central region most quickly. The rhabdomes in *Loligo*, *Octopus* and *Sepia* shortened under illumination and elongated in the dark. D.N.Wheatley

2543. RESPONSES OF MAXILLARY CHEMORECEPTORS IN THE LARVA OF THE SILKWORM, BOMBYX MORI TO STIMULATION BY CARBOHYDRATES. S.Ishikawa: J. cell. comp. Physiol., 1963, 61, 99-107 (Sericult. Expt. Sm., Suginami-ku, Tokyo, Japan) In newly moulted, unfed, 5th instar larvae of *B. mori*, one of the sensilla stylonica on the maxilla was identified as the chemosensor organ for carbohydrates. Four kinds of receptors were present, responding to different sugars and to salts. G.M.Lewis

2544. RECORDING CIRCADIAN RHYTHMS OF COCK ROACH WITH CAPACITY-SENSING DEVICE. M.S. Schechter, S.R.Dutky and W.N.Sullivan: J. econ. Entomol., 1963, 56, 76-79 (Entom. Res. Div., Agric. Res. Serv., U.S.D.A., U.S.A.) A Madeira cockroach was reared in a light-dark culture and tested in the device at room temp, in light and dark, all dark and all light periods. The insect was kept in a 1 l. cylinder with a

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circular plastic barrier 6 in. above the base. Aluminium foil outside this part of the cylinder was attached to the sensing device including a milliammeter and readings were recorded automatically using a 50 mV recorder. Thus no attachments to the animal are used in this method.

H.W.Spencer

2545. FINE STRUCTURE OF ECCENTRIC RETINULA CELL IN INSECT COMPOUND EYE (BOMBYX MORI). E. Eguchi: J. ultrastructure Res., 1962, 7, 328-338 (Anat. Dept., Med. Fac. Kyushu Univ. Fukuoka, Japan)

It has been shown that the compound eye of the silkworm modi contains a special type of cell resembling the eccentric cell found previously only in the horseshoe crab. This eccentrically placed cell resembles a bipolar neuron in form and is larger than the retinula cell. Characteristically the cell forms rhabdomeres on both its cell body and dendrite. Many mitochondria are present in the cytoplasm which is less dense than that of the retinula cell.

H.B.Waynforth

2546. A PHOTORECEPTOR-LIKE STRUCTURE IN VENTRAL NERVE CORD OF CRAYFISH CAMBARUS VIRILIS. K.Jiama: Anat. Rec., 1961, 140, 329-336 (Sch. Med., Univ. Hiroshima, Japan)

In the abdominal ganglia of the crayfish are compound bodies which consist of a pile of lamellae, multivesicular bodies, free vesicles and dense granules, located in the innermost sheath cell of the giant fibre. The structural resemblance between these bodies and known types of photoreceptors strongly suggests that the structures may be responsible for the light response of the ventral nerve cord of the crayfish.

F.Beck

2547. ELECTRICAL RESPONSES IN DECAPOD CRUSTACEAN VISUAL SYSTEMS. T.H.Waterman and C.A.G. Wiesma: J. cell. comp. Physiol., 1963, 61, 1-16 (Dept. Biol., Yale Univ., New Haven, Conn., U.S.A.)

Electrical activity of the compound eyes and eyestalks of the crustaceans Panulirus, Grapsus and Goniopsis has been studied in response to light intensity changes and target movement. Using both wick and needle electrodes visual units of 3 types were recorded; sustaining units with relatively little adaptation, on-off fibres, and movement elements, some of which showed such strong adaptation as to be essentially novelty units. The fields of view were mediated by many ommatidia, and normal function depended on an intact blood supply. There was no evidence of sensitivity to polarized light.

CM.Lewis

2548. PRELIMINARY OBSERVATIONS ON THE ORIENTATION OF TALITRUS SALTATOR IN FRESH AND SEA WATER. E.T.Debenedetti: Naturwissenschaften, 1963, 50, 25-26 (Inst. Zool., Univ., Torino, Italy) Phototactic orientation also affected movement towards land or sea, which appeared to be generally governed by humidity and salinity.

A

J.Wansbrough

ENDOCRINES

549. EFFECT OF SYNTHETIC 'QUEEN SUBSTANCE¹ (9-QXODEC-trans-2-ENOIC ACID) ON OVARY DEVELOPMENT OF THE HOUSEFLY, MUSCA DOMESTICA L. J.K.Nayar: Nature, Lond., 1963, 197, 923-924 (Dept. Entomol., Univ. Manitoba, Winnipeg, Canada) 6-8 week old houseflies were inj. in the

thorax with 5 fig./fly of 2 xngVmL synthetic 'queen substance' in dil. ethanol. Complete inhibn. of ovary development occurred if injn. of the material were repeated at intervals of 24 hr.

G.M.Lewis

2550. HYPERSEXUAL ACTIVITY INDUCED IN FEMALES OF THE COCKROACH NAUPOETA CINEREA. L.M. Roth: Science, 1962, 138, 1267-1269 (Div. Engineering, Harvard Univ., Cambridge, Mass., U.S.A.)

Expt. in which oothecae were removed from ♀ N.cinerea⁸ to stimulate their corpora allata showed that the hormone⁸ from this gland controlled mating by inducing feeding on the tergum of a displaying ♂. Mating induces an inhibitory nervous mechanism, the seat of which is post, to the last abdominal ganglion, which suppresses feeding behaviour. After parturition, ♀ become receptive again. TransectiLon of the nerve cord before or just after mating causes excessive sexual behaviour.

G.M.Lewis

2551. THE HISTOLOGY AND HISTOCHEMISTRY OF &¹⁰ DEVELOPMENT AND RESORPTION IN THE TERMINAL OOCYTES OF THE DESERT LOCUST, SCHISTOCERCA GREGARIA. O.Lusis: Quart. J. micr. Sci., 1963, 104, 57-68 (Dept. Zool., Univ. Sheffield, England)

%V
icular cells play an active part during vitellogenesis, fr yolk synthesis. The term 'corpus luteum' as applied to the ovary of the locust is invalid and 'white' and 'yellow'^{*} follicle are terms introduced to describe the normal and pathol. post-ovulatory follicle. The protein yolk is a protein-carbohydrate compound. Lipid bodies present are dissolved in p-carotene and are (1) phospholipid, (2) combined phospholipid and triglyceride and (3) triglyceride. Concn. or absorption of the lipids causes cystin. of caio* tene and formation of the pigment body. During resorp' ion follicular cells act as lecitholytic cells - breaking down protein, then lipid yolk and finally degenerating themselves. It is suggested that oocytes have an inhered potential for resorption dependant on factors within the body.

W.A

Stevens

2552. VARIATIONS IN MORTALITY IN TADPOLES OF RANA TEMPORARIA TREATED WITH CORTISONE ACETATE, RESERPINE AND METHYSERGIDE. J.C. Czyba and N.Durand: C.R. Soc. Biol., Paris, 1962, 156, 1416-1418 (Chaire Histol., Fac. Méd., Lyon, France)

Tadpoles were kept in 2 l. of water containing 10 drops of an extract of Rauwolfia serpentina (containing reserpine), 0.5 mg. methysergide or 2.5 mg. cortisone acetate. After 47 days 80% of control animal had died, 75% of the group receiving methysergide, 50% of the group in reserpine and 40% of those in cortisone^{*}. The animals in reserpine showed darker pigmentation than the remainder.

(French)

M.A.

2553. ACTION OF LYOPHILIZED HYPOTHALAMUS EXTRACTS ON METAMORPHOSIS OF TADPOLES. C.¹¹L.¹² PARKON WITH THE ACTION OF CORTISONE, V.¹³C.¹⁴ net, J.M.Chevalier, J.C.Duflot and M.Jacquin: C.R. Soc. Biol., Paris, 1962, 156, 1454-1456 (Lab. M^{de} exp., Fac. Méd., Marseille, France)

Tadpoles were kept in soln. containing a lyophilised extract of total^{*} mammillary region of the hypothalamus. In 15 days 100% of tadpoles showing complete development was 5 in j^{or} mal soln., 35 in soln. containing the mammillary f^{or} 16 in soln. containing 1 mg. total hypothalamus/2 1^{mp} 2 mg. cortisone/2 1. retarded metamorphosis while a^{mp} 2 1. stim. metamorphosis. (French)

M.A.

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**2554. EXCYSTATION OF THE POULTRY COCCIDIUM,
EMERIA ACERVUUNA.** DJ.Doian and MM Jan: J.
Protozool., 1963, 9, 154-161 (Beltsville Paraat. Lab.
Animal Dis. and Parasite Res. Div., U.S.D.A., Belts-
ville, Md., U.S.A.) In test intervals up to 5 hr. all
attempts to liberate sporozoites from sporocysts while
still within the intact oocyst were unsuccessful using
"ypsin 1-300 in different combinations of concn., pH,
and exposure intervals. Following the feeding of sporo-
cysts to chickens, large no. of sporocysts were
•Widely released from the oocysts in the gizzard. The
sporozoites escaped from the liberated sp^ocysts in the
^ucolon and jejunum. It would appear that die action
** * e digestive juice was on the sporocysts rather than
*e oocysts. fo vitro attempts to excyst sporozoites from
ftce sporocysts in the absence of bile using P^o MMIC
Prep. produced poor results. The action of the pancreatic
P^oP. was greatly increased in the presence < * > " " <
*fits, and other surface-active agents. ^ tet product-
* of sporozoites was obtained with 0-25% trypan-1-800
TM 5% chicken bile at pH 7.6. R.J.Wallcer

2555. RELATIONSHIPS BETWEEN FEEDING AND ENCYSTMENT IN OXYTRICHA FALLAX. K.Hashimoto:J. Protozool., 1962. ^{*m-mi*} ^{*101*}. Lab. Koza High Sch., Tennōji-ku, Osaka, Japan)

When food is with
tory crystals and
transparent and un-
Firstly the undulat-
soaked, followed by die adoral membranelles. When
tentacles at various precystic stages are cut in
hand, the post. fragment always encysts faster than the
ant.- A e £ 9 E 5 c between the 2 pate to en-
cysting greater at the early stages «» n * 1 ? 1 f ? 2 *
? , I concluded that the adoral membranelles tend to m-
S 1 t e encystment process, and their « * £ « * u con-
Werend an essential requirement for me Vittation of u
versible encystmen Rj.Walker

255. LEECHES AS ENDOPARASITES OF FROGS. K.H.
 Mann and M J.Tyler: Nature, Land., 1963, i*'.
 1224-1225 CDept. Zool., Univ. *e_*^m_z,to**`--
 (England) The leech, "TF***" pandolfieri, lives
 under* fa 6 si>p! of frogsruSiLTE to yn^ space
 Ae skin, but sometimes in the coelom. GJ^Aewi
 2557. BEHAVIOUR OF MICROFILARIAE OF BTOIA PA-
 H.

257. BEHAVIOUR OF MICROFILARIAE OF BTOIA PA-
HAN
Essli
Sch. Med. 1960, 21, 1

»»*»* »the host parasite »>™*ffjg££**

2558. PARASITOLOGICAL AND BIOCHEMICAL INTER-
RELATIONSHIPS IN CHIRONOMUS (DIPT.). W. WILKER:
Naturwissenschaften, 1963, 50, 49-50 (Zool. and
Limnol. Inst., Univ., Freiburg i. Br., Germany)
Electrophoretic differences in the haemolymph of various
sp. of Chironomus were shown to be related to the speci-
ficity of the nematode parasite Paramermis rosea, which
developed normally only in the sp. C. anthracinus.
(German) A.J.Wansbrough

- 2559. THE ALFALFA PLANT BUG, ADELPHOCORIS LINEOLATUS (GOEZE) IN N. SASKATCHEWAN.** C.H. Craig: Canad. Ent., 1963, 95, 6-13 (Entom. Sect., Canada Agric. Res. Stn., Saskatoon, Sask., Canada) IWs pest, the lucerne leaf-bug in Europe and W. Asia, spread westward across Canada at 30-40 miles/yr. from 1947 to 1959, Economic infestations often appear 2-4 yr. after the insect's initial appearance. The migratory behaviour seems to be an inherent characteristic and is necessary for max. reproduction. Because of migration local control measures may have to be taken annually. Seasonal development is described, most of the eggs entering diapause throughout the winter*. Eggs were laid only in stems and stem branches of alfalfa plants. The insect also attacks red clover. Some nymphs were parasitised by braconid larvae. H.W.Spencer

2560. FIRST N. AMERICAN RECORD OF BUFOLUCIU A SBLVARUM (MEIGEN) (DIPTERA:CALLDPHORIDAE) PARASITISING BUFO TERRESTRIS AMERICANUS HOL-BROOK J-S.Bleakney: Canad. Ent., 1963, 95, 107 (Nova Scotia Mus. Sci., Halifax, N.S., Canada) The head of a live adult \$ frog was infested with the larvae of this fly. H.W.Spencer

2561. LONGEVITY, PALATABILITY AND NATURAL SELECTION IN 5 SPECIES OF NEW WORLD SATURNIID MOTH A.D.Blest: Nature, Lond., 1963, 197, 1183-1186 (Dept. Zool., University Coll., London, England) The effects of natural selection are considered among spp. of moths subject to predation, some cryptic and palatable, some aposematic and distasteful. G.M.Lewis

2562. EFFECTS OF γ -RADIATION ON VARIOUS STAGES OF 3 FRUIT FLY SPECIES. J.W.Balock, A.K.Burditt and L.D.Christensen: J. econ. Entomol., 1963, 56, 42-46 (Entom. Res. Div., Agric. Res. Serv*, U.S.D.A., U.S.A.) Material was treated in Al cannisters, the average dosages being 1250-1620 r/min. using ^{80}Co . Oriental and Mediterranean fruit fly eggs were laid on artificial lemon moulds and melon fly eggs in hollowed-out passion fruit shells. Larvae were reared in fortified carrot medium. Water drops containing 600-700 eggs were irradiated on moist blotting paper discs or in rearing medium. Only increasing dosages with age prevented hatching but 1/3 developed eggs were more sensitive than younger ones. 160000 r prevented 95% larval pupation. With mature pupae 100000 r prevented adult emergence but 10000 r caused sterile adult emergence. Environmental differences affect the treatment's success. H.W.Spencer

2563. INFLUENCE OF TEMPERATURE AND HUMIDITY ON RESISTANCE IN ALFALFA TO SPOTTED ALFALFA APHID AND PEA APHID. A.Isaak, E.L.Sorensen and E.J.S.Ortman: J. econ. Entomol., 1963, 56, 52-57 (Dept. Entom., Kansas Agric. Expt. Stn., Crops Res. Div., U.S.D.A., Manhattan, Kans., U.S.A.) Temp. is very important in defining aphid resistance. In 7 day tests, resistance of 3 alfalfa clones to both aphid spp. was indistinguishable at 54°F while the clones represented 2 resistance classes at 70° and 3 resistance classes at 85°F. Humidity had less effect than temp. on survival and reproduction, though at high temp. 25% and 95% R.H. levels provided different resistance classes of clones. Adult condition probably also influences reproduction and nymph survival. H.W.Spencer

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2564. MEASUREMENT OF INCUBATION PERIOD OF CORN EARWORM EGGS. W.H.Luckmann: J. econ. Entomol., 1963, 56, 60-62 (Illinois Nat. Hist. Survey, Urbana, 111., U.S.A.) FTom 1960 and 1961 records, the incubation period of 1157 eggs of *Heliothis zea* was noted. A regression line was fitted to the data of eggs incubated in the laboratory at 60, 66, 75, 85 and 90°F. From base temp. of 54°F the average incubation period was 1824° hr. in the laboratory and 1844° hr. in the field, [1 degree hr.^oi (max. temp. + min. temp.) - (base temp.) x 1 hr.].
H.W.Spencer
2565. BIOLOGY OF HARLEQUIN BUG, MURGANTIA HKTRIONICA. F.A.Streams and Djimentel: J. econ. Entomol., 1963, 56, 108 (Dept. Entom., Cornell Univ., Ithaca, N.Y., U.S.A.) Reared on cabbage plants at 72.5 ±3-GTF and 58.5 ± 9-O^R.H., 79.2% of the eggs hatched and were incubated in 7-1 days. The duration of 4 nymphal stages averaged 4*4, 9*5, 7*6 and 9*9 days for both sexes. The 5th and lastcf nymphal stage required 14-0 days while that of the \$ needed 15-6 days.
H.W.Spencer

2566. FOOD PREFERENCE STUDIES WITH TROGODERMA INCLUSUM, PEST OF DRY MILK INDUSTRY. F.O.Marzki: J. econ. Entomol., 1963, 56, 109 (Dairy Prod. Insects Lab., Madison, Wis., U.S.A.) Of dry milks, caseins and sugars, adults and larvae preferred sweetened casein. Roller-type was more attractive than spray or low heat dry milks. Adults preferred fine topilre or coarse sugars and larvae preferred pure sugars.
H.W.Spencer

2567. TOE EFFECTS OF LOW TEMPERATURES ON SOME PREDACIOUS PHYTOSEIID MITES AND ON THE BROWN MITE, BRYOBIA ARBOREA M. AND A. A.W. Macphee: Canad. Ent., 1963, 95, 444 (Res. Stn., Canada Dept. Agric, Kentville, N.S., Canada) Low temp, exposure times were determined by keeping samples of 30 adult d mites between -5 and -19°F. Each sample for 0-5, 1, 2, 4, 8, 16 or 32 hr. at each temp, was allowed to warm to room temp. The mean freezing point of *Typhlodromus pyri* adults was -2ft*F, *T.finlandicus* -22°F and *T.rhenanus* 24*5°F. Between 0-5 and 8 °Tthe mortality of these spp. increased 12-15% whenever exposure duration was doubled. The mean freezing point of *B. arborea* eggs was -26°F and between 0-25 and 16 hr. the mortality increased 8-10% whenever exposure time was doubled at -24* F or below. H.W .Spencer

2568. INTESTINAL PARASITES OF MAN IN BRITISH NORTH BORNEO. R.E.Kuntz and W.H.Wells: Amer. J. Trop. Med. Hyg., 1962, 11, 773-780 (U.S. Naval Med. Res. Unit No.2, Taipei, Taiwan) The incidence of intestinal protozoa and helminths in a total of 1089 persons was determined from stool specimens. Overall prevalences for the protozoa were much less than expected in an area where conditions would appear to favour parasitisation.
A.A.Zimmerman

MISCELLANEOUS

2569. RELATIONS BETWEEN MOTHS AND PREDATORS. A.D-Blest: Nature, Lond., 1963, 197, 1046-1047 (Dept. Zool., University Coll., London, England) Summary of a lecture. 3 ref.
G.M.Lewis

2570. DISPERSAL OF NYMPHS OF GRASSHOPPER, CAMNULA PELLUCIDA (SCUDD.). L.G.Putnam: Canad. Ent., 1963, 95, 76-80 (Res. Stn., Canada Dept. Agric Saskatoon, Sask., Canada) Nymphs hatching from an egg-bed originally about 800 sq. yd. had occupied about 160 acres by the immature adult stage. For 17 days the average daily advance rate was 6 yd. and the direction was mostly according to topography. Then the dispersal seemed more random at about 20 yd. daily, independently of most topographical features. The whole dispersal between May and July was probably not related to wind movement.
H.W. Spencer

2571. COMPETITION BETWEEN TWO SPECIES OF MITES* H. FACTORS INFLUENCING INTENSITY. W.H.Foott: Canad. Ent., 1963, 95, 45-57 (Res. Stn., Res. Br. Canada Dept. Agric., Harrow, Ont., Canada) *Tetranychus telarius* (T) forms much sheet webbing, *Panonychus ulmi* (P) almost none. In a greenhouse and insectary but not in an orchard, *Panonychus* attack on peach foliage is suppressed because *Tetranychus* produced bing, is more fecund and has a faster development rate. The proportion of *Tetranychus* to *Panonychus* increases with the severity of leaf damage. Competition intensity increases because each tends to occupy different levels of a plant and *Panonychus* tends to utilise upper leaf surfaces more than *Tetranychus*. At low temp, and when leaves are moved by a fan, adult *Panonychus* ? move from upper to lower leaf surfaces.
H.W.Spencei

2572. EFFECT OF CARP FRY AS PREDATORS ON SOME ROTIFER (ROTATORIA) SPECIES. A.Hillbright-Ilkovska: Bull. Acad. pol. Sci., 1963, 11, 87-89 (Inst. Ecol., Pol. Acad. Sci., Poland) Data shows no clearly neg. effect of fish intensity on abundance and time of occurrence of rotifers.
J.E.Hobbs

2573. EGG SIZE AND SHAPE IN THE KITTIWAKE (RISSA TRIDACTyla) AND THEIR USE IN ESTIMATING AGE COMPOSITION OF POPULATIONS. J.C.Coulson: Proc. zool. Soc. Lond., 1963, 140, 211-227 (Dept. Zool., Durham Coll., Univ., Durham, England) The size of the first eggs each yr. of kittiwakes are found to alter as the laying hen gets older. The eggs laid in the later years are shorter but broader and there is an increase in vol. The changes are not so marked in the oldest laying hens. It has been found that the 3rd egg of any clutch differs from the 2 previously laid and that the difference is more exaggerated with increase in age of the hen. N° difference is found between the eggs of a 2-egg clutch. These features of eggs have been used to determine the age composition of several colonies of kittiwakes in North Shields.
D.N.Wheatley

2574. EFFECT OF GIBBERELLIN B ON AN OXYTRICHIDE [PROT.]. CPetroff: Z. Naturforsch. B., 1962, 17. 634 (Humboldt-Univ., Gewulstklinik, Germany). ^{—ali}
Note. (German) (J.C.Crawn**)

2575. HYMENOPTERA: PURE VENOM FROM BEES, WASPS AND HORNETS. R.O'Connor, W.Rosenbrook jun. and R.Erickson: Science, 1963, 139, 420 (DeP^{hi} Chem., Montana State Coll., Bozeman, Mont., U.S.A.) Pure venom can be obtained from individual bees, wasps and hornets by electrical stimm. with inexpensive apparatus.
G .M .Lew^{**}

2576. CHOLINERGIC ACTION OF HOMOGENATES OF SEA URCHIN PEDICELLARIAE. E.G.Mendes, L.Abbud and S.Umiji: Science, 1963, 139, 408-409 (Dept.

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Gen. and Anim. Physiol., Univ. São Paulo, Brazil)
A dialysable material in homogenates of globiferous
Pedicellariae of Ltechinus variegatus reacts like ACh in
different cholinergic effector systems. G.M.Lewis

²⁵77. ACH AND CHOLINESTERASE IN TUNICATES.
E.Florey: Comp. Biochem. Physiol., 1963, 8, 327-330
(Dept. Zool., Univ. Washington, Seattle, Wash.,
U.S.A.) The neural gland and ganglion of Ciona
fateinalis were removed and then dissected free from
one another. The ganglion ACh activity was then determined
by its pharmacol. action on lamellibranch hearts.
ACh to the extent of 20-120 fig./g. wet wt. was found.
Destruction of ACh occurs when extracts are allowed to stand for some time, but addition of eserine inhibits this destruction; indicating that a cholinesterase enzyme is probably present initially. Bound ACh within the ganglion is released upon boiling. The muscles of the body wall* of C. intestinalis respond to ACh by contracting. A cholinergic nervous system is indicated. M.S.Laverack

²⁵78. HAEMOGLOBIN IN A FLATWORM. D.W.T.Crompton and M.H.Smith: Nature, Lond., 1963, 197, 1118-1119 (Molteno Inst., Univ. Cambridge, England)
The rhabdoecol Phaenocora unipunctata contains a Hb concentrated mainly round the muscular pharynx; it has * relatively high O₂ affinity, low iso-electric point and low mol. wt. CM.Lewis

²⁵79. GIANT MUSCLE FBRES IN A BARNACLE, BALANUS NUBILIS DARWIN. G.Hoyle and T.Smyth jun.: Science, 1963, 139, 49-51 (Biol. Dept., Univ. Oregon, Eugene, Ore., U.S.A.) Cross-striated muscle fibres of very large size (between 1 and 2 mm. 5*ck) are described in the scutal-tergal adductor and depressor muscles of B. nubilis. Adductor muscle fibres are innervated by separate nerves, each supplying one J*d with terminals, while the depressor fibres receive S^terminal innervation along their entire length, they may shorten to as little as 1/6th resting length. G.M.Lewis

²⁵80. SONAR SIGNALS OF THE SEA LION. T.C.Poulter: Science, 1963, 139, 753-755 (Stanford Res. Inst., Menlo Park, Calif., U.S.A.) Sea lions approaching pieces of fish thrown into the water emit trains of sound signals like those of the bat and porpoise; they meet criteria of a pulse-modulated sonar system with remarkable echo-ranging prop. CM.Lewis

²⁵81. ALKALINE EARTH ELEMENTS AND THE AVOIDANCE REACTION IN PARAMECIUM MULTIMICRONUCLEATUM. J.D.Yarbrough and J.C.O' Kelley: J. Protozool., 1962, 9, 132-135 (Biol. Dept., Univ. Alabama, Ala., U.S.A.) The normal swimming behaviour of P. multimicronucleatum in an essential mineral soln. containing 0.001M Ca changed to avoid reactions following the replacement of the Cabylimolar Sr. Equimolar barium produced a less pronounced effect. P. mnltimicronucleatum inoc. into auto-inoculated ⁴⁵Sr-containing cultures of Protosiphonia hotenyi multiplied to the same extent while they aere in ⁴⁵Sr. Acceleration avoidance reactions were observed, up to 32 days following inoc. R.J.WaiKer

²⁵/RELATIONSHIPS BETWEEN PIGMENTATION OF HELI. AND OF MANTLE IN THE SNAIL CEPaea NEMORALIS (L.) AND CEPaea HORTENSIA (MULL.). L.R.B.Emberton: Proc. zool. Soc. Lond., 1963, 140, 275-280 (Dept. Physiol., Karolinska Inst., Stockholm, Sweden) Expt. data are presented to show that the essential functional prop. of the intact eye are at least

ley

2583. NEW PROOF OF SELF FERTILISATION FOLLOWING SELF-INSEMINATION DURING COPULATION IN THE WORM, EISENIA FOETIDA SAV. F.André: C.R. Soc. Biol., Paris, 1962, 156, 1384-1386 (Lab. Zool., Fac. Sci., Bordeaux, France) Crossing the 2 varieties of E. foetida, typica and unicolor, resulted in a sterile hybrid with intermediate colouring. This occurred very rarely. Other first generation offspring were fertile and identical with one of the parents. Second generation individuals were similar to their parents. It is suggested that fertile first generation individuals resulted from self fertilisation. (French) M.A.Price

2584. A NOTE ON THE HEAD KIDNEY AND KIDNEY OF THE PERCH PERCA FLUVIATILIS (LINNAEUS), WITH SPECIAL REFERENCE TO THE BLOOD VASCULAR SYSTEM. A.H.Wetherley: Proc. zool. Soc. Lond., 1963, 140, 161-167 (Dept. Zool., Sch. Gen. Studies, Australian Nat. Univ., Canberra, Australia) The relationships of blood vessels to the head kidney and the kidney of the Perch are described. *

2585. FEATHER REPLACEMENT IN BIRDS. G.E.Watson: Science, 1963, 139, 50-51 (Div. Birds, Smithsonian Inst., Washington 25, D.C., U.S.A.) During natural moult in many birds, feathers of the old generation are passively pushed out of the follicles attached to the tips of the sheaths of incoming feathers. G.M.Lewis

2586. SENSITIVITY OF SPATHIDIUM SPATHULA TO LOW DOSES OF X-IRRADIATION. D.B.Williams: J. Protozool., 1962, 119-122 (Biol. Div., Oak Ridge Nat. Lab., Oak Ridge, Tenn., U.S.A.) A dose of 1Jcr was sufficient to increase the time of the first generation from 5 to 5⁵ hr. in S. spathula; while a dose of 4 kr doubled the generation time. Animals irradiated as dry cysts required 10 kr to double their generation time. 24 hr. after exposure, irradiated lines have a reduced growth rate. 48 to 72 hr. later, some lines recover while others remain retarded. Within 24 hr. of radiation, some animals exhibit structural abnormalities and their size is enlarged. The reason for the high sensitivity of S.spathula to X-irradiation is not known. R.J.Walker

2587. NEW APPARATUSES AND REARING TECHNIQUES FOR STUDY OF WIREWORMS (COLEOPTERA, ELATERIDAE) IN ORGANIC SOILS OF S.W. QUEBEC. J.Lafrenière: Canad. Ent., 1963, 95, 1-6 (Res. Sm., Res. Br., Canada Dept. Agric., St. Jean, Quebec, Canada) An insect-sorting box, a flight-trap and an outdoor life cycle rearing cage are described for use in the study of wireworm biology. Each apparatus has been tested and found to be satisfactory. H.W.Spencer

2588. A SIMPLE PARABIOTIC CHAMBER FOR CELL CULTURE STUDIES. J.E.Prier: Amer. J. clin. Path., 1963, 39, 175-176 (Sch. Vet. Med., Univ. Pennsylvania, Philadelphia, Pa., U.S.A.) A simple apparatus is described consisting of 2 tubes with open flanged ends which can be sealed together or separated by a filter. Different cell cultures can then be grown in the 2 compartments allowing free exchange of subcellular sized particles. B.A.Woodger

2589. GLOW, SENSITIVITY CHANGES AND PIGMENT MIGRATION IN COMPOUND EYE OF NOCTURNAL LEPIDOPTERA. CHOGLUND: Life Sci., 1963, No.4, 275-280 (Dept. Physiol., Karolinska Inst., Stockholm, Sweden) Expt. data are presented to show that the essential functional prop. of the intact eye are at least

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temporarily retained after the abolition of the ganglion activity and that the injn. of substances such as nicotine bitartrate and adrenaline can cause the pigment to move towards the dark position even when the eye is illuminated.

KJones

2590. SCLERAL CONTACT FILTERS FOR DOMESTIC BIRDS. CM.Winget, C.A.Mepham, D.HPatde and A.M.Walker: Proc. soc. exp. Biol., N.Y., 1963, 112, 412-416 (Dept. Poultry Sci. and Eng. Sci., Ontario

Agric. Coll., Guelph, Ont., Canada) Details are given of the measurements and prep* of scleral contact filters for the eyes of Domestic fowl. They are made from cellulose acetate of thickness 0*0075 in. by moulding with a brass template at 300°F. When the filters are fitted without scratching the comea and when they fitted snugly, they were found to remain in position as long as 6 months. These filters may provide a means of regulating the wave length and intensiyy of light seen by birds is photopenod expt. D.N.Wheatley

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²592. ADVANCES IN MORPHOGENESIS, 1962, 2.

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²593. ANNUAL REVIEW OF BIOCHEMISTRY, 1963, 32.

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2598. THE QUARTERLY JOURNAL OF MEDICINE, 1963, 32, 126.

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ABBREVIATIONS ETC. USED IN ABSTRACTS

The tame abbreviations are used for the singular and plural forms of nouns.

A	Angstrom	const.	constant	expt.	experiment, -al, -ly
Ab	antibody	c/s	cycles per second	FAD	flavin-adenine dinucleotide
abs.	absolute	C-R	crown-rump	flocen,	flocculation
a.c.	alternating current	curst	r crystalline	FMNftf	flavin mononucleotide [reduced]
ACh	acetylcholine	ciystn.	I crystallised	freq.	frequency
AChase	acetylcholinesterase	cs.f.	crystallisation	FSH	follicle stimulating hormone
ACTH	adrenocorticotropic hormone	CTP	cerebrospinal fluid	ft.	foot
ADH	anti-diuretic hormone	cytol.	cytidine triphosphate		acceleration due to gravity
ad lib.	ad libitum	2,4-D	cytological, -ly	g.	gram
ADP	adenosine diphosphate	d.c.	(2,4-dichlorophenoxy)-acetic acid	GABA	γ-aminobutyric acid
Ag	antigen	DEAE	direct current	GDP	guanosine diphosphate
aggl.	agglutinate, -d	d.e.f.	diethylaminoethyl-(applied to cellulose)	GFR	glomerular filtration rate
aggln.	agglutination	deriv.	number of decayed	GMP	guanosine mono-phosphate (guanylic acid)
alk.	alkaline	DFP	extracted or filled	GOT	glutamic-oxaloacetic transaminase
Amp.	ampere	diam.	deciduous teeth	GPT	glutamic-pyruvic transamin***
AMP	adenosine monophosphate(adenylic acid)	dil.	derivative	GTP	guanosine triphosphate
anhyd.	anhydrous	diln.	diisopropylphosphofluoride	haematol	haematological, -ly
a.n.s.	autonomic nervous system	DMBA	diameter	Hb	haemoglobin
ant.	anterior	DMF	dilute	HCG	human chorionic gonadotrop^
approx.	approximate, -ly	DNA	dilution	5-HIAA	5-hydroxyindolylacetic acid
aq.	aqueous	DNase	9,10-dimethyl-1 _f 2-benzanthracene	histol.	histological, -ly
atm • atmospher-	e, - ic	DNP	number of decayed	hr.	hour
ATP	adenosine triphosphate	DOC(A)	missing or filled	SHT	5-hydroxytryptamine (serotonin**)
ATPase	adenosine tri-phosphatase	DMF	permanent teeth	SHTP	5-hydroxytryptophan
a-v.	arterio-venous	DNA	dinitrophenol	i.a.	intra-arterial, -ly
A-V	auriculo-ventricular	DNase	11-deoxycortico-sterone (acetate)	IAA	3-indolylacetic acid
b.c.g.	ballistocardiogram	DNP	dopa 3,4-dihydroxyphenylalanine	ICSH	interstitial cell stimulating hormone
BCG	Bacille Calmette-Guérin	DOC(A)	see NADtH ₂ 3	i.d.	intra-dermal, -ly
biochem.	biochemical, -ly	dopa	T)	IDP	inosine diphosphate
biol.	biological, -ly	DPN[H]	viscosity	i.m.	intra-muscular, -ly
B.M.R.	basal metabolic rate	E	extinction	immunol.	immunological, -ly
b.p.	blood pressure	EaC i _t 2	erythrocyte stroma + amboceptor + C or components thereof	IMP	inosine monophosphate (inosinic acid)
BSP	sulphobromophthalein sodium	e.c.g.	electrocardiogram	in.	inch
c	curie	ED50	median effective (or exciting) dose	inf.	inferior
C	complement	EDTA	ethylenediaminetetra-acetic acid	INH	isonicotinic acid hydrazide (isoniazid)
cal.	calorie	e.e.g.	electroencephalogram	inhib.	inhibit, -ed
calc.	calculate, -ed	E.M.	electron microscope, -y	inhibn.	inhibition
calen.	calculation	embryol.	embryological, -ly	inj.	inject, -ed
CDP	cytidine diphosphate	e.m.f.	electromotive force	injn.	injection
CF	complement fixation	e.m.g.	electromyogram	inoc.	inoculate, -ed
chem.	chemical, -ly	equiv.	equivalent	inocn.	inoculation
chr.	chromosome	e.r.g.	electroretinogram	inorg.	inorganic
CM	carboxymethyl-	e.s.r.	erythrocyte sedimentation rate	insol.	insoluble
cm. ⁽²⁾ » ⁽³⁾ centimetre (squared) (cubed)		e-V	election volt	i.p.	intra-peritoneal, -ly
CMP	cytidine monophosphate(cytidylic acid)			i.r.	infra-red
CJ1.S.	central nervous system			ITP	inosine triphosphate
CoA	co-enzyme A			I.U.	international unit
coeff.	coefficient				
cone.	concentrate, -ed				
concn.	concentration				
cond.refl.	conditioned reflex				

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* Denotes an Author's abstract edited primarily by the journal of origin.

ANATOMY OTOLOGY AND HISTOCHEMISTRY

- 28 " ^ STRUCTURE AND ORIENTATION OF CELLS AND FIBRES IN THE NERVOUS SYSTEM OF VERTEBRATES, J.D.Fortyn: Nature, Lond., 1963, 198, 398-399 (Dept. Neurol., St. Univ. Groningen, Netherlands) Spatial organisation of neurones in the lat. geniculate body of the rabbit is revealed by examination of sections cut at a variety of angles. Variation of plane of section of the T-porellated with a systematic variation of die shape of the we neurones. G.M.Lewis

- 2802 " ^ ATTEMPT AT CLASSIFYING NERVE CELLS P * THE BASIS OF THEIR DENDRITIC PATTERNS. ^ Ramon-Moliner: J. comp. Neurol., 1962, 119, 211-227 (Univ. Maryland Sch. Med., Baltimore, Md., U.S.A.) Brains of cats, mice, rats and monkeys were stained by a method which impregnated the dendrites of most of the CILS. A classification of dendrites is proposed which suggests the existence of a certain correlation between morphol. and function. G.M.Lewis

2803. " ^ A NOTE ON MYELOARCHITECTONICS. B. Jakenberg: J. comp. Neural., 1962, 118, 141-156 (Istituto di Cibernetica, Scuola di Perfezionamento in C.S. Teorica e Pratica, Univ. Naples, Italy) A densitometric procedure applied to serial sections of the human cerebral hemisphere was used as an objective method of appraising myeloarchitectonic differences. The histological elements (afferents, efferents, intracortical fibres and horizontal collaterals) contained in the SJP * are intracortical fibre population making up the Wtectonic patterns are assessed. G.M.Lewis

2804. " ^ SUBCORTICAL PROJECTIONS IN THE RHESUS MONKEY. H.G.J.M.Kuypers. ^ f m m and J.W.Parijns: J. comp. Neurol., 1962, 118, 107-

137 (Univ. Maryland Med. Sch., Dept. Anat., Baltimore, Md., U.S.A.) Descending subcortico-spinal projections have been studied in the Rhesus monkey. These fibres were interrupted at low medullary levels and the descending degeneration charted. Long descending fibres distributed primarily to propriospinal cells and were grouped into lat. and ventromedial fibre systems. Short fibres were located in the spinal trigeminal complex, nuclei cuneatus and gracilis and the lat. reticular area. G.M.Lewis

2605. AREA 3, A CRITICAL EVALUATION OF CYTO-ARCHITECTONIC STUDIES. G.Clark: J. comp. Neurol., 1962, 119, 21-24 (U.S. Army Res. Inst. Environmental Med., Natick, Mass., U.S.A.) Studies of sections of Macaca mulatta brain indicate that 'area 3' is not an anatomical entity. G.M.Lewis

2606. COMMISSURAL CONNECTIONS BETWEEN OCCIPITAL LOBES OF THE MONKEY. fcE.Myers: J. comp. Neurol., 1962, 118, 1-16 (Johns Hopkins Sch. Med., Baltimore, Md., U.S.A.) The left occipital pole of a monkey was completely amputated including areas, 17, 18 and 19. The contralat. right hemisphere was subsequently sectioned serially in its DOSL half and stained for fibre degeneration. The findings indicated that the terminal distribution of callosal afferents to the occipital lobe is restricted to Brodmann's area 18. G.M.Lewis

2607. MYELOARCHITECTONICS OF THE CINGULAR CORTEX IN DOG. J.Kreinen J. comp. Neurol., 1962, 119, 225-267 (Dept. Comp. Neuroanatomy, Jagellonian Univ., Krakow, Poland) Myeloarchitectonic analysis of the limbic region of die dog's brain (including gyrus genualis, gyrus cinguli ant. and post, and gyrus subcallosus) indicates the presence of 15 areas in this region. Rich connections of all areas of the limbic region with cingulum were observed.

G.M.Lewis

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2308. SIMILARITIES BETWEEN OLIGODENDROCYTE AND CEREBELLAR GRANULE CELL NUCLEI IN MAMMALIA AND AVES. J.Cemmermeyer: Amer. J. Anat., 1963, 112, 111-139 (Lab. Neuropath., N.I.H., Bethesda, Md., U.S.A.) After taking into account factors such as fixation, regional peculiarities and ageing, it was concluded that the nuclei of the 2 cell types were similar in 19 different spp., and that the cells were concerned with the control of intrinsic blood flow. R.M.H.McMinn
2609. VISUAL RADIATIONS IN MAMMALS WITH PUPE-CONE RETINAE. P.R.Vaidya: J. comp. Neurol., 1962, 119, 201-209 (Dept. Anat., Wayne State Univ., Coll. Med., Detroit, Mich., U.S.A.) By using the method of chromatolysis, the cortical projections of the lat. geniculate body were studied in the ground squirrel, *Citellus tridecemlineatus tridecemlineatus*. The structure of the visual cortex in this sp. with pure cone retina was investigated and compared with that of the guinea-pig which has a pure rod retina. Cone dependent vision seemed to require a simpler structural organisation of the visual cortex. G.M.Lewis
2610. SOME FIBRE PROJECTIONS TO THE SUPERIOR COLICULUS IN THE CAT. J.Altman: J. comp. Neurol., 1962, 119, 77-98 (Psychophysiol. Lab., M.I.T., Cambridge, Mass., U.S.A.) Using the Nauta-Gygax staining technique, the projections of the superior colliculus in the cat from the retina, lat. geniculate nucleus, pulvinar, and visual cortex were examined, and projection from these structures to other mesencephalic and diencephalic nuclei investigated. G.M.Lewis
2611. MEDIAL GENICULATE BODY OF THE DOG. B.Sychowa: J. comp. Neurol., 1962, 118, 355-371 (Neuroanatomical Lab. of the Nencki Inst. Expt. Biol., Polish Akad. ScL, Krakow, Poland) Myeloarchitectonic studies on the medial geniculate body of the dog yield results in accord with data obtained previously in physiol. expt. using microelectrode techniques. G.M.Lewis
2612. FASTIGIORETICULAR FIBRES IN THE CAT. AN EXPERIMENTAL STUDY WITH SILVER METHODS. F.Walberg, O.Pompeiano, L.E.Weström and E.Hauglie-Hanssen: I. comp. Neurol., 1962, 119, 187-199 (Anat. Inst., Univ. Oslo, Norway) Following total or partial lesions of the fastigial nucleus in cats, the degeneration in the medullary and pontine reticular formation has been studied in silver impregnated sections. The origin, course and termination of the fastigioreticular fibres are described. No orderly arrangement has been found in the fastigioreticular connection. G.M.Lewis
2613. THE FASTIGIOVESTIBULAR PROJECTION IN THE CAT. AN EXPERIMENTAL STUDY WITH SILVER IMPREGNATION METHODS. F.Walberg, O.Pompeiano, A.Brodal and J.Jansen: J. comp. Neurol., 1962, 118, 49-75 (Anat. Inst., Univ. Oslo, Norway) Following lesions of the fastigial nucleus in the cat, the ensuing degeneration within the vestibular nuclei has been studied by silver impregnation methods. The findings, in conjunction with other anat. and physiol. data, explain the localised effect of stimulating the ant. lobe. Some functional implications are discussed. G.M.Lewis
2614. RETICULAR FORMATION OF THE ALBINO RAT^f S BRAIN STEM; CYTOARCHITECTURE AND CORTICO-FUGAL CONNECTIONS. F.Valverde: J. comp. Neurol.,

1962, 119, 25-54 (Dept. de Biofis., Centro de Invest Biol., C.S.I.C., Madrid, Spain) The cytoarchitecture of the brain stem reticular formation of the rat has been studied in transverse Nissl-stained sections. In embryos and young rats, details of the collaterals of the pyramidal tract to the reticular formation have been observed by Golgi technique and terminal degeneration observed in Nauta stained sections after lesions made in the cerebral cortex. Three different patterns of cortical projection were disclosed. It was concluded that between the cerebral cortex and neurones of any 1 of the motor nuclei of the cranial nerves there is at least 1 intercalated reticular cell, located in the lat. areas.

G.M.Lev*

2615. LOCALISATION OF THE CELL BODIES OF THE VENTRAL SPINOCEREBELLAR TRACT IN LUMBAR SEGMENTS OF THE CAT. J.L.Hubbard and O.Oscarsson: J. comp. Neurol., 1962, 118, 199-204 (Dept. Physiol., Australian Nat. Univ., Canberra, Australia) The cells of origin of the ventral spinocerebellar tract have been recorded intracellularly and their position assessed in the lumbar segments of the cat. The cells are found in the lat. part of the intermediate zone and the lat. part of the base and neck of the dorsal horn; a few cells were also found in adjacent parts of the ventral horn and head of the dorsal horn.

G.M.Lewis

2616. HUMAN HYPOGLOSSAL NUCLEUS (A QUANTITATIVE STUDY). J.Tomasch and A.A.Etemadi: J. comp. Neurol., 1962, 119, 105-112 (Dept. Anat., Univ. Shiraz, Iran) A complete section series of the human brain stem was studied by photography and microscopical examination. Quant. measurements were made of the distribution of cell size, size of nuclei and nucleoli and nuclear vol. in the hypoglossal nuclei.

G.M.Lev/JJ

2617. NEURONE AND SYNAPSE POPULATIONS IN TH^{*} SPINAL CORD: INDICATION OF ROLE IN TOTAL INTEGRATION. S.Gelfan: Nature, Lond., 1963, I^{*}, 162-163 (Neurophysiol. Lab., New York Med. Coll.* New York, U.S.A.) Evidence as to the neuronal structure of the dog spinal cord is reviewed and discussed in relation to that of other spp. including man. The great no. of inter-neurones, the synaptic richness, the dense intercommunicating network within the intrinsic system of the spinal cord, the neuronal interdependency all indicate integrative activities comparable to those of the brain; difference between total activities of brain and spinal cord may reflect principally a difference in no. of units involved.

G.M.Lewis

2618. POSTNATAL GROWTH AND CHANGE OF DENSITY OF THE NERVE FIBRES OF THE CERVICAL SPINAL CORD OF THE ALBINO MOUSE. F.B.Sakl*: J. comp. Neurol., 1962, 119, 97-104 (Anat. Dept., Abbassia Med. Fac, Ein Shams Univ., Cairo, Egypt) The postnatal growth of nerve fibres in the white matter of the cervical spinal cord of the albino mouse was studied. The change in packing density during growth correlated with the process of myelination occurring at the same time.

G.M.Lewis

2619. MYELINATED NERVE FIBRES IN COMMUNICA^{ICA}^{II} RAMI ATTACHED TO CAUDAL LUMBAR NERVES... R.H.Webber, G.H.Wilson, J.W.Chung, R.J.McCard*, and J.H.Wiley: J. comp. Neurol., 1962, 119, H^{**} (Dept. Anat., Creighton Univ. Sch. Med., Oman, Neb., U.S.A.) Degeneration studies of nerves in the cat were made in an attempt to investigate the nature

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fte small myelinated nerve fibres which traverse commissating rami at caudal lumbar levels. Few, if any, nerve cells in the lumbar portion of the sympathetic trunk had myelinated processes. The location was established for the cell bodies of some of the myelinated nerve fibres.

G.M.Lewis

2620. THE HISTOLOGY OF THE CONUS MEDULLARIS AND THE FILUM TERMINALE. I. Schubert: Anat.

Anz. 1963, 112, 211-220 (Anat. Inst., Karl-Marx Univ., Leipzig, Germany) The histol. of the lowermost part of the spinal cord is examined; the medullary cone showed a similar picture as the higher segments of Record; the central canal is still visible; neuroglia present around the canal; grey and white matter alternating in the internal filum; the external filum terminale consists of collagen bundles.

(German) J.E.Linder

2621. CILIATED SCHWANN CELLS IN AUTONOMIC NERVOUS SYSTEM OF ADULT RAT. M.A.Gnollo and S.L.Palay: J. cell Biol., 1963, 16, 430-436 (Dept. Anat., Western Reserve Univ. Sch. Med., Cleveland, Ohio, U.S.A.)

The ultrastructure of modified cilia attached to the surface of Schwann cells is described in t.M. of OsO₄-fixed tissue of the superior cervical, pnenopalatine ganglia, cervical vagus nerve and gastro-intestinal tract. The internal structure differs from other vertebrate and invertebrate cilia and the significance of this is discussed.

P.Barrow

2622. INVERSE ENZYMIC CHANGES IN NEURONS AND GLIA DURING INCREASED FUNCTION AND HYPO-OXIA. A.Hamberger and H.Hyden: J. cell Biol., 1963, 16, 521-525 (Inst. Neurobiol., Med.

Univ. Goteborg, Sweden) Rabbits were exposed to intermittent physiol. stimm. of the vestibular nerve for 7 days. Deiter's nerve cells and the surrounding glia were dissected and assayed for cytochrome oxidase activity, anaerobic glycolysis and RNA content. Anaerobic glycolysis in the nerve cells decreased by 25-40% but increased in the glia which also showed decreased respiratory enzyme activity. Hypo-oxia produced by exposure to 8% O₂ caused an increased O₂ consumption and production in nerve cells, but no change in the J₂. The neurons and glia appear to be linked in a coupled energetic system and the evidence for a regulatory metabolic mechanism between the 2 is discussed.

P.Barro

2623. HISTOCHEMISTRY OF HUMAN CHOROID PLEXUS.

*Issidorides, W.M.Ehanklin and N.A.Azzam: Anat. *c. 1961, 141, 21-29 (Dept. Histol., Sch. Med., American Univ., Beirut, Lebanon) Vacuoles in J²ti Plexus epithelium contain a substance stainable with diamine impregnation, PA-Schiff, Neutral Red, Methyl Green. After oxidation with aldehyde fuchsin and silver diamine reveal a surface layer and unstained central core of the 1²D. The oxidation also blocks vacuole staining J²A-Schlff, Neutral Red, Nile Blue, and Methyl C²J. The distribution of RNP in epithelial cells is VS? to the vacuoles, suggesting production of the ²vacular contents by RNA protein.

2624. LIGHT AND ELECTRON MICROSCOPIC EXAMINATION OF THE PARS INTERMEDIA AND NEUROHYPOPHYSIS OF THE RAT. CONCERNING THE RELATIONSHIP BETWEEN PARS INTERMEDIA AND POSTERIOR LOBE OF THE HYPOPHYSIS.

B.Ziegler: ? - z^{11f}; 1963, 59, 486-506 (Anat. Inst., Univ. Kiel, Germany)

The pituitaries of 6 coloured and 6 albino rats were examined histol.; 3 albino rats were given a 2Pf₀ soln. of NaCl instead of drinking water for 15 days; the result of the histol. examination confirms the presence of 2 different types of epithelial cells in the pars intermedia² light and dark cells which are both PA-Schiff pos.; the dark cells increase in no. when NaCl is given. Neurosecretory nerve fibres penetrate into the pars intermedia from the post. lobe; the amount of neurosecretory substance diminishes when NaCl is administered.

(German) J.E.Linder

2625. ELECTRON MICROSCOPIC STUDY OF HUMAN THYROID CELLS IN VITRO. W.J.Irvine and A.R.Muir: Exp. Cell Res., 1963, 29, 73-81 (Dept. Therap. Anat., Univ. Edinburgh, Scotland)

Trypsinised human thyroid cells studied by E.M. are suggested to be derived from thyroid secretory epithelium and not from any other cell type. A prelim. E.M. study of the cytotoxic effect of C¹-fixing thyroid Ab on these human thyroid cells in vitro, and the morphol. changes are compared.

K.Jones

2626. ULTRASTRUCTURE OF THE FREEZE-DRIED MOUSE THYROID GLAND.

R.Ekholm, H.F.Helander and T.Zelander: Z. Zellforsch., 1963, 59, 467-478 (Dept. Anat., Univ. Gothenburg, Sweden)

The ultrastructure of freeze-dried mouse thyroid embedded in Vestopal or Epon is compared with thyroid glands fixed in the usual manner by immersion into OsO₄ soln. Results were essentially similar to those observed after the usual method of fixation by immersion, although slight differences were observed: plasma membranes of lat. cell surfaces appeared to be asymmetrical, mitochondria had an undulating contour.

J.E.Linder

2627. CYTOLOGY OF NORMAL PARATHYROID GLANDS

OF MAN AND VIRGINIA DEER. LIGHT AND ELECTRON MICROSCOPIC STUDY WITH MORPHOLOGIC EVIDENCE OF SECRETORY ACTIVITY.

B.L.Munger and S.I.Roth: J. cell Biol., 1963, 16, 379-400 (Dept. Anat., Washington Univ. Sch. Med., St. Louis, Mo., U.S.A.)

Human parathyroids contained chief cells in active and inactive phases and oxyphil cells. Chief cells of deer are uniform and contain electron opaque bodies of 100-400 mji, presumed to be secretory granules. Active human chief cells are distinguished by a large Golgi apparatus and numerous secretory granules. These hematoxylin pos. argyrophilic bodies are found in the capillary endothelial cells and surrounding connective tissue and have been followed from their formation in the Golgi. E.M. of 6 human biopsy specimens and the 2 glands at the upper pole of each lobe of the thyroid of 1 deer are described.

P.Barrow

2628. THE THYMUS IN MICE OF STRAIN 129/J

STUDIED WITH THE E.M. S.L.Clark, jun.: Amer. J. Anat., 1963, 112, 1-33 (Dept. Anat., Washington Univ. Sch. Med., St. Louis, Mo., U.S.A.)

The thymus was a solid epithelial organ infiltrated with lymphoid cells and perforated by delicate reticular fibres and blood vessels. There were no Hassal's corpuscles but a few epithelial cells were arranged in acini and possessed cilia. A peculiar type of venule with thick endothelium seemed to be the site of migration of lymphocytes between lymphoid tissue and the blood stream.

R.M.H.McMinn

2629. THE MORPHOLOGY OF THE EPITHELIAL THYMUS

OBSERVATIONS ON LYMPHOCYTE-DEPLETED AND FOETAL THYMUS.

K.J.Shier: Lab. Invest., 1963, 12,

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316-326 (Pathol. DepL. Wayne State Univ., Coll. Med., Detroit, Mich., U.S.A.) Human thymuses from foetuses and children and adults dying from debilitating diseases were studied histol. Attention is drawn to the prominent epithelial lined tubules of early foetal thymuses which become distorted and engulfed by enlarging parenchymal tabulations infiltrated with lymphocytes and appear as corpuscles in sections. Lymphocyte depletion leaves the epithelial portion unaltered and tubular structures may reappear.

A.M.Mackay

2630. ELECTRON MICROSCOPIC STUDIES OF THE EPITHELIAL RETICULAR CELLS OF THE MOUSE THYMUS. T.Hoshino: Z. Zellforsch., 1963, 59, 513-529 (Dept. Anat., Hokkaido Univ. Med. Sch., Sapporo, Japan) Epithelial reticular cells of the thymus of mice ranging in age from 5 to 8 weeks were examined; the epithelial cells are generally interconnected with one another by means of long cytoplasmic processes. Epithelial cells of the cortex are characterised by long processes and the presence of large round vesicles. Two types of epithelial cells are found in the medulla, reticular cells and hypertrophic. Degenerating hypertrophic cells are concentrically surrounded by a few hypertrophic and reticular cells, thus forming Hassall's corpuscles.

J.E.Linder

2631. ACTIVITY MANIFESTATIONS OF HASSALL'S CORPUSCLES IN VITRO AS REVEALED BY CINEMATOGRAPHY. E.G.Flaum: Z. Zellforsch., 1963, 59, 479-485 (Dept. Anat., Univ. Southern California Med. Sch., Los Angeles, Calif., U.S.A.) Tissue cultures of thymic explants, obtained from newborn albino rats, were examined using phase-contrast and timelapse cinematography; several corpuscles exhibited rotatory movement and increased in size with the addition of neighbouring free cells; some of the individual cells of the culture showed pulsatile activity.

J.E.Linder

2632. HISTOLOGICAL STUDY OF THE ZONA GLOMERULOSA OF THE ADRENALS, PINEAL GLAND, DIENCEPHALIC NEUROSECRETION AND THE GLOMERULA REGION OF THE KIDNEY IN WHITE RATS RECEIVING THIOACETYLATED SPIROLACTONE. G.Bugnon, N.Moreau and R^Lenys: C.R. Soc. Biol., Paris, 1962, 156, 1658-1662 (Lab. d'Histologie, Ecole Nat. Med., Besancon, France) Male white rats received 25 mg./day Aldactone for 10 days. There was a decrease in lipid content of the zona glomerulosa with hyperplasia and parenchymatous hypertrophy. There was a decrease in Gomori-pos. neurosecretory material of the supraoptic nuclei with hypertrophy of the cells and nuclei. There was no modification of the glomerula zone of the kidney or of the pineal gland.

(French) M. A. Price

2633. RADIOAUTOGRAPHIC STUDIES WITH TRITIATED THYMIDINE OF CELL MIGRATION IN MOUSE ADRENAL AFTER CARBON TETRACHLORIDE STRESS. R.M.Brenner: Amer. J. Anat., 1963, 112, 81-95 (Dept. Biol., Brown Univ., Providence, R.I., U.S.A.) The upper zona fasciculata was judged to be a region of max. cell turnover from which cells migrated centripetally; migration of cells from the glomerulosa seemed to be minimal.

R.M.H.McMinn

2634. E.M. DESCRIPTION OF A THIRD CELL TYPE IN ISLETS OF RAT PANCREAS. F.Caramia: Amer. J. Anat., 1963, 112, 53-64 (Inst. Path., Univ. Perugia, Italy) Apart from clear and dark types of a cells.

and 3 cells, a third type is described in both young and mature animals that probably corresponds to die D type originally noted by Bloom in the human pancreas.

R.M.H.McMinn

2635. ULTRASTRUCTURE AND ENZYME HISTOCHEMISTRY OF THE PANCREATIC ISLETS IN THE HORSE. N.BjBrkman, C.HellerstrOm, B.Hellman and U.Rothman: Z. Zellforsch., 1963, 59, 535-554 (Dept. Anat. Hist., Royal Vet. Coll., Stockholm, Sweden)

The central parts of the pancreatic islets of die horse contain A2 cells alone, while the Ai and B cells are intermingled at the periphery. It was seen that the A2 cells contain dense spherical granules; light and dark A2 cells can be differentiated; the B cells possess numerous secretory granules whilst Ai cells contain very large no. of mitochondria and ribosomes as well as tiny granules. Alk. and acid phosphatase reactions were neg. throughout the islet tissue; a strong glucose 6-phosphatase activity was found in the peripheral cells. Diphospho- and triphospho-nicotinamide nucleotide diaphorase activity was high in the peripheral cells and considerably weaker in the A2 cells; a low succinic dehydrogenase activity in the islet tissue was observed with a weaker reaction in the A2 cells than in the peripheral ones.

J.E.Linder

2636. ULTRASTRUCTURE OF THE CILIATED EPITHELIUM OF THE NASAL SEPTUM OF THE RAT.

L.Stockinger: Z. Zellforsch., 1963, 59, 443-466 (Hist.-Embryol. Inst., Univ. Vienna, Austria)

The epithelium is high-columnar and contains 4 types of cells: ciliated, indifferent, goblet and replacement cell*. Structure of the cilia, apart from minor details, is simile to previous descriptions; there are numerous centrioles present in the apical cytoplasm and the superficial border zones of the cells. On die surface of the cells there are very long cytoplasmic processes present for which the author proposes the term 'cytofilia' * to differentiate them from the much shorter microvilli.

(German) J.E.Linder

2637. ULTRASTRUCTURE OF THE HUMAN SUB-MAXILLARY GLAND. B.Tandler: Amer. J. Anat., 1962, 111, 287-307 (Dept. Anat., New York Univ. Sch. Med., New York, U.S.A.) The basal plasma membrane is thrown into radiating foot processes that interdigitate with those of adjacent cells. Tubular secretory capillaries, containing large no. of microvilli* are formed by adjacent cells. Finer secretory capillaries, are separated from the basal folds by only 1 or 2 termini bars, a distance as small as 0-4 fi.

R.M.H.McMinn

2638. MORPHOLOGICAL AND HISTOCHEMICAL STUDIES OF EXPERIMENTALLY ENLARGED AND ATROPHIED SALIVARY GLANDS OF RATS.

C.S.Handelman and H.Wells: Amer. J. Anat., 1963, 112, 65-79 (Forsyth Dental Inf., Boston, Mass., U.S.A.)

Repeated amputation of the lower incisor teeth leads to hypertrophy of acinar cells without signif. significantly affecting the size of tubules and ducts. Dibenzamine causes acinar atrophy, with some decrease in width of the granular tubules. The succinic dehydrogen* activity of the tubules is not altered during hypertrophy or atrophy of the glands. RNA accumulates in hypertrophic cells and almost disappears in atrophy, while PA-Schiff and Alcian Blue-pos. material is unchanged.

R.M.H.McMinn

2639. STRUCTURAL DIFFERENCES BETWEEN PAROTID AND SUBMANDIBULAR DUCTS. P.Rother: Anat. ^{ADM}, 1963, 112, 172-190 (Anat. Inst., Karl-Mann Univ., Leipzig, Germany) HistoL of material o ^{ADM} tw

31 Parotid and 20 submandibular ducts is compared; the *all of the parotid duct is made up of columnar epithelium covered by a thin layer of collagen and loose connective tissue; epithelium of submandibular duct may be either cuboidal or stratified, and wall contains numerous elastic but only a few connective tissue fibres.

(German) J.E.Linder

2640. FINE STRUCTURE OF GASTRIC MUCOSA IN RAT. S.Ito and R.J.Winchester: *J. cell. Biol.*, 1963, 16.

541-577 (Dept. Anat., Harvard Med. Sch., Boston, Mass., U.S.A.) The stomach of adult *Myotis lucifugus* was fixed *in situ* with OsO₄ for E.M. and formalin-fixed sections prep. for light microscopy. The fine structure of the different cell types is similar to that of other mammals but the distribution and no. of cells differ.

Retails of surface mucous cells, mucous neck cells, junctional cells, chief cells and argentaffin cells are discussed.

P.Barrow

2641. A TECHNIQUE FOR SEPARATION OF THE CELLS OF THE GASTRIC MUCOSA. A.L.Walder and J.B.

Lunseth: *Proc. Soc. exp. Biol.*, N.Y., 1963, 112.

494-496 (Dept. Surg., Univ. Hosp., Univ. Minnesota,

Minneapolis, Minn., U.S.A.) A technique is described for the separation of gastric mucosal cells from 2* *bit which involved collagenase digestion for 2 hr. V. - Cell types are separated by differential centrifugation in a gradient of sucrose polymer soln.

D.N.Wheatley

2642. INTRINSIC NERVE FIBRES IN LIVER PAREN-

CHYMA. Y.Mikhail and A.L.Saleh: *Anat. Rec.*, 1961, 141, 317-323 (Fac. Med., Ein Shams Univ., Cairo, Egypt) The parenchyma of the liver of rat, guinea-pig, rabbit and dog was found to be

supplied with nerve fibres. Terminal parasympathetic ganglia varying in size, shape and no. of contacts were found. The neurones, rounded or spherular in shape, were usually multipolar. Dendrites from postganglionic fibres together formed a terminal plexus in the liver parenchyma.

F.Beck

***2. NATURE OF THE VILLI IN THE SMALL INTESTINE OF THE RAT.** S.J.Baker, V.L.Mathan and

J.Cherian: *Lancet*, 1963, i, 860 (Wellcome Res.

Jtst, Christian Med. Coll. Hosp., Vellore, South India) About 10 days after birth the finger-like villi are replaced by ridges.

G.H.Bell

3. INFLUENCE OF NORMAL FLORA ON MUCOSAL MORPHOLOGY AND CELLULAR RENEWAL IN THE

S_gM. A COMPARISON OF GERM-FREE AND CONVENTIONAL MICE.

C.D.Abrams, H.Bauer and

g*rtin Lab. Invest., 1963, 12, 355-364 (Dept. JPL, Walter Reed Army Inst. Res.,

Washington, D.C., U.S.A.) Many of the morphological features of 'normal' ileal mucosa develop only in

*. th² of a bacterial flora. [3H]Thymidine was given

to autoradiographs of ileum prep. at various times.

It is shown that lamina propria small cellular renewal

is lower in germ-free mice.

A.M.Mackay

4. THE PRESENCE AND DISTRIBUTION OF MAST CELLS IN THE GASTROINTESTINAL TRACT AT

AUTOPSY. H.T.Norris, N.Zamcheck and L.S.Gottlieb:

Gastroenterology, 1963, 44, 448-455 (Gastrointestinal Res. Lab. Mallory Inst. Path., Boston City Hosp., Boston, Mass., U.S.A.) Post-mortem studies of

human gastrointestinal tract by histol. sectioning and staining of these with Bismarck Brown was used to discover

what changes occurred in the mast cell population of the mucosa, submucosa, muscularis mucosa and serosa after death. It was found that there was no significant change in no. in each region along the gut between 4 and 9 hr. after death. The ileum was richest in mast cells whilst the gall-bladder was least well populated. The distribution of the mast cells in the various layers is described.

D.N.Wheatley

2646. PERITONEAL MAST CELL AS A CONTRIBUTOR TOHEMOCONIA. J.P.Adams and G.H.Paff: *Anat. Rec.*, 1962, 144, 19-23 (Dept. Anat., Univ. Miami Sch. Med., Coral Gables, Fla., U.S.A.) Thoracic

duct lymph of the rat contains granules which stain metachromatically with watery Toluidine Blue. Following rupture of the peritoneal mast cells by i.p. injn. of protamine sulphate, showers of granules appear in the lymph. It is suggested that peritoneal mast cells by total rupture or clasmatisos contribute granules to the peritoneal fluid which pass into the lymphatics and eventually into the blood stream as one of the components of hemoconia.

F.Beck

2647. THE PERIOSTEAL SPREAD TECHNIQUE FOR STUDY OF MAST CELLS. H.Seyle, G.Gabbiani and K.Nielsen: *Proc. Soc. exp. Biol.*, N.Y., 1963, 112,

460-463 (Inst. Méd. et Chir. Expt., Univ. Montreal, Canada) A technique is described for the production of good specimen fixation of periosteal membranes from the cranial flat bones of the rat so that mast cells are preserved in undisrupted integrity. Fixation was performed in formal:alcohol (1:4) using 10% formaldehyde soln. Mast cells appear in 2 rows either side of blood vessels and may be quite varied in their form. Similar expt. with mouse and hamster have proved equally successful.

D.N.Wheatley

2648. TISSUE EOSINOPHIL CELLS. G.Jimbo: *Bull.*

Yamaguchi med. Sch., 1962, 9, 39-44 (Dept. Anat., Yamaguchi Med. Sch., Ube, Japan) The eosinophil cell levels and their infiltration into other organs were

studied in mice under various conditions. Under the influence of various chem. and physical stimn.. the cells in the lamina propria mucosae increased daily, reaching the max. on the 3rd day, and returned to normal level on the 7th day.

K.Jones

2649. ELECTRON MICROSCOPIC STUDY OF ADIPOSE TISSUE (FAT ORGANS) WITH SPECIAL REFERENCE TO THE TRANSPORT OF LIPIDS BETWEEN BLOOD AND FAT CELLS. F.Wassermann and T.F.McDonald:

Z. Zellforsch., 1963, 59, 326-357 (Div. Biol. Med. Res*, Argonne Nat. Lab., Argonne, Ill., U.S.A.)

Circulation of lipids, their removal from blood, uptake and release by the cells of fat depots of the body were studied. Inguinal fat bodies of newborn mice and epididymal fat pads of young adult rats were examined; material derived from over 150 animals was used in this study.

J.E.Linder

2650. ISOLATED FLAGELLA IN HUMAN SKIN.

R.B.Wilson and C.A.McWhorter: *Lab. Invest.*, 1963, 12, 242-249 (Pathol. Dept., Nebraska Univ. Wed. Coll., Omaha, Neb., U.S.A.) Flagella were noted in E.M. prep. of normal and neoplastic epidermal basal cells, dermal fibroblasts and 1 squamous cell carcinoma. A possible relationship to cellular mitotic activity is suggested.

A.M.Mackay

2651. NEW OBSERVATIONS ON THE STRUCTURE OF THE PACINIAN CORPUSCLE AND ITS RELATION TO THE PERINEURAL EPITHELIUM OF PERIPHERAL

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NERVES. T.R.Shanhaveerappa and G.H.Bourne: Amer. J. Anat., 1963, 112, 97-109 (Dept. Anat., Emory Univ., Atlanta, Ga., U.S.A.) The lamellar sheets consist of flat squamous epithelial cells. The superficial layers are an extension of the perineural epithelium which is in turn the continuation of the pia-arachnoid membrane as previously described by the authors. The Pacinian corpuscle appears to be a localised enlargement at the end of the nerve fibre of the perineural epithelium.

R.M.H.McMinn
2652. THE SENSORY INNERVATION OF THE COMMON NORTH AMERICAN RACCOON (PROCYON LOTOR). P.E.Zollman and R.K.Winkelmann: J. comp. Neurol., 1962, 119, 149-157 (Section of Vet. Med., Mayo Clinic, Rochester, Minn., U.S.A.) The skin of the raccoon, (*P. lotor*), which has remarkable manual dexterity and tactile sensitivity, contains the usual mammalian end-organ with nonsp. cholinesterase; the end organ was found much more frequently in the forepaws than the hindpaws. Dermal nerve networks, hair follicle nerve networks, tactile hair discs and Vater-Pacini corpuscles were also observed. G.M.Lewis

2653. STRUCTURAL CONTINUITIES OF TRANSVERSE TUBULAR SYSTEM OF RABBIT AND HUMAN MYOCARDIAL CELLS. D.A.Nelson and S.E.Benson: J. cell Biol., 1963, 16, 297-313 (Dept. Lab. Med., Univ. Minnesota Med. Sch., Minneapolis, Minn., U.S.A.) E.M. of ventricular muscle fixed in OsO₄ embedded in Vestopal W indicate that the transverse tubular system of the sarcoplasmic reticulum is a direct extension of the extracellular fluid space. The results are discussed with ref to diffusion kinetics and excitation and activation of the muscle. P.Barrow

2654. ULTRASTRUCTURE AND DISPOSITION OF VESICULAR NERVE PROCESSES IN SMOOTH MUSCLE. J.C.Thaemert: J. cell Biol., 1963, 16, 361-377 (Dept. Anat., Univ. Colorado Sch. Med., Denver, Colo., U.S.A.) Micrographs of methacrylate-embedded sections prep, from OsO₄-fixed tissue of the descending colon, stomach wall, small intestine and urinary bladder of 2-month-old female albino rats were studied. Bundles of unmyelinated nerve fibre were observed in the intercellular spaces of smooth muscle. Vesiculated nerve processes touching the surface of the smooth muscle cells are assumed to constitute neuromuscular junctions. P.Barrow

2655. HISTOPHYSIOLOGICAL STUDY OF THE RAT DIAPHRAGM. J.C.George and A.K.Susheela: Biol. Bull. Woods Hole, 1961, 121, 471-480 (Div. Animal Physiol. Histochem., Dept. Zool., M.S. Univ. Baroda, India) The nature and distribution of 2 types of fibres in the dorsal, lat. and ventral regions of the rat diaphragm were investigated. The fat and glycogen content and enzymic activity in each region were also determined. It was concluded that the narrow red fibres were adapted for aerobic metabolism, the broad white fibres for anaerobic metabolism. G.J.Peakin

2656. THE HISTOLOGICAL STRUCTURE OF THE FOSSA OVALIS CORDIS. Karl-Heinz Voigt: Anat. Anz., 1963, 112, 135-139 (Anat. Inst., Karl-Marx Univ., Leipzig, Germany) A muscular system consisting of several main layers is described; small regions of connective tissue and fat cells are found between the muscle fibres; 9 specimens of fossa ovalis were serialised and a further 25 specimens were examined as whole mounts after clearing. (German) J.E.Linder

2657. INNERVATION OF THE EXTRINSIC MUSCLES OF THE EYES OF BIRDS. D.W.Burnaschewa: Anat. Anz. 1963, 112, 230-242 (Dept. Hist., Med. Inst., Kasan, U.S.S.R.) The innervation of the extrinsic muscles of the eyes of *Columba livia*, *Bubo bubo* and *Gallus domesticus* was studied, using the silver impregnation techniques of Bielschowsky-Gross and of Jabonero. Numerous bundles of myelinated as well as amyelinated nerve fibres were seen; the most frequently occurring type of motor nerve endings are endplates. Most of the sensory organs are found at the muscle-tendon junctions; large no. of free ending receptor organs were seen.

(German) J.E.Linder

2658. FIBRILLOGENESIS IN REGENERATING TENDON. N.V.P.Fernando and H.Z.Movat: Lab. Invest., 1963, 12, 214-229 (Pathol. Dept., Banting Inst., Toronto Univ., Canada) Changes in regenerating rabbit Achilles tendon were studied by light and E.M. At first ground substance is abundant and cells and fibrils lie haphazardly. Although precursors probably form within fibroblasts, fibrils form extracellularly. Later bundles of collagen fibrils are orientated in the long axis of the tendon. A.M.Mack*

2659. MULTIPLE NATURE OF ALKALINE PHOSPHATASE IN THE MAMMALIAN KIDNEY. R.P.Finegan: Nature Lond., 1963, 198, 193-194 (Histol. Dept., Med. # Gen. Hosp., Alberta, Canada) Alk. phosphatase visualised by both a Ca pptn. method and a coupling & dye method in kidney tissue. In human kidney biopsies from diabetes mellitus or essential hypertension, the former technique revealed very low phosphatase activ^{ity} while the latter showed a normal reaction. The suggestion that this is due to the presence of 2 phosphatases with different substrate specificities (only one being depleted in the disease states) is supported by observations on the staining reactions of kidneys of *Antilocapra americana* and *Scapanus latimanus* by these methods.

GMLCWJ

2660. CHOLINESTERASE ACTIVITY IN THE KIDNEY VARANUS NILOTICUS L. L.Arvy: C.R. Soc. Biol. Paris, 1962, 156, 1560-1563 (Lab. Physiol., Jouy-en-Josas, S-et-O., France) In a histochem. study of the kidney of *V. niloticus* the glomeruli appeared to contain strong cholinesterase activity. Both acetyl and butyryl choline were hydrolysed. The collecting ducts were in cholinesterases and some cholinesterase activity was found in the epithelium. (French) M.A.P.*

M.A.P.*

2661. CYCLE OF SEMINIFEROUS EPITHELIUM IN MAN. Y.Clermont: Amer. J. Anat., 1963, 112, 35-51 (Dept. Anat., McGill Univ., Montreal, Canada) The various generations of germ cells - spermatogonia, spermatocytes and spermatids - have an obvious tendency to form cellular associations of constant composition. Six of these associations referred to as stages of the cycle are described and succeed each other in time in a fixed sequence which goes on repeating itself. In man certain irregularities tend to obscure this general pattern which is nevertheless similar to that in other mammals.

RMHMCMI

2662. DEVELOPMENT AND CHEMODIFFERENTIATION OF THE SEMINAL VESICLE AND COAGULATING GLANDS OF THE RAT UNDER NORMAL AND EXPERIMENTAL CONDITION. B.Henningsen: Z. Zellforsch., 1962, 59, 405-442 (Anat. Inst., Univ. Kiel, Germany) Development and histochem. differentiation of seminal vesicles and coagulating glands of 146 Wistar rats, ranging in age from 1 day to 81 days, were studied; the morphol-

and cyt. development of seminal vesicle and of the coagulating gland are almost completed on the 20th day after birth. NAD-diaphorase can be detected in the seminal vesicle from the 6th day and carbonic anhydrase after 14 days. NAD-diaphorase and carbonic anhydrase can be demonstrated in the coagulating gland for the first time on the 18th day. Testoviron injn. will speed up the development and differentiation of the seminal vesicle but has scarcely any effect upon the coagulating gland.

(German) J.E.Linder

2663. HISTOCHEMICAL AND ULTRASTRUCTURAL OBSERVATIONS ON PROSTATIC EPITHELIUM OF OLDER RATS. D.Brandes: Lab. Invest., 1963, 12, 290-305 (Pathol. Dept., Johns Hopkins Univ. Med. Sch., Baltimore, Md., U.S.A.)

The deposition of electron-dense bodies in the supranuclear region of prostatic acinar epithelium increase with age. Their M. appearance and histochem. reactions are characteristic of lysosomes. They are also related to lipofuscin. Cytoplasmic basophilia is related to the presence of ribosomes in ergastoplasm. A.M.Mackay

2664. USE OF FORMALIN FIXATION IN CYTOCHEMICAL DEMONSTRATION OF SUCCINIC AND NAD AND NADP-DEPENDENT DE HYDROGENASES IN MITOCHONDRIA. D.G.Walker and A.M.Seligman: J. cell Biol., 1963, 16, 455-469 (Dept. Surgery, Sinai Hosp., Baltimore, Md., U.S.A.) A procedure for the cytochem. demonstration of the dehydrogenases which preserves the mitochondria of rat liver is reported. Finely dried tissue blocks were fixed by immersion for 2-4 min. in balanced salt soln. containing 0.7-2% formaldehyde and frozen at -70°. Succinic and D-P-hydroxybutyric lactic malic and isocitric dehydrogenases were demonstrated exclusively in the mitochondria of hepatic acinar cells using the appropriate substrates and tetra-nitro-BT. P. Barrow

2665. USE OF TETRANITRO-BLUE TETRAZOLIUM FOR CYTOCHEMICAL LOCALISATION OF SUCCINIC DEHYDROGENASE. CYTOCHEMICAL AND CYTOLOGICAL STUDIES OF SARCOMA 37 ASCITES TUMOUR CELLS. C.G.Rosa and K.-C.Tsou: J. cell Biol., 1963, 16, 445-454 (Daniel Baugh Inst. Anat., Jefferson Med. Coll., Philadelphia, Pa., U.S.A.) Demonstration of succinic dehydrogenases in the mitochondria of smear prep. of ascites cells using tetrantro-blue tetrazolium [TNBT] and nitro-blue tetrazolium [NBT] were compared. TNBT is a more suitable electron acceptor than NBT as a reagent in oxidation dehydrogenase enzyme localisation. P. Barrow

2666. USE OF GLYCOL-METHACRYLATE IN HISTOLOGY & HISTOCHEMISTRY. J.Lesko, M.Rosenberg and K.Sykora: & L Morfol., 1963, 11, 188-191 (Virov. u. Lek. Conv., Bratislava. Mlynska dolina 1. Czechoslovakia). K.Jones

2667. PLASTIC Embedding of ANATOMICAL PREPARATIONS. J.Lindberg and K.-A.Norberg: Acta Histol. Scand., 1963, 112, 227-229 (Hist. Dept., Karolinska Hiffrif. Stockholm, Sweden) A method for the embedding of museum specimens in celodal, a urea-formaldehyde polymer is described; celodal has good optical prop, and becomes water insol. after semin. J.E.L. er

2668. PRINCIPLES AND METHODS FOR THE MORPHOMETRIC STUDY OF THE L E.R.Weibel: Lab. Invest.,

pulmonary Lab., First Med. Div., Bellevue Hosp., New York, U.S.A.) Preparative techniques, sampling methods, microscopic quantitation and statistical analysis of data obtained in the study of human lung sections are described and evaluated in detail. A.M.Mackay

TISSUE CULTURE

2669. RELATIONSHIP BETWEEN CHROMOSOME NUMBER AND RADIOSensitivity OF TUMOUR CELLS. L.Revesz, U.Glas and G.Hilding: Nature, Lond., 1963, 198, 260-261 (Dept. Tumour Biol., Karolinska Inst. Med. Sén., Stockholm, Sweden)

A series of tumour cell clones derived by serial irradiation of ELD ascites tumour were tested for their radiosensitivity; this could not be consistently related to the chr. no. of different clones. G.M.Lewis

2670. FURTHER OBSERVATIONS OF AORTIC CELL CULTURES FROM UNTREATED AND CHOLESTEROL-FED RABBITS. R.Koide, O.J.Pollak and D.A.Burns: J. Atheroscler. Res., 1963, 3, 32-43 (Dover Med. Res. Center, Inc., Dover, Dela., U.S.A.) Two distinct cell lines were obtained in vitro from aortae of untreated and cholesterol-fed rabbits. They were round endothelial cells and spindle-shaped, fibroblastic or fibrocytic cells, and there was no transition between the different cell lines. Their characteristics are described. KJqnes

2671. UNFRACTIONATED PREPARATIONS OF HISTONES FROM NORMAL MAMMALIAN TISSUES AS AGENTS INHIBITING GROWTH OF TRANSPLANTING TUMOURS. V.L.Vorob'yev and V.M.Bresler: Nature, Lond., 1963, 198, 545-547 (Inst. Cytol., Acad. ScL U.S.S.R., Leningrad, U.S.S.R.) Incubation of cells of mucous liver cancer with normal rat liver histone led to a marked inhibn. of tumour growth. Tryptic or chymotryptic hydrolysates of histone prep. did not inhibit tumour growth. Growth of mucous liver cancer cells was also inhib. by incubation in the presence of rat thymus and calf thymus histones. J.R. Sargent

2672. CYTOTOXICITY OF STEROIDS TO MAMMALIAN CELLS IN TISSUE CULTURE. D.Perlman, N.A.Giuffre, S.A.Brindle and S.C.Pan: Proc. Soc. exp. Biol., N.Y., 1962, 111, 623-625 (Squibb Inst. for Med. Res., New Brunswick, N.J., U.S.A.) Cultured Grey's adrenal cells (3G29) were found to be much more tolerant to fluorinated steroids than Earle's L cells and Ehrlich's ascites cells. Adrenal cells also metabolised steroids more extensively. Progesterone deriv. proved to be more toxic than corticosteroids to all types of cell lines. M.M.Shapland

2673. OESTRADIOL-CELLULAR INTERACTION IN TISSUE CULTURE. R.J.Kuchler, N.J.Arnold and R.C. Grauer: Proc. Soc. exp. Biol., N.Y., 1962, 111, 798-804 (Dept. Microbiol., W.H.Singer Mem. Res. Lab., Allegheny Gen. Hosp., Pittsburgh, Pa., U.S.A.) L-strain mouse fibre-blasts adsorb steroid mol. from tissue culture medium within a few min. the amount of adsorption being directly related to concn. of steroid in the medium. Further accumulation of oestradiol does not occur even after hr. of contact. The interaction is extremely labile, 50% of steroid being removed by diln.

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of cells with equal vol. of medium or by washing once. This indicates that the steroid is bound at the cell membrane and little, if any, permeates the cell. Adsorption was impaired by addition of horse serum to cultures, competition for steroid being between cell surface sites and protein rather than protein and steroid for free sites.

M.M.Shapland

2674. LETHAL EFFECT OF INDOLYL-3-ACETIC ACID ETHYL ESTER AND PROTECTIVE EFFECT ON INDOLYL-3-ACETIC ACID ON FREE CELLS OF THE EHRLICH ASCITES CARCINOMA. R.D.Schultz and D.Norman: *Nature, Load., 1963, 198, 553-554* (North American Aviation, Inc., Downey, Calif., U.S.A.) Incubation of free Ehrlich ascites cells in the presence of suspensions of indolyl-3-acetic acid ethyl ester led to a marked increase in cell mortality, while incubation in the presence of indolyl-3-acetic acid resulted in a mortality rate lower than that of controls.

J.R.Sargent

2675. EFFECT OF MITOMYCIN C ON THE GROWTH AND DEOXYRIBONUCLEIC ACID CONTENT OF NORMAL FIBROBLASTS, CULTIVATED IN VITRO. H.Slotwinska-Oledzka, R.Bassleer and S.Chevremont-Comhaire: *C.R. Soc. Biol., Paris, 1962, 156, 1714-1717.* 0*5-1 pg./ml. mitomycin C inhib. growth and mitotic activity of embryonic chick fibroblasts. In many cells preprophasic synthesis of DNA was normal but no mitoses occurred. These nuclei fragmented and produced small accessory nuclei. In cases where mitoses occurred abnormalities appeared: metaphase block, fragmentation of ch., absence of pycnoses. (French) M.A.Price

2676.. MODIFICATION OF THE CYTOTOXIC EFFECT OF QUARTZ IN MOUSE - FIBROBLASTS (STRAIN L) BY POLYVINYL PYRIDINE-N-OXIDE (P 204). E.G.Beck, J.Bruch and A.Brockhaus: *Z. Zellforsch., 1963, 59, 568-576* (Inst. Hygiene und Microbiol., Med. Acad. Düsseldorf, Germany) A 0*1% quartz dust suspension was applied to a mouse fibroblast culture which had been incubated with polyvinyl pyridine-N-oxide (P204) at various concn. Examination of cultures reveals that mouse fibroblasts are protected by the polyvinyl pyridine-N-oxide against the toxic effect of quartz dust; it is assumed that the polymer, which is being stored in the cell, may increase the cellular resistance or modify the biochem. cellular reaction. (German) J.E.Linder

2677. CYTOLOGIC AND VIROLOGIC STUDIES OF CULTURES DERIVED FROM NEOPLASTIC AND NON-NEOPLASTIC TISSUES OF CHILDREN. R.M.McAuister, M.Mikenas, R.M.Straw and B.H.Landing: *Lab. Invest., 1963, 12, 343-354* (Paediat. Dept., Univ. California Med. Sch., Los Angeles, Calif., U.S.A.) Biopsies of normal, abnormal non-neoplastic, and neoplastic tissues were cultured for varying times. No permanent cell lines were established. No differences in survival times of metabolism was noted. Adenoviruses were recovered from 6 of 13 tonsils. Polykaryocytes were observed in some of the cultures from all sources but were not able to be transmitted. Their significance is discussed. A.M.Mackay

2678. CHEMICAL AND MORPHOLOGICAL STUDIES ON IN VITRO CALCIFICATION OF AORTA. G.R.Martin. E.Schiffmann, H.A.Bladen and M.Nylen: *J. cell Biol., 1963, 16, 243-252* (Nat. Inst. Dent. Res., N.I.H., Bethesda, Md., U.S.A.) Rat aortas were incubated in rat serum containing ⁴⁵CaCl₂ at 37° for 1-72 hr. and then transferred to 0.12M HC1 which was assayed for Ca, PO₄ and 45ca uptake. The tissue was examined by X-ray

diffraction, microautoradiography, electron diffraction and E.M. Ca and PO₄ crystals accumulated after 24 hr. as hydroxyapatite localised in the elastin which is necessary for mineralisation. The collagen fibres remained unchanged. The changes necessary in serum to produce calcification are discussed. P.Barlow

2679. A DISPOSABLE, CONSTRICTED TISSUE CULTURE TUBE. C.Wallis and J.L.Melnick: *Proc. Soc. exp. Biol., N.Y., 1963, 112, 344-346* (Dept. Virol.

Epidemiol., Baylor Univ. Coll. Med., Houston, Tex.

U.S.A.) A new culture vessel is described which has several advantages over present ones. It is disposable; has optically flat culture region surfaces, and can be incubated on the level, thus diminishing cell sloughing. Smaller inocula can be used in subculturing and monolayering of the cells is more rapid and homogeneous.

D.N.Wheatley

EMBRYOLOGY

2680. NOTES ON THE STRUCTURE OF MEMBRANES AND SHELL IN THE HEN'S EGG. AN ELECTRON MICROSCOPICAL STUDY. P.C.M.Simons and G.Wiertz: *Z. Zellforsch., 1963, 59, 555-567* (Lab. of Animal Physiol., Agricultr. Univ., Wageningen, Netherlands) Pieces of shell removed at the equator of 4 hen *'s eggs were examined after decalcification in EDTA; the fibres of the calcified shell are anchored within the basal zone of the mammillae; the remainder of the calcified shell does not possess any fibres. The density of the org. matrix of the spongy layer may be related to the mechanical strength of the shell.

J.E.Linder

2681. HISTOLOGY AND HISTOCHEMISTRY OF PLACENTA AND FOETAL MEMBRANES IN THE BAT TADARIDA BRASILIENSIS CYNOCEPHALA, WITH NOTES ON MAINTAINING PREGNANT BATS IN CAPTIVITY. R.J.Stephens: *Amer. J. Anat., 1962, 111, 259-285* (Dept. ZOO, Cornell Univ., Ithaca, N.Y., U.S.A.) The cervix and corpus uteri are lined by thin stratified squamous epithelium. Implant** is central and superficial, the embryonic disc is oriented antimesometrially, and the discoidal placenta » established mesometrially. Details are given of the placenta and the distribution of alk. and acid phosphatases⁵¹ lipids, glycogen and iron. R.M.H.McMinn

2682. INCIDENCE OF EXPERIMENTALLY PRODUCED ABDOMINAL IMR-ANTATIONS IN RAT. W.P.Jollis*: *Anat. Rec., 1961, 141, 159-167* (Dept. Anat., Queen's Univ., Kingston, Ontario, Canada) Primary abdominal implantations were induced either by flushing tubal ova on to selected peritoneal sites, or by severing tubo-uterine junctions and ligating the cranial ends of uteri. In certain instances 0.5 mg. histamine dihydrochloride was applied either at the region of the cut tubes or at a selected site. By combining optimal techniques! Le. severing the tubo-uterine junctions and adding histamine, an incidence of 9*4Pfo of abdominal implantations was obtained. F. Boe*

2683. POTENTIALITIES OF THE UNINCUBATED BLASTODERM OF BIRDS [DUCK]. H.Lutz, M.Departout, J.Hubert and C.Pieau: *Develop. Biol., 1963, 6, 23-44*

(Lab. Biol. animale. Fac. Sci.. Clermont-Ferrand, France) A high % of normal embryos developed from ant., post, and lat. halves, and from smaller segments of the unincubated duck blastoderm.

(French) J.W.S.Harris

2684. DIFFERENTIATION OF THE HUMAN SUBNUCLEUS INTERPOLARIS AND SUBNUCLEUS ROSTRALIS OF THE NUCLEUS OF THE SPINAL TRACT OF THE TRIGEMINAL NERVE. J.W.Brown: *J. comp. Neurol.*, 1962, 119, 55-76 (Dept. Anat. Univ. Missouri Sen. Med., Columbia, Mo., U.S.A.) The development of the nucleus of the spinal tract of V, with special attention given to subnucleus interpolaris and subnucleus rostralis, was studied in the brain stems of 15 human foetuses ranging from 32-84.5 mm. C-R length (9 to 13 weeks Jj menstrual age). A cervicorostral sequence of development of the entire spinal trigeminal nuclear complex and the role played by the 3 subnuclei (caudalis, interpolaris and rostralis) in the development of reflex patterns is discussed. G.M.Lewis

2685. THE SKELETON OF THE EYE. I. CONJUNCTIVAL FAPILLAE AND SCLERAL OSSICLES. A.J.Coulombe. U.Coulombe and H.Mehta: *Develop. Biol.*, 1962, 5, 382-401 (Lab. Neuroanat. Sci., N.L.H., Bethesda, Md., U.S.A.) In the chick, papilliform thickening of conjunctival epithelium which appear on the 8th day of incubation, correspond in no. and location to the 1 ossicle; which develop on the 12th day. Six cases in the histogenesis of the papillae are described together with results of an expt. study of the role of the papillae in the differentiation of the ossicles.

J.W. 5. Harris

2686. EVIDENCE OF EARLY PITUITARY FUNCTION IN WHITE LEGHORN CHICK. J.Phillips: *Anal. Rec.*, 1962, 144, 69-75 (Zool. Dept., Drew Univ., Madison, WI USAO) Cytochem. studies of the pituitary gland of mucoprotein were located by w. and PA-Schiff staining techniques. It is suggested that this material represents stored TSH. At the early stages of development Rathke's pouch after the lumina of the caudal and cephalic lobes act as reservoirs for the AF and PA-Schiff positive material secreted into it by the cells bordering the cavities. Around the 12uV13th days when the 1st ventricle disappeared, the cysts took over pituitary function. F.BecK

2687. OBSERVATIONS ON LIVING MYOCARDIAL CELLS FROM CULTURED 48-HOUR CHICK HEARTS. K&Rumery, R.J.Blandan and P.W.Hagey: *Anat. Rec.*, 1961, 141, 253-261 (Dept. Anat. Univ. Washington Med., Seattle, Wash., U.S.A.) As cardiac myoblasts matured the mitochondria increased in no. and became predominantly long and filamentous, arranging themselves in linear formation 48 hr. after culturing from 2-day chick embryo hearts, contractions started 24 hr. later. When seen in young cells, the myofibrils were visible in areas of greatest tension. Although non-contracting myofibrils were visible in these cells only those with bands were contracting. As more myofibrils differentiated within the cell, myofibrils in the same plane aligned themselves and gradually fused with their several bands in perfect order. F.BecK

2688. CAPACITY FOR LENS REGENERATION IN CHICK EMBRYO. M.S.McKeehan: *Anat. Rec.*, 1961, 141, 227-230 (Dept. Anat. Sch. Med., Univ. Virginia, Charlottesville, Va., U.S.A.) Embryos 3 to 5 days

of age were allowed to develop in ovo from 1 to 4 days following removal of the right lens. Thorough microscopic examination revealed no evidence of lens regeneration,

F.Beck

2689. EFFECTS OF EYE REMOVAL AT BIRTH ON HISTOGENESIS OF THE MOUSE SUPERIOR COLICULUS: AN AUTORADIOGRAPHIC ANALYSIS WITH [3H]-THYMIDINE.

G.R.DeLong and R.L.Sidmaru: *J. comp. Neurol.*, 1962, 118, 205-223 (Lab. Cell. Neuropathol., Harvard Med. Sch., Boston, Mass., U.S.A.) Mice were inj. with [3H]thymidine to label forming cells at various embryonic and postnatal stages, and one eye removed at birth. It was found that most neurons of the superior colliculus formed on embryonic days 11-13; 40% of these were lost after enucleation. Most neuroglial cells arose after birth. After deafferentation, many failed to form and others degenerated. A proliferation of neuroglial cells occurred between the 2nd postnatal week and adulthood.

G.M.Lewis

2690. INDUCED CHOROID PLEXUS DEVELOPMENT IN THE CHICK METENCEPHALON. W.J.Birge: *J. comp. Neurol.*, 1962, 118, 89-95 (Dept. Zool., Univ. Illinois, Urbana, Ill., U.S.A.) Following ablation by micro-electrocoagulation of the right presumptive metencephalic alar plate in chick embryos at 33-38 hr. development, a simple epithelium regenerates to close the lesion area. When vascularised leptomeningeal tissue appears adjacent to the regenerated epithelium, the latter differentiates into choroid plexus tissue.

G.M.Lewis

2691. GROWTH AND DIFFERENTIATION OF FOZTAT, KIDNEY FOLLOWING BILATERAL NEPHRECTOMY OF PREGNANT RAT AT 18½ DAYS OF GESTATION.

H.D.Rollason: *Anat. Rec.*, 1961, 141, 183-193 (Dept. Zool., Univ. Massachusetts, Amherst, Mass., U.S.A.) On each of the 3 days following maternal nephrectomy body wt. and kidney wt. of controls were significantly heavier than those of expt. foetuses. There were significantly greater no. of mitoses, when compared with controls, in the nephrogenic zone of kidneys of foetuses removed one day (but not later) after maternal nephrectomy. Kidney differentiation appeared to be more rapid in expt. foetuses than in controls. F.Beck

2692. INTERACTION OF INSULIN AND CHLORPROMAZINE IN TERATOGENESIS. W.Landauer and E.M. Clark: *Nature*, 1963, 198, 215-216 (Dept. Animal Genetics, Univ. Connecticut, Storrs, Conn., U.S.A.) 2.5 mg. chlorpromazine inj. into White Leghorn eggs at 120 hr. incubation had little toxicity and no teratogenic effects, but when combined with 4 units of insulin, the incidence of micromelia and beak defects were doubled. Chlorpromazine did not affect the incidence of runglessness produced by insulin when inj. after 24 hr. incubation. The results are consistent with the view that chlorpromazine aggravates the disturbances of phosphorylation produced by insulin.

G.M.Lewis

2693. ROLE OF THE TONGUE IN PRODUCING CLEFT PALATE IN MICE WITH SPONTANEOUS CLEFT LIP.

D.G.Trasler and F.C.Fraser: *Develop. Biol.*, 1963, 6, 45-60 (Genetics Dept., McGill Univ., Montreal, Canada) The presence of an enlarged median process in embryos with spontaneous cleft lip is considered to impede the normal antero-ventral displacement of the tongue. This delays movement of the palatine shelves to such an extent, that if they do eventually become

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horizontal, they are too far apart to fuse together in the mid-line of the mouth. J.W.S.Harris

2694. ABNORMAL DEVELOPMENT INDUCED BY MATERNAL ADMINISTRATION OF 32PHOSPHORUS AFTER 14 OR 17 DAYS OF GESTATION IN THE RAT. L SKELETAL DEFECTS. M.R.Sikov and J.E.Lofstrom: Amer. J. Anat., 1962, 111, 309-317 (Dept. Radiol., Wayne State Univ. Coll. Med., Detroit, Mich., U.S.A.) There was a dose-dependent decrease in the overall size of the foetuses. Defects such as retarded ossification of cranial bones and digits, rib angulation and decreased prominence of the greater trochanter of the femur were more pronounced after injn. at 14 days than at 17 days. R.M.H.McMinn

2695. TIME OF TERATOGENIC ACTION OF TRY PAN BLUE IN GUINEA-PIGS. R.M.Hoar and AJ.Salem: Anat. Rec., 1961, 141, 173-181 (Dept. Anat., Coll. Med., Univ. Cincinnati, Ohio, U.S.A.) Guinea-pigs received an injn. of Trypan Blue on days 6-13 of gestation. Embryos were removed at 30 days or females were allowed to deliver. Response to the injn. took the form of an elevated resorption rate, retardation of growth and gross abnormalities. Max. response in abnormalities was displayed following injn. on day 11. F.Beck

2696. USE OF THE LIVING CHICK EMBRYO AS A BIOLOGICAL INDICATOR OF THE EFFECTIVENESS OF CHELATING AGENTS. H.Smith and LV.Chapman: Nature, Lond., 1963, 198, 32-33 (Production Group, U.K.Atomic Energy Authority, Chapelcross, Annan, Dumfriesshire, Scotland) Effects of tetracycline on chick' embryos can be used as an index of the toxicity of this chelating agent. Marked anat. changes occurred in embryos exposed to tetracycline in amounts greater than 4 mg. Tetracycline was deposited extensively in the skeleton of the embryos and did not inhibit deposition of 89sr in bone. JR. Sargent

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2697. TOPOGRAPHICAL ORGANISATION OF THE LATERAL SEGMENT OF THE BASIS PEDUNCULI IN MAN. O.S.M.Marin, J.B.Angevine, jun. and S.Locke: J. comp. Neural., 1962, 118, 165-183 (Dept. Neurol., Harvard Med. Sch., Boston, Mass., U.S.A.) A study of the origin and topographical organisation of the fibres in the lat. segment of the basis pedunculi in man based on examination of 8 human brains with old vascular and surgical lesions. G.M.Lewis

2698. COMPARATIVE NOTES ON THE CEREBELLUM OF THE MONOTREMES. I. CONTRIBUTION TOWARD A PHYLOGENY OF THE MAMMALIAN BRAIN. L.S.Dillon: J. comp. Neurol., 1962, 118, 343-353 (A. and M. Coll. Texas, College Station, Tex., U.S.A.)

The principal lobules of the cerebellum of platypus (*Ornithorhynchus anatinus*) and echidna (*Tachyglossus aculeatus*) are described and compared with those in a marsupial and placental mammal brain. A possible explanation of the phylogenetic changes noted is offered. G.M.Lewis

2699. PRIMARY OPTIC CENTRES OF THE RAT IN RELATION TO THE TERMINAL DISTRIBUTION OF THE CROSSED AND UNCROSSED OPTIC NERVE FIBRES. W.R.Hayhow, A.Sefton and C.Webb: J. comp. NeuroL 1962, 118, 295-321 (Brain Res. Unit, Dept. Physiol. Univ., Sydney, Australia) The terminal distribution of fibres of retinal origin in the principal subcortical optic centres has been studied in the rat for 5-7 days following section of 1 optic nerve and projection fields of the crossed and uncrossed optic nerve fibres precisely delineated. G.M.Lewis

2700. ANATOMY OF THE HYPOTHALAMUS OF THE FERRET. W.J.A.Westwood: J. comp. Neurol., 1962, 118, 323-341 (Dept. Anat., Univ. Birmingham, England) The main features of the hypothalamus of the ferret are described and compared with the hypothalamus of dog and cat. G.M.Lewis

2701. EXPERIMENTAL STUDIES ON THE MYENTERIC PLEXUS IN MAMMALS. G.C.Schofield: J. comp. Neurol., 1962, 119, 159-185 (Dept. Human Anat., Univ. Oxford, England) The myenteric plexus in each of the major subdivisions of the gut has been examined in a variety of mammals, rat, mouse, guinea* pig, rabbit, cat, monkey, baboon and man. The origin and distribution in the myenteric plexus of nerve fibres reaching the git have been studied by the use of selective denervation expt. The preganglionic nerve supply of the gut is more extensive in its origin than is commonly supposed. G. M. Lewis

2702. ARTERIAL SUPPLY OF THE DIENCEPHALON AND SOME ASSOCIATED AREAS OF THE RABBIT BRAIN. DJ.Prolo and D.L.Stilwell, jun.: J. comp. Neurol., 1962, 119, 229-254 (Dept. Anat., Sch. Med., Univ. Stanford, Calif., U.S.A.) The arteries in the rabbit diencephalon are studied with regard to gross origins, fine distribution, patterns of supply, arterial anastomoses and overlap of terminal distribution, and special areas of vascularity. G.M.Lewis

2703. BRANCHING OF LEFT PULMONARY ARTERY OF CATS STUDIED ON CORROSION SPECIMENS. V.Munka, A.Gregor and M.Knazovicky: Csl. MorfoL# 1963, 11, 117-123 (Inst. Normal Anat., Fac. Med., P.J.Safarik's Univ., Kosice, Czechoslovakia). Kjones

2704. RELATION OF TYPES OF DIETARY FAT TO HEPATIC LIPOSIS AND MYOCARDIAL DAMAGE IN MICE. W.L.Williams and R.I.Oliver: Anat. Rec., 1961, 141, 97-107 (Dept. Anat., Univ. Mississippi Sch. Med., Jackson, Miss., U.S.A.) On the basis of the expt. results it is concluded that a broad range (with ref. to satn. and chain length) of dietary lipids is essenti?: for production of the massive hepatic liposis and of ceroid pigment characteristic of choline deficiency. The abseil of unsat. compound from the diet seems to afford considerable protection (from liposis) to the liver but renders the myocardium susceptible to extensive damage. F.Beck

2705. POLYPLOIDISATION OF RAT LIVER FOLLOWING SEX HORMONE ADMINISTRATION TO CASTRATE INTACT RATS. F.J.Swartz and B.F.Sams: Anat. Rec., 1961, 141, 219-225 (Dept. Anat., Sch. Med., Univ. Louisville, Ky., U.S.A.) Excessive oestrogen administration to castrate ? was able to effect the accelerate^ liver growth rate and diminished octaploid nuclear popu*: lation associated with castration. Relative liver wt.

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Presumable due to induction of octaploid cells, was high.
^ ne failure of & castrates to respond similarly is considered from the standpoint of the amount of hormone 8Wen. Large amounts of oestrogens and testosterone given to intact newborn rats did not affect liver growth Patterns or polyploid distribution. F.Beck

2706. OVARIAN ANDROGEN IN PARABIOTIC MICE. J.C.Desclin, jun.: Anat. Rec. 1961, 141, 305-313 (pept. Histology, Fac. Med., Univ., Brussels, Belgium) The site of production of c? hormone *^{T₄} in the ovary is discussed in the light of expt. on ? J'ice both with normally located ovaries and ovaries Jjansplanted to the submandibular glands. The animals T're united in parabiosis with a spayed or castrated *ⁿimal and ovarian androgen production was evaluated on nistol. of the submandibular glands. F.Beck

2707. TETRACYCLINE LOCALISATION IN THE EARLY STAGES OF ISOGENOUS BONE GRAFT. J.Deleu: Nature, Lond., 1963, 198, 194-195 (Dept. Orthopaedic Surg., Nuffield Orthopaedic Centre, Oxford, England) Daily injn. of chlortetracycline were given to young rats bearing implants of cancellous autogenous bone in the ant. chamber of the eye. Tetracycline selectively localised in dead bone; a high degree of resorption was observed at the edges. G.M.Lewis

2708. CORTICAL RATIO AS AN ESTIMATE OF THE MINERAL CONTENT OF THE HUMAN FEMUR. P.Virtama, P.Kajanoja and A.Telkka: Ann. Med., 1963, 41, 60-64 (Dept. Anat., Univ. Helsinki, Finland)

Cortical ratio, which is the planimetrically measured ratio of the cortex to the rest of the bone, was determined on 43 radiographs of human femur. A highly significant correlation was found between the cortical ratio and mineral content of the bones. The cortical ratio is a better estimate of bone density than is the cortical index measured at one level only and it can apparently be used in large scale or follow-up studies of bone density. G.Faulkner

2709. NAILFOLD CAPILLARIES IN FAMILIAL SCHIZOPHRENICS. H.R.Maricq: Circulation, 1963, 27, 406-413. (V.A. Hosp., Lyons, N.J., U.S.A.) Nailfold capillaries in the sub-papillary plexus were thought to be unduly visible by microscopy in familial schizophrenics compared with non-familial schizophrenics.

R.S.Duff
2710. ANATOMY OF POLYDACTYLISM IN CATS WITH OBSERVATIONS ON GENETIC CONTROL.

V. ^ h n a c P 7, a n and F. N. Zeimer: Anat. Rec. 1961, 141, 205-217 (Dept. Zool., Univ., Denver, Colo., U.S.A.) A study of polydactyly in cats was made to provide precise anatomical information and to correlate this with hereditary mechanisms. F. Beck

Indian Botanic ^ * J.U. Calcutta, West Bengal, India

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- 2711. DENTAL DEVELOPMENT IN DOG. I. CALCIFICATION OF CROWN AND ROOT OF DECIDUOUS DENTITIONS.** L.Arnall: *J. small anim. Pract.*, 1961, 1, 169-173 (Sch. Vet. Sci. Univ., Liverpool, England) The times and rates of calcification of the deciduous and permanent teeth were studied radiographically in a small no. of pure-bred litter-mate puppies from birth to 7 months. Data from other breeds supported and extended the findings. *
- 2712. SKULL SUTURES OF THE RHESUS MONKEY BY COMPARISON OF TOPOGRAPHIC SAMPLING TECHNIQUE, AUTORADIOGRAPHY AND VITAL STAINING.** P.K.-J.Yen and J.H.Shaw: *Arch. oral Biol.*, 1963, 8, 349-362 (Harvard Sch. Dent. Med., Boston, Mass., U.S.A.) Three young and 1 old ♂ rhesus monkeys received ^{45}Ca i.v. After 168 hr. the ^{45}Ca uptake in the skull sutures, synchondroses, adjacent bones and surfaces of discrete areas was studied quant, by the selective grinding method with autoradiography and vital staining with Alizarin Red S. The uptake was different at various locations along the same suture and was also different on both sides of certain sutures suggesting that one side may be growing more rapidly. The mandibular condyle had the highest uptake, which was greater in the post, non-articular portion than the ant. articular portion. High uptake in the post, border of the ramus denoted active growth. In the old monkey the ^{45}Ca uptake was more uniform and much less. *
- 2713. SHORT VERSUS LONG STUDIES WITH RADI-CALCIUM AT VARIOUS SITES OF THE SKULL OF YOUNG AND OLD RHESUS MONKEYS.** P.K.-J.Yen and I.H.Shaw: *Arch. oral Biol.*, 1963, 8, 363-375 (Harvard Sch. Dent. Med., Boston, Mass., U.S.A.) ^{45}Ca uptake was determined in 2 young monkeys sacrificed 15 min. after ^{45}Ca injn., in 1 old monkey sacrificed after 15 min. and another old monkey after 168 hr. In the young monkeys, the ^{45}Ca uptake was higher in sutures and synchondroses than in the adjacent bones. The small differences in uptake in the various areas of the same suture and in the various areas of the same bone were probably still indicative of different rates of bone formation, proliferation and calcification. In old monkeys where there was no apparent growth, the sp. activity ratios were uniform in all sutures and bones and this probably could be attributed almost exclusively to exchange. The difference in uptake between the 2 old monkeys represents the difference in degree of exchange over the time interval from 15 min. to 168 hr. *
- 2714. INCISIVE MUSCLE IN RAT.** L.Sciaky. *Arch. oral Biol.*, 1963, 8, 465-466 (Dept. Oral Diagnosis, Hebrew Univ.-Hadassah Sch. Dent., Jerusalem, Israel) A previously undescribed muscle inserted just behind the lower incisor by muscle-insertion exostoses in lathyritic animals is described. A.E.W.Miles
- 2715. NERVE PLEXUSES IN ORAL MUCOSA.** A.D.Dixon: *Arch. oral Biol.*, 1963, 8, 435-447 (Dept. AnaL. Univ., Manchester, England) The mucosa of the tongue, hard palate, cheek and gingiva of rabbits, cats and monkeys was studied using whole thickness Methylene Blue prep., frozen sections of tissue impregnated with silver, and photographic reconstructions. Coarse submucous plexuses and a much finer subepithelial network associated with sensory nerve terminations were identified. Plexus formations were most dense in the dorsum of the tongue, hard palate and gingiva, particularly in the ant.

part of the mouth. Myelinated somatic fibres predomin* ated in the plexuses but, from a consideration of nerve fibre diam., it was concluded that autonomic fibres con* tribute to the formation of oral nerve networks. The findings support the view that sensory discrimination largely depends on a complex pattern of nerve impulses reaching higher centres. *

- 2716. LIGHT AND ELECTRON MICROSCOPE STUDY OF RAT MOLAR ENAMEL ORGAN.** J.D.Decken Arch, oral Biol., 1963, 8, 301-310 (Dept. Anat., Univ. Washington Sch. Med., Seattle, Wash., U.S.A.) At the embryonic age of 20-20½ days no deposition of mineral had occurred in M1 and M2. The cells of the enamel organ contained large no. of free RNP particles. A cell surface specialisation termed a hemi-desmosome has been observed at the junction of the outer dental epithelium with its basement membrane. Paniculate deposits of glycogen and amorphous lipid droplets were present in the outer dental epithelium. *

- 2717. AUTORADIOGRAPHIC STUDY OF MOUSE INCISOR USING [^3H]HISTIDINE.** W.S.S.Hwang, E.A. Tonna and E.P.Cronkite: *Arch. oral Biol.*, 1963, 8, 377-385 (Brookhaven Nat. Lab., Upton, Long Island, N.Y., U.S.A.) An autoradiographic study with grain counts in 16-day-old mice was made up to 14 d^{ap} after [^3H]histidine administration. Histidine turnover w* more rapid in ameloblasts than odontoblasts and a high concn. of histidine existed in the enamel matrix. *

- 2718. MITOTIC RATES IN ORAL AND GINGIVAL EPI-THELIUM OF RAT.** J.R.Trott and S.L.Gorenstein: *Arch. oral Biol.*, 1963, 8, 425-434 (Dept. Periodont" Fac. Dent., Univ. Manitoba, Winnipeg, Canada) 0*1 mg./100 g. body wt. of colchicine was given to adult rats over a 24 hr. period. The hard palate, cheek and crestal or marginal gingiva had comparable mitotic rat* and tissue renewal times. The attached gingiva had a relatively low mitotic rate, suggesting that it was not as much under the influence of function as the other areas mentioned. The epithelial attachment showed a much higher mitotic rate than the crevicular epithelium, suggesting that this was an active and functioning tissue and not degenerating, and that being non-keratinised there was need for rapid cell renewal. *

- 2719. HISTOCHEMICAL STUDY ON EXPERIMENTAL DENTINE FORMATION IN DOG PULP.** M.Hirata: *Shikwa Gakuho*, 1963, 63, 24-41 (Dent. Coll., Tokyo, Japan) Ca(OH)₂ and MgO were applied to exposed pulp and acid and alk. phosphatase, esterase and succinic dehydrogenase were studied after 1-25 d^{ap}* Alk. phosphatase was present under the necrotic layer a* in the upper layers of the pulp and increased as repair proceeded. Succinic dehydrogenase was found in regenerated odontoblasts.

(Japanese, English summary) C.P.WaU*

- 2720. EVALUATION OF METHOD OF MEASURING FORCES EXERTED BY TONGUE ON TEETH.** M.S.E.Gould and D.C.A.Picton: *Brit. dent. J.*, 1 ** 114, 175-180 (Univ. Coll. Hosp. Dent. Sch., LOB** England) A disc, 7 mm.² in area, was substitute^{**} for the lingual surface of a missing cheek tooth or inc.^{*} The pressure exerted by the tongue at rest, and the increased pressures on swallowing or on saying 'M' or 'C' / were measured with a strain gauge in 7 humans. A.R.

2721. EFFECT ON NORMAL VERTICAL TOOTH

MOBILITY OF RATE OF THRUST AND TIME INTERVAL BETWEEN THRUSTS. D.C.A.Picton: Arch, oral Biol., 1963, 8, 291-299 (Univ. Coll Hosp. Dent. Sch., London, England) The axial mobility of 10 upper central incisors was studied in 5 subjects. The direction and point of application of the thrust was constant for each tooth; force was applied manually via a dynamometer. Using a thrust of 0.2 kg. variation in the rate of thrust, in the range 0.5-25 sec. rise-time, produced no consistent effect on the load/mobility curves. Variation in the time interval between thrusts of standard 1 sec. caused progressive reduction in mobility with 5 sec. intervals. 2 min. intervals caused a less increase in mobility. To ensure repeatable load/mobility curves an interval of 1.1-5 min. was needed, individual variation being present.

2722. MODIFIED GROWTH IN INFERIOR DENTAL NERVE OF CAT.

A.Mohiuddin and F.N. h. J. comp. Neurol., 1962, 118, 157-163 (Dept. Anat. Fac. Med., Singapore) Tooth germs, from the canine backwards, were excised in newborn kittens on one side of the mandible. Studies of the trunk of the inferior dental nerve from both sides of each animal at 3, 6 and 24 months showed that postnatal growth and maturation of myelinated sensory fibres up to the age of 6 months resulted in normal development of the nerve and its branches.

2723. EFFECT OF VITAMIN D ON BONES OF YOUNG RATS RECEIVING DIETS LOW IN CALCIUM OR PHOSPHORUS. H.W.Ferguson and R-L.Hartley: Arch. Oral Biol., 1963, 8, 407-418 (Sch. Dent Surg., Univ. of Verulam, England) Weanling rats were maintained on diets adequate in P(0.42%) but low in Ca (0.08%) for 10 weeks. When vit D was included in the diet a condition showing certain similarities to osteoporosis was observed in the femur. In the absence of vit D the condition of the bones became increasingly osteomalacic and less porotic. Frank rickets was not produced in either case. Results are discussed in relation to the citrate content of the bone and the relative mobility of the total Ca in the expt conditions.

2724. AMINO ACID COMPOSITION OF PROTEINS FROM THE ORAL TISSUES I COMPARISON OF HUMAN ORAL EPITHELIUM, EPIDERMIS AND NAIL PROTEINS. J.E.Eastoe: Arch, oral Biol., 1963, 8, 449-458 (Dept. Dent. Sci., Royal Coll. Surg., London, England) Human oral epithelium, separated from attached collagen by treatment with hot water, was analysed for amino acids by ion-exchange chromatography. Values in close agreement were obtained after hydrolysis for 48 hr. and 72 hr. respectively. The results were compared with those from analyses made for human epidermis and nail. Oral epithelium is a keratin of low cystine content, with high contents of valine, leucine and B0. There is a molar ratio of histidine, lysine and arginine of approximately 1:4:4. While all these epithelial proteins contain a recognisable amino acid pattern, variations are found for other groups of proteins.

2725. EFFECT OF CARBONATE ON SOLUBILITY OF HYDROXYLAPATITE. P.Grin, M.Spinelli, O.Trautz and F.Brudevold: Arch, oral Biol., 1963, 8, 251-263 (Forsyth Dent. Infirmary, Boston, Mass., U.S.A.)

The solubility of hydroxyapatite increased with increasing concn. of HCO_3^- in the soln. Soln. CO_2 exchanged with solid P on a mole for mole basis. About 1/4 of the CO_2 in the carbonate-exposed hydroxyapatite was lost upon heating to 300°, suggesting the presence of appreciable amounts of CO_2 in the form of HCO_3^- . Increase of CO_2 in solid did not change the solubility of hydroxyapatite. Ppt. formed from metastable soln. of Ca and phosphate contained CO_3^{2-} in proportion to the concn. of CO_3^{2-} in the soln. The solubility of the ppt. increased with increase in the CO_3^{2-} content. Heating expt. suggested that the CO_2 in the ppt. was present in the form of CO_3^{2-} . X-ray diffraction studies showed that the ppt. were hydroxyapatite and that the presence of CO_3^{2-} disturbed crystn.

2726. INCORPORATION OF 14C-LABELLED AMINO ACIDS INTO DENTINAL PROTEINS. R.S.Pihl and N.Karahanju: Ann. Med., 1963, 41, 64-73 (Inst. Physiol., Univ. Helsinki, Finland)

Three long-term expts. were conducted on healthy rats to study the incorporation of 14C-labelled amino acids into the dentinal proteins of incisors and molars and their subsequent elimination. This was compared with incorporation into other tissues. Amino acids were incorporated into incisor proteins at a greater rate than into molar proteins. At 1, 6 and 12 days the sp. activity of the dentinal protein in the molars were on an average, 67, 61 and 65% of the corresponding values of the incisors. G.Faulkner

2727. PRELIMINARY INVESTIGATION INTO THE EFFECTS OF AMINOACETONITRILE ON DENTINE COLLAGEN IN THE RAT. S.A.Boswell: Arch, oral Biol., 1963, 8, 461-464 (Res. Lab., J.Sainsbury Ltd., Stamford House, Blackfriars, London, England)

Short comm. *

2728. CONTENT OF ARSENIC IN NORMAL TEETH AND DURING CARIES AND PERIODONTAL DISEASE.

N.A.Vikhm: Stomatologiya, Mosk., 1963, 42, 23-25 (Med. Stomat. Inst., Moscow, U.S.S.R.) The As content of sound teeth was 0.1 jig./g. No significant change occurred with age, caries or periodontal disease.

(Russian) C.P.Wallis

2729. IN VIVO TECHNIQUE FOR DETERMINING EFFECT OF AGENTS ON ENAMEL SOLUBILITY IN HUMAN SUBJECTS. E.Eigen, A.R.Volpe, F.M.Lapeyrolerie, S.Weiss and W.J.King: Arch, oral Biol., 1963, 8, 459-460 (Colgate-Palmolive Res. Center, New Brunswick, N.J., U.S.A.) Short comm. *

2730. APPARATUS FOR PRODUCTION OF DENTAL CAVITIES IN VITRO. S.L.Rowles, D.A.Sidaway, A.B. MacGregor and E.A.Marsland: Arch, oral Biol., 1963, 8, 311-318 (Dept. Dent. Path., Univ., Birmingham, England) The advantages of the so-called 'artificial mouth' in investigations into expt. lesions similar to caries are defined. A glass apparatus suitable for multiple operation is described. Continuous and intermittent flow feed systems and a siphon for supplying Seitz filtered saliva have been evolved. The methods used for mounting and sterilising the expt. teeth are described. By salivary inoculation, a bacterial plaque was produced on a sterile tooth surface. *

2731. PARABIOSIS, TOLERANCE AND CARIES IN RATS. H.D.Hall: Arch, oral Biol., 1963, 8, 387-396 (Univ. Alabama Sch. Dent., Birmingham, Ala., U.S.A.)

Parabiosis was produced between animals of caries-

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susceptible and caries-resistant strains. The caries experience was not modified by a long-existing common circulation or by living under conditions which would permit cross-infection of oral flora or by a chimaeric state. It is concluded that genetically determined blood-borne factors either do not differ between the 2 strains or do not affect caries. *

2732. ROLE OF STRESS IN DEVELOPMENT OF CARIOS. A.E.Sharpenak, V. R. Bobyleva and L.A.Gorozhankina: Stomatologija. Mosk., 1963. 42, 7-10 (Med. Stomat. Inst., Moscow, U.S.S.R.) Rats were subjected twice a week for 6 months to sound from a loud bell sufficient to cause unconsciousness in some animals. With a weakly cariogenic (corn) diet, there was a marked increase in caries; with a more cariogenic diet the effect was slight. The animals which failed to react to auditory stress showed little increase in caries and a delayed rise in urinary pyruvate. (Russian) C.P.Wallis

2733. PROGRESS WITH FLUORIDE TOOTHPASTES. H.FLMuhlemann: Schweiz. Mschr. Zahnheilk., 1963. 73, 383-390 (ZahnSrztliches Institut, Univ., ZUrich, Switzerland) Toothpastes containing SnF₂, NaF, or amine fluoride were applied daily for 2 weeks to the teeth of rats kept on a high sucrose diet. The amine fluoride gave the largest reduction in caries and in solubility of the molars. All the toothpastes reduced the solubility of human teeth in vitro. (German) C.P.Wallis

2734. STATISTICAL STUDY ON OCCURRENCE OF DENTAL CARIOS OF DOMESTIC ANIMALS. L HORSE. K.Honma, M.Yamakawa, S.Yamauchi and S.Hosoya: Jap. J. vet. Res., 1962. 10, 31-36 (Dept. Physiol.. Fac. Vet. Med., Hokkaido Univ., Sapporo, Japan) 97% of horses over 12 yr. showed evidence of caries after slaughtering. Data are presented for caries in each tooth for 4 age groups. The highest incidence was found in first molars, the lowest in canines. C.P.Wallis

2735. INCIDENCE OF SECONDARY DENTINE IN CARIOUS TEETH. M.E.Corbett: Brit. dent. J.. 1962. 114, 142-147 (Dept. Dent. Path., Univ. Birmingham, England) In 210 of 294 deciduous human teeth, and in only 84 of 185 permanent teeth was secondary dentine found beneath a carious cavity. 79% of deciduous, and 61% of permanent teeth with secondary dentine showed also inflammation of the dental pulp. A.R.Ness

2736. D M F SURFACE PERCENTAGE DENTAL CARIOS INDEX. C.L.de Jager: J. dent. Ass. S.Afr., 1963. 18. 96-101 (Fac. Dent., Univ. Pretoria, S. Africa) The new index attempts to take account of the variation in the no. of tooth surfaces at risk at various ages during the period of tooth eruption. A.E.W.Miles

2737. FOUR INVESTIGATIONS TO DETERMINE THE RELIABILITY OF CARIOS-RECORDING METHODS. G.N.Davies and P.B.Cadell: Arch. oral Biol., 1963. 8, 331-348 (Dept. of Preventive Dent., Univ. Otago Dent. Sch., Dunedin, New Zealand) The standardisation of diagnostic criteria and methods of examination did not reduce the variation between examiners unless the examiners underwent a period of pre-examination training or calibration. When these conditions were fulfilled the assessment of dental caries affecting teeth and tooth surfaces was reliable and reproducible. It is recommended that in epidemiological studies examining dentists should conduct duplicate examinations periodically so that the

reliability and consistency of their methods can be assessed. •

2738. BODY FLUID GLUCOSE LEVELS AS RELATED TO DENTAL CARIOS STATUS IN MAN. I.L.Shannon, W.A.Gibson, T.J.O'Leary and H.H.Chauncey: Arch. oral Biol., 1963. 8, 419-424 (Dent. Sci. Div., U.S.A.* Sch. Aerospace Med., Brooks AFB, Texas, U.S.A.) Parotid fluid samples were collected without exogenous stimn. from 507 systemically healthy young adult males. Blood was drawn from each participant and subjects were classified as to DMF surfaces. Parotid fluid flow rate was recorded, and serum and parotid fluid were analysed for glucose concn. by the glucose oxidase procedure. The presence of glucose in parotid fluid was confirmed. Neither parotid fluid flow rate, parotid fluid glucose level, nor serum glucose concn. was related to caries experience. For all participants, the mean for each of the 3 variables was 0.042(S.D. ± 0.036) ml./miru. 0.075 (S.D. ± 0.068) mg.%, and 84.8 (S.D. ± 1.16) mg.% respectively. •

2739. EFFECT OF TOOTHPASTE CONTAINING AMINE FLUORIDE ON CARIOS INCREMENT IN CHILDREN DURING THREE YEARS UNSUPERVISED USE. T.M.Marthalter: Schweiz. Mschr. Zahnheilk., 1963, 73, 390-409 (ZahnSrztliches Inst., Univ., Zflrich, Switzerland) There were 8.3 new DMF surfaces V&M child in 145 children of 10 yr. who had used amine fluori toothpaste since the age of 7 hr., and 11.7 new DMF surfaces in 124 children using the control toothpaste. For children age 15 yr. at the last examination, the corresponding figures were 12.7 and 16.8. The reduction in occlusal caries was negligible.

(German) C.P.Wall⁸

2740. SYNTHESIS OF INTRACELLULAR IODOPHILIC POLYSACCHARIDE BY STREPTOCOCCUS MITIS. RJ.Gibbons and B.Kapsimalis: Arch. oral Biol., 1963, 8, 319-329 (Forsyth Dent. Infirmary, Boston, Mass., U.S.A.) The polysaccharide is a polymer composed solely of glucose linked in part by (X-1, 4-glucosidic bonds. During exponential growth, the organism synthesised polysaccharide at a rate proportional to the biosynthesis of bacterial N. When cultures entered the stationary growth phase, synthesis of microbial N decreased whereas polysaccharide synthesis continued. This metabolic imbalance produced cells rich in intracellular polysaccharide. Comparable results were obtained when protein synthesis was inhibited with chloramphenicol. A glucose concn. of 0.1% permitted polysaccharide synthesis at max. rate. In the absence of exogenous carbohydrate, S. mitis catabolised polysaccharide. The lactic acid formed lowered the pH of packed cells of jjapitro below pH 6, for several hr. in the presence of continuous flowing buffer of pH 7. •

2741. MICROBIOTA OF GINGIVAL CREVICE AREA OF MAN. L TOTAL MICROSCOPIC AND VIABLE COUNTS AND COUNTS OF SPECIFIC ORGANISMS. S.S.Socransky, RJ. Gibbons, A.C.Dale, L.Bortnlc^{*,†}, E.Rosenthal and J.B.Macdonald. H. PREDOMINANT CULTIVABLE ORGANISMS. RJ.Gibbons, S.S.Socj^{*,†}, J.S.Sawyer, B.Kapsimalis and J.B.Macdonald: Arcn-Biol., 1963. 8, 275-280, 281-289 (Forsyth Dent. Infirmary, Boston, Mass., U.S.A.) L Total microscopic, total aerobic and anaerobic viable counts, and counts of aerobic and facultative streptococci, spirochaetes and Bacteroides melaninogenicus per f. WL of gingival debris were determined in normal and

Periodontally-involved individuals. The total microscopic counts approximated $1 \times 10^7 \times 10^{11}$ organisms per g., indicating that gingival debris is composed almost entirely of bacteria. Total aerobic viable counts averaged 1.6×10^{10} , while total anaerobic counts averaged 4×10^{10} . Suggesting that the majority of the bacteria is obligately anaerobic. All organisms which grew aerobic were facultative. Spirochaetes were the only group which increased significantly in periodontal disease.

H. No significant quant. or qual. differences were observed in the microbiota of normal and periodontally-involved individuals. The gingival crevice microbiota consisted of: 28.8% Gram pos. facultative cocci; 20.2% rod-shaped anaerobic rods; 16.1% Gram neg. anaerobic rods; 15.3% Gram pos. facultative rods; 10.7% Gram anaerobic cocci; 7.4% Gram pos. anaerobic cocci; 2.7% Gram neg. facultative rods; and 0.4% Gram neg. facultative cocci.

2242. ARGYROPHILIC FIBRES OF HUMAN GINGIVAL CONNECTIVE TISSUE. A.H.Melchen Arch, oral f°L, 1963, 8, 397-406 (Eastman Dent Hosp., London, England) Two types of argyrophilic fibres are found in areas of collagen destruction in chronic gingivitis. Fine branching reticulin fibres, part of a network which ramifies throughout the gingival connective tissue and includes the argyrophilic fibres at the connective tissue epidermal junction and also non-branching thinnish fibres which are often of much greater diam. Reticulin. These are young developing collagen fibres deposited in the healing response and may be situated directly on pre-existing collagen. Reticulin is more resistant to disaggregation in gingivitis than collagen or young developing connective tissue.

2743. RELATION OF EXCESS PYRIDOXINE TO ALVEOLAR ATROPHY AND MINERAL METABOLISM. V.&Okushko: Stomatologija, Mosk., 1963, 42, 19-23 (Med. Stomat. Inst., Moscow, U.S.S.R.)

Administration of 0.5 ml. 1% pyridoxine daily to rats increased the no. with alveolar resorption from 47% to 77%. The uptake of ^{45}Ca and ^{32}P into teeth and bone was determined 24 hr. after injn₄₅ following 1-36 days administration of vitamin. The ^{45}Ca uptake by molars and incisors was increased after 7 days vitamin administration but ^{32}P uptake was not significantly altered. After 14-36 days the uptake of both isotopes into molars was considerably reduced. Mandibular bone showed a similar decrease. (Russian) C.P.Wallis

2744. HISTOPATHOLOGY OF TEMPOROMANDIBULAR JOINT FOLLOWING BILATERAL EXTRACTION OF MOLARS IN RAT. G.Cimasoni: Oral Surg., 1963, 16, 613-621 (Inst. médecine dentaire, Geneva, Switzerland) The maxillary molar teeth of 14 Long Evans rats were extracted either at 200, 270 or 300 days prior to the animals being killed. Whereas the control animals, and those whose teeth had been extracted for only 200 days, showed normal histology of their temporomandibular joints, the 270 and 300 day groups showed perichondrocytal calcification and necrosis of the cartilage of the glenoid fossa, structural alterations of the meniscus, and pannus formation. D.S. Barker

2745. EXPERIMENTAL MORPHOGENESIS OF PERI-CEMENTITIS. V.V.Panikarovskii, A.A.Prokhorchukov and N.A.Zhizhina: Stomatologija, Mosk., 1963, 42, 17-19 (Med. Stomat. Inst., Moscow, U.S.S.R.)

Rats were maintained on a 55% sucrose diet for prolonged periods and periapical inflammatory changes were examined histol. Cyst formation was observed.

(Russian) C.P.Wallis

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CARBOHYDRATES

2746. EFFECT OF INSULIN, DNP AND Na AZIDE ON GLYCOGEN SYNTHESIS AND GLUCOSE UTILISATION IN SKELETAL MUSCLE. M.K.Gould and E.Racken Bull. res. Counc. Israel, A, 1963, 11, 302-309 (Publ. Hlth. Res. Inst., City of New York, Inc., New York, U.S.A.) The rate-limiting factors of carbohydrate metabolism in rat soleus muscle were analysed by following the conversion of [14C]glucose to glycogen and lactate. Both were increased by the addition of 0.1 units of insulin/ml, incubation medium. Increase of external glucose concn. increased the rate of glycogen synthesis and the addition of insulin increased it further. The anaerobic conversion of glucose to lactate was inhib. by either Na azide or DNP, an inhib. which was completely released when both were added simult. This was explained as the stimm. of ATPase by DNP and its inhibn. by Na azide. With either alone the ADP-phosphate cycle became rate-limiting. L.G.Gillies

2747. IN VIVO OXIDATION OF L-RHAMNOSE AND L-GLUCOSE BY HIGHER PLANTS. G.A.Barber and W.Z.Hassid: Bull. res. Counc. Israel, A, 1963, 11, 249-252 (Dept. Biochem., Univ. California, Berkeley, Calif., U.S.A.) Alcoholic extracts of buckwheat seedlings (*Fagopyrum esculentum*) were examined for aldonic acids after the following monosaccharides had been administered to the plants: D-glucose, D-galactose, D-mannose, D-fructose, L-glucose, L-rhamnose, L-xylose, L-arabinose, D-xylose, D-ribose and D-lyxose. Only L-rhamnose and L-glucose caused a significant accumulation of the corresponding rhammonic and gluconic acids. The latter were identified by chromatography and electrophoresis of the free acids, their lactones and of the aldoses obtained on partial reduction of the lactones with NaBH₄. L.G.Gillies

2748. MONOSACCHARIDES OF BOVINE PLASMA ACID GLYCOPROTEINS. A.Bezkorovainy: Arch. Biochem., 1963, 101, 66-70 (Nat. Animal Disease Lab., Animal Disease and Parasite Res. Div., Agric. Res. Service, U.S. Dept. Agric., Ames, Iowa, U.S.A.) Both orosomucoid and the M-2 glycoprotein contained chromatographically identifiable N-glycolyl- and N-acetyl-neuraminic acids and an unidentified sialic acid which reacted strongly with Ehrlich's reagent and very weakly with the Warren reagent. Both also contained galactose and mannose in a molar ratio of approx. 1:0 and glucosamine. B.M.Stevens

2749. ON PARTIALLY ACETYLATED SUGARS AND SUGAR DERIVATIVES. Y.Z.Frohwein and J.Leibowitz: Bull. res. Counc. Israel, A, 1963, 11, 330-336 (Dept. Biol. Chem., Hebrew Univ., Jerusalem, Israel) Cold acetic KOH acting on an acetonic soln. of poly-acetyl carbohydrates preferentially set free secondary alcoholic groupings, giving carbohydrates esterified in the primary alcohol group(s) only. 6-O-acetyl glucopyranose, 6-O-acetyl methyl α- and β-glucopyranosides, 6,6'-di-O-acetyl sucrose and 6,1',6'-tri-O-acetyl sucrose were thus prep. By-products assumed to be monoacetyl maltose and monoacetyl sucrose were also obtained. The structures of most of these was proved. A new osazone of the first is described. L.G.Gillies

2750. FRUCTOSE 1,6-DIPHOSPHATE BREAKDOWN IN [WHOLE CELLS AND CELL FREE EXTRACTS OF]

E. COLL L.KlungsByr, I.Grundt and K.B.Helle: Biochim. biophys. Acta, 1963, 71, 451-453 (Dept. Pharmacol., Univ., Bergen, Norway). B.M.Steve*

2751. EFFECT OF OXAMATE ON OXIDATION OF SPECIALLY LABELLED GLUCOSE BY EHRLICH ASCITES CARCINOMA CELLS. E.Christensen and A.N.Wick: Proc. Soc. exp. Biol., N.Y., 1963, 112, 430-432 (Chem. Dept., San Diego State Coll., San Diego, Calif., U.S.A.) Sodium oxamate, which is related structurally to pyruvic acid, was incubated at 3 concn. (0.01M, 0.03M and 0.06M) with Ehrlich ascites cells and the utilisation of [14C]glucose substrates was followed. The higher the concn. of oxamate, the greater the expiration of 14CO₂ from [6-14C]glucose substrate but not from [1-14C]glucose. This inhibitor of lactic dehydrogenase shunts more pyruvate into the Krebs' cycle and decreases the need for glucose uptake as an energy suply. There is no lactic acid accumulation. D.N. Wheats

2752. NEW METHOD FOR MICROANALYSIS OF BLOOD GALACTOSE. D.Watson: Analyst. Biochem., 1963, 5, 260-262 (Dept. Pathol., Royal Women's Hosp., Carlton, Victoria, Australia) Blood galactose can be estimated using 6% (v/v) o-amino-toluene and 0.1% (w/v) thiourea in pure acid, after removal from the blood of protein and glucose. 1 pg./ml. can be estimated. A simple and sensitive method could be of use in confirming congenital galactosaemia in the newborn infant. A.D. McS

2753. GLUCOSE AND RIBOSE OXIDATION BY PSEUDOMONAS FRAGI. M.Leroux and H.L.A.Tarr: Canad. Biochem., 1963, 41, 1023-1034 (Fisheries Res. Board Canada, Technol. Station, B.C., Canada) The action of sol. and particulate fractions of sonically disrupted cells of *Pseudomonas fragi* on glucose and ribose was studied. Ribose was oxidised by the particulate fraction to ribono-γ-lactone but no further. Glucose appeared to be oxidised by a single dehydrogenase largely present in the particulate fraction; the sol. fraction possessed only 4% of the dehydrogenase activity of the particulate fraction. The sol. fraction had a 1:10 tonase enzyme which hydrolysed glucono-6-lactone but not glucono-γ-lactone; the washed particulate fraction had no such lactonase activity. J.B.Parish

2754. TRANSFORMATION OF 2-DEOXYHEXOSSES. J.Kocourek, M.Ticha, V.Jíračka, J.Koštff: Biochim. biophys. Acta, 1963, 71, 497-501 (Biochem. Inst. der Karls-Univ., Praha, Czechoslovakia) Ethanolic extracts of 2-3 month old tobacco plants and fully grown sunflowers and seedlings of peas, wheat, maize and sunflowers, which had been supplied with 2-deoxy-D-glucose and 2-deoxy-D-galactose, were examined by paper chromatography. Prelim. confirm. (German) B.M.Steve

2755. CHANGE FROM LIVER TYPE TO MUSCLE TYPE FRUCTOSE METABOLISM IN HEPATOMAS. J.Ashmore, M.J.Sweeney, H.P.Morris and G.Weber: Biochim. biophys. Acta, 1963, 71, 451-453 (Pharmacol., Indiana Univ. Sch. Med., Indiana, Ind., U.S.A.) Slow growing hepatomas showed normal liver type fructose metabolism, but with increasing tumour growth rate, fructose utilisation through fructokinase tended to decrease and the hexokinase route became predominant. B.M. Steve

2756. TOXIC EFFECTS OF OXYGEN AT HIGH PRESSURE ON THE METABOLISM OF D-GLUCOSE BY DISPERSED

OF RAT BRAIN. JJ.Thomas, jun., E.M.Neptune, jun. and H.C.Sudduth: Biochem. J., 1963, 88, 31-45 (Naval Med. Res. Inst., Nat. Naval Med. Center, Bethesda, Md., U.S.A.) Marked and rapid depressions in the catabolism of D-glucose by cell-free dispersions of rat brain were observed during exposure to 02 at high pressure. Less than 30 min. of incubation in oxygen at < atm. resulted in greatly decreased production of $^{14}\text{CO}_2$ from D-[U-14C]glucose, [1-14C]pyruvate, [2-14C]pyruvate, a-oxo[5-14C]glutarate and DL-[1-14C]glutamate. The oxidation of [1-14C]acetate was slightly inhibited, whereas that of [1,4-14C]succinate remained unimpaired during exposure to 02 at high pressure. Incubations at 5 atm. pO₂ resulted in large increases in the production of lactate from D-glucose. Striking decreases in the activities of pyruvate oxidase and d-oxoglutarate dehydrogenase were observed during brief incubations of rat brain mitochondria in 02 at 5 atm.

²²57. UDP-D-GLUCURONIC ACID 5-EPIMERASE AND UDP-N-ACETYLGLUCOSAMINE 4-EPIMERASE OF RABBIT SKIN. BJacobson and E.A.Davidson: Biochim. biophys. Acta, 1963, 73, 145-151 (Dept. Biochem., a Puke Univ. Med. Center, Durham, N.C., U.S.A.) Both enzymes from skin extracts fractionated similarly in X²* (NH₄)₂SO₄. required NAD and were inhibited by NADH or NADP was inactive with both; thiamonotinamide adenine nucleotide and acetylpyridine adenine dinucleotide were less active than NAD. It is suggested that the inhibition of each epimerase by the other's substrate and by UDP-glucose, uracil, uridine and UDP may be explained by a specific binding of the base and/or sugar moiety to the enzymes. B.M.Stevens

²²58. PREPARATION OF CRYSTALLINE 6-DEOXY-6-AMINO-D-GLUCOSE-HYDROCHLORIDE AND CONSTITUTION OF CERTAIN INTERMEDIATES. EHädergger, G.Zanetti and KSteiner: Helv chim. Acta, 1963, 46, 282-287 (Org. chem. Lab. der Eidg. Technischen Hochschule, Zurich, Switzerland) This compound is of interest as a constituent of the antibiotic Kanamycin. It can be produced in preparative quantities (100 g.) by crystallization from acetic acid rather than methanol, after hydrolysis of the 6-deoxy-6-amino-(X-methyl Glucoside. A no. of errors in previous work are corrected. (German) A.D.Smith

²²59. 6-DEOXY-METHYL-a-D-GLUCOSIDE-6-SULPHONIC ACID. B.Helferich and W.Ost: Hoppe-Seylers Z. physiol. Chem., 1963, 331, 114-117 (Chem. inst. Univ. Bonn, 53 Bonn, Germany). (German) LCornish

²²60. A METHOD FOR THE DETERMINATION OF α -LACTOSAMINE IN THE PRESENCE OF β -GLUCOSAMINE. C.Ctissi and F.Serafini-Cessi: Biomed. j., 1963, 88, 132-136 (Istituto di Patologia of ff** Bolo'gris July) The determination of α -lactosamine is carried out by condensation of the amine sugar with acetylacetone in methanol in the presence of triethylamine and pyridine. The product of condensation is transformed into 2-methylpyrrole by heating at 100°C. The reaction with p-dimethylaminobenzaldehyde. colour reaction is separable. The range is 10-50%. Some of the D-Glucosamin intermediates and the mechanism is discussed.

²²61. SYNTHESIS OF N-AMINOACYL-GLUCOSAMINES WHICH CONTAIN ASPARTYL OR GLUTAMYL RESIDUES. M.Liefländer and K.Thomas: Hoppe-Seylers Z. physiol. Chem., 1963, 331, 154-163 (Med. Res. Inst. Max-Planck-Soc., 34 GOTtingen, Germany). (German) LCornish

²²62. COMPETITIVE INHIBITION OF 3-KETOSUCROSE FORMATION BY D-GLUCOSE. S.Fukui and R.M. Hochster: Biochem. biophys. Res. Comm., 1963, 11, 50-54 (Microbiol. Res. Inst., Res. Branch, Canada Dept. Agric., Ottawa, Canada) D-glucose was shown to be a stereospecific inhibitor of the conversion of sucrose to 3-ketosucrose by Agrobacterium tumefaciens. This effect was observed only with intact cells, and not cell free prep. B.Ketterer

²²63. CONVERSION OF SUCROSE TO (X-D-RIBO-HEXY-PYRANOSYL-3-ULOSE-p-D-FRUCTOFURANOSIDE BY CULTURES OF AGROBACTERIUM TUMEFACIENS. S.Fukui and R.M.Hochster: Bull. res. Coun. Israel, A, 1963, 11, 262-268 (Microbiol. Res. Inst., Canada Dept. Agric., Ottawa, Ontario, Canada) A new crystalline disaccharide was isolated from culture media of A. tumefaciens growing on sucrose. The compound was characterised by a variety of physical, chem. and enzymic techniques and shown to be (X-D-ribo-hexopyranosyl-3-ulose-3-D-fructofuranoside. L.G.Gillies

²²64. SYNTHESIS OF D-CHALCOSE. N.K.Kochetkov and A.LUsov: Tetrahedron Letters, 1963, 8, 519-521 (Inst. Chem. of Natural Products, Acad. Sci., Moscow, U.S.S.R.) Chalcose, one of the antibiotic chalco-mycin acid degradation products, was synthesised from methyl 4,6-O-benzylidene-3-O-methyl-2-O-tosyl-a-D-glucopyranoside. Letter. R. H. Kimberlin

²²65. FURTHER INVESTIGATIONS ON THE CARBOHYDRATE MOIETY OF EGG ALBUMIN. A.P.Fletcher, R.D.Marshall and A.Neuberger: Biochim. biophys. Acta, 1963, 71, 505-508 (Dept. Chem. Pathol., St. Mary's Hosp. Med. Sch., London, England) Prelim. comm. B.M.Stevens

²²66. TREHALOSE IN HUMAN AND ANIMAL TISSUES. LS.Loucomskaya and G.LTarasova: Vop. Med. Him., 1963, 9, 214-218 (Acad. Med. Sci. of U.S.S.R., Moscow. U.S.S.R.) (Russian) J.R*Sargent

²²67. GAS CHROMATOGRAPHY OF SUGARS AND OTHER POLYHYDROXY COMPOUNDS. R.Bentley, C.CSweeley, M.Makita and W.W.Wells: Biochem. biophys. Res. Comm., 1963, 11, 14-18 (Dept. Biochem. and Nutr., Graduate Sch. Publ. Hlth. and Biochem. Dept., Sch. Med., Univ. Pittsburgh, Pa., U.S.A.) Sugars and other polyhydroxy compounds in the form of trimethyl silyl deriv. have been successfully separated by gas chromatography. B.Ketterer

²²68. PROPERTIES OF HIGH MOLECULAR WEIGHT GLYCOGEN FROM RAT LIVER. RXaskov and E.Margoliash: Bull. res. Coun. Israel, A, 1963, 11, 351-362 (Dept. Expt. Med., Hebrew Univ.-Hadassah Med. Sch., Jerusalem, Israel) A method is described for the prep. of rat liver glycogen by extraction with phenol and water. The product is highly polydisperse and differential centrifugation showed mol. wt. ranging from 20 x 10⁶ to 400 x 10⁶. The intrinsic viscosity, the frictional ratio and the % of outer branches are independent of the mol. wt. High mol. wt. glycogen is particularly

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sensitive to degradation by acid and alkali at room temp, and by boiling at neutral pH. With repeated extractions the high mol. wt. glycogen was extracted first and later extracts contained the lower mol. wt. material.

L.G.Gillies

2769. BIOLOGICAL CONTROL OF GLYCOGEN METABOLISM IN AGROBACTERIUM TUMEFACIENS.

N.B.Madsen: Canad. J. Biochem.. 1963, 41, 561-571 (Microbiol. Res. Inst., Dept. Agric, Ottawa, Canada)

Glycogen and UDP glucose levels in cells of *A. tumefaciens* were determined at various stages of growth. The glycogen levels increased markedly during the lag phase, decreased during the exponential phase and increased again as growth ceased due to depletion of N from the medium. The UDP glucose concn. paralleled these changes. The addition of NH₄Cl to N-starved cells caused a prompt resumption of growth, a sharp decrease in UDP glucose concn. and a smaller decrease in glycogen concn.

J.B. Parish

2770. GLYCOGEN IN THE LENS OF BIRDS' EYES.

M.Rabaei. Nature, Lond., 1963, 198, 206-207 (Dept. Ophthalmol., Univ. Ghent, Belgium) Glycogen constitutes more than 10% of the dry wt. of the lens in most birds' eyes. It is absent from some birds that have no distinct flying habits. Its possible function is discussed.

G.M.Lewis

2771. GLYCOGEN FRACTIONS IN VARIOUS PARTS OF CHICK EMBRYO. Z.P.Zheludkova: Biokhimija, 1963, 28, 31-35. Glycogen fractions and free

glucose were assayed in the liver, muscles and yolk sac of the developing chick embryo. In the liver, bound glycogen was the predominating fraction up to the 12th day of incubation; after this, free glycogen became more important. In the muscle the bound fraction predominated, whereas the free fraction predominated in the yolk sac. Changes in the glucose concn. in all tissues tested corresponded to those in the bound glycogen fraction.

(Russian) B.J. Cooper

2772. DETERMINATION OF THE DEGREE OF POLYMERISATION OF OLIGOSACCHARIDES. L.Stewart and P.Nordin: Analyt. Biochem., 1963, 5, 175-178 (Dept. Biochem., Kansas State Univ., Manhattan, Kans., U.S.A.) The alk. Cu phosphate reagent for glucose determination described by Somogyi can be coupled with the anthrone method to provide a way of determining the degree of polymerisation of linear starch oligosaccharides. The degree of polymerisation is equal to the total glucose by the anthrone method divided by the glucose equiv. by the Somogyi method. A.D. Smith

2773. CHROMATOGRAPHY ON CELLULOSE PHOSPHATE OF POLYSACCHARIDE HYDROLASES FROM FUNGI. J.H.McClendon and J.H.Kreishen: Analyt. Biochem., 1963, 5, 295-312 (Dept. Agric. Biochem. and Food Technol., Univ. Delaware, Newark, Dela., U.S.A.)

The chromatographic behaviour at room temp, is described of 3 polygalacturonases (one exo and one end J), 2 xylanases (exo and endo), 2 cellulases and a no. of other enzymes on a column of cellulose phosphate in an almost linear pH gradient (2.2 to 7), produced by 0.05M each of citric acid, acetic acid and sodium chloride, and 0.05N NaOH in the reservoir.

A.D. Smith

2774. BIOSYNTHESIS OF CELLULOSE. VII. INTERACTION OF SOLUBLE CARBOXYMETHYLCELLULOSE WITH CELLULOSE FIBRES. L.Ohad: Bull. res. Counc. Israel, A, 1963, 11, 279-285 (Dept. Biol. Chem.,

Hebrew Univ., Jerusalem, Israel) Sol. CM-cellulose [14C-CMC] was incorporated into insol. cellulose fibre using *Acetobacter xylinum* cells. The incorporated material was not washed out by alkali or exchanged with external [12C]CMC. CMC was also incorporated by colloidal salt-precipitated hydrocellulose. The aggregation time of cells synthesising cellulose was delayed when CMC or several other polysaccharides were added to the system. Before onset of aggregation the cellulose synthesised in the presence of CMC would pass through filters which blocked the passage of cellulose fibres. The significance of this and its bearing on cellulose fibre formation in living plant cells was discussed.

L.G.Gillies

2775. METABOLISM OF FRUCTOSE POLYMERS IN PLANTS. m. ACTIVITY OF IF-FRUCTOSYLSUCROSE/SUCROSE TRANSFRUCTOSYLASE IN LIVING TISSUE OF HELIANTHUS TUBEROSUS L. J. Edelman, D.A.C. Recaldin and A.G.Dickerson: Bull. res. Counc. Israel, A, 1963, 11, 275-278 (Dept. Plant Physiol., Imperial Coll. Sci. Tech., London, England) [14C]Sucrose 0*

¹⁴CO₂ were used to label sol. carbohydrates in living tuber discs or in intact tubers attached to the plant. W this means exchange was demonstrated between free sucrose and the sucrosyl residues in IF-fructosyl sucrose. This process is caused by transfer of terminal fructose units from the trisaccharide to free sucrose. An identical reaction is known to be catalysed by an enzyme isolated from tuber tissue.

L.G.Gillies

2776. ISOLATION OF THREE POLYSACCHARIDES FROM THE HEMICELLULOSE B FRACTION OF CORN STALK. R.E.Grama and R.L.Whistler: Arch. Biochem., 1963, 101, 75-80 (Dept. Biochem., Purdue Univ., Lafayette, Ind., U.S.A.) A small amount of a glucan possesst heteroglycan of mol. wt. 23700 were obtained together with a neutral arabinoxylan of 16400 mol. wt. Compl hydrolysis of the last after full methylation produced 2-mono-O-methyl-D-xylopyranose, 2, S-di-O-methyl xylopyranose, 3,5-di-O-methyl-L-arabinofuranose, 2,3,4-tri-O-methyl-D-xylopyranose and 2,3,5-tri-O-methyl-L-arabinofuranose in a molar ratio of 3:6:2:3:1:2:0:2:0:1:0. These results and the physical character suggested a chain of (1-4)-D-xylopyranose units with short linear side chains terminating in L-arabinofuranose and D-xylopyranose unite.

B.M.

Steve

2777. CHEMICAL CONSTITUTION AND MACROMOLECULAR STRUCTURE OF CHONDROITIN SULPHATE PROTEIN [CSP]. E.Buddecke, W.Kroß and E.Lanig: Hoppe-Seylers Z. physiol. Chem., 1963, 331, I⁶? (Physiol. Chem. Inst. Univ., 74 Tübingen, Germany) The isolation and purification of CSP from cartilage artery tissue is described, coupled with pertinent phys. data. The action of cations leading to the formation of molecular aggregates, and tritins and papain degrad^ in yielding large amounts of serine is also discussed. It is suggested that CSP binds extracellular water and reg^ diffusion in the intercellular free space.

(German)

L.Cornell

2778. METABOLISM OF NEURAMINIC ACID IN ANIMALS. LV.Zvetkova: Vop. Med. Him., 1963, J 5c, 115-124 (Inst. Biol. and Med. Chem., Acad. M^{sc} of U.S.S.R., Moscow, U.S.S.R.) Review. 35 ref* (Russian)

2779. IDENTIFICATION OF A SULPHATED MUCOPOLYSACCHARIDE IN CHICK EMBRYOS, STAGES 11-23. S.Franco-Browder, J.De Rydt and A.Dorfman:

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Acad. ScL. Wash., 1963, 49, 643-647 (La Rabida Univ. Chicago Inst. and Dept. of Pediatrics and Biochem., Univ. Chicago, IL, U.S.A.) Papain-toeated chick embryo tissues from stages 11-12 to 23 contain a mucopolysaccharide with the same electro-Bboretic mobility as normally sulphated chondroitin ^Itfiae A. Hydrolysis with RNase, DNase, and hyal-Jfsonidase demonstrated that this material is sensitive to iatter. Marked incorporation of $^{35}\text{SO}_4$ was obtained *in vivo* by embryos stage 16-17 in this mucopolysaccharide. J Mck embryo stage 22-23 fractionation with cetyl-gtdinium chloride of the tissue extracts demonstrated Presence of mucopolysaccharides with different degrees of sulfiation judging by their electrophoretic mobility and salt solubility. J.R.Sargent

²⁷⁸ D. ACID MUCOPOLYSACCHARIDES OF HUMAN BRAIN: IDENTIFICATION BY MEANS OF INFRA-RED ANALYSIS. J.Clausen and A.Hansen: J. Neurochem., 1963, 10, 165-168 (Dept. Biochem., Univ. Copenhagen, Copenhagen, Denmark) A method is described for extracting acid mucopolysaccharide from human brain and its fractionation by ethanol pprn. Ir. spectrographs of these fractions demonstrated the presence of hyaluronic acid chondroitin sulfate and Sulfatase.

²⁷⁸ 1- SEPARATION OF TWO DISTINCT GALACTOSIDASES FROM THE SEED OF PLANT AGO OVATA. J.E.Courtois, F.Petek and T. Dong: Bull. Soc. Chim. France, Paris, 1963, 45, 95-100 (Lab. Chim. Biol. Pharm., Paris, France) Two distinct galactosidases were obtained by alumina column chromatography from seeds of *Plantago ovata*. These were shown to have different pH optima and Km values. Transfer of galactose from phenyl galactoside on to sucrose gave galactose in the first case and raffinose in the second. fFrench) j.C.Crawall

²⁷⁹ L GLYCOSYL TRANSFER BY LEVANSUCRASE AND QCTRANSUCRASE. F.Eisenberg, jun. and S-Hesmn. res. Counc Israel. A, 1963, 11, 269-274 (Nat. Inst. Arthritis and Metabolic Diseases, N.L.H., Bethesda, Md., U.S.A.) The nature of the carbohydrate moiety transferred by the polymerases, levan- α -dextranase and dextranase, was investigated. From the fact of incorporation of ^{18}O into sucrose synthesised by transferase from $[x\text{-}^{18}\text{O}]$ -glucose and raffinose the transfer was either fructosyl or fructosido. Sucrose was found to contain the theoretical amount of ^{18}O for fructosyl transfer and levan-sucrase is therefore a transfructosylase. The availability of the action of dextranase on sucrose to a growing chain of dextran. The dextran was found to be without excess ISO v. The indicated Blucosyl transfer. L.G.GUÜes

²⁷⁸³ CLEAVAGE OF FRUCTANS TO LEVANBIOSE-SPECIFIC HYDROLASE. G.Avigad and R.Zelikso.: Bull. Res. Counc. Israel, A, 1963, 11, 253-257 (Dept. Biol. Chem., Hebrew Univ., Jerusalem, Israel) A levan hydrolysing enzyme ($\beta_2,6$ -fructan- β -levanbiohydrolase) which cleaves the $\beta_2,6$ -fructofuranosidic linkage in various fructans is discussed. L.G.Gillies

²⁷⁸⁴ INSOLITUR-a-AMYLASE-DKTRIN COMPLEX. A.Levitzki and M.Schramm: Bull. Res. Counc. Israel, A, 1963, 11, 258-261 (Dept. Biol. C.W.I., Hebrew Univ., Jerusalem, Israel) Cryst. Pancreatica-amylase interacts with glycogen dextrins at 4° to form an msoi.

complex. Some prop. of this enzyme substrate complex are described. L.G.Gillies

²⁷⁸⁵ 0-GLUCURONIDASE ACTIVITY OF AORTA IN EARLY STAGES OF EXPERIMENTAL RABBIT ATHERO-SCLEROSIS. O.Mrhova, T.Zemplenyi and Z.Lojda: J. Atheroscler. Res., 1963, 3, 44-49 (Inst. Cardiovasc. Res., Prague-Krc, Czechoslovakia) There was a significant increase in the β -glucuronidase activity of rabbit aortae as early as 4 weeks, and 10 weeks after the beginning of daily cholesterol-fat feeding. These findings reflected early metabolic changes in the aortic connective tissue of cholesterol-fat fed rabbits. K.Jones

²⁷⁸⁶ THE MECHANISM OF CARBOHYDRASE ACTION. K. HYDROLYSIS OF SALEP MANNAN BY PREPARATIONS OF a-AMYLASE. P.Z.Allen and W.J.Whelan: Biochem. J., 1963, 88, 69-70 (Lister Inst., London, England) A report that the (X-amylases of *A. oryzae* and *B. subtilis*) attack salep mannan has been investigated. Crude prep. of the enzyme hydrolyse the polysaccharide but mannanase activity disappears when the enzymes are purified and crystallised. Several-times-cryst. specimens are virtually without action on the mannan. Cryst. a-amylases of human saliva and pig pancreas similarly have no appreciable action on the polysaccharide. *

²⁷⁸⁷ IMPROVED PROCEDURES FOR PREPARATION AND CHARACTERISATION OF MYROTHECIUM CELLULASE. I. PRODUCTION OF ENZYME. D.R.Whitaker and R.Thomas. H. PURIFICATION PROCEDURES. D.R.Whitaker, K.R.Hanson and P.K.Datta. III MOLECULAR WEIGHT, AMINO ACID COMPOSITION, TERMINAL RESIDUES AND OTHER PROPERTIES. P.K.Datta, K.R.Hanson and D.f.c.Whitaker. IV. CHARACTERISATION OF ACTIVITY TOWARD (3-METHYL GLYCOSIDES OF 1- \rightarrow 4-8-D-OLIGOGLUCOSIDES. E.G.Hanstein and D.R.Whitaker: Canad. J. Biochem., 1963, 41, 667-670, 671-696, 697-705, 707-718 (Div. Appl. Biol., Nat. Res. Council, Ottawa, Canada) I. An improved procedure for the production of cellulase by *Myrothecium verrucaria* is described. The mould was grown in 2 stages in the same culture vessel: firstly on a semisolid medium of ground cotton linters moistened with a soln. of inorg. salts, and then, by addition of further salt soln. in submerged culture. The first stage consisted of incubation at 30° in darkness for 7 days, supplied with air at approx. 0.5 l/min. The second stage in submerged culture was continued for 10 days, then the cellulase from the first batches of filtrate was purified.

II. Two methods for the purification of cellulase from *Myrothecium* culture filtrates are described. Method 1 consisted of (a) fractionation with $(\text{NH}_4)_2\text{SO}_4$, (b) elution through Sephadex G 25, (c) elution through Sephadex G75, (d) pptn. with polymethacrylic acid and (e) elution through Amberlite CG50 with citrate buffer containing a gradient of urea concn. Method 2 consisted of pptn. with sat. $(\text{NH}_4)_2\text{SO}_4$, (b) and (d) as above, elution through DEAE cellulose with phosphate buffer containing 7M urea, followed by (b) and (c) as above. The products of both methods were identical in sp. activity towards CMcellulose and the increase in sp. activity was 12-fold.

III. The mol. wt. of *Myrothecium* cellulase was estimated by the Archibald method to be approx. 49000. No N-terminal amino acid could be detected by the Edman degradation or with fluorodinitrobenzene. Hydrazinolysis gave glycine as the C-terminal amino acid. No free sulphydryl groups could be detected in the enzyme. The amino acid composition and the fingerprint pattern after

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tryptic digestion were determined.

IV. Two methods for the preparation of β -methyl glycosides of 1->4-3-D-oligoglucosides are described. In method 1 the parent oligoglucoside was acetylated, acetobrominated, methylated, fractionated on Magnesol and deacetylated. In method 2 an acetolysate of cellulose was acetobrominated, methylated, deacetylated and fractionated on Darco G60 charcoal. The kinetics of the hydrolysis of 3-methyl cellobetaoside by purified M⁺rothecium cellulase at pH 5*0 and 28*6° were studied.

J.B. Parish

2783. RAT INTESTINAL SUCRASE. I. INTESTINAL DISTRIBUTION AND REACTION KINETICS.

D.G.R.Blair and J.Tuba. II. EFFECTS OF RAT AGE AND SEX AND OF DIET ON SUCRASE ACTIVITY.

D.G.R.Blair, W.Yakimets and J.Tuba: Canad. J.

Biochem., 1963, 41, 905-916, 917-929 (Dept. Biochem., Univ. Alberta, Edmonton, Alberta, Canada)

I. Sucrase activity was measured in aq. homogenates of 10 cm. sections of the intestine; the activity in normal adult male rats was associated mainly with the first half of the small intestine, a trace in the colon but none in any other tissues examined. The optimum pH was 6'25, optimum substrate concn. was 0'12M to 0-5M sucrose and Km was 0#0128M. At the sucrose concn. used (0'161M) for routine assay the enzyme action was zero order for 20 min. and sucrase action followed the Arrhenius equation between 5° and 37° and an activation energy of 10100 cal/mol. was calc.

II. The sucrase activity of rats of 23 days was approx. two-thirds that of adult rats but sex had no effect on enzyme activity. Sucrase activity fell rapidly during the first 2 to 4 days of fasting. When compared with a carbohydrate-free, high-casein control diet, diets containing IQPfo of sucrose, galactose, melitose, OL-methyl-D-glucoside, fructose or maltose produced increased sucrase activity in the intestine, but glucose, mannose, xylose and lactose did not increase sucrase activity. A 70% raffinose diet decreased sucrase activity. J.B.Parish

2789. SPECIFICITY OF YEAST GLUCOSE 6-PHOSPHATE DEHYDROGENASE FOR D-GLUCOSE.

S.P.Colowick and E.B.Goldberg: Bull. res. Counc. Israel, A, 1963, 11, 373-378 (Dept. Microbiol., Vanderbilt Univ., Nashville, Tenn., U.S.A.)

A glucose 6-phosphate dehydrogenase prep. from yeast acted on non-phosphorylated sugars when these were added in high concn. When a- and 3-D-glucose were compared, the 3-anomer was oxidised slowly until mutarotation occurred. Of the other sugars tested, L(-)-xylose, D(+)-xylose, D(-)-arabinose and L(-)-fucose were also acted upon. These, like (X-D)-glucose, all showed the same dependence on prior mutarotation for rapid oxidation. It is proposed that the physiol. substrate for the enzyme is the β -anomer of D-glucopyranose-6-phosphate. L.G. Gillies

2790. A COMPARATIVE MAPPING OF ENZYMES INVOLVED IN HEXOSE MONOPHOSPHATE SHUNT AND CITRIC ACID CYCLE IN THE BRAIN.

R.L.Friede, L.M.Fleming and M.Knollen: J. Neurochem., 1963,

10^263-277 (Mental Health Res. Inst., Univ. Michigan, Ann Arbor, Mich., U.S.A.) Cytochrome oxidase

(CO), succinic dehydrogenase (SDH), NAD-diaphorase, NADP-diaphorase, glucose-6-phosphate-, 6-phosphogluconic-, lactic- and malic-dehydrogenases were measured in various regions and 'nuclei*' of human and rhesus monkey brain by chem. and histochem. means. Within individual cells hexosemonophosphate [HMP] shunt and glycolytic enzyme were richer in the perikaryon

than in dendrites or neuropil. These enzymes were also richer in white matter oligodendroglia than nerve cells. 15 'nuclei' were found to be very low in GO and SDH activity but rich in HMP shunt enzymes and lactic dehydrogenase. The general distribution pattern of these enzymes is otherwise similar throughout the brain and between the 2 spp.

R. Woodman

2791. EFFECT OF GLYCOLYTIC ENZYMES ON THE METABOLISM OF TUMOUR CELLS. VII. VARIATION OF ACTIVITY OF FRUCTOSE 1,6-DIPHOSPHATE IN HEPATOMA AND ALLOXAN DIABETIC RATS.

E.HeisC C.Kleitke and M.Gflrich: Z. Naturforsch B, 1963, 18, 31-35 (Inst. Med. und Biol., Forschungsgemeinschaft, Deutschen Akad. der Wissenschaften, Berlin, Germany).

The increase of glucose 6-phosphatase and fructose 1,6* diphosphatase [FDPase] in the liver of alloxan diabetic rats and rabbits was proportional to the increase in blood sugar. The FDPase activity in liver was in the order diabetic > normal > hepatoma. The proteolytic activity of FDPase was greater in normal than in diabetic liver and was low in hepatoma liver.

(German) J.C.CrawhaU

2792. ENZYMES IN GLYCOLYSIS BY MICROSONES OF EHRLICH ASCITIC TUMOUR.

K.N.Sorokin: Biokhirkft

1963, 28, 18-21. A study was made of the enzymu^c reactions defining the rate of glycolysis in the microsomes of the Ehrlich ascitic tumour. It was shown that hexokinase played the role of such an enzyme. The uneven distribution of hexokinase accounted for its deficiency i^c the microsomes. The significance of the mitochondria i^c regulating glycolysis in the microsomes is discussed.

(Russian) B.J.Cooper

2793. TRANSGALACTOSYLASE ACTIVITY OF STREPT⁺ COCCUS LACTIS.

S.LNovikova: Biokhimia, 1963,

28, 13-17. Enzyme extracts of a strain of S. lactis acted on lactose to cause the appearance in the medium of free galactose and glucose, and also 3 oligosaccharid* consisting of galactose and glucose residues. In all these 3 the galactose content was much greater than that of glucose. Formation of these compounds appeared to be the result of transgalactosylation involving transfer of glucose to the respective acceptor.

(Russian) B.J.Coopet

2794. INTERACTION OF A RAT KIDNEY ENDOPLASM^C RETICULUM FRACTION WITH GLYCOLYTIC ENZYMES.

V.D.Jones, J.L.Norris and E.J.Landon:

Biochim. biophys. Acta, 1963, 71, 277-284 (Dept. Pharmacol., Vanderbilt Univ. Sch. Med., Nashville, Tenn., U.S.A.) The membrane prep. stimulated glycolytic activity by over 50%. The site of stimn. was shown to be the 3-phosphoglycerate kinase reaction, tW ATPase of the membrane prep. apparently interacting with ATP associated with the kinase. The membrane prep. also oxidised NADH2 generated by glycolysis.

B.M.Steve#

UPIDS AND STEROIDS

2795. MICRODETERMINATION, ISOLATION AND LIQUID CHROMATOGRAPHY OF 2-HYDROXY FA

ACIDS.

Y.Kishimoto and N.S.Radiru: J. lipid Res.

1963, 4, 130-138 (Mental Hlth. Res. Inst., Univ.

Michigan, Ann Arbor, Mich. U.S.A.) A method

described for the sp. isolation of 2-hydroxy fatty acids

Particularly from brain lipids. The procedure involves saponification of the lipids with KOH-propylene glycol, followed by purification with a small silica gel column, and pptn. as the Cu chelate. The total content of 2-hydroxy acids may be determined by direct colorimetric determination of the Cu in the ppt., or the acids may be derated and analysed by gas-liquid chromatography.

J.R. Sargent

^96. THE COLORIMETRIC MICRO-DETERMINATION OF LONG-CHAIN FATTY ACIDS. W.G.Duncombe: Biochem. J. 1963, 88, 7-10 (Wellcome Res. Lab., Beckenham, Kent, England) A colorimetric procedure is described for the determination of long-chain fatty acids in the range 0.05-0.5 μ mole in 5 ml. The method can be applied to C10-C12 sat. acids and to linoleic acid, oleic acid, linoleic and linolenic acid. Water-sol. soaps of the acids can also be determined, and there is no interference from cholesterol, sterol esters or triglycerides except in very high concn. For a single acid an accuracy of $\pm 2\%5\%$ (S.D.) mid-range can be obtained with 1 determination. For mixtures of acids there is some loss of accuracy.

^97. SOME OBSERVATIONS ON ESTIMATION OF NON-ESTERIFIED FATTY ACID [NEFA] CONCENTRATIONS IN COW AND SHEEP PLASMA. S.P.Patterson: Res. vet. Sci., 1963, 4, 230-237 (Cernt. Vet. Lab., Weybridge, England) A modification of Dole's method was used to estimate NEFA concn. in cow and sheep plasma as a measure of the rate of fat mobilisation. When paired samples were taken from starved sheep at approx. 13 min. intervals there was an increased concn. in the second sample, presumably due to nervous activity stim. by the first sampling. J.B-Derbyshire

^98. INHIBITION OF TUMOUR GLYCOLYSIS BY OZONE PEROXIDE FORMED FROM AUTOXIDATION OF UNSATURATED FATTY ACIDS. N. Baker and G.Wilson: Biochem. biophys. Res. Commun. 1963, 11, 854 (Radioisotope Serv., V.A. Center and Dept. Chem., Sch. Med., Univ. California, Los Angeles, Calif., U.S.A.) U.v.-irradiation of unsat. fatty acids produces water sol. material which inhibits enz. in Ehrlich ascites cells. This material has been identified as H_2O_2 . B.Ketterer

^99. STEREOISOMER FORMATION ON THE OZONISATION OF ESTERS OF MONOUNSATURATED FATTY ACIDS. O-S.Privett and E.C.Nickell: J. lipid Res., 1963, 4, 208-211 (Univ. Minnesota, Hormel Inst., Minn., U.S.A.) The formation of stereoisomers of ozonides on the ozonisation of methyl esters of unsat. fatty acids in pentane at 70° was demonstrated by thin layer chromatography, i.r. spectra and analyses. The cis- and trans-isomers of ozonides (t_i^2 and t_i^3 trans-methyl 9-octadenoates (methyl oleate and elaidate) were isolated and characterised.

J.R. Sargent
100. OCCURRENCE OF 2-HYDROXY FATTY ACIDS IN MAMMALIAN TISSUES. Y.Kishimoto and N.S.Radin: Res. Bull. Univ. Michigan, Ann Arbor, Mich., U.S.A.) Determination of 2-hydroxy fatty acids in rat spleen, sciatic nerve and skin, and in bovine liver were determined by a Cu pptn. method, and the various hydroxy acids were determined by gas-chromatography. Two groups of hydroxy

acids were observed, short chain (16 h:O as major component) and long chain (24 h:O as major component). The relative proportions of the 2 groups varied with the tissue. No 2-hydroxy acids could be found in liver or epididymal fat. The 2-hydroxy acids of brain occur only in amide linkage.

J.R. Sargent

2801. BIOSYNTHESIS OF FATTY ACIDS. IV. STUDIES WITH INHIBITORS. J.D.Robinson, R.O.Brady and R.M.Bradley: J. lipid Res., 1963, 4, 144-150 (Lab. Neurochem., Nat. Inst. Neurol., Dis. and Blindness, N.I.H., Bethesda, Md., U.S.A.)

Tetralyl-CoA and propiolyl-CoA have been shown to be strong noncompetitive inhibitors of fatty acid synthesis. A crylyl-CoA and isocrotonyl-CoA also inhibit but at higher concn. Palmityl-CoA and free CoA also inhibit fatty acid synthesis and also block the condensation of acetyl-CoA with malonyl-CoA and the reduction of crotonyl-CoA to butyrate. These materials did not inhibit the reduction of acetoacetyl-CoA to the P-hydroxy deriv. although the complete reduction to butyrate was prevented. Addition of flavin nucleotides also inhibits fatty acid synthesis catalysed by brain enzyme prep.

J.R. Sargent

2802. PARTICIPATION OF MALONYL COENZYME A IN BIOSYNTHESIS OF MEVALONIC ACID. J.D.Brodie, G.Wasson and J.W.Porter: J. biol. Chem., 1963, 238, 1294-1301 (Radioisotope Unit, V.A. Hosp., Madison, Wis., U.S.A.)

A new pathway for biosynthesis of mevalonic acid utilises acetyl- and malonyl-CoA as substrates; the intermediate reactions are catalysed by a purified pigeon liver enzyme system in presence of NADH₂ phosphate and a thiol. This same system also utilises acetyl- and malonyl-CoA for synthesis of fatty acids. Biol. active 3-hydroxy-0-methylglutaryl CoA is formed when NADH₂ phosphate is absent from the incubation mixture. This compound and acetoacetyl CoA are not obligatory intermediates in synthesis of mevalonic acid from acetyl- and malonyl-CoA. The significance of the results is discussed.

J.N.Ashley

2803. CONDENSATION REACTION OF FATTY ACID BIOSYNTHESIS. II. REQUIREMENT OF ENZYMES OF CONDENSATION REACTION FOR FATTY ACID SYNTHESIS. P.Goldman, A.W.Alberts and P.R. Vagelos: J. biol. Chem., 1963, 238, 1255-1261 (Enzyme Section, Lab. Cell. Physiol., Nat. Heart Inst., Bethesda, Md., U.S.A.) Sol. bacterial synthetase systems from *Clostridium kluyveri* and *E. coli* catalyse synthesis of long chain fatty acids from malonyl CoA, acetyl CoA, and NADPH₂. Sat. fatty acids only are produced in the system from *C. kluyveri* where FMN and an unidentified cofactor are present, but sat. and unsat. acids are produced in *E. coli*. The 2 synthetase systems are fractionated; over-all fatty acid synthesis depends on the same thermostable and thermolabile enzymes that catalyse the condensation reaction. But synthesis of butyrate in extracts of *C. kluyveri* does not need malonyl CoA nor the enzymes that catalyse the condensation reaction.

J.N.Ashley

2804. PHOSPHOGLYCERIC ACID KINASE ACTIVITY AND ITS ROLE IN ADIPOSE TISSUE. G.Rose and B.Shapiro: Bull. Res. Coun. Israel, A, 1963, 11, 384-386 (Dept. Biochem., Hebrew Univ.-Hadassah Med. Sch., Jerusalem, Israel)

The presence of a highly active 3-phosphoglyceric acid kinase in adipose tissue was demonstrated by means of hydroxamate formation as well as by coupling with glyceraldehyde-

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phosphate dehydrogenase. Considerable activity of the latter enzyme was also found in the adipose tissue extract. Both enzymes were shown to be part of a chain of reactions which forms the glycerol moiety of fatty acid-glycerides from pyruvate.

L.G.Gillies

2805. MECHANISM OF ACTIVATION OF HOG PAN-CREATIC LIPASE BY SODIUM TAUROCHOLATE. P.J.Fritz and P.Melius: *Canad. J. Biochem.*, 1963, 41, 719-730 (Sch. Chem., Auburn Univ., Auburn, Ala., U.S.A.) A new stable prep. of hog pancreatic lipase is described. From a study of the composition of the reaction mixtures after enzymic hydrolysis with and without taurocholate, it appeared that the hydrolysis of triglyceride to diglyceride was facilitated and that of diglyceride to monoglyceride was depressed by the presence of taurocholate. From the rates of hydrolysis of triolein, monoolein, tributyrin and monobutyrin in the presence and absence of taurocholate it appeared that taurocholate acted by splitting the diglyceride-enzyme complex, thereby increasing the action of the enzyme on the triglyceride.

J. Parish

2806. PHOSPHOLIPASE D ACTIVITY IN A NON-HAEMOLYTIC CORYNEFORM BACTERIUM. K.Fossum and T.Hoyem: *Acta path. microbiol. scand.*, 1963, 57, 295-300 (Dept. Microbiol., Vet. Coll., Oslo, Norway) The ability to produce choline from lecithin has been demonstrated in strains of a non-haemolytic coryneform bacterium. Lecithinase D production is not necessarily associated with haemolytic activity. This may help to distinguish the non-haemolytic coryneform bacterium from *Corynebacterium pyogenes*. A paper chromatography method is described for the demonstration of choline.

LFriedmann

2807. DISTRIBUTION OF ALPHA GLYCERYL ETHERS IN ANIMAL TISSUES. S.Nakagawa and J.M.McKibbin: *Proc. Soc. exp. Biol.*, N.Y., 1962, 111, 634-636 (Dept. Biochem., State Univ. New York, Coll Med., Syracuse, N.Y., U.S.A.) A method for determination of lipid CX-glyceryl ethers in animal tissue is described. These compounds were found in small quantities (0.2-1.35 fmoles/g. of dry lipid-free tissue) in all tissue examined except bone marrow.

M.M.Shapland

2808. CONSTITUENTS OF LIPIDS OF TUBERCLE BACILLI DC. N.Polgar and W.Smith: *J. chem. Soc.*, 1962, 4264-4265 (Dyson Perrins Lab., Univ. Oxford, England) Note.

L.G.Gillies

2809. IDENTIFICATION OF LIPIDS IN BLOOD THROMBOPLASTIN. H. P. Bentley, jun.: *Proc. Soc. exp. Biol.*, N.Y., 1962, 111, 757-759 (Dept. Paed., Univ. Alabama Med. Cen., Birmingham, Ala., U.S.A.) Lipids from blood thromboplastin were identified by column and paper chromatography as inositol phosphatide, lecithin, sphingomyelin, phosphatidyl serine, phosphatidyl ethanolamine and cholesterol. Despite wide variations in thromboplastic activity in 70 samples of blood thromboplastin, there was no change in the presence of any of the lipids.

M.M.Shapland

2810. LIPID EXTRACTION AND DISTRIBUTION STUDIES OF EGG YOLK LIPOPROTEINS. W.G.Martin, N.H. Tattrie and W.H.Cook: *Canad. J. Biochem.*, 1963, 41, 657-666 (Div. Appl. Biol., Nat. Res. Council, Ottawa, Canada) The 3 lipoproteins of egg yolk have been isolated and their lipid compositions determined. The

a- and 6-lipovitellin comprised 22-26% lipid of which 61% was phospholipid, 35% triglyceride and 4% cholesterol and its esters. The low density fraction contained approx. 89% lipid of which 27% was phospholipid, 69% triglyceride and 4% cholesterol and its esters. In all fractions the phospholipids contained 74% lecithins, 18% cephalins and 8% minor phospholipids. Gentle extraction of the low density fraction with ethyl ether left a residue containing 52% lipid which sedimented into 5 component in the ultracentrifuge.

J.B. Parish

2811. CATALYSIS OF UNSATURATED LIPID OXIDATION BY IRON PROTOPORPHYRIN DERIVATIVES.

W.Duane Brown, L.S.Harris and H.S.Olcott: *Arch. Biochem.*, 1963, 101, 14-20 (Inst. Marine Resources Dept. Nutritional Sci., Univ. California, Berkeley, Calif., U.S.A.) MetHb, metmyoglobin, imidazole Hb hemichrome, imidazole myoglobin hemichrome, CO-Hb, oxyHb and NO-Hb were all active catalysts, although some of the Fe²⁺ forms showed induction periods. When catalysts were extracted and examined spectrophotometrically Fe²⁺ forms of haematin compounds were converted to Fe³⁺ on extraction. Denatured metHb and NO-Hb behaved similarly to the native proteins.

B.M. Stevens

2812. LIPIDS OF ASPOROGENIC YEAST-LIKE FUNGO^{OF} THE GENUS CANDIDA. N.P.Yelinov and N.A.

Zaikina: *Vop. Med. Him.*, 1963, 9, 177-180 (Inst. Chem. and Pharmacol., Leningrad, U.S.S.R.)

Stearic, palmitic, lauric, petrosolic and linoleic acids, were present in lipids from the fungoids. Linolenic acid, but not stearic acid, was present in lipids from the fung C. krusei.

J.R. Sargent

2813. APPARATUS FOR PRODUCTION OF CONCAVE GRADIENTS AND ITS APPLICATION TO CHROMATOGRAPHY OF LIPIDS. G.J.Nelson: *Analyst. Biochem.*, 1963, 5, 116-132 (Donner Lab. of Biophysics and Med. Physics, Univ. California, Berkeley, Calif. U.S.A.) An automatic method for the column

chromatographic separation of lipid mixtures, particu^{of} phospholipids, utilising concave gradient elution is described in detail. The gradient in this system is produced by an automatic pumping system using accurate controlled volume pumps and variable pumping rates. A discussion of the theoretical aspects of gradient elution, in relation to nonlinear absorption isotherms is include^d and several chromatographic runs using the system are presented.

A.D. Sin^{et al.}

2814. DAMAGE TO PROTEINS BY PEROXIDISED LIPIDS.

L.D.Desai and A.L.Tappel: *J. lipid Res.*, 1963, 4, 204-207 (Dept. Food Sci. and Technol., Univ. California, Davis, Calif., U.S.A.) Addition reac^{to} of peroxidising linolenic acid with cytochrome c was studied using [14C]linolenic acid. Considerable dan^{to} occurred to cytochrome c in the presence of peroxide^{to} linolenic acid as judged% decreased solubility of ^ protein. Amino acids which were labile to oxidation^{to}, not present in the linolenic-peoxy-cytochrome f P^{10,20}, 70% of the linolenic acid was bound to cytochrome g peroxy bonds the remainder being bound by ether or possibly carbon-carbon bonds.

J.R.S^{et al.}

2815. HIGHLY SENSITIVE METHOD FOR MEASUREMENT OF LIPID HYDROPEROXIDES BY IODIMETRY AND AMPEROMETRIC END POINT. K.Oette, M.L.T.^{et al.} and R.L.McAuley: *J. lipid Res.*, 1963, 4, 212-21*

(Rockefeller Inst., New York, U.S.A.) A simple, accurate and highly sensitive method is described for Measurement of lipid hydroperoxides, utilising standard iodometric reactions and an amperometric end point. Measurement of 10^{18} equiv. of hydroperoxides is feasible in samples of mg. size. Several parameters of the analysis have been defined. J.R.Sargent

²⁸16. PURIFICATION AND ANALYSIS OF PHYSIOLOGICALLY ACTIVE LIPIDS. J.N.Hawthorne: Biochem. Pharmacol., 1963, 12, 401-403 (Dept. Med. Biochem., Med. Sch., Univ., Birmingham, England) Modern methods for the isolation and identification of small quantities of physiol. active lipids are discussed. L.G.Gillies

²⁸17. INFLUENCE OF HAIR GROWTH CYCLE ON THE TRIGLYCERIDE FATTY ACID COMPOSITION OF MOUSE EPIDERMIS. C.Carruthers and A.Heining: Proc. Soc. exp. Biol., N.Y., 1963, 112, 278-280 (Dept. Biochem. Res., Roswell Park Mem. Inst., Buffalo, N.Y., U.S.A.) Mouse hairs were plucked and then the triglycerides of the epidermis were studied 8 to 22 days afterwards in ♂ and ♀ mice. Up to 4 days ^{♂♀} was no sex difference and the situation with regard to triglycerides had not altered up to the 22nd day, Pleic acid ZS% linoleic acid 35%, palmitic acid 18%), but at 12 and 22 days in ♀ there was far more oleic acid present and far less linoleic acid. D.N.Wheatley

²⁸18. LOCALISATION OF BLOCK IN LIPOGENESIS RESULTING FROM FEEDING FAT. W.Bortz, S.Abraham and LL.Chaikoff: J. biol. Chem., 1963, 238, 1266-1272 (Dept. Physiol., Univ. California, Berkeley, Calif., U.S.A.) There is decreased conversion of acetate-C into fatty acids as early as 2 hr. After administration of 2 ml. of maize oil to rats previously fed a fat-free, high carbohydrate diet. The decrease in fatty acid synthesis is most marked 4 hr. after feeding the fat. This decrease is more pronounced in liver slices than in the system composed of supernatant + action plus microsomes. This action of fat feeding is connected with an impaired ability of slices or homogenates to oxidise glucose. In presence of $\frac{14}{14}\text{C}$ IL¹⁴lumcoen. of ATP and CoA, synthesis of fatty acid from ¹⁴C-labeled ¹⁴lumcoen. of ATP and CoA, synthesis of fatty acid in the system of supernatant plus microsomes of livers of fat-fed rats is still decreased. Generation of ¹⁴NADPH₂ from NADP and citrate in the particle free system is not impaired by feeding of fat. Synthesis of fatty acid from acetyl CoA in fat-fed rats is blocked at acetyl CoA carboxylase step. J. N.Ashley

²⁸19. TECHNIQUE FOR THE DETERMINATION OF FEWJM GLYCERIDES. AJover: J. lipid Res., 1963, 24, 228-230 (Washingtonfosp. Centre, Washington, D.C., U.S.A.) Glycerides are hydrolysed to glycerol. Kinetics is an estimated colorimetrically by a periodic phenyl hydrazine procedure. J.R.Sargent

²⁸20. PHENETHYLBIGUANIDE [PEPG] AND TRIGLYCERIDE SYNTHESIS. C.Longcope and R.H. Williams: Soc. exp. Biol. N.Y., 1962, 111, 775-777 (Dept. Me¹⁴o¹⁴n. Univ. Washington Sch. Med., Seattle, Wash., U.S.A.) In vitro studies on triglyceride synthesis in rat epididymal fat pads showed that in intact ¹⁴VcL¹⁴PG interferes with conversion of di- to tri-glyceride and in homogelH¹⁴L¹⁴Tes increases the incorporation of ¹⁴Ued fatty acid into triglyceride. M.M.Shapland

2821. MOLECULAR INTERACTION BETWEEN PHOSPHOLIPIDS AND SALTS AT AIR AND LIQUID-LIQUID INTERFACES. H.L.Rosa no, H.Schiff and J.H.Schulman: J. phys. Chem., 1962, 66, 1928-1932 (Stanley-Thompson Lab., Henry Krumb Sch. Mines, Columbia Univ., New York, U.S.A.) The duplex film method has been used to investigate the interaction between polyvalent salts and cephalin at the water-oil interface. The interaction appears to be dependent on the valency of the salts and the penetration of n-hexadecane into the mixed alkyl-cephalin monlayer. G.C.Barr

2822. THIN LAYER CHROMATOGRAPHY OF PHOSPHOLIPIDS USING SILICA GEL WITHOUT CALCIUM SULPHATE BINDER. V.P.Skipski, R.F. Peterson, J.Sanders and M.Barclay: J. Lipid Res., 1963, 4, 227-228 (Div. Exp. Chemotherapy, Sloan-Kettering Inst. for Cancer Res., Rye, N.Y., U.S.A.) The use of silica gel without calcium sulphate for thin-layer chromatography gives better separation of some phospholipids, especially in the cephalin group. J.R.Sargent

2823. RAPID QUANTITATIVE SEPARATION OF PHOSPHATIDYL ETHANOLAMINE AND PHOSPHATIDYL SERINE BY COLUMN CHROMATOGRAPHY. H.L.Spitzer and J.A.Balint: Analyt. Biochem., 1963, 5, 143-148 (Dept. Med., Univ. Alabama Med. Center, Birmingham, Ala., U.S.A.) A rapid quant. separation of phosphatidyl ethanolamine from phosphatidyl serine on an ammonium silicate column is described. It is more convenient and less time consuming than earlier methods. Elution is with chloroform: methanol (4:1) followed by methanol. Complete separation is achieved.

A.D. Smith

2824. PHOSPHOINOSITIDES. V. THE INOSITOL LIPIDS OF OX BRAIN. R.B.Ellis, T.Galliard and J.N.Hawthorne: Biochem. J., 1963, 88, 125-131 (Dept. Med. Biochem. and Pharmacol., Med. Sch., Birmingham, England) The Folch 'diphosphoinositide' fraction of ox brain was prep. and hydrolysed under mild alk. conditions. The hydrolysis products were separated on Dowex 1 columns and characterised. It was concluded that ox brain contains 3 phosphoinositides: 1-phosphatidylinositol, diphosphoinositide [1-phosphatidyl(inositol 4-phosphate)] and triphosphoinositide [1-phosphatidyl(inositol 4,5-diphosphate)]. Triphosphoinositide was the major component. Evidence was obtained that free inositol diphosphate occurs in ox brain. *

2825. OCCURRENCE OF A LONG-CHAIN ETHER ANALOGUE OF PHOSPHATIDYLETHANOLAMINE IN BRAIN TISSUE. G.B.Ansell and S. Spanner: Biochem. J., 1963, 88, 56-64 (Dept. Expt. Neuropharmacol., Med. Sch., Birmingham, England) After fractionating total brain lipids on an alumina column the ethanolamine-containing phospholipids were further separated by selective hydrolysis, followed by chromatography on silicic acid and Florisil. About 3% of the phospholipids in the brain behaved after saponification like a glycerol-1-alkoxy-3-phosphorylethanolamine. Comparison with synthetic material was made and details of further hydrolysis of the brain lipid and synthetic phospholipid are given. •

2826. ASSAY OF THE RADIOACTIVITY OF THE ALDEHYDOGENIC MOIETY OF PLASMALOGENS. E.M.Neptune, jun. and R.S.Ide: J. lipid Res., 1963, 4, 226 (Naval Med. Res. Inst., Nat. Naval Med. Center, Bethesda, Md., U.S.A.) A method is

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described for separation of palmitic acid and palmitaldehyde hydrazone using thin-layer chromatography. The hydrazone can be eluted for radioactivity assay, recovery being 92-95% of applied hydrazone. J.R.Sargent

2827. METABOLISM OF PLASMALOGEN. XL THE DETERMINATION OF ALKENYL ESTERS IN THE PRESENCE OF FREE ALDEHYDES. H.R. Warner and W.E.M.Lands: *J. lipid Res.* 1963, 4, 216-220 (Dept. Biol. Chem., Univ. Michigan, Ann Arbor, Mich., U.S.A.) A rapid and sensitive method for the analysis of alkenyl ethers (plasmalogens) in the presence of free aldehyde is proposed. The method is applicable over the range 0⁰02-0² jmoles of plasmalogen and is particularly useful for following the course of enzymic or chem. reactions in mixtures containing both free aldehydes and plasmalogens in aq. media. J.R.Sargent

2828. ERYTHROCYTE PHOSPHOLIPIDS IN THE NEW-BORN INFANT. H.P.Bentley, jun.: *Proc. Soc. exp. Biol.* N.Y., 1962, 111, 591-592 (Dept. Paed., Univ. Alabama Med. Cen., Birmingham, Ala., U.S.A.)

The total phospholipids from both the entire r.b.c. and the cell stroma of the newborn infant are equal to those of the adult. M.M.Shapland

2829. CHROMATOGRAPHIC SEPARATION, IDENTIFICATION AND ANALYSIS OF PHOSPHOLIPIDS OF THE INTESTINAL MUCOSA OF THE YOUNG RAT.

J.Clement and G.Di Costanzo: *Bull. Soc. Chim. biol.* Paris, 1963, 45, 127-136 (Lab. Physiol. Animale. Fac. Sci., Dijon, France) Phospholipids of the intestinal mucosa of young rats were separated on silicic acid columns. The various fractions were purified and characterised by thin layer chromatography on kieselguhr. The major constituents were lecithins (35%) and phosphatidic acids (20%). The phosphatidic acids of ethanolamine and serine, inositol cephalin, plasmalogen, lecithins, lysolecithins, sphingomyelin and a trace of lysocephalin were identified. (French) J.C.Crawhall

2830. CEREBROSIDE-SULPHATE-ESTER CLEAVING ENZYME FROM SWINE KIDNEY. E.Mehl and H.Jatzkewitz: *Hoppe-Seylers Z. physiol. Chem.*, 1963, 331, 292-294 (German Res. Inst. Psychiatry, Munich, Germany) The isolation of the enzyme with the aid of thin layer chromatography and radioactive labelling is described. Besides cerebrosides it also attacks chondroitin sulphate. (German) L.Cornish

2831. 0-METHYLCHOLINE-CONTAINING PHOSPHOLIPID DERIVED FROM CARNITINE. L.L.Bieber, V.H.Cheldelin and R.W.Newburgh: *J. biol. Chem.*, 1963, 238, 1262-1265 (Sci. Res. Inst., Oregon State Univ., Corvallis, Ore., U.S.A.) Blowfly (*Phormia regina*) larvae contain a new phospholipid in which choline is replaced by 0-methylcholine when dietary choline is replaced by 0-methylcholine or carnitine. This shows that the latter is decarboxylated by the larvae. J.N.Ashley

2832. LABELLING OF PHOSPHOLIPIDS FROM INORGANIC [32P]PHOSPHATE IN BRAIN PREPARATIONS: EFFECT OF ACETYLCHOLINE, CHLORPROMAZINE AND AZACYCLONOL. W.L.Magee, J.F.Berry, K.P.Strickland and R.J.Rossiter: *Biochem. J.* 1963, 88, 45-52 (Dept. Biochem., Univ. Western Ontario, London, Ontario, Canada) The addition of chlorpromazine (0⁰1 mM) or azacyclonol (1⁰0 mM) to slices of guinea-pig brain caused an increase in incorporation of inorg.

[32p]phosphate into phospholipids, which was not accompanied by any significant increase in respiration, aerobic glycolysis, concn. and sp. radioactivity of ATP or concn. of phosphocreatine. The increase in labelling of phospholipid was confined to phosphatidic acid, phosphatidyl-inositol and phosphatidylserine. No such increase in phospholipid labelling was observed with dispersions prep, from rat brain, and only a slight effect was observed with mitochondria. With all the brain prep, higher concn. of both chlorpromazine (1⁰0 mM) and azacyclonol (5⁰ mM) were inhibitory. •

2833. TRANSFER OF THE PHOSPHORIC ESTER OF N,N-DIETHYLAmino-ETHANOL FROM ITS CYTIDYL¹ DERIVATIVE INTO PHOSPHOLIPIDS OF RAT AND CHICKEN TISSUE HOMOGENATES. T.Czochnicki and T.Korzybski: *Acta biochim. pol.*, 1963, 10, 233-241 (Inst. Biophysics Biochem., Polish Acad. Sci., Warszawa, Poland) By treating CMP with N,N-diethylaminoethanol (DEAE) phosphate in the presence of dicyclohexylcarbodiimide, CDP-DEAE was obtained. For the biosynthesis of phospholipids in chicken liver homogenate CDP-DEAE was as effective as CDP-choline. In rat brain and liver homogenates it was 30-40% less effective than CDP-choline as phospholipids precursor. Satisfactory separation of the phospholipid formed from CDP-DEAE, from the normal tissue phospholipids was achieved by Al₂O₃ column chromatography. M.Korbecki

2834. INCORPORATION OF [32p]ORTHOPHOSPHATE INTO PHOSPHOLIPIDS OF FROG TISSUES DURING FEEDING AND STARVATION. P.W.Odawer and H.Dominas: *Acta biochim. pol.*, 1963, 10, 173-181 (Dept. Biochem., Nencki Inst. Exp. Biol., Warsaw, Poland) Olive oil feeding strongly stim. [32p]orthophosphate incorporation into intestinal, blood, liver and stomach phospholipids. The sp. activity of the phospholipids is about 5 times higher in the intestine and about 20 times higher in the blood of the oil-fed than of the starved frogs. Protein feeding has no effect on the formation of phospholipids. The small intestine appears to be the main site of phospholipid synthesis in the frog. M.Korbecki

2835. BIOSYNTHESIS OF SKIN STEROLS. II REDUCT¹ OF A24-UNSATURATED STEROLS OF RAT SKIN. J.L.Gaylon: *Arch. Biochem.*, 1963, 101, 108-115 (Grad. Sch. Nutr., Cornell Univ., Ithaca, N.Y., U.S.A.) Normal skin sterols were replaced by A24-sterols after triparanol administration and the concn. of some skin sterols increased. Skin from such rats incorporated more labelled acetate into sterols than normal skin. Most of the increased synthesis was associated with composite A²⁴ and A²⁴-sterols. Rat liver homogenates reduced lanosterol to 24,25-dihydrolanosterol; triparanol inhib. this reduction. B.M. Stevens

2836. SIMPLE METHOD FOR SEPARATING POLAR STEROIDS FROM THE LIQUID SCINTILLATION PHOSPHOR. R.S.Rivlin and H.Wilson: *Analyt. Biochem.*, 1963, 5, 267-269 (Endocrinol. Branch, Nat. Cancer Inst., N.I.H., Bethesda, Md., U.S.A.) Separation is achieved by thin layer chromatography on silica gel using ethyl acetate as the solvent. A.D.Smith

2837. STEREOCHEMISTRY OF THE HYDROGEN TRANSFER TO SQUALENE DURING ITS BIOSYNTHESIS FROM FARNESYL PYROPHOSPHATE. B.Samuelson and D.S. Goodman: *Biochem. biophys. Res. Comm.*, 1963, 125-128 (Dept. Chem., Karolinska Inst., Stockholm

Sweden) The stereochemistry of the H transfer occurring at C-1 in farnesyl pyrophosphate during its conversion to squalene was determined by bringing about the conversion of $\text{n}-3\text{Hg-2-14c1trans-trans-farnesyl pyrophosphate to cholesterol}$ in vitro. The cholesterol was then converted to bile acids by administration to a bile-fistula rat. It was found that the cholesterol and cholic and chenodeoxycholic acids derived from it all had the same ratio of 3H/14C. This indicates that 3H introduced during the biosynthesis of squalene and present in cholesterol at C-12 is in the B Position.

B.Ketterer

^{2838.} STEREOSPECIFIC INSERTION OF HYDROGEN ATOM INTO SQUALENE FROM REDUCED NICOTINAMIDE ADENINE DINUCLEOTIDES. J.W.Cornforth, R.H.Cornforth, C.Donninger, G.Popják, G.Ryback and G.J.Schroepfer, jun.: Biochem. biophys. Res. Comm., 1963, 11, 129-133 (Shell Res. Ltd., Chem. Enzymol. Lab., Sittingbourne, Kent, England) A termination of the stereochem. of the H transfer occurring at the C-1 of farnesyl pyrophosphate during its conversion to squalene was obtained by isolating squalene synthesised from [1-2H₂]farnesyl pyrophosphate and grading it to laevulinic and succinic acids by ozonolysis. An optically active trideuterio succinic acid was obtained, the abs. configuration of which was determined by comparison with a reference trideuterated succinic acid.

B.Ketterer

^{2839.} SOME OBSERVATIONS ON THE AI-DEHYDROGENATION OF STEROIDS BY BACILLUS SPHAERICUS. V-Stefanovic, M.Hayano and R.I.Dorfman: Biochim. biophys. Acta. 1963, 71, 429-437 (Worcester Found. Expt. Biol., Shrewsbury, Mass., U.S.A.) Dehydrogenation by intact cells and cell free prep. of B. sphaericus (ATCC 7055) had 2 phases, first a reversible rapid exchange of the C-10 and C-2 with the H²O medium and secondly the irreversible formation of the Al bond. ³H-steroids and [3H]water were used to examine the 2 phases. Various electron acceptors were tested with the cell free prep. and those with the quinone structure were shown to be highly effective.

B.M. Stevens

^{2840.} CHROMATOGRAPHY OF UNESTERIFIED STEROLS ON SILICIC ACID-SUPER-CEL. LD.Frantz, jun.: J. Lipid Res., 1963, 4, 176-178 (Dept. Med. and Physiol. Chem., Univ. Minnesota Med. Sch., Minneapolis, Minn., U.S.A.) A simple method is described for the separation of unesterified sterols using commercially available materials.

J.R.Sargent

^{2841.} QUANTITATIVE¹ ISOLATION OF STEROLS. W.M.Speery: J. lipid Res., 1963, 4, 2 H-B 5 (Dept. Biochem., New York Psychiatric Inst. and Coll. Phys. Surg., Columbia Univ., New York, U.S.A.) Procedures are described for the quant. gravimetric isolation of cholesterol and cholestan-3P-ol as the acetates and for the quant. recovery of these sterols (as digitonides in die range of 0⁰, 5⁰, 4⁰, 1⁰) J. R. Sargent

^{2842.} ESTERIFICATION OF CHOLESTEROL BY HOMOGENATES OF RAT ADRENAL TISSUE. CAoogope and R.H.Williams: Endocrinology. 1963, 72, 735-741 (Med. Dept., Washington Univ., Seattle, Wash., U.S.A.) Cholesterol esterification activity has been demonstrated in homogenates of rat adrenal cortex. Mg and reduced glutathione were needed for optimum activity. n-Etioyl-maleimide ^{^JJTM} Jones

^{2843.} CHOLESTEROL BIOSYNTHESIS. IV. REDUCTION OF LANOSTEROL TO 24,25-DIHYDROLANOSTEROL BY RAT LIVER HOMOGENATES. J.Avigan, DeW.S. Goodman and D.Steinberg. V. TIME COURSE AND PATHWAY OF LATER STAGES OF CHOLESTEROL BIOSYNTHESIS IN LIVERS OF INTACT RATS.

-- DeW.S.Goodman, J.Avigan and D.Steinberg: J. biol. Chem., 1963, 238, 1283-1286, 1287-1293 (Lab. Metabol., Nat. Heart Inst., Bethesda, Md., U.S.A.)

IV. Labelled lanosterol (biosynthetically prep, from [2-14c]mevalonic acid) is reduced to the dihydro deriv. in rat liver homogenates. Enzymic activity is associated with cell particles, mostly microsomes, that need NADPH₂. The enzyme is inhib. by thiol reagents, and does not need a divalent cation for activity. Triparanol and 2 other inhibitors of biosynthesis of cholesterol block reduction in vitro of lanosterol and desmosterol. A single enzyme is probably responsible for reduction of both sterols.

V. ¹⁴C rapidly appears in liver sterol after i.v. injn. of DL-[2-14C]mevalonic acid into rats. After 2 min. 1% of the injn. ¹⁴C is present in liver non-saponifiable material and 43% of this is in sterols and 57% is present as squalene. After 30 min. 11% of the ¹⁴C is present in non-saponifiable products and 89% of this is in sterols. Within the sterol fraction ¹⁴c is present mainly in lanosterol, an intermediate fraction, cholest-7-, and -8-enol, and cholesterol. The first 4 lie on the main biosynthetic route to cholesterol. After 2 min. 53% of the sterol ¹⁴c is in lanosterol and only 19% in cholesterol. After 30 min. 76% of the ¹⁴c is in cholesterol. In normal rats no significant ¹⁴c is present in cholesta-7, 24-dienol or in zymosterol, whereas appreciable ¹⁴c is present in one or both of these in triparanol-treated rats. Only traces of ¹⁴c are found in 24,25-dihydrolanosterol and in desmosterol; probably neither lies on the main route to cholesterol.

J.N.Ashley

^{2844.} METABOLISM OF CHOLESTA-4,7-DIEN-3-ONE AND CHOLESTA-4,6-DIEN-3-ONE BY MOUSE LIVER MICROSONES. A.A.Kandutsch: J. lipid Res., 1963, 4, 179-187 (Jackson Mem. Lab., Bar Harbor, Maine, U.S.A.) Incubation of cholesta-4,7-dien-3-one with mouse liver microsomes and NADP or NADPH₂ resulted in the production of 2 new metabolites. These were identified as cholesta-4,6-dien-3-one and cholest-4-en-3-one. Incubation of cholesta-4,6-dien-3-one with liver microsomes and NADPH₂ resulted in the production of cholest-4-en-3-one. The effects of >H, substrate concn. and other factors on the reactions were examined. Conversion of either cholesta-4,7-dien-3-one or cholesta-4,6-dien-3-one to the metabolic products described was inhib. by j.j-chloromercuribenzoate, by certain detergents, and by triparanol.

J.R.Sargent

^{2845.} NEW METHOD FOR THE DETERMINATION OF DIHYDROCHOLESTEROL IN TISSUES. E.H.Mosbach, J.Blum, E.Arroyo and S.Milch: Analyt. Biochem., 1963, 5, 158-169 (Div. Lab. Diagnosis, Pub. Hlth. Res. Inst. City of New York, Inc., N.Y., U.S.A.) The analysis of dihydrocholesterol in the sterol fraction of mammalian tissues and in gallstones can be performed by a new method based on the oxidation with performic acid of cholesterol contained in cholesterol-dihydrocholesterol mixtures to cholestan-33,5a,6@-triol, leaving the dihydrocholesterol unchanged. It has been shown that gallstones and atheroma often contain < 0⁵% dihydrocholesterol, which is at variance with previous concepts.

A.D. Smith

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- 2846. TISSUE RESPIRATION RATES OF SOME ORGANS IN EXPERIMENTAL HYPERCHOLESTEROLAEMIA AND ATHEROSCLEROSIS.** L.V.Maylsheva: *Vop. Med. Him.*, 1963, 9, 142-146 (Dept. Biochem., Kubishevsky Med. Inst., Moscow, U.S.S.R.) Respiration rate of rat brain was increased by 25% by addition of cholesterol in vitro. Addition of cholesterol did not alter respiration rates of liver, kidney and spleen in vitro. During expt. hypercholesterolaemia a gradual decrease occurred in respiration rates in rabbit brain and liver. Expt. atherosclerosis caused the following decreases in respiration rates in rabbit organs: brain 21%, liver 37%, kidney 33% and heart muscle 38%. J.R. Sargent

AMINO ACIDS, PEPTIDES AND PROTEINS

- 2847. ACTIVE TRANSPORT OF AMINO ACID INTO CEREBRAL CORTEX SLICES.** Y.Tsukada, Y.Nugata, S.Hirano and T.Matsutani: *J. Neurochem.*, 1963, 10, 241-246 (Dept. Phys., Sch. Med., Toho Univ., Ohmori, Tokyo, Japan) Using guinea-pig brain slices, accumulation of D- and L-glutamate was linear for 60 min. and accompanied by swelling of tissue and K⁺ uptake. GABA and D-alanine did not cause tissue swelling. All 4 acids reached a max. tissue level independent of the original medium content from 5-20mM. Accumulation was prevented by metabolic inhibitors or cold or omission of medium K. GABA transport caused increased 32p turnover of cytoplasmic phospholipids but not L- or D-glutamate. Competitive transport with simult. addition of GABA and (D-alanine or D-glutamate and L-aspartate was observed but not between GABA and D-glutamate. A detergent and ouabain (10^{-5} M) destroyed the K gradient (whereby Na is largely expelled from the cell). R. Woodman

- 2848. POSTNATAL CHANGES IN AMINO ACID CONTENT OF KITTEN CEREBRAL CORTEX.** S.Berl and D.P.Purpura: *J. Neurochem.*, 1963, 10, 237-240 (New York State Psychiat. Inst., Coll. Phys. Surg., Columbia Univ., New York, U.S.A.) Levels of glutamic acid (1), aspartic acid (2), glutamine (3), GABA (4), and glutathione (5), as fmoles/g. fresh wt. of tissue were measured over the period 0-25-35 days and on the 210th day after birth. (1) rose from 4-1-11 • 2, (2) from 1-7-2-9, (3) from 5-2-5-6, (4) from 1-3-2-8, and (5) from 1-6-2-1 fmoles/g. Dry wt. rose from 11-77-15-5-0 on the 35th day to 20-6-2-0 on the 210th day. R. Woodman

- 2849. AN IMPROVED METHOD OF SEPARATING AMINO ACIDS AS N-2,4-DINITROPHENYL DERIVATIVES.** N.A.Matheson: *Biochem. J.*, 1963, 88, 146-151 (Rowett Res. Inst., Bucksburn, Aberdeen, Scotland) An improved method of separating ether-sol. DNP-amino acids by partition chromatography on 15-19 cm. kieselguhr columns is described. The DNP-amino acids are partitioned largely as ions, between aq. buffers and ethyl acetate, forming unusually narrow bands with a wide range of Rf values. The DNP-deriv. of almost any one of the common amino acids can be separated from a dinitrophenylated mixture within an hour or two.

- 2850. THE QUANTITATIVE ISOLATION OF VALINE FROM AMINO ACID MIXTURES AS ITS DINITROPHENYL DERIVATIVE.** N.A.Matheson: *Biochem. J.*, 1963, 88, 152-155 (Rowett Res. Inst*, Bucksburn, Aberdeen, Scotland) A method is described for the quant. determination of valine as its DNP deriv. It is simple, accurate and requires no special apparatus. Several determinations may be done in parallel and the range is 0-1-1-6 fmole of valine. Recoveries of valine were good and the valine content of purified insulin was close to the calc. value. The method should be applicable to many other amino acids. *

- 2851. SEPARATION OF SOME DL-AMINO ACIDS INTO THEIR OPTICAL ISOMERS BY PAPER ADSORPTION CHROMATOGRAPHY.** C.L.De Ligny, H.Nieboer, J.J.M.De Vlijlder and J.H.H.G.Van Willigen: *Rec. Trav. chim. Pays-Bas*, 1963, 82, 213-224 (Lab. Analytical Chem., State Univ., Utrecht, Netherlands) A systematic search has been carried out to determine the optimum conditions for the separation of optical isomers of amino acids on paper. A 90 vol. % methanol-water mixture at -15° was used and this was capable of separating the optical isomers of DL-cystine, a separation not hitherto achieved. G.C.Barr

- 2852. ISOPIESTIC COMPARISON METHOD FOR ACTIVITIES. ACTIVITIES OF L-SERINE AND L-ARGININE HYDROCHLORIDE.** J.O.Hutriens, K.M. Figlio and S.M.Granito: *J. biol. Chem.*, 1963, 238, 1419-1422 (Dept. Riysiol, Univ. Chicago, 111, U.S.A.) A modified method for determination of the activities of solutes is described. Sp. gravity gradef tubes are used for measurement of molalities; this allows small drops of ioln. to be placed and compared of a single block of silver and enclosed in a small gas spac* No shaking is needed. L-Arginine HCl is compared with KC1 and L-serine is compared with sucrose.

- J.N.Ashley
2853. ORNITHINE CARBAMOYLTRANSFERASE IN HIGHER PLANTS. J.Reifer, K.Kleczkowski, E.Klimowicz and K.Zielinska: *Acta biochim. pol.*, 1963, 10, 151-156 (Inst. Biochem. Biophys., Polish Acad. Sci., Centr. Coll. Agric, Warszawa, Poland)

The presence of ornithine carbamoyltransferase was established in 46 plants belonging to 19 botanical families. At the early stages of plant growth a distinct increase in the enzyme activity was observed, with additional peaks at the time of early flowering and of formation of the reproductive organs of the plant. It is suggested that the increases of enzyme activity are closely linked with physiol. changes in plant growth and development. Furthermore a close relation between ornithine carbamoyltransferase activity and the quantities of endogenous ureides present in the plant tissue was also observed.

- 2854. CHROMATOGRAPHIC SEPARATION OF ISOMERIC DNP DERIVATIVES OF ALPHA-EPSILON DIAMINOPIMELIC ACID.** Djilšić, C.Roy, AJ. Schocher and R.W.Watson: *Canad. J. Biochem.*, 1963, 41, 817-820 (Div. AppL Biol. Nat. Res. Council, Ottawa, Canada) The separation of isomeric DNP deriv. and di-DNP deriv. of diaminopimelic acid in tert. amyl alcohol-phthalate of pH 6-2 on paper is described after isolation of the isomers from mixtures resulting from dinitrophenylation of the amino acids released during hydrazinolysis of purified mucopeptide from *Aerobagig cloacae*.

J.B. Parish

2855. A COMPARATIVE STUDY OF e-LYSINE ACYLASE.

W.K.Paik: Comp. Biochem. Physiol., 1963, 9, 13-22 (Dept. Biochem., Ottawa Univ., Ontario, Canada) The enzyme e-lysine acylase is capable of hydrolysing ^N-N-acetyl-lysine included in the diet of expt. vertebrates. Enzymic activity was estimated by a manometric Method in rats, cats, cows, pigs, chicken, pigeon, turkey, canary, sparrow, frog, mushroom and yeast. In ⁷⁷C and other mammals the enzyme was found in the kidney, brain and sometimes in liver, heart, spleen and Pancreas. In birds it was often localised to a high degree in the kidney (e.g. chicken, turkey and pigeon), whilst in others (canary, sparrow) no enzymic activity at all was observed. Pig enzyme is sol. whilst that of chickens is bound to particulate material such as mitochondria, as shown by centrifugation. Optimal pH for action was pH 9.0 for chicken Drep., and pH 7.2 for rat material.

M.S.Laverack

2856. DETERMINATION OF HISTIDINE DECARBGX7LASE ACTIVITY BY LIQUID SCINTILLATION COUNTING OF ¹⁴C_O₂. Y.KDbayashi: Analyt. Biochem., 1963, 5, 284-290 (Worcester Found. Expt. Biol., Shrewsbury, Mass., U.S.A.) L-Histidine decarboxylase activity ⁵⁷Sn be determined using [U-14C]- or [CO₂H-14C]-histidine in a closed system. The ¹⁴C_O₂ produced by enzyme is trapped by aq. hyamine hydroxide spread P filter paper edged with paraffin wax. The radioactive farnine carbonate is assayed in a liquid scintillation counter. This method can detect the decarboxylation of ¹¹⁰01 tig. L-histidine.

A.D.Smith

2857. STUDIES ON THE HYDROXYLATION OF LYSINE IN VIVO. D.Fujimoto and N.Tamiya: Biochem. Mophys. Res. Comm., 1963, 10, 498-501 (Med. Sch. Tokyo Med. and Dental Univ., Bunkyo-ku, Tokyo, Japan) In chicken embryos, the source of the O of K³⁴-hydroxyl group of hydroxy lysine is water rather than Secular O₂. B.Ketterer
2858. OCCURRENCE OF P-HYDROXYASPARAGINE IN FORMAL HUMAN URINE. T.Tominaga, C.Hiawaki, T.Maebara and H.Yoshida: J. Biochem., Tokyo, 1963, 53, 227-230 (Dept. Biochem., Seik. Med., Nagasaki Univ., Japan) 116 mg. of cryst. P-hydroxy-asparagine were isolated from 200 L of adult p⁺ urine. A blue colour was produced by reaction with ^{2,4,6}-trinitrobenzoic acid:acetic acid:water and 80% phenol respectively. Several other mammalian spp. also excreted the acid.

B.M. Stevens

2859. ^N-ACETYL AND CARBAMYL PHOSPHATE UTILISATION WITH ASPARTATE TRANSCARBAMYLASE AND ^L-CARBAMATE KINASE. S.Grisiola, R.Amelunxen and R.Rajman: Biochem. biophys. Res. Comm., 1963, 11, 75-78 (Dept. Biochem., Univ. Kansas Med. Center, Kansas City, Kans., U.S.A.) Examples are presented of the utilisation of carbamyl phosphate and acetyl phosphate by animal and bacterial aspartate transcarbamylases.

B.Ketterer

2860. SYNTHESIS OF OPTICALLY ACTIVE N-MONO-AMINO ACIDS. P.Quitt. J.Hellerbach and K.Vogler: Helv. chim. Acta, 1963, 46, 327-333 (Chemische Forschungsabteilung der F.Hoffmann-La Roche & Co. AG., Basel, Switzerland) Optically active amino acids can be converted to their N-benzyl deriv. and methylated, and the benzyl group can be removed by hydrogenolysis, without racemisation occurring & (German)

A.D.Smith

2861. PROPERTIES OF A CARRIER SYSTEM TO TRANS-PORT L-dopa INTO BRAIN SLICES. Y.Yoshida, K-Kanjiike and J.Namba: Nature, Lond., 1963, 198, 191-192 (Dept. Pharmacol., Osaka Univ., Japan)

Expt. on the effect of concn. of various ions and a no. of metabolic inhibitors on the uptake of L-dopa into guinea-pig brain cortex slices support a hypothesis than an amino acid transport system consists of 2 parts, a sp. site to combine with L-dopa, phenylalanine and tyrosine, and an ouabain-sensitive site including Na, K activated ATPase as a component. Intracellular K concn. also appears to be an important regulator. G.M.Lewis

2862. DETERMINATION OF FREE PROLINE IN SERUM.

G.K.Summer and J.A.Hawes: Proc. Soc. exp. Biol., N.Y., 1963, 112, 402-404 (Dept. Pediatrics, Med. Sch., Univ. North Carolina, Chapel Hill, N.C., U.S.A.) Free proline from serum was recovered by (i) using 2-2% tungstic acid in 0.15M sulphuric acid, (ii) *lW/o* TCA and (iii) 95% acidic ethanol. The recovered proline was compared, after condensation with ninhydrin, by u.v. spectrometry. The result showed that there were 2 tautomers isolated, one with a max. at 515 mp (acid precipitant) and the other with a max. at 550 m*l* (neutral precipitant) but the rate of formation did not differ significantly as far as this extraction method is concerned.

D.N.Wheatley

2863. HYDROXYAMINO ACIDS, m. EFFECT ON GROWTH OF E. COLI 9637. T.T.Otani: Arch.

Biochem., 1963, 101, 131-138 (Lab. Biochem., Nat. Cancer Inst., Bethesda, Md., U.S.A.) ³-Hydroxy-aspartic acid and P-hydroxyleucine markedly inhib. growth; (X-hydroxymethyl)serine, (X-methylserine, a-ethylserine, 3-hydroxynorleucine and 3-(E^{"nitro"})phenylserine were ineffective. Some naturally occurring amino acids, mostly structurally similar to the inhibiting 0-hydroxyamino acids, completely reversed the inhib., others reversed partially. Inhib. appeared to be competitive.

B.M. Stevens

2864. LEUCINE BIOSYNTHESIS IN HIGHER PLANTS.

G.W.Butler and L.Shen: Biochim. biophys. Acta, 1963, 71, 456-458 (Dept. Biochem. Biophys., Univ. California, Davis, Calif., U.S.A.) Some evidence for the condensation of 2-ketoisovaleric acid and acetate to yield leucine was found in flax.

B.M. Stevens

2865. CYSTEINE BIOSYNTHESIS IN BEET DISCS.

R.J.Ellis: Phytochemistry, 1963, 2, 129-136 (A.R.C. Unit Plant Physiol., Imperial Coll, London, England) The incorporation of ^{[35]S}sulphate into cysteine by beet discs is markedly stim. by L-serine when the endogenous amino acid pool is low. Glycine does not have this effect, and D-sedne inhibits the incorporation. No ^{[35]S}cysteine sulphuric acid was detected. The discs also convert L-[14C]serine to [14C]cysteine.

B.H.Davies

2866. S-ALKYLCYSTEINASE: ENZYMIC CLEAVAGE OF S-METHYL-L-CYSTEINE AND ITS SULPHOXIDE.

J.Nomura, Y.Nishizuka and O.Hayaishi: J. biol. Chem., 1963, 238, 1441-1446 (Dept. Med. Chem., Kyoto Univ. Fac. Med., Japan) The enzyme is isolated, and purified approx. 30-fold, from S-methyl-L-cysteine adapted cells of *Pseudomonas cruciviae*. It catalyses the stoicheiometric conversion of S-methyl-L-cysteine sulphoxide into methyl methanethiol sulphinate, pyruvic acid, and NH₃. The optimum pH is 8.8 and pyridoxal phosphate is needed as coenzyme. Although methionine

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and cysteine are inactive, other S-alkyl-L-cysteines, and their sulphoxides, and S-carboxyalkyl-L-cysteines serve as substrates.

J.N.Ashley

2867. SYNTHESIS AND CHARACTERISATION OF SODIUM CYSTEINE-S-SULPHATE MONOHYDRATE. LH.Segel and M.J.Johnson: *Analyt. Biochem.*, 1963, 5, 330-337 (Dept. Biochem., Univ. Wisconsin, Madison, Wis., U.S.A.) Cryst. Na cysteine-S-sulphate was prep, by aerating stoicheiometric amounts of cystine and sodium sulphate in aq. ammonia containing trace amounts of CuCl₂. Elemental analysis and equiv. wt. determinations were used to characterise the product. The equilibrium constant for the reaction of cysteine-S-sulphate with cysteine, yielding cystine and inorg. sulphite, was estimated.

A.D.Smith

2868. HALOGENATION OF TYROSINE DURING ACID HYDROLYSIS. F.Sanger and E.O.P.Thompson: *Biochim. biophys. Acta*, 1963, 71, 468-471 (M.R.C. Lab. Mol. Biol., Cambridge, England).

B.M.Stevens

2869. MICROBIAL DISSIMILATION OF D- AND L-TRYPTOPHAN IN THE PRESENCE OF ANALOGUES. N.N.Durham and J.R.Martin: *Biochim. biophys. Acta*, 1963, 71, 481-482 (Dept. Microbiol., Oklahoma State Univ., Stillwater, Okla., U.S.A.) In a resting cell suspension of a *Flavobacterium* sp. tryptazan and 5HTP inhib. both D- and L-tryptophan oxidation, IAA and 2-oxindolealanine, inhib. oxidation of the D- but not the L-isomer while tryptamine had no effect. Prelim, comm.

B.M.Stevens

2870. TRYPTOPHANASE-TRYPTOPHAN REACTION. XL CONCENTRATION OF INTRACELLULAR TRYPTOPHAN IN E. COLI. F.C.Happold and T.A.Scott: *Hoppe-Seylers Z. physiol. Chem.*, 1963, 331, 118-123 (Dept. Biochem. Univ. Leeds, England)

An enzymic method with an accuracy of ±9·5% was used for the determination of the concn. Excess Na in the medium was beneficial for intracellular tryptophan formation but K, phenylalanine and tyrosine were detrimental.

(German) LCornish

2871. FACTORS AFFECTING THE ACTIVITY IN VITRO OF THE TRYPTOPHAN AND PHENYLALANINE HYDROXYLATING SYSTEMS. R. A. Freedland: *Biochim. biophys. Acta*, 1963, 73, 71-75 (Dept. Physiol. Sci., Sch. Vet. Med., Univ. California, Davis, Calif., U.S.A.) 'Induction' or suppression of 1 hydroxylase in vivo produced an equal change in the same direction in the other hydroxylase. In vitro, ascorbic acid and/or Fe²⁺ increased, and EDTA decreased, tryptophan hydroxylase activity without affecting phenylalanine hydroxylation. Cu²⁺ inhib. both but the tryptophan reaction was more severely inhib. NADP could replace NAD in both reactions.

B.M.Stevens

2872. CYCLOL FORMATION IN PEPTIDE SYSTEMS. in. REARRANGEMENT OF N-(S-HYDROXYPROPYONYL)-PIPERIDONE INTO A 10-MEMBERED CYCLODEPSIPEPTIDE. V.K.Antonov, A.M.Shkrob and M.M.Shemyakin: *Tetrahedron Letters*, 1963, 7, 439-443 (Inst. Chem. Natural Products, U.S.S.R. Acad. Sci., Moscow, U.S.S.R.) Letter.

R.H.Kimberlin

2873. ACTION OF IMIDAZOLE IN PEPTIDE SYNTHESIS WITH THIOPHENYL COMPOUNDS. T.Wieland, H.Determin and W.Kahle: *Angew. Chem.*, 1963, 2,

154 (Inst. für Org. Chem. UniversitSt, Frankfurt, Main, Germany) Imidazole facilitates the formation of peptides in good yields and without significant racemisation from thiophenyl compounds of acylated amino acids and free amino acids.

K.Brew

2874. GAS CHROMATOGRAPHIC INVESTIGATION OF RACEMISATION DURING PEPTIDE SYNTHESIS.

F.Weygand and A.Prox, L.Schmidhammer and W.Konig: *Angew. Chem.*, 1963, 2, 183-188 (Org.-Chem. Inst. der Technischen Hochschule, Munchen, Germany)

It is shown that the methyl esters of many diastereoisomer: N-trifluoroacetyl dipeptides can be separated by gas chromatography on Golay columns enabling accurate quan investigations of racemisation occurring during peptide synthesis to be carried out. The synthesis of the methyl ester of carbobenzoxy-L-valyl-L valine was used as an example in examining various methods of forming peptide The synthesis of the methyl esters of N-trifluoroacetyl L-valyl L-valine was investigated as a model for the linking of peptides. The influence of numerous factors on racemisation was determined and general conclusions drawn regarding peptide synthesis.

ICBrew

2875. EFFECT OF PRIOR INCUBATION WITH GLYCYL-L-ALANINE ON THE UPTAKE OF PEPTIDES BY LACTOBACILLUS CASEI. F.R.Leach and E.E.Snell: *Biochim. biophys. Acta*, 1963, 71, 454-456 (Dept. Biochem., Univ. California, Berkeley, Calif., U.S.A)

Exposure to unlabelled peptide increased the apparent rate of uptake of labelled peptide in subsequent expt.

B.M.Stevens

2876. GUINEA-PIG KALLIKREIN SYSTEM. G.E.Davies and J.S.Lowe: *Nature*, Lond., 1963, 198, 94-95 (Res. Dept., LC.LLTD., Pharmaceuticals Div., Alderley Park, Macclesfield, Cheshire, England)

Guinea-pig 7S γ-globulins purified by DEAE cellulose chromatography contains an enzyme which has all the prop, associated with kallikrein. The capillary permeability activity is related to the esterase activity (against tosylarginine methyl ester) and fully accounted for by the kallikrein content. An activator system present in guinea-pig serum resembles the activation scheme suggested for human kallikrein.

G.M.Lewis

2877. DIPEPTIDES WITH TRIFUNCTIONAL AMINO ACIDS. F.Weygand, A.Prox, E.C.Jorgensen, R.Axen and P.Kirchner: *Z. Naturforsch B*, 1963, 18, 93-1⁰⁴ (Organ.-Chem. Inst., Tech. Hochschule, Mflnchen, Germany) The gas chromatographic sequence analay of various dipeptides containing the trifunctional amino acids glutamic acid (α and γ peptides), α-methyl or β-trimethylsilyl deriv. of tyrosine dipeptides and the β-trimethylsilyl deriv. of serine or threonine dipeptides was described. Cysteine, cystine and methionine ¹⁴C-peptides were desulphurised with Raney nickel before analysis. The free amino group was protected by conversion to tri trifluoroacyl deriv. in each case.

(German) J.C.Crawhall

2878. REACTIVITY OF PEPTIDE IMIDAZOLE, AMINOJ AND PHENOLIC GROUPS TOWARDS D-NITROPHENYL ACETATE. W.L.Koltun, L.Ng and F.FcN.Gurd: *J. W⁺ Chem.*, 1963, 238, 1367-1372 (Dept. Biochem.. Cornell Univ. Med. Coll., New York, U.S.A.)

The rates of reaction of D-nitrophenyl acetate with e-aminocaproate, imidazole-4-acetate, N-acetyltyrosine, γ-guanidinobutyrate, glycyl-L-histidine, glycyl-L-tyrosine, L-valyl-L-alanine, glycylsarcosyl-glycine, and a copolymer of L-aspartic acid and

L-histidine are reported, and the values for the individual amino, imidazole, and phenolic groups in glycyl-L-histidine and glycyl-L-tyrosine are determined. Imidazole and amino groups are the classes of groups likely to contribute significantly to the over-all reactivity of a protein with β -nitrophenyl acetate. J.N.Ashley

2879. GLYCOPEPTIDES. IV. PERIODATE OXIDATION OF GLYCOPEPTIDES FROM HUMAN γ -GLOBULIN. J.A.Rothfus and E.L.Smith: *J. biol. Oiém.*, 1963. 238. 1402-1410 (Lab. for Study of Hered. Metabol. Disorders. Univ. Utah Coll. Med., Salt Lake City, Utah. U.S.A.) When the glycopeptides from papain digests of human γ -globulin are oxidised with HIO_4 and then reduced with $NaBH_4$, the amount of HIO_4 used and the composition of the product agree with destruction of 3 residues of glucosamine and 1 of mannose, and with complete oxidation of galactose and fucose. The utility of HIO_3-NaBH_4 treatment as a mild method for degradation of carbohydrate portions of glycoproteins is shown by degradation of γ -globulin glycopeptides to a smaller glycopeptide, glutamylaspartyl-(glucosamine)2, in which the bond between aspartic acid and one glucosamine residue is probably an amide. Five residues of glucosamine and 4 of mannose remain unaltered by treatment with HIO_4-NaBH_4 . These residues of glucosamine are probably 1,4- or 1,3-linked, whilst the mannose residues are either 1,3-linked or multiple bonded. In either case mannose appears to be flanked by sugars labile to HIO^+ . J.N.Ashley

2880. ELECTROPHORESIS OF HISTONES AND HISTONE FRACTIONS ON POLYACRYLAMIDE GELS. H.C.McAllister, jun., Y.C.Wan and J.L.Irviru: *Analyst Biochem.*, 1963, 5, 321-329 (Dept. Biochem., Univ. North Carolina Sch. Med., Chapel Hill, N.C. U.S.A.) Zone electrophoresis of histones on polyacrylamide gels was applied to a comparison of unfractionated calf thymus histones with various fractions obtained by other methods. The lysine-rich histone fraction yielded 1 mobile band in starch gel and 9 in polyacrylamide gel. A method is described for estimation of relative amounts of electrophoretically separated components by determination of bound dye. A.D.Smith

2881. AMINO ACID COMPOSITION OF HIRUDIN. IDENTIFICATION OF THE N-TERMINAL RESIDUE. P.de la Llosa, C.Tertrin and MJutisz: *Bull. Soc. Chim. biol.*, Paris, 1963, 45, 55-60 (Lab. Morphol. Exp. Endocrinol., Coll. de France, Paris, France) DNA-hirudin was prep, and the N-terminal residue was shown to be leucine or isoleucine. Its mol. wt. was 13000. The total amino acid content was determined by ion change column chromatography. It contained a high portion of dicarboxylic amino acids and was deficient in tryptophan and arginine. The amino acid composition differed identical with that of the previously reported hirudin. (French) J.C.Crawhall

2882. PURIFICATION OF HIRUDIN. MJutisz, A.Charbonnel-Bérault and G.Martinoli: *Bull. Soc. Chim. biol.*, Paris, 1963, 45, 61-73 (Lab. Morphol. ^AP. Endocrinol., Coll. de France, Paris, France) Acetone powder of the heads of leeches (4 kg.) was reacted with 0.3% NaCl. The ppt. obtained after alcohol addition in the presence of zinc acetate was dried ^{10°} in Amberlite IRC-50 at pH 5. The product was sain chromatographed on DEAE-cellulose and purified by ^y co-tercurrent distribution. Two active forms were

isolated. One of these a-hirudin, was homogeneous on paper electrophoresis. (French) J.C.Crawhall

2883. S-CARBOXYMETHYLKERATINS EXTRACTED FROM PEPSIN-TREATED WOOL. SEPARATION AND CHARACTERISATION OF PROTEINS EXTRACTED FROM MORPHOLOGICALLY DISTINCT FRACTIONS. Y.Moschetto and G.Biserte: *Bull. Soc. Chim. biol.*, Paris, 1963, 45, 75-93 (Lab. Chim. Biol., Fac. Méd. Pharm., Lille, France) The cortex cells obtained by peptic hydrolysis of virgin wool were treated with potassium thioglycollate. The reduced keratins extracted as S-carboxymethyl keratins were heterogeneous. Fractions were purified by chromatography on DEAE-cellulose and by isoelectric pptn. A relatively pure fraction was obtained with a low cystine content and a high proportion of N-terminal glycine. (French) J.C.Crawhall

2884. STUDIES OF COLLAGEN TISSUE AGEING: THERMAL SHRINKAGE OF METABOLITE-TREATED COLLAGENOUS TISSUES. R.A.Milch and R.A.Murray: *Proc. Soc. exp. Biol.*, N.Y., 1962, 111, 551-554 (Div. Orth. Surg., Johns Hopkins Univ. Sch. Med., Baltimore, Md., U.S.A.) Of the various intermediary metabolites of the Embden-Meyerhof pathway studied, only glyceraldehyde was capable of acting as a cross-linking agent for collagen under pH, ionic strength and temp. conditions similar to the extracellular body fluids. M.M.Shapland

2885. APPEARANCE OF PROTEINS IN REGENERATING WOUND TISSUE. W.Guschlbauer and M.B.Williamson: *Canad. J. Biochem.*, 1963, 41, 820-823 (Dept. Biochem., Graduate Sch., Loyola Univ., Chicago, Ill., U.S.A.) From 5 to 18 days after wounding in the rat samples of regenerating wound tissue were collected and analysed for content of tyrosine, tryptophan, hydroxyproline, and nitrogen and from these data the amount of cellular proteins and collagen were calc.; collagen and hydroxyproline were present to a small extent in early regeneration whereas the amount of cellular protein did not change much during regeneration. J.B.Parish

2886. STARCH GEL ELECTROPHORESIS OF COBRA AND RATTLESNAKE VENOMS. J.M.Neelin: *Canad. J. Biochem.*, 1963, 41, 1073-1078 (Div. Appl. Biol., Nat. Res. Council, Ottawa, Canada) The effect of pH on gradient starch gel electrophoresis of the venoms of *Crotalus adamanteus* and *Naja flavia* showed that sodium acetate buffer, pH 4.1, ionic strength 0.020, was the most effective for resolution of the former venom, while acetate buffer, pH 4.1 or cacodylate buffer, pH 6.0, was the most effective for the latter venom. Two-dimensional starch gel electrophoresis resolved at least 20 zones from *Crotalus* venom and 11 from the *Naja* venom. Two zones of haemolytic activity were separated from each venom. J.B.Parish

2887. STUDIES OF PROTEIN METABOLISM OF CORNEA. I. DISTRIBUTION OF NITROGENOUS SOLIDS IN RABBIT CORNEAS. RX.French and Z.Duma: *Canad. J. Biochem.*, 1963, 41, 1005-1011 (Dept. Ophthalmol., Fac. Med., Univ. Toronto, Ontario, Canada) The normal rabbit cornea contained 77.3% moisture. On a dry wt. basis the cornea contained 14.7% N. and consisted of epithelium 10%, stroma 87%, and endothelium plus Descemet's membrane 3%. The solid and N content of the stroma was nearly identical with that of the whole cornea. Endothelium plus Descemet's membrane and epithelium layers were low in nitrogen (10 and 12% of dry wt. respectively), while the epithelium was high in solids (30%).

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The partition of N as protein and non-protein, sol. or insol. was estimated for each corneal layer.

J.B.Parish

2888. ACTIVATION OF PURIFIED HUMAN PLASMINOGEN IN SOLUTIONS OF ETHYLENE GLYCOLS. P.S.Roberts: *Canad. J. Biochem.*, 1963, 41, 889-895 (Med. Coll. Virginia. Richmond, Va., U.S.A.)

The plasmin formed from purified human plasminogen when activated was measured using the substrate p-toluene-sulphonyl-L-arginine methyl ester. In 50% soln. of ethylene glycols at pH 7.6 and 30° plasmin accumulated faster in diethylene and triethylene glycols than in glycerol but in ethylene glycol no plasmin was formed. In 4%M soln. of the glycols only diethylene glycol showed a fast rate of accumulation of plasmin. No plasmin was found when plasminogen was incubated at pH 7.6 and 30° in 50% of propylene glycols, ethers of the ethylene glycols, polymers of glycols and dioxane.

J.B.Parish

2889. PURIFICATION AND SOME PROPERTIES OF AUTOPROTHROMBIN C. W.H.Seegers, E.RXole, CR-Harmison and E.Marciniak: *Canad. J. Biochem.*, 1963, 41, 1047-1063 (Dept. Physiol. Pharmacol., Wayne State Univ. Coll. Med., Detroit, Mich., U.S.A.) A mixture of thrombin and autoprothrombin

C was obtained from bovine prothrombin by activation in a reaction mixture containing thromboplastin and Ac-globulin. The autoprothrombin C was separated from thrombin by chromatography on a column of DEAE cellulose in phosphate buffer pH 7.0 and eluting at 0.4M phosphate buffer pH 8.2*. Autoprothrombin C was pptd. with (NH₄)₂SO₄ and subsequently with cold acetone. 0.35 fig. of this purified autoprothrombin C was sufficient to clot recalcified plasma in 15 sec. The mol. wt. of autoprothrombin C was 21500, all amino acids were found and it contained 7% carbohydrate and 3-8% hexosamine.

J.B.Parish

2890. PROTEINS (CONCHAGEN) AND CHITIN IN SUPPORTING TISSUE OF CUTTLE FISH [SEPIA]. H.Stegemann: *Hoppe-Seylers Z. physiol. Chem.*, 1963, 331, 269-279 (Med. Res. Inst., Max-Planck-Soc., 34 Göttingen, Germany) The conchagen from a no. of fishes was converted to sol. proteins separating the chitin. This was shown to consist of 2Pjo protein, containing some unidentified phenolic amino acids and amino sugars. The conchagen fraction was also investigated by the terminal DNP method and some amino acids identified. (German)

L.Cornish

2891. PHOSPHOPROTEIN ISOLATED FROM TROUT EGG. Y.Ito, T.Fujii and R.Yoshioka: *J. Biochem.*, Tokyo, 1963, 53, 242-243 (Dept. Biochem., Gifu Med. Sch., vGifu, Japan) The water sol. phosphoprotein is suggested to be of a new type. Prelim, comm.

B.M.Stevens

2892. PREPARATION OF LIVETIN FRACTION FROM THE YOLK OF HEN'S EGG. A.Oberdorfer: *Hoppe-Seylers Z. physiol. Chem.*, 1963, 331, 280-286 (Clin.-Chem. Inst. State Hosp., Munich, Germany) Extraction of lipids with butanol, soln. in phosphate buffer and pptn. with SO₄²⁻, followed by separation by electrophoresis, ultracentrifugation and chromatography, gave 2 pure livetin fractions. Quant, amino acid analyses of these are reported. (German)

L.Cornish

2893. REACTION OF RHODOSPIRILLUM RUBRUM CYTOCHROME C2 WITH PSEUDOMONAS CYTOCHROME OXIDASE AND COW CYTOCHROME C. T.Yamanaka,

K.Okumuki and T.Horio: *Biochim. biophys. Acta*, 1963, 73, 165-167 (Dept. BioL, Fac. Sci., Univ. Osaka, Nakanoshima, Osaka, Japan). B.M. Stevens

2894. TWO CYTOCHROMES ISOLATED FROM THE BACTERIAL GENUS BORDETELLA. LW.Sutherland: *Biochim. biophys. Acta*, 1963, 73, 162-164 (Bacterio! Dept., Univ. Edinburgh, Scotland) Some prop. of the cytochromes, which had a absorption max. of 553 mji and 550 mfi in the reduced form, are described.

B.M. Steven

2895. PURIFICATION AND SOME PROPERTIES OF CYTOCHROME C FROM THE TOAD, BUFO VULGARIS. T.Yamanaka, H.Mizushima and K.Okunuki: *Biochim. biophys. Acta*, 1963, 73, 167-169 (Dept. Biol., Fac. Sci., Univ. Osaka, Nakanoshima, Osaka, Japan) Reactivities with *Pseudomonas* cytochrome oxidase and with cow cytochrome ji were examined. B.M.Steven:

2896. SPECIFICITIES OF CHICKEN OVOMUCOID AND OVOINHIBITOR. R.E.Feeney, F.C.Stevens and D.T. Osuga: *J. biol. Chem.*, 1963, 238, 1415-1418 (Dept. Food Sci. and Tech., Univ. California, Davis, Calif., U.S.A.) The specificities of chicken ovomucoid and ovoinhibitor, and of turkey ovomucoid against trypsin, chymotrypsin, and fungal proteinase are very different. Chicken ovomucoid inhibits only trypsin; chicken ovo-inhibitor inhibits all 3 enzymes; whilst turkey ovomucoid inhibits trypsin and chymotrypsin. The reported weak inhibn. of chymotrypsin by chicken ovomucoid is due to contamination with ovoinhibitor.

J.N.Ashley

2897. THE DECREASE IN REDUCING POWER OF OVOMUCOID DURING PROTEOLYSIS. J.G.Beeley and F.R.Jevons: *Biochem. J.*, 1963, 88, 15-19 (Dept. Chem., Univ. Manchester, England) When incubated with proteolytic enzymes, the reducing power of ovomucoid and chymotrypsinogen towards an I_k. Cu reagent falls to about one-third of the original value. This reducing power is attributable largely to cystine, serine and tryptophan; a suggested explanation of the decrease is a decreased tendency to 3-elimination from cystine and serine residues. +

2898. ELECTROPHORETIC SEPARATION OF BIOLOGICALLY ACTIVE CONSTITUENTS OF SCORPION VENOMS. R.W.P.Master, S.Srinivasa Rao and P.D. Soman: *Biochim. biophys. Acta*, 1963, 71, 422-428 (Dept. Immunol., Haffkine Inst., Bombay, India)

Starch gel electrophoresis indicated the presence of protease in both *Buthus tamulus* and *Palamneus gravimanus* venoms. The former also possessed 5'-nucleotidase; the latter phosphodiesterase. Both had a guinea-pig ileum contracting factor. Neither contained phospholipase A, cholinesterase or L-amino acid oxidase.

B. tamulus venom contained 2 toxins, one of which produces increased breathing and die other stiffening of the hind portion of inj. mice. None of the *P. gravimanus* fractions were lethal to mice.

B.M.Stevens

2899. STARCH GEL ELECTROPHORESIS OF VENOMS OF INDIAN KRAIT AND SAW SCALED VIPER AND IDENTIFICATION OF ENZYMES AND TOXINS.

R.W.P.Master and S.Srinivasa Rao: *Biochim. biophys. Acta*, 1963, 71, 416-421 (Dept. Immunol. Haffkine Inst., Bombay, India) *Bugarus caeruleus* venom had 4 toxic components. *Echis carinatus* venom had only 1 toxin which was shown to be a proteolytic enzyme with * strong coagulant action.

B.M.Stevens

- 900. CORRELATION OF FRACTIONS OF CONTRACTILE PROTEINS IN MUSCLE.** T.P.Serebrenikova: Biokhimia, 1963, 28, 36-44. A study was made of striated, cardiac and smooth muscle in dogs and pigs by fractionated salting out. Similar curves were obtained respective of the salt used. A quant. assay was made of fractions of contractile proteins. Extraction was carried out with soln. of various acidity. In the smooth muscle extract, salting out of an actin-like protein, actomyosin and myosin was observed. The neutral extract of canine cardiac muscle contained 42% actomyosin and 17% myosin; for the neutral extracts of striated muscles the figures were 46% and 18% respectively. Marked tissue disintegration occurred in striated muscle triturated with and, and this distorted the salting out pattern.
 (Russian) B.J. Cooper

1901. MACROMOLECULAR AGEING IN VIVO. H.Walter: Nature, Lond., 1963, 198, 189-190 (Med. Res.)
 Programs, V.A. Hosp., Long Beach, Calif., U.S.A.) Evidence on the alteration in the prop. of Hb as it ages is reviewed and the concept of macromol. ageing extended to give a possible explanation of the observed electroforetic heterogeneity of a no. of cryst. enzymes.
 G.M.Lewis

1902. STUDIES OF COLLAGEN TISSUE AGEING: DEGRADATION OF GLYCERALDEHYDE-TREATED HIDE COLLAGEN. R.A.Milch, R.A.Murray and P.I. Kenmore: Proc. Soc. exp. Biol., N.Y., 1962, 111, 554-556 (Div. Orth. Surg., Johns Hopkins Univ. Sch. Med., Baltimore, Md., U.S.A.) Glyceraldehyde treatment of hide powder resulted in diminished swelling and lesser solubilisation relative to the untreated, indicating improved stability of collagen prep, after interaction with such metabolites. M.M.Shapland

1903. PREPARATION OF PURIFIED COLLAGENASE. S.Keller and I.Mandl: Arch. Biochem., 1963, 101, 81-87 (Columbia Univ., Coll. Phys. Surg., New York, U.S.A.) *Clostridium histolyticum* collagenase was drifted by gel filtration on Sephadex G-200 columns or by ion exchange chromatography on DEAE-Sephadex *-50. Ca containing buffers were necessary for good recovery in both cases. Yields of up to 94%, free of top. proteolytic activities, were consistently obtained. B.M.Stevens

1904. ISOLATION OF LOW DENSITY SERUM LIPOPROTEINS AFTER FLOCCULATION WITH SODIUM PHOSPHOTUNGSTATE AT NEUTRAL pH AND IN PRESENCE OF MgCl₂. M.Buistein: Nouv. Rev. franc. Hemat., 1963, 3, 139-148 (Centre National de Transfusion Sanguine, Paris, France) Selective reversible *tn. of the p-lipoproteins and chylomicrons is achieved by adding to serum sodium phosphotungstate and MgCl₂ at pH 7*8. Modifications using MgZnCl₂ and sucrose are described. Homogeneous lipid soln. of up to 100 g./L, coloured by carotene, are obtained. Paper, starch-gel and immuno-electrophoresis show only one component. (French) V.Eisen

1905. SELECTIVE PRECIPITATION OF LOW-DENSITY SERUM LIPOPROTEINS BY NEUTRAL SODIUM PHOSPHOTUNGSTATE IN THE PRESENCE OF A RAISED SALT CONCENTRATION. M.Burstein: J. Physiol., Paris, 1962, 54, 647-656 (Centre Nationale de Transfusion Sanguine, Paris, France) In the presence of a raised salt concn. and neutral pH, sodium phosphotungstate Ppt. the low-density group of human serum lipoproteins. This pptn. is reversible and under certain conditions selective, and allows pure lipoproteins to be isolated by chem. procedures alone. (French) A.Angel

2906. ALLEGED INTERACTION IN VITRO BETWEEN PLASMA 0-LIPOPROTEINS AND AORTIC MUCOPOLYSACCHARIDES. C.J.F.Bottcher, F.P.Woodford and F.B.Klynstra: J. Atheroscler. Res., 1963, 3, 24-31 (Dept. Phys. Chem., Univ. Leiden, Netherlands)
 No complex formation between arterial wall mucopolysaccharides [MPS] and plasma 0-lipoproteins could be detected by paper electrophoresis. It is concluded that the interaction between pure isolated MPS and intact plasma proteins does not occur during electrophoresis. K.Jones

2907. VARIATIONS IN THE ELECTROPHORETIC MOBILITY OF (X₁-GLOBULINS OF RAT SERUM IN DIFFERENT BUFFERS. M.J.Escribano: C.R. Acad. ScL, Paris, 1962, 255, 409-411 (Service de Chimie micro-biennne, Inst. Pasteur, Paris, France) The mobility of the C₁-globulins of normal rat serum during electrophoresis on agar decreases sufficiently as the ionic concn. and pH of the buffer increase to facilitate their separation from albumin. Optimal results were obtained at pH 9 and a molarity of 0*05 in the gel. Buffers tested were sodium veronal-hydrochloric acid, Michaelis and carbonate-sodium bicarbonate. Mean relative mobilities of albumin, (X₁-globulin, 82-globulin and y-globulin in these buffers are tabulated. During immunoelectrophoresis albumin moves alone, the 0Ci-globulin group stays together and the 4 di-globulins always have the same relative mobilities. (French) S.A.Thistlewood

2908. COMPARISON OF METHODS OF PREPARATION OF 02A-GLOBULINS OF HUMAN SERUM. R.Havez, P.Sautiere, M.Sautiere and G.Biserte: C.R. Soc. Biol., Paris, 1962, 156, 1641-1647 (Lab. Bioch., Fac. M&ed., Lille, France) Electrophoresis of 02A"globulins fraction prep, by ZnSO₄ and (NH₄)₂SO₄ pptn. according to Heremans showed the presence of (3-globulins, d-macro-globulins, siderophilin, haptoglobulins, y-globulins and serum albumin. Fractionation by (NH₄)₂SO₄ at constant pH and 20° resulted in the pptn. of 02A"globulins at 33% satn. Chromatography of the 02A"globulin fraction on DEAE-cellulose columns allowed the prep. of an immunoelectrophoretically pure sample of 02A"globulins. (French) M.A.Price

2909. ALLOTYPY IN RABBIT 19S PROTEIN. C.W.Todd: Biochem. biophys. Res. Comm., 1963, 11, 170-175 (Service d'Immunochimie Analytique, Inst. Pasteur, Paris, France) Evidence is presented that rabbit 19S protein and 19S y-globulin have 2 groups of allotypic "immunol. specificities in common. B.Ketterer

2910. MOLECULAR SUBSTRUCTURE OF FIBRINOGEN. R.H.Haschmeyer and R.E.Nadeau: Biochem. biophys. Res. Comm., 1963, 11, 217-223 (Dept. Biochem., Tufts Univ. Sch. Med., Boston, Mass., U.S.A.) Expl are described showing that fibrinogen dissociates into sub-units having a sedimentation coeff. of 3*5S when either heated at pH 10 or subjected to sulphitolytic in the presence of sodium dodecyl sulphate. B.Ketterer

2911. DEVELOPMENTAL CHANGES IN PLASMA PROTEIN PATTERN OF THE RAT. R.W.Wise, F.J.Ballard and E.Ezekiel: Comp. Biochem. Physiol., 1963, 9, 23-30 (Dept. Biochem., Univ. Western Australia, Nedlands, W. Australia) Plasma obtained from rats, adults and at various developmental stages, were subjected to paper, starch-gel and 2-way electrophoresis. Eighteen plasma protein bands have been observed though not all are present at the same time. Two post-albumins were the major components of early foetal plasma, but these disappear

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shortly after birth. A transferrin and a slow ag-globulin also disappear after birth. Other proteins tend to increase in concn. during prenatal development, and a fast and slow (Xi-globulin occurring in adults can be just detected in 19-day embryos. M.S.Laverack

2912. Hb CONTENT OF THE BLOOD OF SIX SPECIES OF SCOMBROID FISHES. W.L.Klawe, LBarrett and B.M.H.Klawe: *Nature, Lond.*, 1963, 198, 96 (Inter-American Tropical Tuna Commission, Scripps Inst. Oceanography, La Jolla, Calif., U.S.A.) The Hb content of the blood of 6 spp. of scombroid fishes was determined by the pyridine haemochromogen method. The Hb concn. were higher than for other groups of fishes, especially in those spp. possessing a highly developed cutaneous vascular system. G.M.Lewis

2913. HYBRID MOLECULES FORMED BY REACTION BETWEEN Hb FROM DISTANTLY RELATED ANIMALS. H.E.Herner and A.Riggs: *Nature, Lond.*, 1963, 198, 35-36 (Zool. Dept., Univ. Texas, Austin, Tex.. U.S.A.) Formation of hybrid Hb mol. occurred with Hb from the following spp.: - tadpole with elephant, tadpole with mouse, mouse with donkey, mouse with elephant. No hybridisation occurred with Hb from adult and tadpole frogs. J.R.Sargent

2914. ALTERATION IN THE CHAIN OF HAEMOGLOBIN FERRARA. L Bianco, G.Modiano, E.Bottini and R-Lucci: *Nature, Lond.*, 1963, 198, 395-396 (Inst. d'Igiene dell* Univ. Roma, Centro di Studi della Microcitemia e delle Anemie Micocitemiche, Rome, Italy) Expt. of hybridisation of Hb LFerrara with human Hb S, A2 and F and canine Hb indicate that the structural alteration of Hb LFerrara is in the a chain. G.M.Lewis

2915. Hb. VH. N- AND C-TERMINAL FRAGMENTS DERIVED FROM BOVINE GLOBIN a AND 0 WITH N-BROMOSUCCINIMIDE [NBS] OXIDATION. S.Sasakawa. VIE. TRYPTIC PEPTIDES OF BOVINE GLOBIN a. K.Satake and S.Sasakawa: *J. Biochem.*, Tokyo, 1963, 53, 188-200, 201-203 (Dept. Chem., Fac. Sci., Metropolitan Univ., Tokyo, Japan) VII. Reaction at pH 3*5 cleaved only Cryptophanyl linkages whereas at pH 4*5 C-tyrosyl linkages were also cleaved. With a large excess of NBS and a limited reaction period, yields up to 65-75% were obtained, except for the Tyr.-Thr. of globin p which was only 20% cleaved. Cystine and methionine residues were oxidised to cysteic acid and methionine sulphoxide residues respectively but other side reactions were not observed. Comparing the N-terminal residues before and after NBS oxidation indicated the presence of Tyr.-Gly., Tyr.-Phe., Tyr.-Gly. and Tyr.-Arg. in the OL-chain and Tyr.-Gly., Tyr.-Thr., Tyr.-Glu. and Tyr.-His. in the 3-chain. Terminal structures for the a and 3 globin are suggested.

VIH Globin a obtained from type HbA/HbA was partially hydrolysed with trypsin and the sol. peptides were resolved on paper 2 dimensionally, first by electrophoresis and then by chromatography. Most of the 16 main spots showed good correspondence with the tryptic peptides from human globin a 14 spots were isolated in a homogeneous state and N-terminal amino acids and total composition were compared with those of the corresponding human peptides. Tryptic core was purified by partition chromatography and further hydrolysed with pepsin. The fragments were examined for amino acid composition and N-terminal residues. A partial structure for bovine globin a is suggested. B.M.Stevens

2916. PRIMARY STRUCTURE OF THE (X-CHAIN FROM HORSE Hb. G.Braunitzer and G.Matsuda: *J. Biochem.*, Tokyo, 1963, 53, 262-263 (Max-Planck-Inst. Biochem., Munchen, Germany). B.M.Stevens

2917. ABNORMALITY OF THE PRIMARY STRUCTURE OF HAEMOGLOBIN SHIMONOSEKI. M.Hanada and D.L.Rucknagel: *Biochem. biophys. Res. Comm.*, 1963, 11, 229-234 (Dept. Human Genetics, Univ. Michigan Med. Sch., Ann Arbor, Mich., U.S.A.)

Evidence is presented to show that glutamine normally present as the 54th residue in the CX-chain of Hb A is substituted by arginine in Hb Shimonoseki.

B.Ketterer

2918. ISOLATION OF ASCARIS Hb. M.H. Smith and M.Morrison: *Biochim. biophys. Acta*, 1963, 71, 364-370 (Molteno Inst., Univ., Cambridge, England) Neither of the 2 Hb were obtained free from contaminating protein except during ultracentrifugation. Isoelectric points were approx. 5*0 and 6*7. MoL wt. were approx. 14000 and 280000. General spectral characters resembled those of other Hb but even allowing for contamination the protein absorption appeared to be unusually high. Prop. differed from those of mammalian Hb in every respect examined. B.M.Stevens

2919. SOME ASPECTS OF THE COMBINATION OF ASCARIS Hb WITH OXYGEN AND CARBON MONOXIDE. M.H.Smith: *Biochim. biophys. Acta*, 1963, 71, 370-376 (Molteno Inst., Univ., Cambridge, England) Biochem. reducing systems were shown to produce the same effects as Na₂S₂O₄. The deoxygenation velocity of body wall Hb increased approx. 3-fold with a 10° rise in temp, and changed markedly with pH while that of perienteric fluid Hb increased approx. 5-fold with a 10° temp, rise but was little affected by pH. At 38° the reaction of the former Hb was approx. 17 times as fast as that of the latter. Both Hb had @ bands more intense than the a bands in the oxygenated form and the high affinity for O₂ which appears to be found in this case. The partition coeff. for both Hb were shown to be < 0*1 and probably nearer 0*01. B.M.Stevens

2920. U.V. ABSORPTION SPECTRA OF a, 3 AND y POLYPEPTIDE CHAINS FROM HUMAN Hb. G.Matsuda. T.Maekawa and LMuta: *Hoppe-Seylers Z. physiol. Chem.*, 1963, 331, 295-297 (Dept. Biochem. Sch. Med., Univ., Nagasaki, Japan) Tryptophan can be detected in human foetal Hb by its u.v. absorption. It is shown that this is due to the y polypeptide chain of the Hb mol. (German) LCornish

2921. STABILISATION OF POLYPEPTIDE HELICES BY HYDROPHOBIC INTERACTIONS. N.M.Green: *Arch. Biochem.*, 1963, 101, 186 (Dept. Chem. Pathol, St. Mary's Hosp. Med. Sch., London, England). B.M.Stevens

2922. BUOYANT BEHAVIOUR OF BOVINE SERUM MERCAPTALBUMIN IN SALT SOLUTIONS AT EQUILIBRIUM IN ULTRACENTRIFUGE. L PROTEIN CONCENTRATION DISTRIBUTION BY SCHLIEREN OPTICS AND NET HYDRATION IN CsCl SOLUTIONS. J.B.Ifft and J.Vinograd: *J. phys. Chem.*, 1962, 66, 1990-1998 (Gates and Crellin Lab. Chem., California Inst. Technol., Pasadena, Calif., U.S.A.) Bovine serum mercaptalbumin has been banded in CsCl soln. at sedimentation equilibrium. The distribution appeared gaussian indicating density and moL wt. homogeneity. The partial sp. vol. in CsCl wa* found to be 0*736 g./cm³

and from this and the measured buoyant density, it was calc. that the net hydration for the salt-free protein was $0.20 \text{ g.H}_2\text{O/g}$. A value for the mol. wt. was also obtained.

G.C.Barr

2923. HYDROGEN BONDING IN MONOMOLECULAR FILMS: STRENGTH OF KETO-IMINO HYDROGEN BOND IN AQUEOUS MEDIA. G.E.Hibberd and A.E. Alexander: *J. phys. Chem.*, 1962, 66, 1854-1858 (Phys. Chem. Dept., Univ. Sydney, N.S.W., Australia) The association between $> \text{C} \ll \text{O}$ and $\text{H}-\text{N} <$ groups in an aq. environment was examined by monolayer studies of octadecyl acetamide. This type of hydrogen bond is believed to be of major importance in the stability of protein configuration and the present studies indicate that the energy of die hydrogen bond in water has a value of 2 kcal./mole. The effect of several salts and of urea on this bond strength has been measured quant.

G.C.Barr

2924. MOLECULAR WEIGHT, LIMITING AREA AND FLEXIBILITY OF UNIMOLECULAR LAYERS OF SERUM ALBUMIN AND ITS DERIVATIVES. M.Muramatsu and H.Sobotka: *J. phys. Chem.*, 1962, 66, 1918-1923 (Chem. Dept., Mount Sinai Hosp., New York, U.S.A.) Physical prop. of bovine serum albumin and some of its deriv. was studied by a spreading technique. The influence of electrolytes on the limiting area per mol. was examined and values for the mol. wt. and flexibility calc. The effect on-the physical prop. of the unimolecular layer is described for the acetylation of amino groups and phenolic groups and for the coupling of the protein with diazo compounds.

G.C.Barr

2925. POLYMERISATION OF SILICIC ACID AND ITS SUBSEQUENT INTERACTION WITH PROTEINS AND OTHER HYDROGEN-BONDING AGENTS. L.Bergman and E.S.Nelson: *J. colloid Sci.*, 1962, 17, 823-827 (Safety in Mines Res. Estab., Ministry of Power, Sheffield, England) Polymerised silica sols show varying binding powers for different proteins. The ones studied were bovine serum globulin, bovine serum albumin and gelatin. The conditions of this binding are discussed and the large ability of silica surfaces to bind globulins is put forward as a possible explanation for the power of ^3U ica surfaces to kill cells and lead to fibrosis.

G.C.Barr

2926. REVERSIBLE DECOLOREATION OF CAERULO-PLASMIN UNDER ACID CONDITIONS. G.Curzon: *Biochim. biophys. Acta*, 1963, 71, 249-250 (Dept. Chem. Pathol., Inst. Neurol., Nat. Hosp. for Nervous Dis., London, England) Prelim. comm.

B.M.

Stevens

2927. SPECTROPHOTOMETRIC STUDIES ON THE TYROSYL AND TRYPTOPHANYL GROUPS OF CARBOXYPEPTIDASE A. H.Fujioka and K.Imahori: *J. Biochem.*, Tokyo, 1963, 53, 244-249 (Dept. Chem., Coll. Gen. Education, Univ. Tokyo, Japan) On titration in 1M NaCl soln. at 25° , 8 of the 16-17 tyrosyl groups in bovine pancreatic carboxypeptidase A ionised freely and reversibly at pH 8-10 $^{+5}$. The further ionisation of 8-9 groups at pH above 10 $^{+5}$ was time dependent. The groups were almost instantaneously ionised at pH 13. After exposure to pH 13 for 16 hr. all tyrosyl groups were normalised and reversibly titrated with an apparent pK of 9.9. The tyrosine content was spectrophotometrically determined to be 16 residues/ enzyme. The effect of 20% sucrose on the absorption spectrum was examined by difference spectra.

Results suggested approx. 3 moles of 'exposed' tryptophan were present.

B.M.Stevens

2928. CONCENTRATION DEPENDENCE OF THE SEDIMENTATION COEFFICIENT OF TRANSFERRED
A.Mahling; *Z. Naturforsch. B*, 1963, 18, 1-3
(Behringwerke A C, Marburg/Lahn, Germany) Two human transferrins were isolated from plasma and their sedimentation coeff. determined in the Spinco analytical centrifuge at various concn. The first did not contain neuraminic acid and had $\epsilon = 5.628$, the other contained neuraminic acid and had $S = 5.505$.

(German) J.C.Crawhall

2929. REACTION OF GLUTATHIONE WITH SERUM ALBUMIN, GLUTEN AND FLOUR PROTEINS. R.Frater and F.J.R.Hird: *Biochem. J.*, 1963, 88, 100-105 (Univ. Melbourne, Parkville, Victoria, Australia) The reaction of glutathione with the disulphide bonds of serum albumin and gluten has been followed by using the current-voltage wave to follow its disappearance. The reaction is slow and limited in extent at pH 5.0 and increases with increase in pH, being very fast and extensive at pH 9.0. Evidence is given that glutathione and oxidised glutathione react with the disulphide bonds and thiol groups respectively of the proteins in dough. Low-mol. wt. thiol(s) and disulphide(s) have been shown to be present in flour. The above observations are discussed in relation to the hypothesis that thiol-disulphide-exchange reactions are important in determining the rheological prop. of dough.

2930. SCHIFF PERIODIC ACID-FUCHSIN REACTION WITH OROSOMUCOID AND ITS HYDROLYSIS PRODUCTS. R.Paquin and F.Percheron: *Bull. Soc. Chim. biol.*, Paris, 1963, 45, 101-109 (Lab. Chim. Analytique, Fac. Pharmacie, Paris, France) The consumption of periodic acid by native orosomucoid was rapid in the first few min. The reaction was less rapid after gentle acid hydrolysis or after neuraminidase activity. The final total quantity of periodic acid consumed was the same in each case. The Schiff reaction showed the presence of 2 aldehyde groups after periodic acid oxidation of the native glycoprotein per mol. neuraminic acid.

(French) J.C.Crawhall

2931. ISOLATION AND AMINO ACID SEQUENCE OF ELEDOISIN, THE ACTIVE ENDECAPEPTIDE OF THE POSTERIOR SALIVARY GLANDS OF ELEDONE. A.Anastasi and V.Ersparmen: *Arch. Biochem.*, 1963, 101, 56-65 (Framitalia S.p.A. Res. Lab., Milan, Italy) Crude methanol extracts were chromatographed on alk. alumina or absorbed on serum albumin and then subjected to ion exchange chromatography and countercurrent distribution. Pure eledoisin thus obtained was subjected to total and partial acid hydrolysis, tryptic and chymotryptic digestions and end group determination expt. and was shown to have the structure pyroglutamyl-Pro.-Ser.-Lys.-Asp.-Ala.-Rie.-neu.-Gly.-Leu.-Met.-NH₂.

B.M.Stevens

2932. CONVENIENT APPARATUS FOR PROTEIN HYDROLYSIS AND GREASELESS FREEZE-DRYING. J.Bello: *Analyt. Biochem.*, 1963, 5, 366-367 (Biophysics Dept., Roswell Park Mem. Inst., Buffalo, New York, U.S.A.) The use of grease can be eliminated if O-ring spherical joints held together by a spherical joint clamp are used. No loss of liquid was observed at $U<$ during 20 hr. hydrolysis, and high vacuum is maintained in freeze drying.

A.D.Smith

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2933. CONTRIBUTION TO THE STUDY OF THE DISULPHIDE BONDS IN HEN'S EGG WHITE LYSOZYME. J.Jolles, J.Jauregui-Adell and P.Jolles: Biochim. biophys. Acta. 1963, 71, 488-490 (Lab. Biol. Chem., Fac. Sci., Paris, France) The 4 cystine containing peptides were isolated after enzymic digestion, oxidised with performic acid and studied by the method of Spackman, Stein and Moore to determine which half-cystine residues were joined in the native enzyme. Prelim, comm. B.M. Stevens

2934. MECHANISM OF METMYOGLOBIN OXIDATION. N.Kelso King and M.E.Winfield: J. biol. Chem. 1963, 238, 1520-1528 (Div. Phys. Chem., Commonwealth Sci. and Ind. Res. Organisation, Melbourne, Australia) When horse heart metmyoglobin is oxidised by H_2O_2 at pH 6 and 0-1° most of it is in a free radical state a few sec. after addition of the H_2O_2 . The mol. that contains the free radical also contains Fe^{4+} . This first oxidation product, although it resembles in some ways the first oxidation product of a peroxidase by H_2O_2 , is different because an Fe and a C have been oxidised. Mechanisms are suggested for formation of the free radical and for its loss. The amount of O_2 evolved during oxidation of myoglobin in the ferric state is about 40% less than that expected from a catalytic decomposition of H_2O_2 ; this is due, amongst other things, to oxidation of amino acids. J. N. Ashley

2935. THE REACTION OF PROTEIN THIOL GROUPS WITH SOME DISULPHIDES. T.E.Islas and P.C.Jocelyn: Biochem. J., 1963, 88, 84-88 (Dept. Clin. Chem., Univ. Edinburgh, Scotland) The SH content of some purified blood proteins was determined by mixing the proteins with Na β -chloromercuribenzoate and determining the latter remaining in soln. when the proteins are pptd. Cystine reacts with these proteins, abolishing the SH content of human and bovine serum albumin and decreasing that of bovine Hb by 50%. There is no reaction between oxidised glutathione and the protein SH groups. Bovine serum albumin forms a mixed disulphide with cystine and 1 mol. of cystine is lost for the loss of 2 groups of protein SH. The reaction is second-order, and the rate decreases with decreasing pH but is uninfluenced by heavy-metal ions. The protein SH groups lost in the reaction are regenerated by adding either reduced glutathione or NaCN*

2936. N-TERMINAL RESIDUES IN ACETONE PRECIPITATED COMMERCIAL GELATIN. CHANGES IN THE APPARENT AVERAGE CHAIN WEIGHT. F.S.Steven and G.R-Tristram: Biochim. biophys. Acta, 1963, 71, 392-396 (Dept. Physiol. Biochem., St. Salvator's Coll., Univ. St. Andrews, Scotland) Physically associated nonprotein-N constituents were removed by serial acetone pptn. from dil. acetic acid soln. The average chain wt., measured by N-terminal analysis, increased from 55000 with each pptn. to a limiting value of 104000. B.M. Stevens

2937. TWO NEW STAINING PROCEDURES FOR QUANTITATIVE ESTIMATION OF PROTEINS ON ELECTROPHORETIC STRIPS. S.Fazekas de St.Groth, R.G. Webster and A.Datyner: Biochim. biophys. Acta, 1963, 71, 377-391 (Dept. Microbiol., Australian Nat. Univ., Canberra, Australia) Protein complexes of Procion Brilliant Blue RS and Coomassie Brilliant Blue R250 followed Beer's law up to 50 and 20 fig./cm. respectively. Lower limits of detection were 2 and 0.5 fig./cm. Within these limits the abs. amount of protein could

be estimated by direct photometry within a single test with an accuracy of approx. $\pm 10\%$. The major error arose from uneven sample application. Relative concn. within a protein mixture could be evaluated to an accuracy better than $\pm 2P\%$. Technical details are given in full. B.M. Stevens

2938. REACTION OF TRYPSIN WITH ϵ -NITROPHENYL ACETATE IN DIMETHYL SULPHOXIDE. F.A.Bettelheim and A.Lukton: Nature, Lond., 1963, 198, 357-359 (Chem. Dept., Adelphi Coll., Garden City, New York, U.S.A.) Reaction of trypsin with ϵ -nitrophenylacetate [PNPS] in dimethyl sulphoxide led to an initial rapid shift of the enzyme u.v.-absorption peak from 280 m μ to longer wavelengths. Following this shift a slower reaction occurred resulting in peaks at 320 and 432 m μ ; the latter were due to liberated p -nitrophenol. The intermediate complex which causes the initial rapid shift was unstable and was not acetylated trypsin. The shift is considered to be due to loose complexing of trypsin with PNPS which causes changes in protein conformation as a result of enhanced internal hydrophobic bonding. J.R. Sargent

2939. CLEAVAGE OF SPERM WHALE MYOGLOBIN WITH CYANOGEN BROMIDE. A.B.Edmundson: Nature, Lond., 1963, 198, 354-357 (M.R.X.Lab.Mol. Biol., Hills Rd., Cambridge, England) Cleavage of whale myoglobin at its methionine residues with cyanogen bromide led to the isolation of 3 peptides whose amino acid compositions were determined. Ratios of mol. wt. of the 3 peptides produced were 1:2:3. One peptide is derived from the C-terminal portion of myoglobin, another from the N-terminal portion and the 3rd from the interior portion of the polypeptide chain of myoglobin. The significance of these results in the amino acid sequence of myoglobin is considered. J.R. Sargent

2940. HYDROLYSIS OF DENATURED OVALBUMIN BY PEPSIN. M.P.Chernicov: Vop. Med. Him., 1963, 9, 125-127 (Inst. Nutrition, Acad. Med. Sci. of U.S.S.R. Moscow, U.S.S.R.) Pepsin caused rapid hydrolysis of ovalbumin at pH 1-2 though max. rates were obtained only in the presence of 6M urea. Heat denatured ovalbumin was hydrolysed at pH 1-2 at a decreased rate but this rate was again increased in the presence of 6M urea. Ovalbumin was hydrolysed by pepsin at pH 4-7 only in the presence of 6M urea. J.R. Sargent

2941. APPLICATIONS OF RADIOACTIVELY LABELLED MARKER PROTEINS IN DENSITY GRADIENT ULTRACENTRIFUGATION. P.A.Charlwood: Analyt. Biochem.* 1963, 5, 226-245 (Nat. Inst. Med. Res., The Ridgeway, Mill Hill, London, England) The advantages of internal reference substances, especially when radioactive to study rate of sedimentation are referred to. Iodination of readily available proteins, ranging in size from lysozyme to serum macroglobulin gives valid markers. Two different isotopes can be used to permit use of 2 markers. The principle can be applied in controlling prep. of macroglobulins, and studying the size of Ab and Ag. A.D. Smith

2942. MODIFICATION OF PROTEIN STRUCTURE BY MEANS OF AZLACTONES. T.Baranowski, M.Kochman, K.Nowak and L.Siemion: Bull. Acad. pol. ScL, 1963, 11, 107-111 (Dept. Physiol. Chem., Sch. Med., Wroclaw, Poland) The reaction of a protein (gelatin) with an azlactone (of ϵ -nitrobenzoyl-D,L-valine) was studied spectrophotometrically at different pH values and quant. relations between the azlactone and the protein.

From pH 3 to 10 the no. of free amino groups of the gelatin which reacted with the azlactone increased, and at pH 7*4 about half of the free amino groups were found. The practical application of these findings lies in the possibility of using azlactones for the modification of protein structures under physiol conditions.

E.Parkinson

2943. COMPARATIVE STUDY OF THE BIURET AND PHENOL REAGENT METHODS OF PROTEIN ESTIMATION. RESEARCHES IN ASPERGILLUS. R.Khanna, K.K.Tewari and P.S.Krishnan: Arch. Mikrobiol., 1963, 44, 352*355 (Div. Biochem., Lucknow Univ., Lucknow, U.P., India) Erroneously high results are obtained with the biuret method when applied to crude extracts of mycelial and other tissues, and the phenol reagent is to be preferred.

E.M.Ling

2944. IDENTIFICATION OF TYROSINE AT ACTIVE SITE OF ANTI-*p*-AZOBENZENEARSONIC ACID ANTIBODY. M.E.Koshland, F.M.Englberger and S.M. Gaddone: J. biol. Chem., 1963, 238, 1349-1352 (Biol. Dept., Brookhaven Nat. Lab., Upton, N.Y., U. S. A.) During iodination of anti-*p*-azobenzene-arsonic acid Ab the tyrosyl residues are most susceptible; histidyl residues are iodinated more slowly, and oxidation of methionyl and tryptophanyl residues does not occur until most of the available tyrosyl residues have reacted. Essentially all immunol. activity is lost when only tyrosyl and histidyl residues are iodinated. By combined use of photo-oxidation, which selectively alters histidyl residues, and iodination, which decreases significantly the binding capacity by the reaction of only tyrosyl groups, a tyrosyl residue is shown to be the I-reactive group at the active site of the Ab.

J.N.Ashley

2945. RATES OF REACTION OF NATIVE HUMAN GLOBIN WITH SOME HAEMS. Q.H.Gibson and E.Antonini: J. biol. Chem., 1963, 238, 1384-1388 (Dept. Biochem., Univ. Sheffield, England) The rate of reaction of native human globin with the CO compounds of various haems decreases in the order proto-, ¹eso-, deutero-, and haemato-haem. The dimethyl ester of deuterohaem disulphonate does not react. The results correlate well with the known structure of Hb in which the vinyl groups lie deeply in the hydrophobic interior of the mol. Spectrophotometric evidence is obtained of the formation of an intermediate complex in reaction between haem and globin. Spectrophotometric data are given for various haematin, haems, and CO-haems.

J.N.Ashley

2946. TRYPTIC CLEAVAGE AT CYSTEINYLY PEPTIDE BONDS. M.A.Rafferty and R-D.Cole: Biochem. biophys. Res. Comm., 1963, 10, 467-472 (Dept. Biochem., Univ. California, Berkeley, Calif., U.S.A.) After fraction with ethylenimine, cysteinyl peptide bonds score quant, converted to S-(*p*-aminoethyl) cysteinyl peptide bonds which are substrates for trypsin.

B.Ketterer

²⁹⁴⁷ **SIMPLE ESTIMATION OF CATHEPSIN C USING A NEW CHROMOGENIC SUBSTRATE.** R.J.Planta and M.Gruben Analyt. Biochem., 1963, 5, 360-362 (Biochem. Lab., Rijksuniversiteit Groningen, Nether-U.S.Jfnds) Gly-Phe-p-nitroanilide was synthesised and used as a substrate for cathepsin C estimation. The reaction was followed by determining absorbance in the range 410-415 nm. A degree of accuracy of $\pm 2\%$ was obtained.

A.D. Smith

2948. PSEUDOMONAS AEFUGINOSA PROTEINASE. I. PURIFICATION AND GENERAL PROPERTIES. K.Morihara, II MOLECULAR WEIGHT-AND MOLECULAR DIMENSION. H.Inoue, T.Nakagawa and K.Morihara: Biochim. biophys. Acta, 1963, 73, 113-124, 125-131 (Shionogi Res. Lab., Shionogi and Co., Ltd., Osaka, Japan) L Extracellular proteinase of *P. aeruginosa* IFO 3080, obtained as needle-like crystals and recryst. 3 times, appeared homogeneous on electrophoresis and ultracentrifugation; a small amount of impurity was detected by chromatography on DEAE-cellulose columns. The isoelectric point was slightly below pH 4*08. Max. absorption was at 280 m/i and min. at 250 m/j. The proteinase was fairly stable at pH 5-9 and 30° and up to 50° at pH 7. The optimum pH and temp. were 7-9 and 60°. Casein, gelatin, egg albumin and Hb were hydrolysed but not collagen, benzoyl-L-arginine amide, acetyl-L-tyrosine ethyl ester, carbobenzoxy-L-glutamyl-L-tyrosine, carbobenzoxyglycyl-L-phenylalanine or L-leucinamide. Oxidising agents, EDTA, o-phenanthroline, heavy metal ions and high urea concn* inhibited, but not reducing agents, SH reagents, DFP or soyabean and potato inhibitors.

II Boundary gradient curves obtained from sedimentation velocity expt. were analysed by Fujita's theory. S and the diffusion coeff. at infinite diln. were calc. to be 7.99×10^{-13} sec. and 7.4×10^{-7} sq.cm./sec. respectively. The mol. wt. was hence 48400. Assuming the mol. to be a rigid ellipsoid of revolution, hydrated to 307° the mol. dimensions were calc. to be 3*5 mjj for the a axis and 6*8 m/j for the b axis for an oblate ellipsoid and 8*6 mji for the a axis and 4*3 mfi for the b axis for a prolate ellipsoid.

B.M. Stevetis

2949. PROTEOLYTIC ENZYME IN HUMAN LENS.

A.Devi: Biochim. biophys. Acta, 1963, 73, 155-158 (Dept. Biochem., Fac. Med., Laval Univ., Quebec, Canada) Normal lens possessed an intracellular peptidase with a pH optimum of 7*2-7*4 and esterase activity, both of which disappeared in senile cataract.

B.M. Stevens

2950. THE DISTRIBUTION OF PEPTIDASES IN SUBCELLULAR FRACTIONS FROM THE MUCOSA OF THE SMALL INTESTINE OF THE RAT. G.B.Robinson: Biochem. J., 1963, 88, 162-168 (Dept. Biol. Chem., Univ., Illinois Coll. Med., Chicago, Ill., U.S.A.) The subcellular distribution of intestinal mucosal peptidases hydrolysing L-leucylglycine and glycylglycine was determined. Of the peptidase activity 80%-90% was located in the supernatant fraction. The remaining activity was found mainly in the microsomal fraction with some in the mitochondrial fraction. The subcellular fractions were characterised by E.M. and by determining the distributions of cytochrome oxidase and alk. phosphatase in the fractions. *

2951. LENS AMINOPEPTIDASE. I. PURIFICATION AND PROPERTIES. A.Spector: J. biol. Chem., 1963, 238, 1353-1357 (Howe Lab. Qriithalmol., Harvard Med. Sch., Boston, Mass., U.S.A.) The peptidase, which is purified approx. 680-fold, hydrolyses amino acid esters and amides as well as peptides. There is an abs. metal requirement, and Mn is most effective in stimulating activity. The pH optimum is 8*6, and the temp. optimum is 57°. Glutathione and cysteine decrease the activity.

J.N.Ashley

2952. PURIFICATION OF A BRAIN PROTEINASE.

A.V.Palladin, N.M.Polyakova and V.K.Lishkcx

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- J. Neurochem., 1963, 10, 187-194 (Inst. Biochem. Acad. Sci. of Ukrainian SSR, Kiev. U.S.S.R.) Cathepsin was extracted from bovine brain acetone powder with distilled water. After removal of other proteins by lead acetate or $(\text{NH}_4)_2\text{SO}_4$ or acetone pptn., or adsorption on CMcellulose, greatest purification (2000 x activity of brain homogenate) was achieved by elution of cathepsin after adsorption on DEAEcellulose followed by electrophoresis on agar gel at pH 8*6. Mobility on agar gel is compared with phosphoglucomutase, aldolase, guanine and adenosine deaminase also from bovine brain. R.J. Woodman
2953. DETERMINATION OF D-AMINO ACID OXIDASE ACTIVITY IN INSECT TISSUES USING D-ALLO-HYDROXYPROLINE AS SUBSTRATE. J.J.Corrigan, D.Wellner and A.Meisten Biochim. biophys. Acta, 1963, 73, 50-56 (Dept. Biochem., Tufts Univ. Sch. Med., Boston, Mass., U.S.A.) The substrate was enzymically dehydrogenated to D-pyrroline-4-hydroxy-2-carboxylic acid which on acidification was converted to pyrrole-2-carboxylic acid. This last reacted very slowly, if at all, with β -dimethylaminobenzaldehyde but after decarboxylation to pyrrole a rapid reaction occurred yielding a red product. 10 mmoles of pyrrole could thus be detected. Activity was found in the fat body, midgut and Malpighian tubules of *Galleria mellonella*, *Calliphora erythrocephala*, *Oncopeltus fasciatus*, *Teriplaneta americana*, *Byssotria fumigata* and *Eurycotis floridana*. Muscle and testis of *Oncopeltus* and testis of *Byssotria* and *Periplaneta* also showed activity. No differences in activity were found between *Eurycotis* reared under sterile and non-sterile conditions. B.M.Stevens
2954. LOCALISATION AND PROPERTIES OF PHOSPHOPROTEIN PHOSPHATASE IN THE FROG EGG AND EMBRYO. S.Nass: Biol. Bull. Woods Hole, 1962, 122, 232-251 (Wenner-Gren Inst. Exp. Biol., Stockholm, Sweden) The highest phosphoprotein phosphatase activity was found in the pigment containing fraction of homogenates of frog ovaries and embryos. The enzyme activity of this fraction dropped sharply after fertilisation and then rose to reach a max. at the tail bud stage. G.J.Peakin
2955. PIG HEART GLUTAMIC ASPARTIC TRANSAMINASE MECHANISM OF TRANSAMINATION. A.E.Evangelopoulos and L.W.Sizen Proc. nat. Acad. Sci., Wash., 1963, 49, 638-643 (Dept. BioL, M.L.T., Mass., U.S.A.) Evidence is presented which indicates that the coenzyme of glutamic aspartic transaminase is only pyridoxal phosphate and not pyridoxamine phosphate. A new hypothesis of transamination is proposed in which the enzyme forms a ternary complex with both amino acid and keto acid prior to the exchange of amino and keto groups. J.R. Sargent
2956. PROTEIN MODIFICATIONS CATALYSED BY TRANSGLUTAMINASE. S.E.Komguth and H.Waelsch: Nature, Lond., 1963, 198, 188-189 (New York Psychiatric Inst., Columbia Univ., New York, U.S.A.) A no. of proteins were examined as amine-donating agents in the glutaminase reaction using carbobenzoxy-glutamyl [^{14}C]valine ethyl ester as acceptor peptide. β -lactoglobulin and globin were very effective replacement agents, a and γ -globulin less effective, and bovine serum albumin and lysozyme essentially neg. In an encephalitogenic extract, peak A was a more efficient replacing agent than peak 1. G.M.Lewis
2957. COMPARATIVE STUDIES ON GLYCOGEN PHOSPHORYLASE. V. AMINO ACID COMPOSITION OF RABBIT AND HUMAN SKELETAL MUSCLE PHOSPHORYLASE. M.M.Appleman, A.A.Yunis, E.G.Krebs and E.H.Fischer. J. biol. Chem., 1963, 238, 1358-1361 (Dept. Biochem., Sch. Med., Univ. Washington, Seattle, U.S.A.) Cryst. rabbit and human skeletal muscle phosphorylase b appear to be essentially identical in amino acid composition. Twenty-two residues of half-cystine per mol of rabbit enzyme are obtained by oxidation with performic acid compared with only 9 obtained by titration with $\text{J}(\text{J})$ -chloromercuribenzoate. No amino-terminal groups are present in native and denatured rabbit phosphorylase. No amino acids are released after attack by leucine aminopeptidase and carboxypeptidase A. The results are discussed in the light of chem., physical, and immunoL prop. of the phosphorylases of both spp. J.N.Ashley
2958. MECHANISM OF THE EFFECT OF TRYPSIN ON SPECIFIC HAEMAGGLUTINATION WITH INCOMPLETE Rh ANTISERA. M.D.Prager and M.A.Fletcher: Proc. Soc. exp. Biol., N.Y., 1962, 111, 722-725 (Wadley Res. Inst., Dallas, Tex., U.S.A.) Under conditions of trypsin treatment of r.b.c. which produce sp \gg aggl. by incomplete Rh antisera, the enzyme binds firmly to the cells. The enzymically inactive diisopropyl phosphoryl trypsin binds to a higher degree but fails to produce the seroL effect. M.M.Shapland
2959. ELECTROPHORETIC MAP OF CHEMICALLY DERIVED SUB-UNITS OF PAPAIN-DIGESTED γ -GLOBULIN. M.D.Poulikx Nature, Lond., 1963, 198, 752-753 (Child Res. Cen. Michigan, Detroit, Mich., U.S.A.) A method is described for 2-dimensional separation of γ -globulin sub-units on starch gels. Used in conjunction with immunoelectrophoresis die technique provides a system of 'immunological finger-printing'. It was shown that some of the sub-components of the F fragment (H-chain) of papain-digested γ -globulin, dissociated in urea-into 2 'micro sub-units', one of which is composed of 2 parts linked together by disulphide bonds. J.R.Sargent
2960. MODIFICATION OF AMINO ACID RESIDUES IN ANTI-p-AZOBENZENEARSONIC ACID ANTIBODY DURING EXTENSIVE IODINATION. M.E.Koshland, F.M.Englberger, M.J.Erwin and S.M.Gaddone: J. biol. Chem., 1963, 238, 1343-1348 (BioL Dept., Brookhaven Nat. Lab., Upton, N.Y., U.S.A.) A method is described for extensive iodination of proteins without causing formation of significant amounts of insoL product, and for determination of the residues modified by I. The methods are used to identify the available reactive residues in anti-jg-azobenzeneearsonic acid Ab, which contains an I-reactive group at its active site. I is present in 7 of die 16 histidyl and in 44 of the 59 tyrosyl residues. Also 10 of the 13 methionyl and 6 of the 18 tryptophanyl residues are oxidised and traces of cysteic acid are formed*. The I-reactive group is narrowed to 4 residues, and a tyrosyl or histidyl residue is implicated. J.N.Ashley
2961. SYNTHETIC POLYPEPTIDE ANTIGENS. K. ANTI-GENICITY OF NEW GROUP OF LINEAR SYNTHETIC POLYPEPTIDES. T.J.Gill, m and L.S.Mathews: J. biol. Chem., 1963, 238, 1373-1379 (Lab. Clin. Path., Dept. Path., Harvard Med. Sch., Boston, M**** U.S.A.) A new group of linear synthetic polypeptides containing L-glutamic acid, L-lysine, L-tyrosine, L-phenylalanine, and L-alanine in various combinations

and proportions causes Ab formation in rabbits. Copolymers that contain only glutamic acid or lysine and alanine or tyrosine cause less formation of Ab than those that contain both glutamic acid and lysine. Antisera to Polypeptides that contain both glutamic acid and lysine in approx. mol. ratio 3:2 cross-react well with poly-Peptides that contain both glutamic acid and lysine in the same ratio, and to a slight and variable extent with Polypeptides that contain only glutamic acid or lysine. Antisera to the latter polypeptides usually cross react poorly with copolymers containing both glutamic acid and lysine. Antisera that contain high concn. of Ab to synthetic polypeptides cross-react to a limited extent with various native proteins. Rabbit antibovine γ -globulin does not cross-react with several synthetic polypeptides.

J.N.Ashley

NUCLEIC ACIDS, NUCLEOPROTEINS AND NUCLEOTIDES

2962. INTERACTION OF MENADIONE WITH SOLUBLE PYRIDINE NUCLEOTIDE OXIDISING SYSTEMS FROM BRAIN. S.Englard and H.J.Strecken Bull. Res. Counc. Israel, A, 1963, 11, 319-329 (Dept. Biochem., Einstein Coll. Med., Yeshiva Univ., New York, U.S.A.) From a study of the reaction of NADH₂ with menadione catalysed by brain enzymes, it is suggested that under certain conditions the rate of re-oxidation of reduced menadione may become the limiting step in the overall oxidation of reduced pyridine nucleotides. Under these conditions added cytochrome c greatly accelerates the overall rate of oxidation of reduced pyridine nucleotides in a non-stoichiometric manner. This was attributed in part to the presence of autoxidisable components in cytochrome c prep, and in part to catalysis by trace metals. L.G.Gillies

2963. REACTION OF NAD AND RELATED PYRIDINIUM SALTS WITH ALKALI. R.M.Burton and N.O.Kaplan: Arch. Biochem., 1933, 101, 139-149 (McCollum-Pratt Inst., Johns Hopkins Univ., Baltimore, Md., U.S.A.) Spectra and difference spectra resulting from reaction of OH⁻ with NAD, nicotinamide mono-nucleotide, nicotinamide riboside and N¹-methylnicotinamide are presented. Temporal relationships between spectral changes, fluorescence and chem. and enzymic activity of NAD indicated that NAD and OH⁻ initially associated to form a charge transfer complex. Subsequently the OH⁻ was added to the pyridinium ring using an acid-labile dihydropyridine. B.M.Stevens

2964. REACTION OF REDUCED PYRIDINE NUCLEOTIDES WITH ACID. R.M.Burton and N.O.Kaplan: Arch. Biochem., 1963, 101, 150-159 (McCollum-Pratt Inst., Johns Hopkins Univ., Baltimore, Md., U.S.A.) Reduced pyridine nucleotides and related compounds reacted with acid to give a primary product absorbing at 260 m^μP*. Evidence is presented indicating that this was effected by opening the heterocyclic ring to yield an aldehyde. At pH 7, ³²P³²V chromophore was cleaved from the nucleotide giving ADP-ribose and a pyridine derivative. The acid product is discussed in relation to a postulated mechanism of oxidative phosphorylation at the pyridine nucleotide level. B.M. Stevens

2965. CONCENTRATION OF NAD IN CARRAGEENIN-INDUCED PROLIFERATION. M.Luscombe: Nature, Lond., 1963, 197, 691-692 (M.R.C. Rheumatism Res. Unit, Bath Area Central Lab., Manor Hosp., Bath, Wilts., England) Proliferation was stim. in rabbit synovia by injn. into the femorotibial joint of a soln. of carrageenin in saline, and the content of NAD estimated in terms of DNA-phosphorus. A fall in NAD concn. is associated with proliferation. In rats bearing granulomata induced by carrageenin, injn. of NAD reduced their rate of growth, suggesting that NAD has an inhibitory effect on cell division. G.M.Lewis

2966. STUDIES ON THE SEPARATION OF PYRIDINE NUCLEOTIDES BY THIN-LAYER CHROMATOGRAPHY. R.L.Scheig, R.Annunziata and L.A.Pesch: Analyst. Biochem., 1963, 5, 291-294 (Dept. Int. Med., Sch. Med., Yale Univ., New Haven, Conn., U.S.A.) One-dimensional ascending chromatography on silica gel G was used to separate NAD, NADH₂ and NADPH₂* Solvent systems used were isobutyric acid: 0*880 ammonia: water (66:1:33) and ethanokammonium acetate, pH 7*5 (70:30). A clear separation of mixtures of the compounds was obtained in a 5 hr. run. A.D. Smith

2967. EFFECT OF BUFFERS ON NICOTINAMIDE ADENINE DINUCLEOTIDE HYDROLYSIS. B.M.Anderson and C.D.Anderson: J. biol. Chem., 1963, 238, 1475-1478 (Dept. Biochem., Univ. Louisville Sch. Med., Ky., U.S.A.) The rate of hydrolysis of NAD to nicotinamide and adenosine diphosphoribose at 100° varies considerably with the buffer used to maintain a const. pH. The rate const, obtained at neutral pH in nitrogenous base buffers are essentially equal and are the lowest values observed under these conditions. Much higher rate const, are obtained under similar conditions but with buffers such as phosphate, p-glycerol phosphate, ASO₄³⁻, P2O₇²⁻, and AMP. There are no differences in the products formed in any of the buffers. The high rates of hydrolysis in phosphate and 0-glycerol phosphate buffers are reversed by Tris, imidazole and glycylglycine buffers. At neutral pH hydrolysis of NAD at 100° in phosphate and related buffers proceeds mainly through a hydroxyl ion attack. J.N.Ashley

2968. ENZYME HYDROLYSING FMN IN PLANTS. L PARTIAL PURIFICATION AND PROPERTIES OF THE ENZYME FROM PHASEOLUS RADIATUS. N.Appaji Rao, H.R.Cama, S.A.Kumar and C.S.Vaidyanathan, IL PHOSPHOTRANSFERASE ACTIVITY OF THE PARTIALLY PURIFIED ENZYME FROM PHASEOLUS RADIATUS. S.A.Kumar and C.S.Vaidyanathan: Biochim. biophys. Acta, 1963, 73, 87-97, 98-104 (Dept. Biochem., Indian Inst. Sci., Bangalore, India)

The enzyme was partially purified from seed extracts by pptn. of inert material with MnSO₄ and protamine sulphate, fractional pptn. with alcohol and chromatography on CMcellulose, to yield prep, with a sp. activity 200 times that of the crude extract. The prep, was comparatively sp. for FMN but 0-glycerophosphate, p-nitrophenyl phosphate and 5'-nucleotides were also hydrolysed to a much smaller extent. Differential effects of ions on FMN and p-glycerophosphate hydrolysing activities are discussed.

The prep, could transfer the phosphate cleaved from FMN to acceptors like thiamine, pyridoxal, pyridoxamine and nucleosides to give the corresponding phosphate esters and nucleotides. The prop. of the FMN hydrolysing enzyme and the phosphotransferase activity were compared. B.M.Stevens

BIOCHEMISTRY

2939. PURIFICATION OF NICOTINAMIDE ADENINE DINUCLEOTIDE AND KINETIC EFFECTS OF NUCLEOTIDE IMPURITIES. K.Dalziel J. biol. Chem., 1963, 238, 1538-1543 (Dep.: Biochem., Univ. Sheffield, England) The kinetic effects of an impurity in a coenzyme which acts as a competitive inhibitor are examined theoretically and by expt. with liver alcohol dehydrogenase and the competitive inhibitor ADP ribose. A competitive inhibitor is separated from several very pure commercial prep. of NAD. It causes large errors in determination of initial rate parameters for liver alcohol dehydrogenase. For valid kinetic studies of mechanism, and of the effects of pH on rates, the purity requirements for NAD and NADH₂ may be very exacting, and published kinetic data for other enzymes, and conclusions drawn from them, may need revision. J.N.Ashley
2940. STUDIES ON RESPIRATORY CHAIN-LINKED REDUCED NICOTINAMIDE ADENINE DINUCLEOTIDE DEHYDROGENASE. III. CATALYTIC PROPERTIES OF ENZYME FROM OX HEART. S.Minakami, T.Cremona, R.L.Ringler and T.P.Singer: J. biol. Chem., 1963, 238, 1529-1537 (Ford Inst. Med. Res., Henry Ford Hosp., Detroit, Mich., U.S.A.) Very pure prep. of NADH₂ dehydrogenase oxidise various NADH₂ analogues and catalyse transhydrogenation between NADH₂ and NAD analogues. K₃Fe(CN)₆ is the only satisfactory electron acceptor studied. The enzyme shows very little, or no reaction with cytochrome c, menadione, lipoic acid, or coenzyme Q10. The kinetics of the purified dehydrogenase are described. The enzyme is competitively inhib. by NAD and its analogues. It is rapidly inactivated at acid pH values, temp, above 30°, and in presence of org. solvents. Amytal interrupts electron transport on the O side, not on the substrate side, of the dehydrogenase. J. N. Ashley
2941. OXIDATION OF REDUCED NADP IN RAT LIVER MICROSOMES. A.Beloff-Chain, R.Cacanzeri and G.Serlupi-Crescenzi: Nature, Lond., 1963, 198, 351-354 (Internat. Centre Gen. Biochem., Inst. Superiore di Sanita, Rome, Italy) O₂ uptake measurements determined polarographically show that NADPH₂, but not NADH₂, is oxidised by rat liver microsomes. O₂ uptake in the presence of NADPH₂ is not inhib. by cyanide or antimycin A. ADP, UDP, GDP or CDP each stim. NADPH₂ oxidation. NADPH₂ oxidation in the presence of ADP was not dependent on phosphate concn. J.R. Sargent
2942. NON-ENZYMIC HYDROGEN EXCHANGE BETWEEN NICOTINAMIDE ADENINE DINUCLEOTIDES. J.Ludwerg and A.Levy: Biochem. biophys. Res. Comm., 1963, 11, 19-23 (Dept. Orthopaedic Surg. and Rheum. Dis. Grp., Dept. Med., Univ. California, San Francisco Med. Center, Calif., U.S.A.) It is shown that a direct and non-stereosp. H transfer without net oxidation or reduction is a general prop. of the nicotinamide adenine dinucleotides and analogue systems. B.Ketterer
2943. CARBONYL ADDITION REACTIONS OF NICOTINAMIDE ADENINE DINUCLEOTIDE IN FROZEN ALKALINE SOLUTION. M.L.Dolin and K.B.Jacobson: Biochem. biophys. Res. Comm., 1963, 11, 102-105 (Biol. Div., Oak Ridge Lab., Term., U.S.A.) Acetone present in many prep. of NAD undergoes an addition reaction with NAD frozen at -20° at pH 11-11.9. Similar carbonyl addition compounds have been shown to form with acetaldehyde, acetoin, fructose, ribose 5-phosphate and adenosine diphosphoribose. B.Ketterer

2944. COLOUR REACTION BETWEEN REDUCED PYRIDINE NUCLEOTIDES AND o-AMINOBENZALDEHYDE OF POTENTIAL ANALYTICAL USE. R.L.Larson and H.P.Broquist: Analyt. Biochem., 1963, 5, 255-258 (Lab. Biochem., Dept. Dairy Sci., Univ. Illinois, Urbana, Ill., U.S.A.) NADH₂ and NADPH₂ give an orange colour (480 m*λ*) in acid soln. in 1 hr. which can be used for quant. assay. The method is only about a third as sensitive as the direct spectrophotometric assay but requires only a colorimeter. A.D. Smith
2945. PATHWAYS OF REDUCED PYRIDINE NUCLEOTIDE OXIDATION IN RAT BRAIN HOMOGENATE DEMONSTRATED BY A TETRAZOLIUM METHOD. R.Hess and A.G.E.Pearse: Biochim. biophys. Acta, 1963, 71, 285-294 (Dept. Pathol., Postgrad. Med. Sch., London England) Comparable activities with both NADH₂ and NADPH₂ were obtained with mitochondrial and cytoplasmic fractions of sucrose homogenates using either O₂ or an N-thiazol substituted monotetrazole as final electron acceptor and menadione as an intermediary carrier. Tetrazolium reduction by enzymically formed hydroquinone was faster than its autoxidation at all pH. Irreversible removal of H by formazan formation kinetically activated menadione reduction. Reduction of mono-tetrazole and oxidation of reduced pyridine nucleotide showed an equimolar relationship. Apparent Km at the optimum pH indicated mitochondrial and extramitochondrial menadione reductases were closely related. Kinetic data indicated that mitochondrial NADH₂-NADP-tetrazolium reductase was not identical with menadione reductase. B.M. Stevens
2946. ENZYMIC BREAKDOWN OF DIPHOSPHOPYRIDINI NUCLEOTIDE. S.E.Severin, L.A.Tseitlin and T.N. Druzhimina: Biokhimiiia, 1963, 28, 145-151. Stud] of enzyme systems causing DPN breakdown in cardiac and skeletal muscle homogenates revealed a non-nucleosidic as well as a nucleosidase pathway, though the latter was the major pathway. The total activity of enzymes causing DPN breakdown was 4-6 times higher in the cardiac than in the skeletal homogenates. The optimum PH in both cases was in the range 6.0-7.0. The non-nucleosidase optimum was pH 7.5. (Russian) BJ.Cooper
2947. PHOTOCHEMICAL REDUCTION OF NADP BY CELL-FREE EXTRACTS OF BLUE-GREEN ALGAE. C.C.Black, C.A.Fewson and M.Gibbs: Nature, Lond., 1963, 198, 88 (Dept. Biochem., Cornell Univ., Ithaca, New York, U.S.A.) The activity of a photo-synthetic nicotinamide nucleotide reductase has been detected in cell free extracts of blue green algae, Anacystis, Anabaena, Nostoc and Tolyphothrix. The enzyme from Nostoc was purified by means of Dowex-Bentonite and had an absorption spectrum like that of similar enzymes from other sources. G.M.Lewis
2948. FEEDBACK INHIBITION OF THYMIDINE KINASE BY THYMIDINE TRIPHOSPHATE. D.H.Ives, P.A.Mo* jun. and V.R.Potter: J. biol. Chem., 1963, 238, 1467-1474 (McArdle Mem. Lab., Med. Sch., Univ. Wisconsin, Madison, Wis., U.S.A.) Thymidine kinase and thymidylate kinase, present in the high speed supernatant fraction of Novikoff hepatoma cells, have similar functions, but they differ in various prop. such as their affinities for substrates and metal cofactors, pH optima, and susceptibility to product inhib. Thymidine kinase, but not thymidylate kinase, is strongly inhib. by its distal product, thymidine triphosphate, at concn.

equal to that of the thymidine in the reaction mixture. The extent of inhibn. is independent of enzyme concn. but is markedly affected by concn. of substrate. Inhibn. tends to be reversed by high concn. of thymidine or ATP. Inhibn. of thymidine kinase is very sp. because neither the proximal product, thymidylate, nor various other nucleotides, inhibit it.

J.N.Ashley

2979. ADENOSINE TRIPHOSPHATE AND PHOSPHORUS METABOLISM IN FISH OVA. N.M.Abrosimova and R.L.Tatarskaia: *Biokhimiia*, 1963, 28, 128-136.

In addition to ATPase, certain other enzymes were demonstrated in ripe unfertilised fish ova: 5'-nucleotidase (only in the sturgeon), non-sp. acid phosphatase, inorg. pyrophosphatase, adenylate kinase and adenylate deaminase. Certain conclusions were drawn concerning P metabolism in fish ova, including the fact that their ATPase is bound to cellular structures.

(Russian) B.J.Cooper

2980. 'CATCH' (VISCOUS TONE) AND NUCLEOSIDE TRIPHOSPHATE. J.C.Rtlegg and E.Strassner:

Z. Naturforsch. B, 1963, 18, 133-138 (Inst. Physiol., Max-Planck-Inst. Med. Forsch., Heidelberg, Germany) ATP levels of the resting anterior byssal retractor muscle of *Mytilus edulis* did not alter during contraction or 'catch' and subsequent 5HT relaxation. The condition of 'catch' was thus a reversible rigor unlike that occurring in the vertebrate skeletal muscle.

(German) J.C.Crawhall

2981. SYNTHESIS OF OROTIDINE. W.V.Curran and R.B.Angier: *Tetrahedron Letters*, 1963, 8, 533-535 (Org. Chem. Res. Section, Lederle Labs., American Cyanamid Co., Pearl River, N.Y., U.S.A.) 14.5% yield was obtained by condensing the monomeric deriv. of n-butyl orotate with 2,3,5-tri-O-benzoyl-D-ribofuranosyl chloride. Letter. R.H.Kimberlin

2982. PYRIMIDINE NUCLEOSIDE HYDROLASE IN THERMOBACTERIUM ACIDOPHILUM. C.Janion and S.Ltfvtrup: *Acta biochim. pol.*, 1963, 10, 183-189 (Dept. Histol., Univ. Goteborg, Sweden) The presence of a pyrimidine nucleoside hydrolase in *T. acidophilum* was demonstrated. Among the substrates tested, the highest activity was shown toward cytidine, followed by thymidine and uridine. Optimum pH was close to 8. Incubation of extracts caused equal losses of activity with cytidine and uridine as substrates, suggesting that in both fractions 1 enzyme is involved. For growth of *T. acidophilum*, uracil could be replaced by uridine; this is turned to be due to pyrimidine nucleoside hydrolase activity. M.Korbecki

2983. FORMATION OF URACIL NUCLEOTIDES IN THERMOBACTERIUM ACIDOPHILUM. C.Janion and S.Ltfvtrup: *Acta biochim. pol.*, 1963, 10, 191-198 (Dept. Histol., Univ. Goteborg, Sweden) The pathways of utilisation of uracil by *T. acidophilum* were investigated. UMP:pyrophosphate phosphoribosyltransferase acting UMP was found in bacterial acetone powder which also possess ATP:nucleosidemonophosphate transferases leading to formation of UDP, which ATP:nucleosidediphosphate phosphotransferase acts. Thus small scale prep. of labelled UMP, UDP and UDP from labelled uracil is possible. Some prop. of these reactions were investigated. M.Korbecki

2984. PREPARATION OF POLY-5-FLUOROURIDYLIC ACID AND THE PROPERTIES OF HALOGENATED POLY-URIDYLIC ACIDS AND THEIR COMPLEXES

WITH POLY-ADENYLIC ACID. W.Szer and D.Shugar: *Acta biochim. pol.*, 1963, 10, 219-231 (Inst. Biochem. Biophys., Polish Acad. Sci., Warszawa, Poland)

Poly-fluorouridylic acid exists as a random coil at room temp, and exhibits some secondary structure only below 5°. Its twin-stranded complex with poly-A is less thermostable than that of poly-U with poly-A. Poly-bromo-uridylic acid and poly-chlorouridylic acid, on the other hand, exhibit secondary structure at room temp, and form complexes with poly-A more stable than those of poly-U and poly-A. Taken in conjunction with previous results for poly-ribothymidylic acid, it follows that the stability of polynucleotide helices must be due to factors other than, and perhaps additional to, hydrogen bonding. Some suggestions are made regarding additional expt. and theoretical work necessary for resolution of this problem.

M.Korbecki

2985. IN VITRO SYNTHESIS OF HISTAMINE ADENINE DINUCLEOTIDE BY MICROSOMAL NICOTINAMIDE ADENINE DINUCLEOTIDASE OF RAT SPLEEN. A.Devi and M.A.Mukundaw: *Arch. Biochem.*, 1963, 101, 186-188 (Dept. Biochem., Fac. Med., Laval Univ., Quebec, Canada) The enzyme degrading NAD at the nicotinamide linkage did not appear to be identical with the enzyme catalysing histamine adenine dinucleotide synthesis, the former being found in mitochondria and the latter in microsomes. Prelim, comm.

B.M.Stevens

2986. ISOLATION AND STRUCTURE OF URIDINE NUCLEOTIDE-PEPTIDES FROM AEROBACTER CLOACAE NRC 492. R.A.Anwar, C.Roy and R.W. Watson: *Canad. J. Biochem.*, 1963, 41, 1065-1072, (Div. Appl. Biol., Nat. Res. Coun., Ottawa, Canada)

Penicillin-treated cells of *A. cloacae* NRC 492 were extracted with boiling 60% ethanol and the extracts dialysed. These were fractionated on Dowex-1-Cl⁻ columns with aq. lithium chloride soln., and the nucleotide-peptides were ppts. with methanol-acetone. Further separation by paper chromatography and high voltage electrophoresis yielded 4 closely related uridine nucleotide-peptides which were partially characterised.

J.B.Parish

2987. SOME OBSERVATIONS ON THE ISOLATION AND ESTIMATION OF THE SOLUBLE NUCLEOTIDES OF WHEAT SEEDLINGS. A.J.Keys: *J. exp. Bot.*, 1963, 14, 14-28 (A.R.C. Unit Plant Physiol., Imperial Coll. Sci. and Technol., London, England) A new technique is described which separates nucleotides from other interfering substances in extracts of wheat seedlings. During germination, endosperm sol. nucleotides remained at a low level, but in the embryo there was a 30-fold increase in 2 days. Acid hydrolysis of the sol. nucleotides yielded guanine, adenine and uridylic acid.

L.D.J.Phillips

2988. FRACTIONATION AND PROPERTIES OF GUANYLIC ACID POLYMERS SYNTHESISED BY RNase T1. H.Hayashi and F.Egami: *J. Biochem.*, Tokyo, 1963, 53, 176-180 (Dept. Biophys. Biochem., Fac. Sci., Univ. Tokyo, Japan) Polymers containin i 2-12 guanylyl residues were synthesised from guanosine 2',3'-cyclic phosphate and fractionated by DEAEcellulose column chromatography. Extinction coeff. decreased as the no. of nucleotide units increased up to 4-5 units, thereafter the coeff. was unchanged. The 1 of max. absorption was displaced 2-3 mji towards longer X in larger polymers. The polymers were completely digested to mononucleotides by the same enzyme although chem. synthesised polyguanylic acid was only partly digested.

BIOCHEMISTRY

The behaviour of polyguanylic acid on gel filtration
was examined. B.M. Stevens

2989. ACID SOLUBLE NUCLEOTIDES OF MILK.
n. ISOLATION AND IDENTIFICATION OF TWO NOVEL URIDINE NUCLEOTIDE OLIGOSACCHARIDE CONJUGATES FROM HUMAN MILK AND COLOSTRUM. A.Kobata: J. Biochem., Tokyo, 1963, 53, 167-175 (Res. Lab., Takeda Chem. Ind., Ltd., Osaka, Japan) The compounds were shown to be uridine 5'- (4-O-p-D-galactopyranosyl-N-acetylglucosamine 1-dihydrogen pyrophosphate) and uridine 5'-(2 or 4-O-L-fucopyranosyl-4-O-3-D-galactopyranosyl-N-acetylglucosamine 1-dihydrogen pyrophosphate) respectively. B.M.Stevens

2990. FURTHER STUDIES ON ADENYLYL 2,3-DIPHOSPHOGLYCERIC ACID. T.Hashimoto and H.Yoshikawa: J. Biochem., Tokyo, 1963, 53, 219-226 (Dept. Physiol. Chem. Nutr., Fac. Med., Univ. Tokyo, Japan) Adenylyl 2,3-diphosphoglyceric acid isolated from blood had the same chem. prop, and was attacked by enzymes in the same way as the chem. synthesised compound. The formation and degradation of the nucleotide by haemolysate were examined. It is suggested that the nucleotide is synthesised by nucleotidyl transferase and hydrolysed by nucleotide pyrophosphatase in the r.b.c. B.M.Stevens

2991. NUCLEIC ACID METABOLISM OF GERMINATING CORN SEEDLINGS. E.Volkin and D.Schwartz: Bull. Res. Coun. Israel, A, 1963, 11, 387-388 (Biol. Div., Oak Ridge Nat. Lab., Oak Ridge, Tenn., U.S.A.)

Note. L.G.Gillies

2992. INFLUENCE OF AGE AND N, N'-DIETHYLENE-N'-PHENETHYLPHOSPHORAMIDE (PEDP) UPON NUCLEIC ACID AND RIBONUCLEASE ACTIVITY IN TUMOUR TISSUE. R.W.Wannamacher, jun., J.B. Allison, D.Chu and M.L.Crossley: Proc. Soc. exp. Biol., N.Y., 1962, 111, 708-710 (Bureau Biol. Res., Rutgers Univ., New Brunswick, N.J., U.S.A.) As the Walker 256 rat tumour increased in size and approached max. development, the RNase activity/g. of tumour or/ mg. of DNA-P also increased. The slower growing, larger tumour had a markedly decreased RNA-P and protein concn. Treating the tumour-bearing rat with PEDP resulted in increased RNase activity and decreased RNA-P. M.M.Shapland

2993. X-RAY DIFFRACTION AND MOLECULAR MODEL BUILDING STUDIES OF THE INTERACTION OF ACTINOMYCIN WITH NUCLEIC ACIDS. L.D.Hamilton, W.Fuller and E.Reich: Nature, Lond., 1963, 198, 538-540 (Sloan-Kettering Inst., New York, U.S.A.)

Oriental fibres were prep, from complexes of actinomycin Ci [AMC] and calf thymus DNA. The complexes contained a max. of about 1 mol. of AMC per 18 nucleotides of DNA. X-ray diffraction studies of the complexes showed that confirmation of DNA mol. and intermol. spacing of DNA mol. were little affected by AMC binding. A mol. model of the complex, consistent with these findings, was constructed in which guanine is linked to the AMC chromophore by 3 hydrogen bonds. Some features of the model are discussed. J.R. Sargent

2994. ENZYMIC METHYLATION OF RNA AND DNA. M.Gold, J.Hurwitz and M.Anders: Biochem. biophys. Res. Comm., 1963, 11, 107-112 (Dept. Microbiol., New York Univ. Sch. Med., N.Y., U.S.A.) It is reported that extracts of E. coli contain at least 5 RNA

methylating enzymes and in addition, DNA methylating activity. S-Adenosyl-methionine is indicated as the active methylating agent. B.Ketterer

2995. PRECIPITATION OF NUCLEIC ACIDS BY TANNIN. L.Baranowski, M.Kochman and A.Szewczuk: Bull. Acad. pol. ScL, 1963, 11, 113-118 (Dept. Biochem., Inst. Immunol. Exp. Therapy, Polish Acad. Sci., Wroclaw, Poland) The formation of insol. ppt. of nucleic acids and nucleoproteins with tannin is described. A quant. method for the determination of RNA, DNA and deoxyribonucleoprotein is worked out using the O.D. of the ppt. obtained with tannin. The presence of nucleic acids in the sample was found to influence in an unpredictable way the determination of proteins by the tannin method of Mejbaum. E.Parkinson

2996. NUCLEIC ACID ESTIMATES OF MAMMARY TISSUE AND NUCLEI. H.A.Tucker and R.P.Reece: Proc. Soc. exp. Biol., N.Y., 1962, 111, 639-642 (Dept. Dairy Sci., New Jersey Agric. Exp. Sta., New Brunswick, N.J., U.S.A.) A modified Schmidt and Thannhauser nucleic acid procedure was applied for extraction of nucleic acids from rat mammary tissue. DNA per mammary cell nucleus was found to be the same in glands from pregnant or lactating rats and so DNA content can be used as an index of development. M.M.Shapland

2997. NUCLEIC ACID CONTENT OF MAMMARY GLANDS OF PREGNANT RATS. H.A.Tucker and R.P. Reece: Proc. Soc. exp. Biol., N.Y., 1963, 112, 370-372 (Dept. Dairy Sci., N.J.Agric. Exp. Station, New Brunswick, N.J., U.S.A.) The DNA content per 100 g. body wt. of Norway rat mammary glands was found to increase during pregnancy by about 184%, the increase being a steady one. RNA content also rose in a similar fashion to a value of 261% increase over the original value. D.N.Wheatley

2998. NUCLEIC ACID CONTENT OF MAMMARY GLANDS OF LACTATING RATS. H.A.Tucker and R.P. Reece: Proc. Soc. exp. Biol., N.Y., 1963, 112, 409-412 (Dept. Dairy Sci., N.J.Agric. Exp. Station, New Brunswick, N.J., U.S.A.) DNA contents of mammary glands of Norway rats were calc. before and after parturition. There was a far greater increase in the DNA content per 100 g. body wt. within 3 days of parturition than at any other time. This reflects the hyperplasia of the mammae which takes place mostly during early lactation. Ovariectomy just after parturition did not affect this hyperplasia. The DNA content did not increase after 24 days of lactation. RNA content rose to a max. 21 days after the beginning of lactation then declined precipitously. D.N.Wheatley

2999. MICROCHEMICAL AND MICROSPECTROPHOTOMETRIC STUDIES ON INTRALAMINAR DISTRIBUTION OF NUCLEIC ACIDS IN BRAIN CORTEX UNDER VARIOUS EXPERIMENTAL CONDITIONS. M.N.Baranov and L.Z.Pevzner: J. Neurochem., 1963, 10, 279-283 (Lab. Functional Biochem. of Nerv. System, Pavlov Inst. Physiol. Acad. ScL U.S.S.R., Leningrad, U.S.S.R.) RNA and DNA analyses were performed in 4-6 mg. fresh wt. of rat brain or on single cells by ILV. microspectrophotometry and 6 successive layers up to a depth of 1*7 cm. from either motor or visual cortex surface were examined. Both RNA and DNA tended to be higher in the middle (4th and 5th) layers than the adjacent ones. Injn. of hexenal (100 mg./kg.), caffeine (500 mg./kg.) or

camphor (400 mg./k&0. 4 hr. before death or circulation hypo-oxia caused changes in nucleic acid content of the surface and deep layers but not so much the middle layer.

R.Woodman

3000. PREPARATION OF BACTERIAL DEOXYRIBONUCLEIC ACID.

H.KrSger, R.C.Warner and S.Ochoa: Bull. Res. Counc. Israel, A, 1963, 292-296 (Dept. Biochem., New York Univ. Sch. Med., N.Y.. U.S.A.)

A method is described for the recovery of DNA from $(\text{NH}_4)_2\text{SO}_4$ supernatant fractions of bacterial extracts at 70% satn. These supernatants contain 70-80% of the DNA and 2-4% of the RNA and protein of the extract. The Procedure yields DNA of low RNA content without the use of RNase or alkali. While the DNA is largely undenatured and biol. active, its degree of polymerisation is low with mol. wt. under 4×10^6 .

L.G.Gillies

3001. STUDIES ON THE DEOXYRIBONUCLEIC ACID OF SERRATIA MARCESCENS. A.S.Jones and R.T. Walker.

J. gen. Microbiol., 1963, 31, 187-194 (Chem. Dept., Birmingham Univ., England) A method based on Kirby's phenol extraction procedure is described for quant. isolation of pure highly polymerised DNA from *S⁺marcescens*. No statistically significant differences were detected in the base composition or sequence between the DNA of a wild and a mutant strain of the organism, and the DNA contained 6-methyl-aminopurine. The prop. of this base and its N-nitroso deriv. were compared with those of a synthetic sample.

K.Brew

3002. MATHEMATICAL ANALYSIS OF STATISTICAL DISTRIBUTION OF DNA CONTENT IN CELLULI^{j*} NUCLEI. Z.Lodin, E.Navratil and M.Podlaha: Csl. Morfol., 1963, 11, 135-144 (Physiol. Inst., Czechosl.

Acad. Sci., Prague, Czechoslovakia) The min. no. of measurements, n, necessary for constituting the histograms, suitable for analytical evaluation was estimated to be $n > 1700$. A formula is proposed which shows the relation between the statistical distribution of the DNA content and statistical distributions of DNA concn. and of the vol.

K.Jones

3003. STATISTICAL DISTRIBUTION OF VOLUMES OF CELLULAR NUCLEI AND ITS RELATION TO STATISTICAL DISTRIBUTION OF THEIR PRO[^]CTION AREAS.

Z.Lodin, E.Navratil and M.Podlaha: Csl. Morfol., 1963, 11, 145-151 (Physiol. Inst., Czechosl. Acad. Sci., Fac. Tech. Nuclear Physics, Prague, Czechoslovakia) The errors committed in determining the values of the amount of DNA in individual cellular nuclei are the product of the measured extinctions and areas pointed out. Transformation formulae are derived which are suitable for finding the statistical distribution of Vol. of cellular nuclei in the given tissue from the statistical distribution of the measured areas of cellular nuclei in the prep.

K.Jones

3004. MOLECULAR STATE OF DEOXYRIBONUCLEIC ACID IN sd PHAGE CORPUSCLE. T.I.Tikhonenko, N.G.Pichugina and I.Koudelka: Biokhimia, 1963, 28, 101-H2. The results are given of a complex study concerning the chromatography, sedimentation and viscosity of DNA in the corpuscle of the sd phage of *E.coli* SK and of the T2 phage. (Russian)

B.J.Cooper

3005. COHESION OF DNA MOLECULES ISOLATED FROM PHAGE LAMBDA. A.D.Hershey, E.Burgi and J.Ingraham: Proc. nat. Acad. Sci., Wash., 1963, 49, 48-755 (Genet. Res. Urit, Carnegie Inst. Washington,

Cold Spring Harbor, Long Island, N.Y., U.S.A.)

The DNA of phage X undergoes reversible transitions from linear to characteristically folded mol., and from linear monomers to open polymers. Some conditions favouring one state or another have been defined. It may be surmised that each mol. carries 2 specifically interacting cohesive sites.

J.R.Sargent

3006. PHOTOCOCONDUCTIVITY OF SODIUM DNA IN THE DRY STATE.

C.Y.Liang and E.G.Scalco: Nature, Lond., 1963, 198, 86-87 (Exploratory Res. Lab., American Viscose Corp., Marcus Hook, Pa., U.S.A.)

The dark and photoconductivities of Na-DNA from salmon sperm in the dry state were determined at various temp, and applied voltages. The activation energy for photoconduction was 0.89 e.v.

G.M.Lewis

3007. DECREASE IN FREQUENCY OF BIRTH IN MICE TREATED WITH ENZYMIC DIGESTS OF DNA.

C.G.Heden, T.Lindahl and W.Braaru: Acta path. microbiol. scand., 1963, 57, 257-260 (Dept. Bact., Karolinska Inst. Stockholm, Sweden)

Treatment of mice during pregnancy with enzyme-digested DNA may reduce fertility. The effect of the digested DNA varies with different DNA prep.

L.Friedmann

3008. SEPARATION AND CHARACTERISATION OF CARP EGG RIBONUCLEIC ACIDS. C.Y.Lu and F.J.Finamore:

Comp. Biochem. Physiol., 1963, 9, 41-49 (Isotope Metab. Res. Lab., S. Illinois Univ., Carbondale, Ill., U.S.A.)

Mature ovarian eggs obtained from *Cyprinus carpio* differ in their RNA composition from liver of the same sp. Extraction was carried out in 0.17M and 1M NaCl and different characteristics were obtained for each extract. In 0.17M NaCl there is 30% acid-sol. RNA, but in 1M NaCl only 10% is acid-sol. Separation on chromatographic columns (Ecteola) indicates 4 fractions present in each extract type.

M.S. Lave rack

3009. STEPWISE SYNTHESIS OF DEOXYRIBO-OLIGO-NUCLEOTIDES. G.Scheuerbrandt, A.M.Duffield and A.L.Nussbaum: Biochem. biophys. Res. Comm., 1963, 11, 152-155 (Dept. Biochem., Stanford Univ. Med. Center, Palo Alto, Calif., U.S.A.)

The synthesis of the trinucleotide pTpCpC is described and used to test the specificity of *E. coli* phosphodiesterase. The enzyme was found to degrade from the 3'-OH end only.

B.Ketterer

3010. INTERACTION OF POLYAMINES WITH TURNIP YELLOW MOSAIC VIRUS RNA. S.Mitra and P.Kaesberg:

Biochem. biophys. Res. Comm., 1963, 11, 146-151 (Dept. Biochem., Univ. Wisconsin, Madison, Wis., U.S.A.)

Absorbancy, sedimentation and viscosity studies show that bis(3-amino propyl)amine and spermine are remarkably efficient in preventing unfolding of turnip yellow mosaic virus RNA.

B.Ketterer

3011. CHEMICAL METHOD FOR STUDYING THE DETAILED SECONDARY STRUCTURE OF RNA.

G.Zubay and R.Marcielo: Biochem. biophys. Res. Comm., 1963, 11, 79-82 (Biol. Dept., Brookhaven Nat. Lab., Upton, N.Y., U.S.A.)

It was found that soL RNA, ribosomal RNA and F2 bacteriophage RNA were only slightly reactive to formaldehyde at 10^5 in the presence of 0.01M MgCl₂. A considerably greater rate of reaction is achieved if Mg is absent.

B.Ketterer

3012. DYNAMIC BIREFRINGENCE AND MOLECULAR STRUCTURE OF RIBONUCLEIC ACID. E.V.Frisman,

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V.I.Vorob'ev, N.K.Ianovskiaia and L.V.Shchaginai
Biokhimiia, 1963, 28, 137-144. Dynamic birefringence was applied to the study of the RNA mol. obtained from various sources. The value for the geometrical asymmetry of the mol. agreed with E.M. data. The value of intrinsic anisotropy was in accordance with Spirin's RNA model. (Russian) BJ.Cooper

3013. RIBONUCLEIC ACID IN PLANT MATERIAL.

H.-G.Fritz and B.R.Otter: *Z. Naturforsch. B*, 1963, 18, 124-132 (Max-Planck-Inst. Virusforschung, TQbingen, Germany) An extract containing the nucleic acid fractions of fresh green tobacco leaves was submitted to alk. hydrolysis (KOH at 37° for 22 hr.). Mononucleotide fractions containing cytidylic, adenylic, guanylic and uridylic acids were separated on Dowex I columns by formate-ammonium formate elution techniques. (German) J.C.Crawhall

3014. ACID HYDROLYSIS OF DEOXYRIBOSIDE AND RIBOSIDE. A.Wacker and L.TrSger: *Z. Naturforsch. B*, 1963, 18, 13-16 (Inst. Therapeut. Biochem., Univ. Frankfurt am Main, Germany) The acid hydrolysis of various ribosides and deoxyribosides was studied using TCA and HCl respectively. Hydrolysis of 5-halogenuracildeoxyribosides by 5% TCA at 60° was 3-4 times faster than that of thyminedeoxyriboside or uracildeoxyriboside but 16 times slower than that of cytosinedeoxyriboside. Purineribosides were hydrolysed 14 times as fast as pyrimidineribosides by HCl.

(German) J.C.Crawhall

3015. RESISTANCE OF s-RNA TO RIBONUCLEASES IN THE PRESENCE OF MAGNESIUM ION. S.Nichimura and G.D.Novelli: *Biochem. biophys. Res. Comm.*, 1963, 11, 161-165 (Biol. Div., Oak Ridge Nat. Lab., Oak Ridge, Tenn., U.S.A.) Enzymic digestion of s-RNA from *E. coli* by bovine pancreatic and *B. subtilis* RNases was inhib. in the presence of 0.01M Mg. It is suggested that Mg causes the s-RNA to assume a more rigid structure which is more resistant to enzymic attack. B.Ketterer

3016. MOLECULAR STRUCTURE OF HELICAL POLY-CYTIDYLIC ACID. R.Langridge and A.Rich: *Nature*, Lond., 1963, 198, 725-728 (Dept. Biol., M.I.T., Cambridge, Mass., U.S.A.) Polycytidyllic acid (poly-C) exists in a helical form in which the apparent pitch is 18.65A and there appear to be 6 residues per helical turn. Poly-C in the ordered helical form is a 2-stranded mol. in which both strands are parallel to each other and are related by a 2-fold rotation axis. The asymmetric unit of cytidylic acid is related to its nearest neighbour on the polymer chain by a translation of 3*11A and a rotation of 30°. H-bonding between cytosine residues in the twin helix is achieved by an arrangement in which 3 hydrogen bonds are formed by addition of 1 protein for every 2 cytosine residues. J.R.Sargent

3017. INHIBITION OF THE FORMATION OF POLY-ADENYLIC-POLYURIDYLIC ACID DOUBLE HELIX COMPLEXES. F.Cramer and H.Seidel: *Z. Naturforsch. B*, 1963, 18, 162-163 (Inst. Org. Chem., Tech. Hochschule, Darmstadt, Germany) Note. (German) J.C.Crawhall

3018. THE INTERACTIONS OF POLY-C AND GUANINE TRINUCLEOTIDE. M.N.Lipsett: *Biochem. biophys. Res. Comm.*, 1963, 11, 224-228 (N.L.H., Bethesda, Md., U.S.A.) Evidence is presented which suggests that the helical C + G structure can bond a 2nd strand of G and that the 2nd strand of G can be melted off without disrupting the C + G core of the structure. B.Ketterer

3019. BLOOD PLASMA ADENOSINE DEAMINASE IN RATS WITH FIBROSARCOMA. G.G.Villela, L.A.Abreu and R.R.Abreu: *Proc. Soc. exp. Biol.*, N.Y., 1962, 111 737-739 (Biochem. Lab., Inst. Oswaldo Cruz, Rio de Janeiro, Brazil, S. America) Increased levels of plasma adenosine deaminase were found in rats with transplantable fibrosarcoma when compared with normal animals. M.M.Shapland

3020. ROLE OF TRANSHYDROGENASE IN ENERGY-LINKED REDUCTION OF NADP. F.Hommes and R.W. Estabrook: *Biochem. biophys. Res. Comm.*, 1963, 11, 1-6 (Dept. Biophys. and Phys. Biochem., Johnson Fndn., Univ. Pennsylvania, Philadelphia, Pa., U.S.A.) Some prop. of the transhydrogenase reaction of submitochondrial particles mediating the energy linked reduction of NADP are described. B.Ketterer

3021. PHOSPHODIESTERASE ACTIVITY OF RIBOSOME PREPARATION FROM GOAT BRAIN. R.K.Datta and J.J.Ghosh: *J. Neurochem.*, 1963, 10, 285-286 (Dept. Biochem., Univ. Coll. Sci. Technol., Calcutta, India) The enzyme activity was studied using p-nitrophenyl-phosphate as substrate; has a broad alk. pH optimum around 8.9 and temp. optimum of 35-40°; is thermostable above 80°; is slightly inhib. by 1-10 mM divalent cations and 64% inhib. in the presence of 5mM EDTA. PO₄ is inhibitory (38% at 10mM) but not arsenate which differentiates it from phosphomonoesterase activity in ribosomes. * R. Woodman

3022. ISOLATION OF RIBONUCLEASE B, A GLYCOPROTEIN, FROM BOVINE PANCREATIC JUICE. T.H.Plummer, jun. and C.H.W.Hirs: *J. biol. Chem.*, 1963, 238, 1396-1401 (Biol. Dept., Brookhaven Nat. Lab., Upton, Long Island, N.Y., U.S.A.) RNase B is isolated by chromatography of the juice on IRC-50. Each g. of pancreatic protein gives approx. 1*25 mg. of RNase B which has the same amino acid composition, sp. activity, and u.v. spectrum as those of RNase A. The mol. wt. of RNase B is 14700 ± 300. There are 5 residues of mannose and 2 of glucosamine bound to each mole of protein. A glycoprotein identical chromatographically with RNase B is isolated from a commercial prep, obtained by fractionation of cryst. RNase; it contains 1 residue of glucosamine and 3 of hexose. Hence cryst. RNase may contain RNase B and modified forms derived by partial removal of carbohydrate. J.N.Ashley

3023. ISOLATION AND CHARACTERISATION OF SPLEEN ACID DEOXYRIBONUCLEASE. G.Bernardi, M.Griffé and E.Appella: *Nature*, Lond., 1963, 198, 186-187 (Centre de Recherches sur les Macromol., Strasbourg, France) Acid RNase was purified from hog spleen by extraction with Na d, pptn. with ammonium sulphate and chromatography on DEAE cellulose, hydroxyapatite and Amberlite resin. The final product behaved as a single component on ultracentrifugation and electrophoresis. Neutral and acidic amino acids predominated in the material and the amount of ammonia present was consistent with most of the acidic amino acids being present as amides. G.M.Lewis

3024. INFLUENCE OF COPRECIPITATION ON QUANTITATIVE ESTIMATIONS OF RIBONUCLEASE ACTIVITIES BY PRECIPITATION METHODS. L.Lepoutre, J.Stockx and L.Vandendriessche: *Analyt. Biochem.*, 1963, 5, 149-157 (Laboratorium voor Fysiologische Scheikunde, Rijksuniversiteit/ Ghent, Belgium)

The coprecipitation of nonprecipitable degradation Products with RNA was investigated at varying concn. of degradation products and RNA. It was shown that co-Precipitation causes interference with the assay which must be taken into account. A.D.Smith

A.D.Smith

**3025. ULTRACENTRIFUGAL AND VISCOMETRIC
STUDIES OF REVERSIBLE THERMAL DENATURATION
OF RIBONUCLEASE. D.N.Holcomb and K.E.Van Holde:
J. phys. Chem., 1962, 66, 1999-2006 (Dept. Chem.
and Chem. Engng., Univ. Illinois, Urbana, Ill.).**

U.S.A.) Sedimentation velocity and intrinsic viscosity measurements have been used to study the reversible thermal denaturation of RNase-A at pH 2⁸. The results indicate that denaturation is more complex than an equilibrium between native ribonuclease and a single denatured form. The data are not consistent with the hypothesis that denaturation corresponds to a gradual unfolding with increasing temp. G.C.Barr

G.C.Barr

3026. ACQUISITION OF THYMIDINE KINASE ACTIVITY BY HERPES SIMPLEX INFECTED MOUSE FIBROBLAST CELLS. S.Kit and D.R.Dubbs: Biochem.

biophys. Res. Comm., 1963, 11, 55-59 (Div. Biochem. Virol., Baylor Coll. Med., Houston, Tex., U.S.A.) It is demonstrated that herpes simplex, which contains only 4.5×10^{-6} mol. wt. equiv. of DNA/particle is capable of inducing thymidine kinase in infected cells.

B.Ketterer

³>>27. NUCLEUSES AND THEIR INHIBITORS IN THE CELLULAR COMPONENTS OF HUMAN BLOOD.

S.Gupta and R.M.Herriott: Arch. Biochem., 1963,
101, 88-95 (Dept. Biochem., Johns Hopkins Univ.
Sch. Hyg. Public Hlth., Baltimore, Md., U.S.A.)

W.b.c. contained a DNase inhibitor which was released on incubation. Sonically disrupted w.b.c. possessed RNase activity equiv. to that of whole blood. Lysed r.b.c. confined appreciable quantities of DNase inhibitor and comparatively little RNase inhibitor. On incubation of serum Jbe high DNase activity disappeared, apparently owing J£ the development of an inhibitor which also reduced ^e activity of added pancreatic DNase. O'OM Mg ^ccelerated the appearance of this inhibitor.

B.M.Stevens

³⁰28. EFFECT OF SNAKE VENOM UPON MEMBRANE ATPase OF HUMAN ERYTHROCYTE. M.Tatibana:

I. Biochem., Tokyo, 1963, 53, 260-261 (Dept.
t, Physiol. Chem., Fac. Med., Univ. Tokyo, Japan)
*The activity of the Na-K dependent, ouabain sensitive
ATPase appeared to be closely related to the integrity of
r.b.c. membrane structure. B.M.Stevens

B.M.Stevens

³29. CONTROL OF ENDOGENOUS ADENOSINE TRIPHOSPHATASE ACTIVITY OF PIGEON HEART MITOCHONDRIA BY ENERGY-LINKED REDUCTION OF NICOTINAMIDE ADENINE NUCLEOTIDE. I. GENERAL PROPERTIES OF REACTION B.Chance and T.Ito.

H- STOICHEIOMETRY BETWEEN ADENOSINE TRIPHOSPHATE AND REDUCED NICOTINAMIDE ADENINE NUCLEOTIDE. B.Chance, T.Ito, P.K.Maitra and K.Oshino: J. biol. Chem., 1963, 238, 1509-1515, 1516-1519 (Johnson Res. Found., Univ. Pennsylvania).

4-Tu-hiladelphia, Pa., U.S.A.) L The endogenous
~~6%^a~~ specifically inhib. by low concn. of succinate;
~~re~~^b conditions are qual. identical with those that lead to
 reduction of succinate-linked NAD. Control of endo-
 genous ATPase by succinate is inhib. by malonate.

$\text{cGJ}^{1\text{e}}$ and glutamate, in presence of malonate, do not
Qu^rol endogenous ATPase reactivity, whereas this occurs

with succinate and glutamate. In the interval before reduction of NAD in the energy-linked pathway there is rapid breakdown of ATP. This control of ATPase activity may be due to competition between a 'hydrolysis' of an essential intermediate in ATPase activity and the binding of a component of this intermediate by NADH₂ formed in the energy-linked reduction. The mode of action of antimycin A in activation of ATPase and in inhibn. of energy-linked reduction of NAD is discussed; these 2 types of activity in intact mitochondria are due to interaction with a respiratory carrier (cytochrome b).

IL Determination of H⁺ formation that accompanies utilisation of ATP in the succinate-linked reduction of NAD in pigeon heart mitochondria shows a total change of approx. 32 μ mol. of H⁺ per mg. of protein. Correction of this for H⁺ change caused by reduction of NAD and conversion to change of concn. of ATP gives 28 nmol. of ATP per mg. of protein. This gives a stoichiometry of 2:8 ATP per NAD reduced. Comparison of the results of chem. determination of ADP formation from ATP breakdown with those of direct determination of ADP by spectroscopic response of the respiratory carriers gives 3 ADP formed per mol. of NAD reduced. J.N.Ashley

3030. CYTOCHEMICAL DEMONSTRATION OF ATPase
IN STYLONYCHIA PUSTULATA. N.W.Hunter: J. cell,
comp. Physiol., 1963, 61, 209-213 (Dept. Biol.,
Morgan St. Coll., Baltimore, Md., U.S.A.) The
ATPase of the hyoothrichous ciliate S. pustulata was
localised in the mitochondria and most active at pH 7*6
at 30°. It was stim. by Ca, Mg and Fe and by glutathione,
but depressed by Zn, Co and cysteine HCl. G.M.Lewis

3031. ENZYMIC ACTIVITY OF POLYALANYL RIBONUCLEASE. D.Wellner, H.I.Silman and M.Sela: J. biol. Chem., 1963, 238, 1324-1331 (Dept.

Biophys., Weizmann Inst. Sci., Rehovoth, Israel)
 With RNA as substrate, poly-DL-alanyl RNase enriched with 94 alanine residues per mol. of enzyme [PAR 4D] and poly-DL-alanylRNase enriched with 130 alanine residues per mol. of enzyme [PAR 4E] are more active than RNase at pH 5 and low ionic strength, but at their optimum pH, RNase is about 8 times more active than PAR 4D, and at pH 8 PAR 4D is less than 2% as active as RNase. With nucleoside 2'³-cyclic phosphates as substrates the activities of PAR 4D and PAR 4E are of the same order of magnitude as that of RNase in the range pH 5-8. At pH 8 both are more active towards cytidine 2'³f-diphosphate, whilst at this pH PAR 4E is less active towards uridine 2' 3-diphosphate. 6M urea increases the apparent activity of RNase towards RNA and decreases that of PAR 4E.

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3032. SEQUENTIAL INDUCTION OF MALTOSE-PERMEASE AND MALTASE SYSTEMS IN SACCHAROMYCES CEREVISIAE. G.Harris and D.J.Millin:

Biochem. J., 1963, 88, 89-95 (Brewing Ind. Res. Found., Nutfield, Redhill, Surrey, England) The induction of maltose-permease and maltase systems was studied in stationary cells of S. cerevisiae. In one strain the induction of the maltase system was dependent on

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preinduction of the transport system and additionally on the presence of exogenous N. However, maltose permease induction was independent of an external N source, thus enabling separate induction of the transport and hydrolysing systems in this strain. This phenomenon is discussed in relation to protein synthesis and turnover. Two other strains possessed the ability to transfer radioactivity from [^{14}C]maltose to [^{14}C]trehalose at external pH values where yeast maltases are not usually active. This suggests the possibility of pathways of maltose metabolism not involving maltase in these strains. *

3033. REPLACEMENT OF PROLINE BY AZETIDINE-2-CARBOXYLIC ACID DURING BIOSYNTHESIS OF PROTEIN [IN BACTERIA AND HIGHER PLANTS]. L.Fowden and M.H.Richmond: *Biochim. biophys. Acta*, 1963, 71, 459-461 (Dept. Bot., Univ. Coll., London, England). B.M.Stevens

3034. REPRESSION AND DEREPRESSION OF CYTOCHROME c BIOSYNTHESIS IN E. COLI [K12 AND E. AUREUS CFSNS ATCC 12814]. J.W.T.Wimpenny, M.Ranlett and C.T.Gray: *Biochim. biophys. Acta*, 1963, 73, 170-172 (Dept. Microbiol., Dartmouth Med. Sch., Hanover, N.H., U.S.A.) The cytochrome was formed anaerobically in the manner of an induced enzyme; biosynthesis was inhib. by aerobic conditions. Prelim, comm. B.M.Stevens

3035. THE RELEASE OF PROTEIN FROM RETICULOCYTE RIBOSOMES. A.J.Morris: *Biochem. biophys. Res. Comm.*, 1963, 11, 201-207 (Dept. Biochem., Nat. Inst. Med. Res., Mill Hill, London, England) Evidence is presented that the release of completed protein mol. from ribosomes *in vitro* specifically requires GTP and has the characteristics of an enzyme catalysed reaction. B.Ketterer

3036. INCORPORATION OF ^{14}C -LABELLED AMINO ACIDS INTO THE PROTEINS OF THE LIVER. R.S.Piha, A.J.Uusitalo and S.S.Oja: *Ann. Med.*, 1963, 41, 73-88 (Inst. Physiol., Univ. Helsinki, Finland) The rate of incorporation of ^{14}C -labelled amino acids into the proteins of the supernatant and the precipitate fractions separated from liver homogenates at 4000 £ for 30 min. and their subsequent turnover were studied in healthy untreated rats and rats inj. with chlorpromazine, meprobamate and LSD. In control group at 24 hr. after ^{14}C injn. sp. activities of proteins in liver supernatant and precipitate fractions were 48*0 and 55*5% of the isotope content of total plasma proteins. Chlorpromazine lengthened the time for liver proteins to reach max. activity, dec. max. sp. activity in both fractions. LSD lowered rate of ^{14}C incorporation and caused rapid initial elimination in precipitate fraction, followed by normal rate of protein elimination. It increased slightly the elimination of supernatant proteins. Meprobamate had no effect on incorporation of amino acids into liver proteins in 24 hr. expt. Mechanism of protein synthesis in liver and inhibitory effect of chlorpromazine on liver function are discussed. Relationship between liver and plasma protein metabolism is dealt with. G.Faulkner

3037. MECHANISM OF PROTEIN BIOSYNTHESIS IN RAT LIVER AND TRANSPLANTABLE TUMOUR MICROSOMES in. S.Ya.Davidova and G.A.Drozdova: *Vop. Med. Him.*, 1963, 9, 161-167 (Lab. Biochem., Inst. Expt. and Clinical Oncol., Acad. Med. Sci., Moscow, U.S.S.R.) No differences between normal and neo-

plastic tissue were detected in respect of binding of amino acids to transfer RNA or transfer of amino acids to microsomes. Rate of incorporation of [^{14}C]glycine into microsome protein was greater in tumours than in normal tissues during the first few min. of incubation; this ratio was later reversed. The results suggest a higher turnover rate of protein in tumours than in normal tissues.

J.R.Sargent

3038. CHEMICAL COMMUNICATION SYSTEMS IN THE CELL. H.Quastlen: *Trans. N.Y. Acad. Sci.*, 1963, 25, 382-395 (Biol. Dept., Brookhaven Nat. Lab., Upton, N.Y., U.S.A.) Genotype-phenotype interactions are discussed in terms of encoding and decoding between proteins and nucleic acids. A model for repression-de-repression mechanism is proposed which does not demand a very high enzyme specificity and which suggests that structurally related genes can produce functionally related enzymes which react with the same substrates and inhibitors, e.g. at the same time that a structural gene specifies an enzyme which reacts with a substrate A, the corresponding regulator gene specifies a repressor enzyme which mediates the interaction between A and the regulator gene. R. H. Kimberlin

3039. ANALYSIS OF THE LIFE CYCLE IN MAMMALIAN CELLS. V.Defendi and L.A.Manson: *Nature*, Lond., 1963, 198, 359-361 (Wistar Inst., Philadelphia, Pa., U.S.A.) The time required for synthesis of DNA was determined by incorporation of [^{3}H]thymidine and found to be similar in diverse types of mammalian cell lines of both normal and tumour origin. Differences in generation time are caused by variation in the length of the phase preceding DNA synthesis. Six hr. appears to be the min* time required for duplication of DNA. G.M.Lewis

3040. LABELLING WITH ^{14}C -AMINO ACIDS OF ALBUMIN-LIKE PROTEIN BY RAT LIVER RIBONUCLEOPROTEIN PARTICLES. A.von der Decken: *J. cell Biol.*, 1963, 16, 471-481 (Wenner-Gren Inst. for Expt. Biol., Univ. Stockholm, Sweden) RNP particle were separated from rat liver microsomes using detergents and KCl. When incubated for 2/ hr. in the presence of cell sap and ATP + GTP the particles incorporate [^{14}C]leucine and [^{14}C]valine. Immunoelectrophoretic studies of the sol. albumin obtained revealed the existence of 2 immunol. reactive albumins differing from rat serum albumin in their electrophoretic mobility. P.Barlow

3041. BIOSYNTHESIS OF PROTEIN IN CYTOPLASMIC GRANULES. L.Toliushis: *Biokhimiiia*, 1963, 28, 161-171. The total fraction of large cytoplasmic granules from the rat liver activated tyrosine, resulting in aminoacyladenylate formation. The activity of the granules did not decrease with additional washing, and on destruction of the granules it passed into the soln. An extract of the granules attached labelled tyrosine to RNA. On incubation of the granules with s-RNA labelled with [^{14}C]tyrosine, the latter was transferred from the s-RNA to the proteins of the granules. This ability was destroyed on destruction of the granules. (Russian) B.J.Cooper

3042. INCORPORATION OF AMINO ACIDS IN INSULIN* B.S.Sakhareva: *Biokhimiiia*, 1963, 28, 45-51. It was found that on incubation of insulin with labelled glycine, tyrosine, leucine, phenylalanine, alanine and methionine, these amino acids were incorporated into the insulin by means of firm bonds. No selective bondage occurred at the C- and N-ends of the protein mol. The share of total protein radioactivity of N-terminal insulin

residues did not exceed 1% and that of O-terminal residues 13%. Neither blockage of amino and carboxyl groups nor amide groups splitting from the insulin and albumin mol appreciably affected incorporation of amino acids. Amino acids incorporated into the insulin mol. were uniformly distributed in its A- and B-chains. The isolated B-chain incorporated labelled alanine, tyrosine and methionine. (Russian) B.J.Cooper

3043. STUDIES ON THE ISOLATED ISLET TISSUE OF FISH. IV. IN VITRO INCORPORATION OF CARBON-14 AND TRITIUM LABELLED AMINO ACIDS INTO GOOSEFISH ISLET TISSUE PROTEINS. G.E.Bauer and A.Lazarow: Biol. Bull. Woods Hole, 1961, 121, 425-437 (Dept. Anat., Univ. Minnesota, Minneapolis, Minn., U.S.A.)

The radioactivity of the purified alcohol-sol. fraction of goosefish (*Lophius piscatorius*) islet tissue, which was assumed to contain the insulin synthesized in vitro, was 3 times greater than the TCA ptd. protein residue. The rate of labelled amino acid incorporation into the alcohol sol. fraction increased with increased time of incubation but decreased in the absence of O₂ and in the presence of glucose.

G.J.Peakin

3044. BIOCHEMISTRY OF AMPHIBIAN DEVELOPMENT. I. RIBOSOME AND PROTEIN SYNTHESIS IN EARLY DEVELOPMENT OF RANA PIPiens. H. HIGH MOLECULAR WEIGHT RNA. JJL IDENTIFICATION OF FERRITIN IN-THE EGG AND EARLY EMBRYOS OF RANA PIPiens. D.D.Brown and J.D.Caston: Develop. Biol., 1962, 5, 412-434, 435-444, 445-451 (Carnegie Inst. Washington, Dept. Embryol., Baltimore Md., U.S.A.)

I. Because of ribosomal binding an isotope dil. technique was used to measure the true endogenous population of egg and embryo ribosomes. Synthesis of few ribosomes was negligible until Shumway stage 18 when there was a rapid increase in cytoplasmic ribosomes with a simultaneous increase in sol. protein content, and embryos began to concentrate Mg from the medium. New ribosomes appeared in the cytoplasm as 80-100 S articles which were absent in Mg-deficient embryos.

II. Unfertilised eggs contain high mol. wt. RNA with pse ratio characteristics of adult ribosomes. In 32p-labelled mature eggs and embryos, no synthesis of this occurred before Shumway stage 16, and it was most active after formation of cytoplasmic ribosomes mentioned.

All Fe in the egg (0.4-1.0 µg./egg) and early embryo is present in a form bound to ferritin. The protein moiety is indistinguishable chem. from purified horse-pleen ferritin and cross reacts immunol. with anti-horse-teen ferritin. Ferritin iron content is constant until Shumway stage 20, but at stage 25 no detectable iron remains in the ferritin fraction. J.W.S. Harris

3045. INDEPENDENCE OF AMOUNTS OF INCORPORATION OF AMINO ACIDS INTO HISTONES ON THE AMINO ACID COMPOSITION OF THESE PROTEINS. A.S.Konikova, A.V.Pogosova, E.A.Rapoport, T.D. Guljamov and M.G.Kritzman: Nature, Lond., 1963, 198, 167-169 (A.V.Vishnevsky's Inst. Surg., Acad. Med. Sci., Moscow, U.S.S.R.) Topically labelled amino acids were inj. i.p. into rats. The amount of radioactivity appearing from any given amino acid in & nine-rich and lysine-rich histone fractions from liver was not correlated with the amount of that amino acid present in the histones on a molar basis. J.R.Sargent

3046. MITOCHONDRIAL PHOSPHOPROTEIN METABOLISM. K.Ahmed and J.D.Judah: Biochim. biophys. Acta, 1963, 71, 295-304 (Wistar Inst. Anat. and Biol., Philadelphia, Pa., U.S.A.) Rat liver mitochondria incubated at 20° with KCl, tris, EDTA and 32p rapidly incorporated 32p into ATP and phosphoproteins but not into phospholipids. Inhibitors of electron transport and oxidative phosphorylation reduced the rate of phosphoprotein labelling, control levels of radioactivity never being achieved at any time. ATP turnover was also reduced but the same isotopic equilibrium was reached in a few min. Oligomycin did not inhibit phosphoprotein turnover at concn. which greatly reduced ATP labelling. B.M. Stevens

3047. RIBOSOMAL AGGREGATES ENGAGED IN PROTEIN SYNTHESIS: ERGOSOME BREAKDOWN AND MESSENGER RNA TRANSPORT. H.Noll, T.Staehelin and F.O.Wettstein: Nature, Lond., 1963, 198, 632-638 (Dept. Microbiol., Sch. Med., Univ. Pittsburgh, Pa., U.S.A.) Evidence is presented which demonstrates that breakdown of rat liver polyribosome aggregates (ergosomes) and protein synthesis by these aggregates proceed synchronously and result in the stepwise release of single 73 S ribosomes containing nascent protein. A scheme is presented in which messenger RNA is considered to move relative to ribosome sites at which messenger RNA interacts with transfer RNA providing amino acids to a growing polypeptide chain. Roles for GTP and transfer factors I and II are suggested in the scheme.

J.R.Sargent
3048. A RIBOSOME BOUND INTERMEDIATE IN POLYPEPTIDE SYNTHESIS. R.Arlinghaus, G.Favelukes and R.Schweet: Biochem. biophys. Res. Comm., 1963, 11, 92-95 (Dept. Biochem., Univ. Kentucky Med. Center, Lexington, Ky., U.S.A.) The transfer of [14C]phenylalanine from [14C]phenylalanyl-RNA to polyphenylalanine is shown to involve 2 steps catalysed by different enzyme fractions and the formation of a labile ribosome-bound [14C]phenylalanine intermediate.

B.Ketterer
3049. POLYRIBOSOMES IN NORMAL AND POLIOVIRUS-INFECTED HeLa CELLS AND THEIR RELATIONSHIP TO MESSENGER-RNA. S.Penman, K.Scherrer, Y.Becker and J.E.Darnell: Proc. nat. Acad. Sci., Wash., 1963, 49, 654-661 (Dept. Biol., M.L.T., Cambridge, Mass., U.S.A.) The cytoplasm of HeLa cells was shown to contain polyribosomes of various sizes which contain a fraction of RNA with characteristics of messenger RNA. In poliovirus-infected cells polyribosomes of very large size are assembled. J.R.Sargent

3050. AMINO ACID-ESTER LINKAGE IN AMINO ACYL RNA. W.Frank and H.G.Zachau: Hoppe-Seylers Z. physiol. Chem., 1963, 331, 258-268 (Inst. Genet. Univ., 5 Kolin-Lindenthal, Germany) A quant. ester estimation of aminoacyl-adenosine is described.

(German) L.Cornish
3051. AMINOACYL TRANSFER FROM SOLUBLE RIBONUCLEIC ACID TO RIBOSOMES. RESOLUTION OF TWO SOLUBLE TRANSFERRING ACTIVITIES. J.M.Fessenden and K.Moldave: J. biol. Chem., 1963, 238, 1479-1484 (Dept. Biochem., Tufts Univ. Sch. Med., Boston, Mass., U.S.A.) Transfer of labelled amino acids from aminoacyl sol. RNA to purified rat liver ribonucleoprotein particles needs presence of 2 distinct sol. aminoacyl transferases (or polymerases). The 2 activities are separated by salt fractionation methods. Neither factor is active alone. Transferase I is obtained very pure;

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transferase II, which is also present in deoxycholate extracts of microsomes, is partially purified. Aminoacyl transfer occurs with 0[#]1 jmol. or less of GTP per mL_f and exhibits a requirement for glutathione or another thiol.

J.N.Ashley

3052. PARTICIPATION OF LOW POLYMER RNA IN NUCLEAR PROTEIN SYNTHESIS. V.A.Gvozdev and M.A.Ponomareva-Stepnaia: Biokhimiia, 1963, 28, 152-160. Incubation of isolated nuclei with labelled aminoacyl-RNA (low polymer) resulted in transfer of amino acids from the low polymer (s-)RNA to nuclear proteins. On incubation of the nuclei with s-RNA carrying labelled amino acids, radioactivity was shown not only in the proteins of the nuclear sap but also in the chr. proteins. Histones were an exception to this.

(Russian) B.J.Cooper

3053. THE FUNCTION OF TRANSFER-RNA AS AMINO ACID ADAPTOR IN THE SYNTHESIS OF HAEMOGLOBIN. G.von Ehrenstein, B.Weisblum and S.Benzon: Proc. nat. Acad. Sci., Wash., 1963, 49, 669-675 (Johns Hopkins Univ., Baltimore, Md., U.S.A.)

'Rabbit' Hb was prep. in a cell-free system using rabbit reticulocyte ribosomes and [14c]alanine attached to the *E.coli* transfer RNA that normally carries cysteine. Alanine was incorporated into a peptide of the a-chain that normally contains cysteine but not alanine. Thus, in confirmation of the result previously obtained with a synthetic polynucleotide, the transfer-RNA mol. acts as a sp. adaptor in true protein synthesis. J.R. Sargent

3054. SYNTHESIS OF TRANSFER-RNA BY ISOLATED NUCLEI. M.L.H.Chipchase and M.L.Birnstiel: Proc. nat. Acad. Sci., Wash., 1963, 49, 692-699 (Div. Biol., California Inst. Technol., Calif., U.S.A.)

It is shown that isolated pea nuclei contain an active transfer RNA which will accept amino acids from both cytoplasmic and nuclear amino acid activating enzymes. Isolated pea nuclei synthesise in vitro a small mol. RNA of the physical characteristics of amino acid transfer RNA. This synthesis is DNA-dependent. It was shown that this RNA is in fact transfer RNA and that the in vitro synthesised mol. are capable of accepting amino acids.

J.R.Sargent

3055. MOLECULAR FACETS OF MITOTIC REGULATION. I. SYNTHESIS OF THYMIDINE KINASE. Y.Hotta and H.Stern: Proc. nat. Acad. Sci., Wash., 1963, 49, 648-654 (Bot. Dept., Univ. Illinois, Urbana, Ill., U.S.A.) Brief appearance of thymidine kinase activity prior to DNA synthesis in microspores of *Lilium* is due to de novo synthesis of protein. The chain of events leading to such synthesis begins with the formation of RNA; any of the steps in the sequence may be blocked by an appropriate inhibitor.

J.FLSargent

3056. A POSSIBLE CHEMICAL TERM FOR THE OPERATOR-GENE. M.Bartalos: Nature, Lond., 1963, 198, 109 (Dept. Pathol., Johns Hopkins Univ., Sch. Med., Baltimore, Md., U.S.A.) It is suggested that 'operator genes' are in fact histones which can stop the production of the DNA-dependent RNA synthesis by combining directly with the responsible structural gene.

G.M.Lewis

3057. INVOLVEMENT OF SYNTHESIS OF RNA IN THYMINELESS DEATH. P.C.Hanawalt: Nature, Lond., 1963, 198, 286 (Biophysics Lab., Univ., Stanford, Calif., U.S.A.) A new polyauxotroph, *E.coli* 15T- (TAU-bar) which requires arginine, methionine, proline and tryptophan, showed a slow loss in viability when an exponentially growing culture was deprived of

thymine and uracil. Removal of one or all of the required amino acids as well resulted in an increased killing rate. The evidence is taken to suggest that messenger RNA synthesis is involved in the killing process in thymine-less bacteria.

G.M.Lewis

3058. METABOLIC HETEROGENEITY OF INFORMATIONAL RNA ISOLATED FROM EHRLICH CARCINOMA CELLS. G.P.Georgiev and M.L.Lerman: Vop. Med. Him., 1963, 9, 218-220 (Inst. Biol. and Med. Chem., Acad. Med. Sci., Moscow, U.S.S.R.)

(Russian) J. R. Sargent

3059. ACTINOMYCIN D-RESISTANT RNA SYNTHESIS IN ANIMAL CELLS. J.Paul and M.G.Struthers: Biochem. biophys. Res. Comm., 1963, 11, 135-139 (Dept. Biochem., Univ. Glasgow, Scotland) Evidence is given that in animal cell nuclei, there is in addition to Actinomycin D-sensitive RNA synthesis a system which is Actinomycin D-resistant which may be a precursor of a ribosomal component.

B.Ketterer

3060. CONTRIBUTION TO THE CODING PROBLEM.

L.K.Blumenthal: J. theoret. Biol., 1962, 2, 72-73 (Bact. Lab., Cornell Univ., Ithaca, N.Y., U.S.A.)

Examination of the work of Lanni indicates that his explanation of the clustering of the values of (cytosine + guanine):(total DNA bases) must be discarded.

J.A.Dawson

3061. NUCLEIC ACID METABOLISM DURING SYNCHRONOUS DEVELOPMENT OF AZOTOBACTER VINE-LANDII. G.N.Zaitseva, Ngo ke Syong and A.N. Belozerskii: Biokhimiia, 1963, 28, 172-186.

A study was made of the metabolism of various nucleic acids and nucleotides (DNA, ribosomal and sol. RNA) associated with respiration and oxidative phosphorylation in a synchronously developing culture of *A. vinelandii*. It seemed possible that free nucleotides of the metabolic pool performed the role of regulators of nucleic acid synthesis. The problem of the participation of some nucleotide-peptides in the synthesis of cell wall protein is discussed.

(Russian) B.J.Cooper

3062. SEPARATION OF THE RNA MESSAGE TRANSCRIBED IN RESPONSE TO A SPECIFIC INDUCER.

M.Hayashi, S.Spiegelman, N.C.Franklin and S.E.Luria: Proc. nat. Acad. Sci., Wash., 1963, 49, 729-736 (Dept. Microbiol., Univ. Illinois, Urbana, Ill., U.S.A.)

Hybridisation of RNA with DNA from a transducing phage carrying the *lac* genetic region and chromatographic fractionation of RNA were employed to detect the sp. *lac* message RNA in *E.coli*. Increased amounts of RNA messages complementary to the *lac* region were observed in induced cells. This RNA can be identified chromatographically and distinguished from other *E.coli* messages which possess homology for some portions of the phage genome.

J. R. Sargent

3063. SYNTHESIS OF MESSENGER RNA WITHOUT PROTEIN SYNTHESIS IN NORMAL AND PHAGE-INFECTED THYMINELESS STRAINS OF E. COLI

S.S.Cohen, M.Sekiguchi, J.L.Stern and H.D.Barnen: Proc. nat. Acad. Sci., Wash., 1963, 49, 699-707 (Dept. Biochem., Univ. Pennsylvania Sch. Med., Philadelphia, Pa., U.S.A.)

E.coli lacking ability to synthesise thymine, uracil and an amino acid, synthesise a small fraction of normal RNA from uracil in the absence of thymine and the amino acid. Synthesis of this RNA is markedly inhib. by concomitant DNA synthesis. The RNA made appears on the ribosomes and when made

r, the presence of an inducer of (3-galactosidase allows synthesis of this enzyme to proceed, T_{br+}-infected cells made characteristic phage-induced RNA in the absence of protein synthesis. This RNA stimulates rapid synthesis of deoxycytidine hydroxymethylase, an early enzyme, but not lysozyme, a late enzyme. Results support the concept that sequential production of phage proteins may be determined by sequential transcription of phage genome, i.e. sequential production of phage-induced messenger RNA.

J.R.Sargent

1064. STUDIES OF BIOCHEMISTRY AND PHYSIOLOGY OF NORMAL AND TUMOUR STRAIN CELLS. I. SYNTHESIS OF RNA, DNA AND NUCLEAR PROTEIN IN NORMAL AND TUMOUR STRAIN CELLS. II. GROWTH CONTROL MECHANISMS IN NORMAL AND TUMOUR STRAIN CELLS. J.Seed: Nature, Lond., 1963, 198, 147-153 (Dept. Radiotherap., Univ. Cambridge, Cambridge, England) I. In rapidly dividing monkey kidney cells, the time synthesis curve for the majority of RNA is similar to that for DNA and the bulk of RNA synthesis in the chromatin does not start until DNA and nuclear protein synthesis begin. In HeLa cells, dry mass values for nuclei increase early in interphase and continue to rise throughout this period while DNA synthesis occurs only after a lag period. A large part of nuclear RNA synthesis in HeLa cells is continuous in pattern and not particularly associated with DNA synthesis.

II. The sequence of synthetic events in normal cell nuclei is considered to be (a) dissociation of double-handed DNA from protein, (b) unwinding of double stranded DNA into single chains, (c) synthesis of RNA, (d) synthesis of protein. In tumour strain cells the Association of nuclear protein and RNA synthesis from RNA synthesis is suggested to be due to DNA functioning in the synthetic sequence in a double stranded form.

J.R. Sargent

1065. RAPIDLY LABELLED RNA IN THE CELL NUCLEUS. H.Harris: Nature, Lond., 1963, 198, 184-195 (Dept. Cell Biol., John Innes Inst., Bayfordbury, Herts., England) HeLa cells were exposed to [8-14C]adenine and then transferred to a non-radioactive medium containing adenosine, guanosine and actinomycin D. It was found that very little of the rapidly labelled nuclear RNA transferred to the cytoplasm in stable form. The relationship of nuclear and cytoplasmic RNA is discussed.

G.M.Lewis

1066. RELATIONSHIP BETWEEN NUCLEAR AND CYTOPLASMIC RNA. I. U.N.Singh and R.Koppelman. II. H.Harris: Nature, Lond., 1963, 198, 181-183, 183-184 (Dept. Biochem., Univ. Chicago, 111., U.S.A.) Results published by Harris and Watts are re-examined on more rigorous quant. basis and found to be compatible with a precursor-product relationship between the nuclear & cytoplasmic RNA in logarithmically growing HeLa cells.

II- The conclusions of Singh and Koppelman (above) are contradicted and the hypothesis that cytoplasmic RNA is synthesised in the cytoplasm from acid-sol. precursors is restated.

G.M.Lewis

1067. NICOTINAMIDE MONONUCLEOTIDE [NMN] ACTIVATION OF A NEW DNA-DEPENDENT POLYADENYLIC ACID SYNTHESISING NUCLEAR ENZYME. P-Chambon, J.D.Weill and P.Mandel: Biochem. Phys. Res. Comm., 1963, 11, 39-43 (Inst. de Chimie Bid., Fac. Med., Strasbourg, France) ^{14C}NMN-³²P polymerase from hen liver nuclei, stim. by other prop. distinct from those of RNA polymerase is described.

B.Ketterer

3068. INTIPACELLULAR TRANSFER OF NUCLEIC ACIDS. I. FATE OF NUCLEIC ACIDS IN RAT LIVER CELLS.

T.Kusakari, M.Yano, M.Mitsuhashi, LNagata, S.Ohmura and Y.Miura: J. Biochem., Tokyo, 1963, 53, 250-255 (Dept. Physiol. Chem., Chiba Univ. Sch. Med., Chiba, Japan)

Nuclear and cytoplasmic RNP of weanling livers were fractionated on DEAEcellulose columns 1, 4, 8 and 24 hr. after i.p. injn. of [14C]4-amino-5-imidazole-carboxamide [AICA]. Cytoplasmic RNP was divided into 4 fractions. The supernatant fraction was of nuclear origin and was most metabolically active. The sp. activity of the post-microsomal fraction became higher than that of the supernatant fraction after 4 hr. Radioactivity appeared in sol. RNA and ribosomes in the later stages. Only part of the DNA became labelled; such DNA was isolated by ECTEOLA-cellulose column chromatography. Administration of purine and pyrimidine precursors with the AICA increased the radioactivity of the supernatant fraction.

B.M.Stevens

3069. INTERPRETATION OF THE KINETICS OF HELIX FORMATION. N.R.Kallenbach, D.M.Crothers and

R.G.Mortimen: Biochem. biophys. Res. Comm., 1963, II, 213-216 (Univ. California, San Diego, Calif., U.S.A.)

A kinetic model for the formation of the double stranded poly (A + U) helical complex is described which treats the reaction as a multistage "zipping" process in which all steps but the first have identical rate constants in both the forward and the backward direction.

B.Ketterer

3070. ADP-I-N-OXIDE SYNTHESIS AND ITS INCORPORATION INTO POLYADENYLIC ACID. F.Cramer, K.Randerath and E.A.SchSfen: Z. Naturforsch. B, 1963, 18, 162 (Inst. Organ. Chem., Tech. Hochschule, Darmstadt, Germany) Note.

(German) J.C.Crawhall

3071. PURIFICATION AND PROPERTIES OF THE 3CL-HYDROXY STEROID-DEPENDENT NAD TRANSHYDROGENASE OF RAT LIVER. D.N.Baron, M.B.R. Gore, R-Pietruszko and D.C.Williams: Biochem. J., 1963, 88, 19-25 (Royal Free Hosp., London, England)

The 3d-hydroxy steroid-dependent NAD transhydrogenating system present in the sol. fraction of rat-liver homogenate was partially purified by (NH₄)₂SO₄ fractionation and DEAE-cellulose column chromatography. The enzyme is activated by certain anions. The effect of SO₄²⁻ ions (the most potent activating anion) on the pH, androsterone and NADP optima, and on the reversibility of the reaction in a coupled transhydrogenating system, was studied. NAD- and NADP-linked steroid dehydrogenases in the rat-liver prep. were also tested for SO₄²⁻ ion activation.

3072. BIOSYNTHESIS OF NUCLEIC ACIDS IN BACILLUS MEGATERIUM. I. THE ISOLATION OF A NUCLEAR MATERIAL. J.A.V.Butler and G.N.Godsor: Biochem. J., 1963, 88, 176-182 (Chester Beatty Res. Inst., London, England)

Methods are described for cleanly fractionating protoplasts of *B. megaterium* into (a) a nuclear fraction, containing 90-95% of the total DNA, some RNA and protein, (b) a cytoplasmic fraction containing over 90% of the total RNA and nearly all of the cellular ribosomes, and (c) a membrane fraction made up of clean cytoplasmic membranes. Basic proteins cannot be extracted from the nuclear material by dilute acids.

3073. SEPARATION OF CLOSTRIDIUM PERFRINGENS POLYNUCLEOTIDE PHOSPHORYLASE INTO TWO COMPONENTS. E.Knight, jun., P.S.Fitt and M.Grunberg-

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Manago: Biochem. biophys. Res. Comm., 1963, 10, 488-491 (Inst. Biol. Physico-chim., Paris, France) An account is given of the separation of the polynucleotide phosphorylase of C. perfringens into 2 enzymes with somewhat different activities by means of Ca phosphate gel adsorption. B.Ketterer

3074. ENZYMIC SYNTHESIS OF TRANSFORMING DNA. R.M.Litman and W.Szybalski: Biochem. biophys. Res. Comm., 1963, 10, 473-481 (Dept. Biophys., Florence R.Sabin Lab., Univ. Colorado Med. Center, Denver, Colo., U.S.A.) Evidence is presented to show that new, primer free, active transforming mol. of DNA have been synthesised in vitro by the catalytic action of E. coli polymerase with denatured transforming primers, B.Ketterer

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3075. TRANSPORT OF INORGANIC IONS AND PAH IN ISOLATED CELLS OF THE RENAL CORTEX OF THE RABBIT. J.BosaEková: Biochim. biophys. Acta, 1963, 71, 345-354 (Lab. Cell. Metab. Inst. Microbiol., Czechoslovak Acad. Sci., Prague, Czechoslovakia) On aerobic incubation at 25° with 10mM acetate, Na was actively extruded and K accumulated in a manner linearly dependent on the K concn. of the medium. Anaerobic incubation inhibited Na extrusion and K accumulation and the cells swelled. On reintroduction of O₂, Na was extruded, K accumulated and the cell vol. decreased. 10-4M DNP produced similar effects to anaerobiosis. PAH was actively accumulated especially by those cells whose K content was maintained closest to that of fresh tissue during prep. When high K concn. in the medium increased the cell K content above normal, PAH accumulation decreased. 7*5mM Ca in the medium decreased PAH accumulation. 20 equiv. Li/equiv. PAH inhib. PAH accumulation; the inhibn. was reduced by increasing Ca concn. in the medium which changed the Li distribution between cells and medium. B.M.Stevens

3076. INFLUENCE OF CATIONS ON THE REACTIVITY OF THE SULPHYDRYL GROUPS OF ACTIN. A.M.Katz: Biochim. biophys. Acta. 1963, 71, 397-407 (Los Angeles County Heart Ass. Cardiovascular Res. Lab., Univ. California, Los Angeles, Calif., U.S.A.) Low CaCl₂ concn. inhib. the reactivity of at least 2 of the 4 slowly reacting SH of G-actin with β -chloromercuribenzoate. Mg²⁺ stim. SH reactivity slightly and partially reversed the inhibn. by Ca. ZnCl₂, CoCl₂ and NiCl₂ stim. while MnCl₂ inhib. LiCl, NaCl, KCl and RbCl in concn. normally inducing actin polymerisation and CdCl₂ had no effect on SH reactivity. ATP inhib. reactivity slightly but greatly increased the inhibn. by Ca. ATP reduced the stimulating effect of Mg. Ca is suggested to favour a 'closed' actin configuration while Mg produces an 'open' configuration. No effects on the SH reactivity of the actin monomer were observed. B.M.Stevens

3077. CHEMICAL FACTORS CONTROLLING THE MOVEMENT OF IONS DURING NERVOUS ACTIVITY. D.Nachmansohn: Bull. Soc. Chim. biol., Paris, 1963, 45, 29-54 (Dept. Biochem. and Neurol., Coll. Phys. Surg., Columbia Univ., New York, U.S.A.) Review. 44 ref. (French) J.C.Crawhall

3078. DIFFUSION OF SALTS THROUGH A LIPOPROTEIN INTERFACE. L.Saunders: J. Pharm., Lond., 1963, 15, 348 (Sch. Pharm., Brunswick Sq., London, England) A letter. Diffusion in soln. was studied by noting the changes of conductivity with time. J.M.Whitmarsh

3079. SODIUM- AND POTASSIUM-DEPENDENT ATPase ACTIVITY IN A RAT KIDNEY ENDOPLASMIC RETICULUM FRACTION. E.J.Landon and J.L.Norris: Biochim. biophys. Acta, 1963, 71, 266-276 (Dept. Pharmacol., Vanderbilt Univ. Sch. Med., Nashville, Tenn., U.S.A.) Dialysed prep. possessed an Mg dependent ATPase which was activated by Na and K added together. Na and K appeared to be bound at separate sites. Ouabain, org. mercurial diuretics and Ca inhib., the first inhibiting cation uptake rather than ATPase activity. H effects on ATPase activity were examined. B.M.Stevens

3080. SIGNIFICANCE OF VARIOUS FACTORS INCLUDING LACTIC DEHYDROGENASE ON THE ACTIVE TRANSPORT OF SODIUM IONS IN SKELETAL MUSCLE. E.J.Conway: Nature, Lond., 1963, 198, 760-763 (Dept. Biochem., Univ. Coll., Dublin, Ireland) Results suggest that the active secretion of Na from Na-loaded frog sartorius muscle is mediated by an electron transport pathway and not by energy rich phosphates. Under conditions of Na secretion a certain amount of lactate is continuously formed, even anaerobically, which results in secretion of Na⁺. Lactate so formed diffuses to other regions of the fibre membrane where it is oxidised to pyruvate resulting in a further secretion of Na. Oxidation of lactate is considered to be linked to the cytochrome system. J.R. Sargent

3081. SODIUM-POTASSIUM ACTIVATED ATPase. V. CORRELATION OF ENZYME ACTIVITY WITH CATION FLUX IN SIX TISSUES. S.L.Bonting and L.L. Caravaggio. VI. ITS ROLE IN CATION TRANSPORT IN THE LENS OF CAT, CALF AND RABBIT. S.L.Bonting, L.L.Caravaggio and N.M.Hawkins: Arch. Biochem., 1963, 101, 37-46, 47-55 (Section Cell Biol., Ophthalmol. Branch, Nat. Inst. Neurol. Dis. and Blindness, Bethesda, Md., U.S.A.) V. Na-K activated ATPase activity, expressed as moles/sq. cm./sec., was correlated with previously reported active cation fluxes in human r.b.c., frog toe muscle, squid giant axon# frog skin, toad bladder and the noninnervated membrane of electric eel Sachs organ over a 25000-fold range. Temp, coeff. for the enzymes were measured for all tissues except r.b.c. and enzyme activities were corrected for the temp, at which flux values were obtained. Average ratio of equiv. cation transported/mole ATP hydrolysed was 2.56 ± 0.19. Total ATPase was not correlated with flux values.

VI. Lens epithelium showed relatively high activity but ant. and post. capsule, cortex and nucleus showed no activity. The transport system was also located in the epithelium. Both enzyme and transport system were inhibited by ouabain, half max. inhibn. concn. for the 2 systems agreeing well in both calf and rabbit lens when determined in media of the same K level. In both enzyme and transport systems Rb replaced K. In rabbit lens the enzyme pH optimum was 7.3 while the pH optimum for Rb uptake was 7.5. Temp, coeff. for the 2 systems were 2.4 and 2 respectively. Equiv. cation transported/mole ATP hydrolysed by the Na-K ATPase ranged from 2.51 to 4.15 for the 3 cations actively transported in calf and rabbit lens. B.M. Stevens

3082. 2-AZADENOSE TRIPHOSPHATE AS A SUBSTITUTE FOR ATP IN ACTIVE TRANSPORT OF POTASSIUM ACROSS THE ERYTHROCYTE MEMBRANE. M.Tatibana, T.Hashimoto and H.Yoshikawa: Biochim. biophys. Acta. 1963, 71, 464-465 (Dept. Physiol. Chem. Nutr. Fac. Med. Univ., Tokyo, Japan). B.M.Stevens

3083. ATPase ACTIVITY RELATING TO ACTIVE TRANSPORT IN THE CORTEX OF SEA URCHIN EGGS. T.Ohnishi: J. Biochem., Tokyo, 1963, 53, 238-241 (Dept. Physiol. Sch. Med., Univ., Nagoya, Japan) An ATPase related to the active transport of Na and K was detected. Activity was max. at the pH and ionic strength of sea water. Both Na and K were required for activity. Ouabain, metabolic inhibitors and detergent inhib. B.M.Stevens

3084. EXCHANGE OF [G]-ACTIN BOUND CALCIUM WITH VARIOUS BIVALENT CATIONS. W.Drabikowski and H.Strzelecka-GqZaszecka: Biochim. biophys. Acta, 1963, 71, 486-487 (Dept. Biochem., Nencki Inst. Expt. Biol., Warsaw, Poland) Prelim. comm. B.M.Stevens

3085. VITAMIN D3 INHIBITION OF RADIOCALCIUM BINDING BY CHICK INTESTINAL HOMOGENATES. R-H.Wasserman and A.N.Taylor: Nature, Lond., 1963, 198, 30-32 (Dept. Phys. Biol., New York St. Vet. Coll., Cornell Univ., New York, U.S.A.) Ca was used to study the uptake of Ca by the particulate fraction of duodenal homogenates from rachitic chicks and from rachitic chicks supplied with vit. D3 2⁴⁸ hr. before killing. The presence of vit. D3 causes appreciable decreases in binding of Ca by the particulate "action of the duodenum. This decrease was largely unaffected by pH and the presence of citrate. J.R.Sargent

3086. VARIATIONS IN CALCAEMIA OF NORMAL DOGS AFTER INGESTION OF CHOLESTEROL, CRYSTALLISED INETHANOLORHEXANE. CMarnay: C.R. Soc. Biol., Paris, 1962, 156, 1573-1577 (Lab. Physiol. Fac. Pharmacie, Paris, France) Ingestion of 50 mg. cholesterol, recryst. in ethanol, produced a progressive increase in calcaemia in dog, with a max. level after 24 hr. 50 mg. cholesterol, recryst. from hexane, administered under the same conditions, produced a comparable decrease in calcaemia. (French) M.A.Price

3087. RESPIRATION-DEPENDENT ACCUMULATION OF INORGANIC PHOSPHATE AND Ca²⁺ BY RAT LIVER MITOCHONDRIA. A.L.Lehninger, C.S.Rossi and J.W. Greenawalt: Biochem. biophys. Res. Comm., 1963, 10, 444-448 (Dept. Physiol. Chem., Johns Hopkins Univ. Sch. Med., Baltimore, Md., U.S.A.) It is shown that the inorg. phosphate [Pj] of the medium is the sp. and major anion accompanying the active uptake of Ca²⁺ by rat liver mitochondria and that Ca and Pj enter in a molar ratio of 1:8. B.Ketterer

RELATIONSHIP BETWEEN CALCIUM IN SWEAT. CALCIUM BALANCE, AND CALCIUM REQUIREMENTS. F.Consolazio, L.O.Matoush, R.A.Nelson, L.R.Hackler and E.E.Preston: J. Nutr., 1962, 78, 78-88 (U.S. Army Med. Res. and Nutr. Lab., Fitzsimons Gen. Hosp., Denver, Colo., U.S.A.) Up to 20 mg. Ca per hr. may be lost by the human male during heavy sweating. When living at 100°F up to 22% of the total Ca excretion may take place in the sweat. The significance of these observations in relation to Ca balance studies was investigated and discussed. A.Fleck

3089. STUDIES IN THE ROLE OF MANGANESE IN BONE FORMATION. I. EFFECT UPON THE MUCOPOLYSACCHARIDE CONTENT OF CHICK BONE. R.M.Leach, jun. and A.Muensten: J. Nutr., 1962, 78, 51-56 (U.S. Plant, Soil and Nutr. Lab., U.S. Dept. Agric., Ithaca, N.Y., U.S.A.) Dietary Mn deficiency in <? white Plymouth Rock chicks results in reduction in the galactosamine containing mucopolysaccharide content of cartilage and bone. A.Fleck

3090. COLORIMETRIC DETERMINATION WITH MUREXIDE OF MICROGRAM AMOUNTS OF CALCIUM IN TISSUES. E.S.Reynolds and R.E.Linde: Analyst. Biochem., 1963, 5, 246-254 (Armed Forces Inst. Path., Washington, D.C., U.S.A.) A simple, direct colorimetric method employing murexide has been developed for determination of Ca in tissues. This method, which requires ashing of the samples and pptn. of PO₄, is insensitive to Mg and is capable of detecting 0.05 µg. Ca. Other metals, in concn. normally found in tissue samples, do not interfere. The means and their standard deviations for Ca content of fresh rat liver and mouse skeletal muscle with this method are 21.8 ± 3.3 and 99.4 ± 10.4 µg. Ca per g. of tissue, respectively. A.D. Smith

3091. BEHAVIOUR OF STRONTIUM-85 IN A NORMAL MAN FOLLOWING A SINGLE INGESTION-ABSORPTION AND EXCRETION. M.Fujita, A.Yabe, K.Ueno, M.Oshino and N.Okuyama: Health Physics, 1963, 9, 407-415 (Health Physics, Japan Atomic Energy Res. Inst., Tokai, Ibaraki, Japan) A normal man was given 4.96 µg ⁸⁵SrCl₂ orally. Considerable amounts of the ingested labelled material were removed in the faeces (86%) and urine (3.6%) in the first 2 days and a total of 13.6% was absorbed. After this period more label is removed via the urine than the faeces. Chronic retention of a small fraction of the material occurs for up to 162 days. The clearance of 85Sr is closely parallel to the clearance of Ca, and the plasma concn. of &Sr. M.S.Laverack

3092. RADIUM-226 IN BONE AND SOFT TISSUES OF MAN. J.B.Hursh and A.Lovaas: Nature, Lond., 1963, 198, 265-268 (Univ. Rochester Sch. Med. and Dent., Rochester, N.Y., U.S.A.) Analysis of 226Ra in autopsy material indicates that 80% of the body burden of Ra is contained in the skeleton. Soft-tissue levels range from 1% (liver and intestine) to 1.5% (muscle) of that found in the clavicle. G.M.Lewis

3093. COMPETITION BETWEEN MAGNESIUM AND GUANIDINE FOR MITOCHONDRIAL BINDING SITES. B.C.Pressman and J.K.Park: Biochem. biophys. Res. Comm., 1963, 11, 182-186 (Johnson Res. Fndn., Univ. Pennsylvania, Philadelphia, Pa., U.S.A.) It is shown that the binding of guanidine to mitochondria shows a common pattern with that of Mg in its response to various inhibitors and that guanidine and Mg are mutually competitive for mitochondrial binding sites. B.Ketterer

3094. FLUORESCENCE OF MAGNESIUM-, CALCIUM-, AND ZINC-8-QUINOLINOL COMPLEXES. S.Watanabe, W.Frantz and D.Trottier: Analyst. Biochem., 1963, 5, 345-359 (Cardiovascular Res. Inst., Univ. California Med. Center, San Francisco, Calif., U.S.A.) The fluorescence of 8-quinolinol with Mg, Ca and Zn was studied in aq. soln. of triethanolamine and tris. The molar fluorescence and the apparent binding constant of these metal complexes and 8-quinolinol were estimated and agreed well with those found by other methods. The

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sensitivity and specificity of the method for Mg determination is discussed.

A.D. Smith

3095. MEASUREMENT OF NATURAL CONTENTS OF

RaD (LEAD-210) AND RaF (POLONIUM-210) IN HUMAN BONE - ESTIMATES OF WHOLE BODY

BUPDENS. R.B.Holtzman: *Health Physics*, 1963, 9, 385-400 (Radiol. Physics Divn., Argonne Nat. Lab., Argonne, Ill., U.S.A.) Bone samples obtained from unexposed individuals were analysed for their natural RaD (210pb) content, by measurement of the RaF (^{210}Po) which is the decay product after α emission to RaE (210Bi) and further β emission to RaF. The RaD is uniformly distributed in the skeleton, and shows an average concn. of 0.146 pc/g. ash. compared with average 226Ra concn. of 0.037 pc/g. ash. Men had more RaD than women, 0.161 pc/g. ash against 0.119 pc/g. ash. Calcn. shows that the majority of RaD in the body comes from the food and air. M.S. Laverack

3096. BIOSYNTHESIS OF SELENO-COMPOUNDS FROM

INORGANIC SELENIUM BY SHEEP. I.Rosenfeld: *Proc. Soc. exp. Biol. N.Y.* 1962, 111, 670-673 (Div. Agric. Biochem., Univ. Wyoming, Laramie, Wyo., U.S.A.) Following per os administration of [^{75}Se]-H₂SeO₃, [^{75}Se]selenocystine and selenomethionine were demonstrated in the hydrolysate of sheep wool.

M.M.Shapland

3097. EFFECT OF CHELATING AGENTS ON THE COPPER-PROTEIN BOND IN LIVER. S.Freyer and J.M.Walshe: *Nature, Lond.* 1963, 198, 189 (Columbia Univ. Med. Sch., New York, U.S.A.)

In extracts of fresh human liver, addition of penicillamine did not significantly increase the concn. of copper recovered in an ultra-filtrate through collodion membranes. 64Cu inj. into rabbits was rapidly taken up by the liver and bound by protein in insol. form. Neither penicillamine or BAL (dimercaptopropanol), both -SH chelating agents, released Cu from its bound form.

G.M.Lewis

3098. INTERACTION OF CUPRIC AND ZINC IONS WITH SPERM WHALE METMYOGLOBIN. E.Breslow and F.R.N.Gurd: *J. biol. Chem.*, 1963, 238, 1332-1342 (Dept. Biochem., Cornell Univ. Med. Coll., New York, U.S.A.)

Zn and Cu compete for the same set of binding sites that show the highest affinity for metal ions. The decrease in pH that occurs after binding of Cu is greater than that predicted for simple binding to a set of independent imidazole groups. At least one H is at or above pH 5 for each Cu bound. At higher pH values each Cu can displace as many as 3H. Imidazole groups probably take part in metal ion binding as members of chelate sites, and binding leads to equilibration of normally masked with normally reactive imidazole groups.

J.N.Ashley

3099. INFLUENCE OF PREGNANCY ON BLOOD, PLASMA AND CAERULOPLASMIN COPPER LEVELS OF SHEEP.

E.J.Butler: *Comp. Biochem. Physiol.*, 1963, 9, 1-12 (Biochem. Dept., Moredun Inst., Edinburgh, Scotland) Sheep kept on a maintained standard diet showed a fall in Cu levels of blood, plasma, r.b.c. and caeruloplasmin during pregnancy. These falls in Cu were reversed after parturition, and a month after this event normal levels are again found. Reduction in Cu levels was most marked in animals with a diet deficient in this metal. These changes are opposite to those found in women. During the first part of pregnancy Cu appeared to pass from plasma into r.b.c., and there was an increase in proportion

of non-caeruloplasmin Cu. These changes were reversed in later pregnancy. Pregnancy did not affect Ca, Mg and PO₄ levels.

M.S.Laverack

3100. SOME PROPERTIES OF PSEUDOMONAS BLUE

PROTEIN AND ITS APO-PROTEIN. T.Yamanaka,

S.Kijimoto and K.Okunuki: *J. Biochem., Tokyo*,

1963, 53, 256-259 (Dept. Biol., Fac Sci., Univ.

Osaka, Japan) The protein readily lost its Cu on dialysis against aq. K cyanide. The apo-protein thus obtained recombined stoichiometrically with Cu²⁺ but not with other metal ions tested. The reconstructed blue protein had the same prop, as the native protein. The u.v. absorption spectrum underwent significant changes on oxidation and reduction of the Cu. B.M.Stevens

OTHER BODY CONSTITUENTS

3101. ACETO-COENZYME A KINASE AND THE CONDENSING ENZYME IN THE 2-SPOTTED SPIDER MITE.

K.N.Mehrotra: *Nature, Lond.* 1963, 198, 287-288 (Dept. EntomoL, Cornell Univ., Ithaca, New York, U.S.A.)

Acetone powder extracts of *Tetranychus telarius* synthesise citrate from acetate, oxaloacetate, ATP and CoA and from acetyl-CoA and oxaloacetate, indicating the presence of both aceto-CoA-kinase and condensing enzyme.

G.M.^ewis

3102. METABOLISM OF PROPIONATE IN THE ISOLATED COW'S UDDER. M.W.Raafat, R.Verbeke and G.Peeters: *Biochem. J.*, 1963, 88, 155-159 (Physiol. Dept. Vet. Coll., Univ. Ghent, Belgium)

Excised cows' udders were perfused with blood containing [1-14C]propionate, [1-14C]hexanoate or [3-¹⁴C]butyrate. The 14c from [1-14C]propionate and [1-14C]hexanoate was incorporated to a large extent into the Krebs cycle acids and to a smaller extent into pyruvic acid. The 14c of succinic acid from the [14C]propionate and [14C]butyrate expt. was localised in the carboxyl groups. Almost all the 14c of glutamic acid from the [14C]propionate expt. was localised in the (X-carboxyl group). In glutamic acid from the [14C]hexanoate expt. the a- and y-carboxyl groups contained one-third and two-thirds respectively \approx the total 14C. The results are consistent with propionate metabolism proceeding by the succinate pathway.

3103. STRUCTURE OF BILIRUBIN. J.Fog and E.Jellum: *Nature, Lond.* 1963, 198, 88-89 (Inst. Med. Bioche¹, Univ. Oslo, Norway)

Two possible structures for bilirubin are proposed. Data obtained from the i.r. spectr² of bilirubin, mesobilirubin and its dimethyl ester indicate the presence of intramol. H bonds in bilirubin.

G.M.Lewis

3104. FLUORESCENT MATERIALS FROM EPHESTIA KUHNIELLA ZELLER. IV. SYNTHESIS OF ERYTHRO^{*} PTERIN, EKAPTERIN AND LEPIDOPTERIN.

M.Viscontini and H.Stierlin: *Helv. chim. Acta*, 1 & *' 46, 51-56 (Org.-chem. Inst. Univ. Zurich, Switzerland)

The synthesis of erythropterin from xanthopterin and pyruvic acid is described. Erythropterin $\xrightarrow{\text{Na borohydride}}$ ekapterin on reduction with Na borohydride and subsequent oxidation in air and lepidopterin on treatment with NH₃. (German)

A.D.Smith

U05. ENZYMIC DECOMPOSITION OF UROCANIC ACID. V. FORMATION OF 4-OXOGLUTAMIC ACID. A NON-ENZYMIC OXIDATION PRODUCT OF 4(5)-IMIDAZOLONE-5(4)-PROPIONIC ACID. H.Hassall and D.M.Greenberg: J. biol. Chem., 1963, 238, 1423-1431 (Dept. Biochem., Univ. California Sch. Med., San Francisco, Calif., U.S.A.) 4-Oxoglutaric acid is isolated as the primary product of the reduction of a H acceptor such as 2,6-dichlorophenol-indophenol that occurs in soln. containing urocanate and urocanase. It is formed by non-enzymic oxidation of H5-imidazolone-5(4)-propionic acid, the immediate product of the enzymic reaction. 4-Oxoglutaric acid is not on the direct oxidative pathway of metabolism of Urocanic acid, but is a decomposition product of an intermediate on the main hydrolytic pathway. J.N.Ashley

***106. EXTRACTION OF ACh IN SMALL SAMPLES OF CEREBRAL TISSUE.** L.Beani and C.Bianchi: J. Pharm., Lond., 1963, 15, 281-282 (Univ. Florence, Italy) A method is described. Letter. J.M.Whitmarsh

3107. LACK OF EFFECT OF ACh ON PHOSPHOPROTEIN METABOLISM IN THE SALT GLAND OF THE SEA GULL. L.E.Hokin and M.R.Hokin: Biochim. biophys. Acta, 1963, 71, 462-463 (Dept. Physiol. Chem., Univ. Wisconsin, Madison, Wis., U.S.A.) B.M.Stevens

***108. IDENTITY WITH AUTHENTIC ACh OF ACh-LIKE ACTIVITY IN EXTRACTS OF RAT BRAIN.** G.Pepeu. K.F.Schmidt and N.J.Giarman: Biochem. Pharmacol., 1963, 12, 385-388 (Dept. Pharmacol., Yale Univ. Sch. Med., New Haven, Conn., U.S.A.) Short c'orrm. L.G.Gulies

3109. FORMATION OF LIPID SOLUBLE SALTS OF ACh WITH Na AND Ca SALTS OF PHOSPHATIDIC ACID AS RECEPTOR MODELS. W.Vogt: Hoppe-Seylers Z. Physiol. Chem., 1963, 331, 239-244 (Pharm. Div. Med. Res. Inst., Max-Planck Soc, Gfltingen, Germany) The ability of ACh to form a salt with phosphatidic acid has been used for its extraction from an aq. soln. The solvent system was isobutanol/benzene 1:1. Na may be present, but Ca and atropine have to be absent due to their high affinity for phosphatidic acid. The effect of phosphatidic acid on smooth muscle is also discussed. (German) LCornish

ENZYMES

II. SENSORY DEPRIVATION AND AUGMENTATION IN THE EXAMINATION OF ENZYME ADAPTATION. T.G.Scott: Nature, Lond., 1963, 197, 498-499 (Dept. Neuropathol., Nat. Hosp. for Nervous Dis., Queen Sq., London, England) The hypothesis is presented that the activity of any given enzyme in a cell or tissue is dependent, inter alia, on the overall activity of all other enzymes in the cell. This hypothesis may be tested by examining changes in the nervous system after sensory deprivation or re-introduction of sensory stimulation. G.M.Lewis

3111. SERUM ENZYME STUDIES OF A HYDROCEPHALIC FETUS OF NEWBORN HALVES. M.B.Rhodes, H.R. Lunnan, C.L.Marsh and O.D.Grace: Proc. Soc. exp.

Biol., N.Y., 1962, 111, 735-737 (Dept. Vet. Sci., Coll. Agric, Univ. Nebraska, Lincoln, Neb., U.S.A.) The levels of GOT and GPT, lactic and malic dehydrogenases and aldolase in the sera from 4 hydrocephalic calves were found to be 30 times the levels in sera from normal calves of the same age. The elevated serum enzyme levels are thought to be due to the extensive muscular dystrophy observed in these calves.

M.M.Shapland

3112. PROPORTIONALLY CONSTANT GROUPS IN RESPECT TO THE DIFFERENTIATION OF THE ENZYMIC ACTIVITY PATTERN FROM SKELETON MUSCLES OF RABBITS. D.Pette and TruBttchen Hoppe-Seylers Z. physiol. Chem., 1963, 331, 180-195 (Physiol. Chem. Inst., Univ., Marburg/Lahn, Germany) There is a different level of enzyme activity in white and red muscles. In red muscle the cytochrome f and glycerol diphosphate dehydrogenase are in an equimol. proportion; corresponding rat muscles show smaller differences in the cytochrome content. A compensation phenomenon between glycolysis/respiratory chain ratio and the Meyerhoff-Green enzyme/respiratory chain ratio is functionally significant. Creatine kinase is functionally assigned to the contractile apparatus.

(German) LCornish

3113. ENZYMIC ACTIVITY OF THE RETINA OF CATTLE. P.Bastide, M.T.Meunier and G.Dastigue: C.R. Soc. Biol., Paris, 1962, 156, 1627-1630 (Lab. Chimie biol., Fac. Méd., Clermont-Ferrand, France) The GOT activity of the retina of cattle was high. The GPT activity was 88% lower. The level of creatine phosphatase activity was similar to that of GOT. The enzyme activity did not vary significantly with the age of the animal.

(French) M.A.Price

3114. BIOCHEMISTRY OF DYSTROPHIC MUSCLE. II. SOME ENZYME CHANGES IN DYSTROPHIC MOUSE MUSCLE. R.J.Pennington: Biochem. JI, 1963, 88, 64-68 (Dept. Clin. Chem., King's Coll., Newcastle upon Tyne, England) The activity of a no. of enzymes in homogenates of muscle from mice with hereditary muscular dystrophy (Bar Harbor strain) was compared with those of normal mice of the same strain. In young mice (3-4 weeks) AMP deaminase was about 60% of normal; cathepsin (pH 4), 140%; cathepsin (pH 8*6), 165%; glucose 6-phosphate dehydrogenase, 300%. In older mice (12-20 weeks) AMP deaminase was about 25% of normal; cathepsin (pH 4), 330%; cathepsin (pH 8*6), 220%; glucose 6-phosphate dehydrogenase, 500%; acid phosphatase, 145%; adenylate kinase, 195%. Cathepsin activity at pH 8*6 relative to that at pH 4 was greater in older mice. *

3115. CARBONIC ANHYDRASE KINETICS AND INHIBITION AT 37°: AN APPROACH TO REACTION RATES IN VIVO. T.H.Maren: J. Pharmacol. exp. Ther., 1963, 139, 129-139 (Coll. Med., Univ. Florida, Gainesville, Fla., U.S.A.) From studies in vitro and of renal FT⁺ excretion in man and dogfish and of pancreatic HCO₃⁻ excretion in the dog, it is concluded that for the kidney and pancreas it is unlikely that carbonic anhydrase could be a limiting factor in acid or base secretion.

J.M.Whitmarsh

3116. EVALUATION OF RATES OF BIOLOGICAL PROCESSES FROM TRACER KINETIC DATA. I. INFLUENCE OF LABILE METABOLIC POOLS. A.L.Koch: J. theoret. Biol., 1962, 3, 283-303 (Depts. Biochem. and Microbiol., Univ. Florida, Gainesville, Fla., U.S.A.) Mathematical consideration is given to the

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effects of small* metabolically labile, intermediate 'pools' linking a variety of metabolic systems, on the assessment of biochem. processes by tracer isotope studies. The influence of growth on tracer kinetics is also discussed.

G.F.Blane •

3117. NEW GENERAL ELECTROCHEMICAL METHOD OF DETERMINING ENZYME KINETICS. KINETICS OF THE ENZYMIC HYDROLYSIS OF THIOCHOLINE IODIDE ESTERS. G.G.Guilbault, D.N.Knamer and P.L.Cannor, jun.: *Analyt. Biochem.*, 1963, 5, 208-216 (Protective Develop. Div., Chem. Res. and Develop. Lab., Army Chem. Center, Md., U.S.A.)

A const. current of 25 pamp. is applied across 2 platinum thimble electrodes. AE/At allows the calcn. of relative rates of hydrolysis. Hydrolysis of thiocoline, iodide esters by cholinesterases was followed and agreed well with results obtained by other methods. The method is generally applicable.

A. D. Smith

3118. MECHANISM OF ACTION OF DEHYDROGENASES. ROLE OF THE ADP RESIDUE IN NAD. G.Pfleiderer, E.Sann and F.Ortanderl: *Biochim. biophys. A* eta, 1963, 73, 39-49 (Inst. Biochem. Inst. Org. Chem., J.W.Goethe-Univ., Frankfurt/Main, Germany)

The pure adenine-free deriv. of NAD, 3-acetylpyridine adenine dinucleotide, 3-acetylpyridine mononucleotide and nicotinamide cytosine dinucleotide were prep. and characterised. Comparison of absorption spectra of dihydro deriv. and of cyanide and SO₂ addition compounds indicated that interaction took place between both heterocyclic bases. The adenine-free compounds were reduced by cryst. yeast and liver alcohol dehydrogenases, rabbit skeletal muscle and pig heart lactic dehydrogenases, horse heart mitochondrial malic dehydrogenase, ox liver glutamic dehydrogenase and rabbit skeletal muscle glyceraldehyde 3-phosphate dehydrogenase but at greatly differing rates. Km were determined. Pyrophosphate and adenine parts appeared to be important in binding as well as activation.

(German) B.M. Stevens

3119. DETERMINATION OF INITIAL RATES IN ENZYMIC NON-LINEAR PROGRESS REACTIONS. LD.Algranati: *Biochim. biophys. Acta*, 1963, 73, 152-155 (Inst. Invest. Bioquím. 'Fundación Campomar', Buenos Aires, Argentina) A simple analytical method, consisting of the calcn. of an equation fitting the expt. results using the Gregory-Newton interpolation method, is described.

B.M.Stevens

3120. NOMENCLATURE FOR THE QUATERNARY STRUCTURE OF AN ENZYME MOLECULE. H.F.Fisher: *Nature*, Lond., 1963, 198, 665-667 (E.Ford Inst. Med. Res., H.Ford Hosp., Detroit, Mich., U.S.A.) Reaction rates for the following systems have been studied in terms of pH changes over a range of time scale from fractions of a sec. to several min.: hydrolysis of a peptide by trypsin, ATPase activity of mitochondria after addition of DNP or succinate, the hexokinase reaction. The significance of kinetic data obtained in this way is discussed.

J.R.Sargent

3121. RECORD OF pH CHANGES DURING ENZYME REACTIONS AND KINETIC STUDIES WITH YEAST HEXOKINASE. H.Gutfreund and B.R.Hammond: *Nature*, Lond., 1963, 198, 667-670 (N.I.R.D.. Shinfield, Nr. Reading, Berks., England) A nomenclature is suggested for enzyme sub-units e.g. sub-units of glutamic dehydrogenase. The proposed nomenclature is based on 3 principles: (1) protein units of the same approx.

mol. wt. are designated by a lower case Greek letter, (2) such letters are assigned alphabetically in order of increasing degrees of subdivision, (3) units of the same mol. wt. which differ in conformation are designated by numerical subscripts.

J. R. Sargent

3122. CHEMICAL NATURE OF THE CATALYTIC SITES IN GLYCERALDEHYDE 3-PHOSPHATE DEHYDROGENASE [GPD]. L.Harris, B.P.Meriwether and J.H.Park: *Nature*, Lond., 1963, 198, 154-157 (M.R.C. Lab. Mol. Biol, Hills Rd., Cambridge, England) Each mol. of GPD contains at least 3 structurally equiv. catalytic sites. The amino acid sequence around the catalytic sites has been determined. Each site contains a reactive -SH group which participates in the formation of a covalent bond with substrates as well as with die inhibitors iodoacetate and β -nitrophenyl acetate. It is suggested that GPD consists of at least 3 identical polypeptide chains each with mol. wt. about 40000.

J.R.Sargent

3123. EFFECT OF TEMPERATURE ON THE ACTIVITY OF SUCCINIC DEHYDROGENASE FROM THE LIVERS OF RATS AND FROGS. H.E.Vroman and J.R.C.Brown: *J. cell. comp. Physiol.*, 1963, 61, 129-131 (Dept. Zool., Univ. Maryland, College Park, Md., U.S.A.)

The activity of liver mitochondrial succinic dehydrogenase from rat and frog was studied at temp. ranging from 7 to 37°. Arrhenius plots were made of the reaction rates and energies of activation calc. It was clear that the enzyme in the frog, whose body temp. changes with that of the environment, changed little in activity with varying temp. and had a low energy of activation. The energy of activation for the rat enzyme was 3 times higher and changes in temp. had a much greater effect on reaction velocity.

G.M.Lewis

3124. PURIFICATION AND PROPERTIES OF HUMAN ERYTHROCYTE MALIC DEHYDROGENASE. E.Shrago and A.B.Falcone: *Biochim. biophys. Acta*, 1963, 73, 7-16 (Metabolic Res. Lab., V.A.Hosp., Madison, Wis-U.S.A.) The enzyme was purified 3000-fold from mature r.b.c. Effects of pH on activity and Km for substrates and cofactors corresponded closely to those reported by previous workers for malic dehydrogenase from other sources.

B.M. Stevens

3125. ALKALI-INACTIVATION OF THE SUCCINOXIDASE SYSTEM AND ITS REACTIVATION ('RECONSTITUTION'). T.Kimura, J.Hauber and T.P.Singer: *Nature*, Lond., 1963, 198, 362-366 (Ford Inst. Med. Res., Henry Ford Hosp., Detroit, Mich., U.S.A.) Following treatment of succinoxidase prep. with alkali, succinoxidase** and succinic dehydrogenase activities were destroyed. Succinic dehydrogenase activity was not present in the supernatant fractions after alkali treatment. Alkali treatment did not greatly change the content of bound flavin & succinoxidase prep. Addition *jpf* sol. succinic dehydrogenase to alkali-inactivated prep. resulted in an uptake of succinic dehydrogenase activity and restoration of succinoxidase activity. From these and other considerations it inferred that the process studied is one of reactivation *an*V hot reconstitution.

J. R. Sargent

3126. IS THE RECONSTITUTION OF RESPIRATORY SJCCINATE OXIDASE REALLY A PROCESS OF RE-ACTIVATION? T.E.King: *Nature*, Lond., 1963, I⁹, 366-368 (Lab. Respiratory EnzymoL. Oregon St. Univ-> Corvallis, Ore., U.S.A.) Evidence is presented mat restoration of activity to alkali-inactivated succinoxidase prep. by addition of sol. succinic dehydrogenase is more

Ukely to be due to^{*} reconstitution rather than reactivation of the system. Evidence for and against reconstitution and reactivation is discussed. J.R. Sargent

3127. REVERSIBILITY OF ACTIVATION OF SUCCINATE DEHYDROGENASE. T.Kimura, J.Hauber and J.P.

Singer: Biochem. biophys. Res. Comm., 1963, 11, 83-87 (Ford Inst. Med. Res., Henry Ford Hosp., Detroit, Mich., U.S.A.) Both the activation and the spectral change associated with succinate treated bound and sol. succinate dehydrogenase were extensively reversed by passage through Sephadex G 25 columns. In the case of malonate-treated prep, deactivation was partial and there was no reversal of spectral change.

B.Ketterer

3128. AUTOTROPHIC ENZYME SYSTEMS. I. ELECTRON TRANSPORT SYSTEMS CONCERNED WITH HYDROXYLAMINE OXIDATION IN NITROSOMONAS. M.LH.Aleem and H.Lees: Canad. J. Biochem., 1963, 41, 763-778

(Microbiol. Dept., Univ. Manitoba, Winnipeg, Canada) Fotot cells or cell-free extracts of N. europaea catalysed the rapid and stoichiometric conversion of nitrohydroxylamine to nitrite at rates comparable to the oxidation of NH₄⁺ or hydroxylamine to nitrite. Cell-free extracts assessed a powerful hydroxylamine-cytochrome f reductase which activated hydroxylamine to donate electrons to the cytochrome systems comprising h₂, f and a type components. The partially purified enzyme complex is sensitive to low concn. of cyanide and inhibitors of the flavoproteins. J.B. Parish

3129. OXIDASE FUNCTION OF PLANT PEROXIDASE.

B.Rubin and T.M.Ivanova: Life Sci., 1963, No. 4, 281-289 (Bach Inst. Biochem., Acad. Sci., Moscow, U.S.S.R.) K.Jones

3130. EXTRACTION AND PROPERTIES OF ALCOHOL DEHYDROGENASE FROM PSEUDOMONAS AERUGINOSA.

E-Azoulay and M.T.Heydeman: Biochim. biophys. Acta, 1963, 73, 1-6 (Centre Nat. de la Rech. Sci., Lab.: £^c etliTM, Bactérienne, Marseille, France) A partially purified, NAD sp. heptanol dehydrogenase was obtained from extracts of P. aeruginosa strain Sol 20 grown on heptanol. Activity was higher with higher alcohols than with ethanol. The enzyme was 55% in extracts of cells grown under a variety of conditions but whole cells consumed O₂ in the presence of alcohols only if they had been grown on hydrocarbons or other alcohols. B.M.Stevens

3131. INHIBITION OF LACTIC DEHYDROGENASE ISO-

ENZYMES. F.G.Warburton, D.Smith and G.S.Laing: Nature, Lond., 1963, 198, 386-387 (Dept. Pathol., M.P.E Hosp., Salford, Lancs., England) Oxalic acid, citric acid, pyridine-3-sulphonate, iodine and zinc sulphate inhibit human lactic dehydrogenases of different types to the same extent. CHCl₃ however, although far less affecting the activity of heart lactic dehydrogenase, inhibits the other types in varying degree, the enzyme being the most susceptible. G.M.Lewis

3132. ONTOGENY OF ISOZYME PATTERNS OF LACTATE DEHYDROGENASE IN THE MOUSE. C.L.Market and H.Ursprung: Develop. Biol., 1962, 5, 363-381 (J.Pt. Biol., Johns Hopkins Univ., Baltimore, Md., U.S.A.) Fine electrophoretically distinct mol. variants of lactate dehydrogenase [LDH] were demonstrated in every tissue or organ of adult mice, in proportions that were sp. for the tissue. Initially embryonic tissue had

principally LDH-5, the other isozymes appearing in later stages of development. LDH isozymes differed in kinetic prop., LDH-5 was more abundant in tissues subject to relative anaerobiosis, while those at the opposite end of the spectrum were more abundant in highly oxygenated tissue.

J.W.S.Harris

3133. PAPER ELECTROPHORESIS OF XANTHINE DE-

HYDROGENASE FROM DROSOPHILA. E.C.Keller, jun.. P.Saverance and E.Glassman: Nature, Lond., 1963, 198, 286-287 (Dept. Biochem., Med. Sch., Univ.

North Carolina, Chapel Hill., N.C., U.S.A.) Xanthine dehydrogenase in homogenates of D. melanogaster can be detected after paper strip electrophoresis by spraying with the substrates and separating the fluorescent product by paper chromatography. The enzyme produced 1, 2 or sometimes 3 spots. It migrated faster than the xanthine dehydrogenase of rat and rabbit liver.

G.M.Lewis

3134. FACTORS INFLUENCING REACTIVATION OF REDUCED EGG WHITE LYSOZYME. C.J.Epstein and R.F.Goldberger: J. biol. Chem., 1963, 238, 1380-1383 (Lab. Cell. Physiol., Nat. Heart Inst., Bethesda, Md., U.S.A.)

The rate of reactivation is inversely proportional to protein concn. From pH 7.0 to 8.5 the rate increases with increase of pH, and reactivation is more rapid at 38° than at 24°. At both temp, presence of 6-mercaptopethanol in the medium increases the rate and extent of reactivation. The results agree with the suggestion that active configurations of the enzymes are determined by their amino acid sequences.

J.N.Ashley

3135. HYDROLASES OF DIGESTIVE JUICES. VIII. CHOLINESTERASE OF DOG PANCREATIC JUICE. H.Szafran and Z.Szafran: Acta biochim. pol., 1963, 10, 141-150 (Dept. Physiol. Chem., Med. Sch., Krakow, Poland)

The enzyme, partly purified by (NH₄)₂SO₄ fractionation and classified as butyrylcholinesterase, hydrolyses butyrylcholine, propionylcholine, ACh and benzoylcholine with decreasing rate, the relative activities being 100, 59, 40 and 28, respectively. Acetyl-0-methylcholine, tributyrin and β -nitrophenyl acetate are hydrolysed more slowly (respectively 0.2, 5 and 0.4%). The enzyme has optimum pH at 8.6 but is labile in alk. medium. Eserine and diisopropylfluorophosphate inhibit the enzyme in concn. 10⁻⁸ M, iodine, arsenite and p-chloromercuribenzoate in concn. 10⁻⁵ to 10⁻³ M. Cysteine protects the enzyme against inhibn. by thiol reagents.

M.Korbecki

3136. EFFECT OF n-BUTANOL ON ESTERASE ACTIVITY IN THE HOUSEFLY (MUSCA DOMESTICA L.). H.H.

Shatoury: J. insect Physiol., 1963, 9, 165-176 (Imp. Coll. Fd. Stn., Ashurst Lodge, Sunninghill, Berks., England) n-Butanol increased the hydrolytic activity of heads of M. domestica to phenylacetate and all choline esters tested except benzoylcholine. It inhibits the hydrolysis of aliphatic esters such as ethylbutyrate. The hydrolysis of triacetin and amyłacetate which are hydrolysed by cholinesterase was inhib. by n-butanol. It is suggested that n-butanol inhibits both cholinesterase and esterase by denaturation, and the activation effect may be due to the release of an enzyme which normally exists in an inactive form. This activated proenzyme system may include a cholinesterase and an arylesterase.

R.J.Walker

3137. AMINO ACID SEQUENCE OF A TETRADECA-PEPTIDE CONTAINING THE REACTIVE SERINE IN E. COLI ALKALINE PHOSPHATASE. J.H.Schwartz,

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A.M.Chestfield and F.Lipmann: Proc. nat. Acad. Sci., Wash., 1963, 49, 722-729 (Rockefeller Inst., New York, N. Y., U.S.A.) The amino acid sequence of a tetra-decapeptide containing the reactive serine of phosphorylated alk. phosphates has been established as Thr-Gly-Lys-Pro-Asp-Tyr-Val-Thr-Asp-Ser(phosphate)-Ala-Ala-Ser-Ala. J.R. Sargent

3138. CYTOCHEMICAL LOCALISATION OF PHOSPHODIESTERASE BY THE AZO DYE SIMULTANEOUS COUPLING METHOD. H.Sierakowska and D.Shugar: Biochem. biophys. Res. Comm., 1963, 11, 70-74 (Inst. Biochem. and Biophys., Acad. Sci. and Dept. Biochem.. State Inst. Hyg., Warsaw, Poland) Kidney phosphodiesterase was localised cytochem. by the simult. azo dye coupling method using (X-naphthyl thymidine-5-phosphate as a substrate. B.Ketterer

3139. ACID PHOSPHATASE OF THE LYSOSOMAL AND SOLUBLE FRACTION OF RAT LIVER. S.Shibko and A.L.Tappel: Biochim. biophys. Acta. 1963, 73, 76-86 (Dept. Food Sci. and Technol., Univ. California, Davis, Calif., U.S.A.) Enzyme from the 2 sites showed no differences in K_m or pH effects. A difference in sensitivity to F⁻ and L-(+)-tartrate could only be demonstrated with f -nitrophenylphosphate as substrate. Similar patterns were obtained on starch electrophoresis and column chromatography although the latter showed some quant. differences between the various forms of phosphatase activity present in each fraction. The major portion of the sol. acid phosphatase is concluded to be similar to the lysosomal phosphatase. B.M.Stevens

3140. PURIFICATION AND PROPERTIES OF AN ARYL-SULPHATASE FROM HUMAN BRAIN. A.S.Balasubramanian and B.K.Bachawac: J. Neurochem., 1963, 10, 201-211 (Neurochem. Lab., Dept. Neurol. and Neurosurg., Christian Med. Coll. Hosp., Vellore, S. India) The enzyme was purified 320-fold by Zn acetate and (NH₄)₂SO₄ fractionation with 337° recovery. Using nitrocatechol sulphate as substrate, pH optimum was 4.5, activity falling with time along a hyperbolic curve. Relationship between activity and enzyme concn. was linear (0.5 fig. protein per 2.4 ml. reaction mixture for incubation periods 10 and 60 min. but not 150 min. Activity was completely inhib. by Hg, 90% by Au, 40% by Cu, 10% by Mg, Zn, Ca, Ni, Mn, Ba, Co, Cd. and 4% by EDTA (all materials at 10mM). HSO₄⁻ inhib. 58% at 5 mM and H₂PO₄⁻ 30% at 50 JMM. The inhib. being competitive. At 5mM SO₄²⁻ inhib. 33%. CN⁻ - 23% and 86%. At 5mM, cystein glutathione and BAL were slightly inhibitory. p-Chloromercuribenzoate at 0.1mM was 90% inhibitory and not reversed by cysteine. Activity doubles with 10° increase of temp, between 1° and 21°. Optimum was 35°-38°. The enzyme was not active towards adenosine 3-phosphate-5-phosphosulphate, p-nitrophenylsulphate or chondroitin sulphate. R.J. Woodman

3141. MONOAMINE OXIDASE, CHOLINE ESTERASE AND HISTAMINASE ACTIVITIES IN GASTRIC MUCOSA. L.N.Karpenko: Vop. Med. Him., 1963, 9, 133-136 (Chair of Normal Ffphysiol, State Med. Sch., Lvov, Poland) Highest cholinesterase activity in dog gastric mucosa occurred in the curvatura minor region, lowest activities occurred in the pylorus region. Significant individual variations in MAO activities in gastric mucosa were also encountered. Highest MAO activities were found in the curvatura minor and pylorus regions. Histaminase activity in gastric mucosa varied significantly. Highest

activity was found in the curvatura major legion.

J.R. Sargent

3142. NEW METHOD FOR THE ESTIMATION OF HISTAMINASE ACTIVITY. P. S.J. Spencer: J. Pharm., Lond., 1963, 15, 225-232 (Sch. Pharm., London, England) Rat ileum enzyme was used in the investigation. The time for destruction of one half of the histamine was inversely proportional to the enzyme content of the incubation mixture. This was the basis of the method described, which is accurate to 10%. J.M.Whitmarsh

3143. CRYSTALLIZATION AND SOME PROPERTIES OF METAPYROCATECHASE. M.Nozaki, H.Kagamiyama and O.Hayaishi: Biochem. biophys. Res. Comm., 1963, 11, 65-69 (Dept. Biochem., Osaka Univ. Sch. Med., Osaka, Japan) A cryst. prep. of metapyrocatechase from cells of Pseudomonas arvillae is described. It was protected from inactivation by air by low concn. of alcohol or acetone. It appeared to contain one atom of Fe per mol. of enzyme. B.Ketterer

3144. DISTRIBUTION OF CARBONIC ANHYDRASE IN HUMAN BRAIN. T.Nishimura, H.Tanimukai and K. Nishinuma: J. Neurochem., 1963, 10, 257-261 (Dept. Neuropsych., Osaka Med. Sch., Osaka, Japan) Using Phenol Red to observe pH changes in the presence of tissue homogenate, carbonate and CO₂ at 4°, carbonic anhydrase activity was measured in 32 regions of 6 normal brains (3-16 hr. post-mortem) and 9 regions of guinea-pig brain. In human tissue activity could be correlated with degree of respiratory activity but was also higher in subcortical white matter. This latter observation was not paralleled in guinea-pig. R. Woodman

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3145. ANTIMETABOLITES IN THE NUTRITION OF AEDES AEGYPTI L. LARVAE. NICOTINIC ACID ANALOGUES. S.Akov and K.Guggenheim: Biochem. J., 1963, 88, 182-187 (Israel Inst. Biol. Res., Ness-Ziona, Israel) The effect of 3-acetylpyridine, a-picolinic acid, iso-nicotinic acid hydrazide, pyridine-3-sulphonic acid and 6-aminonicotinamide on A. aegypti L. larvae, grown on a chem. defined diet, was studied. The quant. nicotinamide requirement was determined. Nicotinic acid and nicotinamide were equally effective. Tryptophan could not replace nicotinamide. Inhib. indices for each antagonist were calc. Nicotinamide could not reverse the effects of the antagonists. The ability of the analogues to replace the vitamin was tested. 3-Acetylpyridine could replace nicotinamide as a growth factor, but the others were inactive. The nicotinic acid metabolism of insects is discussed. •

3146. SUCCINIC CYTOCHROME c REDUCTASE ACTIVITY IN KIDNEY AND LIVER TISSUE FROM STARVED AND FED RABBIT. J.R.Allen and H.L.Rosenthal: Proc. Soc. exp. Biol., N.Y., 1962, 111, 556-559 (Dept. Physiol. Chem., Washington Univ. Sch. Dent., St-Louis Mo., U.S.A.) Enzyme activity of rabbit kidney and liver homogenates aged for 48 hr. at 4° is significantly greater than that of the fresh prep. Activity of homogenates from fed animals is greater than that from animals starved for 10 days, but the activity of aged prep. of both are approx. the same. M.M.Shapland

3147. YAMS AND LIVER NECROSIS. C.Gilbert and J.Gillman: *Nature, Lond.*, 1963, 198, 196 (Nat. Inst. of Hlth. and Med. Res., P.O. Box M.32, Accra, Ghana) 9°e sp. of yam (*Dioscorea rotundata*) causes massive liver necrosis when fed to weanling rats; none of the other yams tested promoted growth or survival beyond 100 days. In adults, wt. was maintained for 150 days, then lost steadily until death within 294 days; no liver necrosis was evident. G.M.Lewis

3148. HISTO-PHYSIOLOGICAL STUDIES ON CHICK PANCREAS AS INFLUENCED BY FEEDING RAW SOY-BEAN MEAL. H.C.Saxena, L^AJensen, J.McGinnis and JJC.Lauber: *Proc. Soc. exp. Biol., N.Y.*, 1963, 112, 390-393 (Dept. Poultry Sci., Washington State Univ., Pullman, Wash., U.S.A.) Chicks fed on raw soybean diet showed pancreatic hypertrophy. This was due to accumulation of zymogen rather than hyperplasia. Pilocarpine stimn. which releases zymogen from the pancreas in control chicks had no effect on those fed raw soybean. Pancreatic hypertrophy was not induced when chicks were fed heated soybean diet. D.N.Wheatley

3149. EFFECT OF DIET FED DURING THE POST-NATAL PERIOD ON DEVELOPING RAT MOLARS. P.O'Day and L.A.Bavetta: *J. Nutr.* 1962, 78, 37-43 (Dept. Biochem. Nutr., Sch. Dent., Univ. Southern California, Los Angeles, Calif., U.S.A.) The molars of Holtzman rats frd a purified high carbohydrate diet grew at a greater rate than those of rats fed a stock diet. AJleck

3150. EFFECTS OF UB1QUINONES AND PHYTYL-UBICHROMENOL UPON ENCEPHALOMALACIA AND MUSCULAR DYSTROPHY IN THE CHICK. E^Andergaard, M.L^Acott and H.Dam: *J. Nutr.* 1963, 78, 15-20 (Dept. Biochem., Polytechnic Inst., Copenhagen, Denmark) Supplementation of encephalomalacia-producing diets with 0⁹Q2⁹fo of phytol-ubichromenol presented encephalomalacia in New Hampshire x White Leghorn chicks to approx. the same extent as that observed when the diet was supplemented with 60% of *Torula* or Fleischmann's yeast, which was the amount of yeast required to supply 0.02% ubichromenol in the diet. The effect of ubichromenol in preventing muscular dystrophy in chicks is not as great as its effect in preventing encephalomalacia. A.Fleck

3151. CHANGES IN COMPOSITION OF SALIVA OF COWS ON GRAZING HEAVILY FERTILISED GRASS. A.Dobson: *Res. vet. Sci.*, 1963, 4, 238-246 (Rowett Res. Inst., Aberdeen, Scotland) The Na and K concn. w^as compared in parotid saliva and mixed saliva from a r. whose Na-status was altered by withdrawing its HCO₃ supplement, or by dosing with NaHCO₃. Changes in the composition of mixed saliva reflected changes in parotid saliva during the induction of Na⁺Cl⁻ m^any. When the diet of 6 lactating cows was changed from stall-feeding to grass fertilised with NH₄NO₃ and KC1, there was a rise in the K and a fall in the Na-concn. of mixed saliva. J.B.Derbyshire

3152. CHANGES IN COMPOSITION OF SALIVA OF SHEEP ON FEEDING HEAVILY FERTILISED GRASS. A.Dobson and LMcDonald: *Res. vet. Sci.*, 1963, 4, 247-257 (Rowett Res. Inst., Aberdeen, Scotland) K⁺ K concn. in mixed saliva of sheep increased when the diet was changed from hay and meal to grass utilised with KC1 and (NH₄)₂SO₄. The response was rapid and intense in grazing sheep, but there was

considerable individual variation. The response was not suppressed by dosing with NaCl. A rise in K concn. in parotid saliva was inferred from the results on mixed saliva, and this suggested a raised peripheral aldosterone concn. An increased K concn. in the rumen liquor sometimes preceded die increased salivary concn.

J.B.Derbyshire

3153. INCORPORATION OF 59Pe IN BLOOD CORPUSCLES, BONE MARROW AND OTHER TISSUES DURING EXPERIMENTAL PROTEIN DEFICIENCY. A.Aschkeissy: *C.R. Soc. Biol., Paris*, 1962, 156, 1786-1790 (Hop. de la Pitie, Paris, France) The incorporation of 59Pe by the r.b.c. of rats and the total reticulocytes decreased after 7 days of a protein-free diet. Fixation of 59Pe by the bone marrow increased after 2 days and remained at twice the normal level for 50 days. The ⁵⁹Fe fixation of the liver increased during the first week with return to the normal level within 2 weeks. (French) M.A.Price

3154. INVESTIGATION OF Ca, P AND VITAMIN D3 RELATIONSHIPS IN RATS BY MULTIPLE REGRESSION TECHNIQUES. P.T.Chandler and R.G.Cragle: *J. Nutr.*, 1962, 78, 28-36 (Univ. Tennessee - Atomic Energy Commission, Agric. Res. Lab., Oak Ridge, Tenn., U.S.A.) Max. growth of weanling cf rats was obtained when the diet contained C <27% Ca and 0.217< Pi or the ratio of Ca/P was 1-3. A.Fleck

3155. EFFECT OF CARBOHYDRATES ON UTILISATION OF PROTEIN AND LYSINE BY RATS. Vet-oy Chang: *J. Nutr.* 1962, 78, 21-27 (Div. Home Econ., Univ. Wyoming, Laramie, Wyo., U.S.A.) Male Sprague-Dawley rats fed 18% dietary protein as wheat gluten and various carbohydrates responded to the supplementation of the diet with 0.7% lysine by an increase in the availability of lysine and an increase in the protein efficiency ratio. A.Fleck

3156. EFFECT OF OVARIECTOMY ON BLOOD CONCENTRATION OF ORALLY ADMINISTERED [131I]TRIOLEIN IN BITCHES ON LOW AND MODERATE FAT INTAKE. F.N.Dost and W.M.Dickson: *Proc. Soc. exp. Biol., N.Y.*, 1962, 111, 674-676 (Coll. Vet. Med., Washington State Univ., Pullman, Wash., U.S.A.) Castrate ? beagles were found to have a greater max. % of administered [¹³¹I]triolein in the blood than intact bitches when both were fed on a moderate fat diet. Castrate and intact animals when fed on low fat diet presented only slightly different mean peak values. M.M.Shapland

3157. EFFECT OF DIFFERENT DIETARY FATS ON BLOOD COAGULATION, PLATELET ECONOMY AND BLOOD LIPIDS. J.F.Mustard and E.A.Murphy: *Brit. med. J.*, 1962, i, 1651-1655 (Dept. Med., Univ. Toronto, Canada) Studies on "white Canadian veterans aged 56-65 yr. showed that in vitro blood coagulability was most active and platelet survival shortest on diets rich in dairy fats and eggs. When the diet contained little fat converse results were obtained. A diet rich in vegetable fat gave intermediate results. Serum cholesterol and phospholipids were highest with dairy fat and eggs, but correlation between these levels and results of coagulation tests was poor. M.E.Nutt

3158. EFFECTS OF SATURATED FAT IN RATS FED RAPE-SEED OIL. J.L.Beare, J.A.Campbell, C.G.Youngs and B.M.Craig: *Canad. J. Biochem.*, 1963, 41, 605-612 (Food and Drug Lab., Dept. Nat. Hlth. and Welfare, Ottawa, Canada) - A mixture of palm oil and

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Swedish rapeseed oil fed for 4 weeks as 20% of a purified diet to rats promoted wt. gains which exceeded those obtained with Polish rapeseed oil of a similar erucic acid content and altered the proportion of sat. fatty acids in the tissues to reflect that in the diet. When methyl esters of sat. fatty acids were added to Swedish rapeseed oil wt. gain was not observed but these were shown to be of less nutritional value than the original glycerides.

J.B.Parish

3159. FATTY ACID COMPOSITION OF LIPIDS OF SERUM AND AORTA IN CHICKEN ON DIFFERENT DIETS. P.Björntorp, A.Liljemark and L.Angervall: J. Atheroscler. Res., 1963, 3, 72-79 (1st Med. Service, Sahlgren's Hosp., Univ. Götteborg, Sweden). K.Jones

3160. SERUM AND AORTA LIPIDS IN DIETARY CHICKEN ATHEROSCLEROSIS. L.Angervall, P.Björntorp and A.Liljemark: J. Atheroscler. Res., 1963, 3, 63-71 (2nd Dept. Pathol., Sahlgren's Hosp., Univ. Göteborg, Sweden) Total serum and aorta cholesterol was higher in chickens fed cholesterol + hydrogenated coconut oil than in the control and cholesterol-fed ones. The contents of serum triglycerides were low in the control group and the cholesterol-fed group, but high in the group fed a high amount of hydrogenated coconut oil + cholesterol. The last group also showed the highest atherosclerotic gradings and total fat contents. K.Jones

3161. EFFECT OF PROLONGED DIETARY TREATMENT ON ATHEROSCLEROSIS IN MATURE FOWL. H.Fisher, H.S.Weiss and P.Griminger: J. Atheroscler. Res., 1963, 3, 57-62 (Dept. Poultry Sci. Rutgers, State Univ., New Brunswick, N.J., U.S.A.) Leghorn chickens, given an egg-enriched, balanced poultry ration, or the control ration supplemented with dicoumarol, showed an increase in the severity of abdominal aortic atherosclerosis. It is suggested that the relatively high pectin and peanut oil content of the ration may be implicated. K.Jones

3162. PHOSPHOMONOESTERASE AND ADENYL PYROPHOSPHATASE ACTIVITIES OF AORTA IN EARLY STAGES OF EXPERIMENTAL RABBIT ATHEROSCLEROSIS. T.Zemplenyi, O.Mrhova and Z.Lojda: J. Atheroscler. Res., 1963, 3, 50-56 (Inst. Cardiovasc. Res., Prague-Kre, Czechoslovakia) The activity of phosphomonoesterase I was increased as early as 4 weeks, and 10 weeks after the beginning of cholesterol feeding. The activity of phosphomonoesterase II revealed an increase of borderline significance, while activities of adenylpyrophosphatase and 5'-nucleotidase showed no change after daily administration of cholesterol-fat. K.Jones

3163. FATTY LIVER OF PORTAL TYPE. SEQUENTIAL DETERMINATION OF TOTAL LIVER LIPIDS, PHOSPHOLIPIDS, PLASMALOGENS. CHOLESTEROL AND ESTERIFIED FATTY ACIDS. G.P.Vennart: Lab. Invest., 1963, 12, 327-333 (Pathol. Dept., Univ. N. Carolina Med. Sch., Chapel Hill, N.C., U.S.A.) Weanling rats fed on a corn and vegetable oil diet develop fatty livers. Liver phospholipids and plasmalogens are depressed first. Stainable fat appears before the accumulation of total lipid which is largely esterified fatty acids and cholesterol. Animals vary widely in their susceptibility to the deficient diet. A.M.Mackay

3164. EFFECT ON LIPID METABOLISM OF CERTAIN DERIVATIVES OF BENZHYDROL WITH PSYCHOLEPTIC PROPERTIES. B.Drevon and G.Montavon: C.R. Soc.

BioL, Paris, 1962, ^156, 1876-1880 (Lab. de Pharmacochimie, Fac. Med., Lyon, France) The diphenylhydroxyacetate of diethylaminoethanol (Benactyzine) decreased the total serum lipids, phospholipids and 0-lipoproteins in dogs previously receiving a high cholesterol diet. (French) M.A.Price

3165. TOLERANCE TO INTRAVENOUS ADMINISTRATION OF A SOLUTION OF VEGETABLE FAT. M.Lemarche, G.Grignon and R.Royer: C.R. Soc. Biol., Paris, 1962, 156, 1666-1668. Administration of 10ty suspension of vegetable fat i.v. for a short period to mice and rabbits, increased the lipid content of the hepatic cells and Kupffer cells. Prolonged treatment with lower doses of vegetable fat decreased the lipid content of hepatic cells and increased the Sudan pos. inclusions of the Kupffer cells and connective cells of the liver and lungs. (French) M.A.Price

3166. LIPID AND LIPOSOLUBLE VITAMIN CONTENT OF THE HEPATOPANCREAS AND STRIATED MUSCLE OF SCORPENA PORCUS AFTER A NORMAL DIET AND AFTER FASTING. J.Jouanneteau, G.Peres and G.Zwingelstein: C.R. Soc. Biol., Paris, 1962, 156, 1848-1850 (Lab. Physiol., Fac. Sci., Lyon, France) The hepatopancreas of *S. porcus* on a normal diet contained 11*2% lipid, 3*5 mg. vit. A/100 g., 25 mg. vit. E/100 g. and 1080 mg. total sterols/100 g. The muscle contained 0*84% lipids, 3*1 mg. vit. E/100 g. and 58-6 mg. total sterols/100 g. After 1 month fasting there was an increase in the lipid content of muscle and hepatopancreas, a decrease in the vit. A content of the hepatopancreas and an increase in the vit. E content with a decrease in muscle. (French) M.A.Price

3167. EFFECT OF DOSE LEVEL OF ESSENTIAL FATTY ACIDS UPON FATTY ACID COMPOSITION OF THE RAT LIVER. H.Mohrhauer and R.T.Holman: J. lipid Res., 1963, 4, 151-159 (Univ. Minnesota, Hormel Inst., Austin, Minn., U.S.A.) The influence of carefully measured doses of highly purified essential fatty acids, ethyl linoleate, ethyl arachidonate, and ethyl linolenate upon the composition of the liver lipid fatty acids in rats is described. The relationships between dietary essential fatty acids and wt. and dermal symptoms in fat deficiency have been related to sp. biochem. changes in tissue fatty acids. These relationships can be used to estimate more precisely the essential fatty acid requirement of the rat and to calculate dietary essential fatty acid intake from tissue analysis. J.R.Sargent

3168. EFFECTS OF ETHIONINE AND METHIONINE ON SERUM LIPIDS AND LIPOPROTEINS. J.C.Seidel and A.E.Harpen Proc. Soc. exp. Biol., N.Y., 1962, 111, 579-582 (Dept. Biochem., Univ. Wisconsin, Madison, Wis., U.S.A.) Prolonged feeding of ethionine to rats receiving a diet of cholesterol cholic acid and hydrogenated coconut oil causes approx. a 1-fold increase in serum triglyceride concn. and reduces serum cholesterol concn. This increase is prevented by the inclusion of an equal amount of methionine in the diet but the cholesterol level is reduced further. Methionine alone, reduces serum triglyceride level only slightly but substantially lowers serum cholesterol. M.M.Shapland

3169. FATTY ACID COMPOSITION OF VARIOUS PHOSPHOLIPIDS OF THE INTESTINAL MUCOSA OF THE YOUNG RAT FASTING AND AFTER FEEDING. G.Di Costanzo and J.Clement: Bull. Soc. Chim. biol-t Paris, 1963, 45, 137-144 (Lab. Physiol. Animale, Fac. Sci., Dijon, France) The phospholipids of the

intestinal mucosa of the young rats fasting and after a meal containing 10% lard were separated by silicic acid column chromatography and thin layer chromatography. The major phospholipid constituents were not altered by feeding. Phosphatide fatty acids were from C12 to C22. Principally palmitic and stearic acids. The main constituents from fasting animals were unsat. phosphatidic acids. The sat. acids increased during absorption.

(French) J.C.Crawhall

3170. ALIMENTARY LIPAEMIA AND PLASMA FIBRINO LYtic ACTIVITY. D.Ogston and H.W.Fullerton:

Brit. med. J., 1962, ii, 1288-1290 (Dept. Med.. Univ. Aberdeen, Scotland) Diurnal increase in Plasma fibrinolytic activity, found in a 31 hr. period after a low fat breakfast, was not significantly altered by alimentary lipaemia produced by meals containing 85 g. animal or vegetable fat, or by low fat and 50 g. butter fat breakfasts on alternate days. Anxiety at time of initial venepuncture was associated with high fibrinolytic activity. Allayed anxiety on subsequent occasions may lead to the mistaken conclusion that decreased fibrinolysis is due to the test meal. M.E.Nutt

3171. LIPID CHANGES IN PLASMA, (X-LIPOPROTEINS, LIVER AND AORTA OF CHICKS FED DIFFERENT FATS.

G.A.Leveille and H.E.Sauberlich: Proc. Soc. exp. Biol., N.Y., 1963, 112, 300-303 (U.S. Army Med. Res. and Nutr. Lab., Fitzsimons Gen. Hosp., Denver, Colo., U.S.A.) Chicks were fed on a basal diet either supplemented with oils (coconut, olive or corn oils) or not, and also with or without added cholesterol. The plasma level of cholesterol was highest in the group of animals not fed added cholesterol but given oils, when cholesterol was fed to chicks, coconut oil was most effective in inducing a high plasma cholesterol level although all fats induced higher levels. The situation was different with regard to liver cholesterol content, evidence is put forward to show that increased cholesterol *level is found bound in the g-lipoproteins of the plasma and not in the (X-lipoproteins. D.N.Wheatley

3172. EFFECT OF RAW SOYBEAN MEAL ON FAT ABSORPTION IN YOUNG CHICKS. M.CNesheim,

J.D.Garlich and D.T.Hopkins: J. Nutr., 1962, 78, 89-94 (Dept. Poultry Husbandry, Cornell Univ., Ithaca, N.Y., U.S.A.) Raw soybean meal in the diet of white Plymouth Rock or Rhode Island Red x Barred Plymouth Rock chicks depressed fat absorption at 2 weeks old but not at 4 weeks. A.Fleck

3173. PLASMA PROTEIN SYNTHESIS IN NUTRITIONAL MUSCULAR DYSTROPHY. J.F.Diehl: Z. Naturforsch.

B., 1963, 18, 167-168 (Dept. Biochem., Univ. Arkansas Med. Center, Little Rock, Ark., U.S.A.) No. te. J.C.Crawhall

3174. METHOD OF STUDYING THE FACTORS AFFECTING NITROGEN REQUIREMENTS. M.D.Mezincenco and A.Popescu-Stefanescu: Arch. Sci. physiol.,

I^A2, 16, 245-254 (Lab. Chim. biol., Fac. Med., Bucharest, Roumania) Previous expt. indicating an increase in N requirement (as determined by wt. increase in rats fed protein and carbohydrate at different times of day rather than simult. were repeated and confirmed. After xanthine oxidase activity also varied with N requirement could give a more consistent and more sensitive cation of its magnitude. (French) S.A.Thistlewood

'UNESSENTIAL' NITROGEN: A LIMITING FACTOR FOR HUMAN GROWTH. S.E.Snyderman, L.E.Holt, jun., J.Dancis, E.Roitman, A.Boyer and M.E.Balis: J. Nutr., 1962, 78, 57-72 (Dept. Paediatrics, New York Univ. Sch. Med., New York, U.S.A.) In a study of 4 normal human infants it was found that unessential N (that is, dietary N apart from that of the essential amino acids) is the limiting factor in protein and amino acid deficiency. A.Fleck

3176. BIOLOGICAL ASSAY OF MILK AND WHEY PROTEIN COMPOSITIONS FOR INFANT FEEDING.

R.M.Tomarelli and F.W.Bernhart: J. Nutr., 1962, 78, 44-50 (Wyeth Inst. Med. Res., Radnor, Pa., U.S.A.) Whey protein and mixtures of whey and milk protein were superior to milk protein alone in several rat assay procedures. A.Fleck

3177. EFFECT OF NONESSENTIAL N SUPPLEMENTS ON

GROWTH AND ON THE AMINO ACID CONTENT IN PLASMA AND MUSCLE OF WEANLING RATS FED A LOW-PROTEIN DIET. M.E.Swendseid, J.B.Hickson and B.W.Friedrich: J. Nutr., 1962, 78, 115-119 (Sch. Public Health, Sch. Med., Univ. California, Los Angeles, Calif., U.S.A.) Nonessential N supplements to diets containing 8*0% casein and 0*3% methionine retarded the growth of young Sprague-Dawley rats. This effect was prevented by the addition of tryptophan and threonine to the diet. A.Fleck

3178. NEW EFFECTS OF MAILLARD'S REACTION ON NUTRITION. J.Adrian, L.Petit and B.Godon:

C.R. Acad. Sci., Paris, 1962, 255, 391-393 (Centre de Recherches sur la Nutrition du C.N.R.S., Bellevue, Seine-et-Oise, France) Equimol. mixtures of glycine and glucose in water (12*75 g. in 2*5 ml. water) were heated to 90% for 1, 4 or 6 hr. The % of amino N in the mixture decreased. Addition of the soln. in low doses to a balanced, 12% casein diet fed to rats increased the animals' growth rate and wt. gain/g. protein intake. Higher doses decreased the growth rate, wt. gain/g. protein intake and the proportion of the N intake retained. (French) S. A.Thistlewood

3179. FACTORS INFLUENCING NUTRITIONAL VALUE OF FISH FLOUR. II. AVAILABILITY OF LYSINE AND SULPHUR AMINO ACIDS. A.B.Morrison and Z.I.Sabry:

Canad. J. Biochem., 1963, 41, 649-655 (Food and Drug Lab., Dept. Nat. Health and Welfare, Ottawa, Canada) Measurements of net protein ratio and protein efficiency ratio in 8 samples of fish flour indicated marked variability in nutritional value of the protein. The availability of lysine was examined by in vitro digestion studies, gross protein value determinations and the dinitrofluorobenzene procedure and one sample was found to have no available lysine. The available methionine was studied by the ability of the flour to supplement a methionine-deficient diet and by the release of methionine during in vitro digestion with proteolytic enzymes; the same sample had no available methionine. J.B.Parish

3180. SULPHUR METABOLISM. X. NON-EQUIVALENCE

OF CYSTINE AND CYSTEINE AS RELATED TO THE SULPHUR REQUIREMENTS OF THE RAT. G.Wellers: J. Physiol., Paris, 1962, 54, 677-685 (Lab. Physiol., Fac. Med., Paris, France) Rats fed on a diet containing either cystine or cysteine as the sole source of S showed a more neg. balance on cystine (10-11*4 mg./kg./day) than on cysteine (3-4*5 mg./kg./day). In the adult

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rat cystine can provide about 60% and cysteine about 85% of the sp. endogenous S requirement. Of the min. methionine-S requirement, cystine can provide about 66% and cysteine about 87%. The difference in the neg. S balance is due to a higher production of neutral S and of free urinary sulphates by the animals fed on cystine.

(French) A. Angel

3181. DIFFERENTIAL UTILISATION OF AMINO ACIDS BY MYZUS PERSICAE (SULZER) FED ON ARTIFICIAL DIETS. J.C.Bragdon and T.E.Mittlen: *Nature*, Lond., 1963, 198, 209-210 (Dept. Entomol., Univ.

California, Berkeley, Calif., U.S.A.) The excretion of amino acids in honeydew droplets by *M. persicae* fed on sucrose soln. containing threonine, valine, methionine, lysine, leucine and asparagine did not occur in the same proportions as they occurred in the diet, indicating some differential absorption. G.M.Lewis

3182. NITROGEN BALANCES OF YOUNG WOMEN FED THE FAO REFERENCE PATTERN OF AMINO ACIDS AND THE OAT PATTERN. R.M.Leverton and D. Steel: *J. Nutr.*, 1962, 78, 10-14 (Oklahoma Agric. Exp. Station, Stillwater, Okla., U.S.A.)

Six young women were fed semi-purified diets with the essential amino acids proportioned as in the FAO reference pattern and based on levels of tryptophan of 160, 200, and 240 mg. of tryptophan daily. For N balance, 240 mg. daily of tryptophan were required. When the FAO and the oat pattern of amino acids were supplied by purified amino acids and fed at the same tryptophan level there were no significant differences among the N balances of the subjects. A.Fleck

3183. EFFECT OF THREONINE-INDUCED AMINO ACID IMBALANCE ON THE EXCRETION OF TRYPTOPHAN METABOLITES BY THE RAT. R.L.Florentino and W.N.Pearson: *J. Nutr.*, 1962, 78, 101-108 (Div. Nutr., Dept. Biochem., Vanderbilt Univ. Sch. Med., Nashville, Tenn., U.S.A.)

The results of feeding weanling Sprague-Dawley rats a niacin-free diet with 0'09% DL-tryptophan and 0'4% DL-threonine supported the hypothesis that in amino acid imbalance there is excretion of surplus amino acids and a wasting of the limiting amino acid due to catabolism and excretion. A.Fleck

3184. ABILITY OF THE CHICK TO UTILISE D- AND EXCESS L-INDISPENSABLE AMINO NITROGEN IN THE SYNTHESIS OF DISPENSABLE AMINO ACIDS.

W.R.Featherston, H.R.Bird and A.E.Harper: *J. Nutr.*, 1962, 78, 95-100 (Dept. Poultry Sci. and Biochem., Univ. Wisconsin, Madison, Wis., U.S.A.) Cornish x White Rock chicks fed N from D- and excess L- indispensable amino acids was used for the synthesis of dispensable amino acids. The N of the 2 sources was used equally well. A.Fleck

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3185. POTENCY OF VITAMIN A ACID IN THE VAGINAL SMEAR ASSAY. T.K.Murray: *Proc. Soc. exp. Biol.*, N.Y., 1962, 111, 609-611 (Food and Drug. Lab., Dept Nat. Hlth. and Welfare, Ottawa, Ont., Canada) The biol. potency of vit. A acid as measured by a modified vaginal smear assay was found to be &fo that of vit. A. M.M.Shapland

3186. EFFECT OF NITRATE AND NITRITE* ON VITAMIN A STORAGE IN THE RAT. R.J.Emerick and O-E.Olson: *J. Nutr.*, 1962, 78, 73-77 (Station Biochem. Dept., S. Dakota Agric. Expt. Stat., Brookings, S. Dak., U.S.A.) Both nitrate and nitrite significantly lowered the liver storage of vit. A of \$ Sprague-Dawley rats. Nitrite in the diet exhibited the greater effect.

A.Fleck

3187. VITAMIN A AND CAROTENE UTILISATION IN PROTEIN-DEPRIVED RATS. J.Mathews and G.H.Beaton: *Canad. J. Biochem.*, 1963, 41, 543-549 (Dept. Nutr., Sch. Hyg., Univ., Toronto, Ont., Canada) Maintenance of rats on a protein-free, but not a 4% casein diet produced a lowering of serum vit. A. This effect was seen in rats deprived of vit. A or given 90 pg. twice weekly. Weanling rats were depleted of vit. A by feeding for 5 weeks on an unsupplemented diet of 4Pfo or 20% casein and were then given daily additions of 6 fig. or 12 fig. of vit. A or 24 fig. carotene. The blood vit. A response to administered vit. A was not affected by the level of dietary protein but its response to administered carotene was halved on the lower level of protein intake.

J.B.Parish

3188. THIAMINE-SPARING ACTION OF MUSTARD AND ROLE OF COPROPHAGY. S.K.Meghal and M.C.Nath: *Nature*, Lond., 1963, 198, 89 (Dept. Biochem., Univ. Nagpur, India) In weanling rats fed a thiamine deficient diet containing aq. extract of mustard, thiamine deficiency symptoms occurred if coprophagy was prevented while animals allowed to eat their own faeces showed a high thiamine content in liver, heart and intestine. G.M.Lewis

3189. SEPARATION AND DETERMINATION OF THIAMINE AND PYRITHIAMINE IN BIOLOGICAL MATERIALS BY CHROMATOGRAPHY ON POLY-ETHYLENE POWDER. G.Rindi and V.Perri: *Analyt. Biochem.*, 1963, 5, 179-186 (Inst. Human Physiol., Univ. Pavia, Italy) Pyrithiamine and thiamine contained in the same sample (pure soln., liver, urine) can be determined separately after oxidation and separation of the oxidation products on columns of polyethylene powder by stepwise elution with 5, 8 and 50% methanol in 0'1N NaOH, and fluorometric determination of the effluent fractions. 62% of inj. pyrithiamine appeared in the urine after 24 hr. A.D. Smith

3190. THIAMINE SUPPLY AND SEDOHEPTULOSE 7-PHOSPHATE FORMATION. Iu.M.Ostrovskik Biokhimia, 1963, 28, 22-30. It was shown that thiamine in the diet of pigeons promoted the formation of sedoheptulose 7-PO₄. This was studied by examination of various homogenates from pigeons which had been on diets with a certain thiamine content.

(Russian) B.J.Cooper

3191. 54Mn STUDIES IN PYRIDOXINE DEFICIENT RATS. J.M.Hsu and B.Kawin: *Proc. Soc. exp. Biol.*, N.Y., 1962, 111, 679-682 (Biochem. Res. Lab., V.A. Hosp., Baltimore, Md., U.S.A.) Pyridoxine deficiency is associated with increased uptake by brain and testes and decreased uptake by liver and heart of i.v. inj. 54Mn^{d2}. No difference in 54Mn concn. were observed in other tissues examined. The gastrointestinal tract and faeces of deficient rats are significantly higher in 54Mn content than those of controls, however urinary excretion of 54Mn is reduced. M.M.Sfoapland

3192. DIFFERENT INFLUENCES ON TRYPTOPHAN METABOLISM IN RATS DEFICIENT IN-VITAMIN B6-

F.Weber and O.Wiss: Hoppe-Seylers Z. physiol. Chem., 1963, 331, 124-131 (Hoffmann-La Roche A.G., Basle, Switzerland) Increased excretion of xanthurenic acid is attributed to the greater effect of vit. B₆ deficiency on kynureninase than kynurenine:2-oxoglutarate transaminase. Hydroxytryptophan decarboxylase in the liver is reduced, but not in brain. On administration of thiosemicarbazide, the enzyme is considerably diminished in both organs. (German) L.Cornish

3193. BINDING OF PYRIDOXAL 5-PHOSPHATE TO ASPARTATE AMINOTRANSFERASE OF PIG HEART. V.Scaldi, P.Scotto, M.Iaccarino and E.Scarano: Biochem. J., 1963, 88, 172-175 (Lab. Chim. Fermentazioni, 1st. Chim. Org., Univ., Napoli, Italy) Conditions are described under which aspartate aminotransferase can be dissociated into coenzyme and apoenzyme. Only the pyridoxamine form of the enzyme can be resolved. The resolution can be performed by incubation with several anions, of which phosphate is the most effective. The conditions under which phosphate is effective in resolving aspartate aminotransferase suggest that this phenomenon has physiol. significance.

3194. GLUTAMIC OXALOACETIC TRANSAMINASE ACTIVITY IN OVARY OF HYPOTHYROID AND VITAMIN B₆ DEFICIENT RATS. B.Eckstein: Endocrinology, 1963, 72, 777-781 (Zool. Dept., Hebrew Univ., Jerusalem, Israel) In vit. B₆ deficient rats, in which the reactivity of the ovary to gonadotrophin stimn. is low, large doses of serum gonadotrophin did not stimulate ovarian and uterine GOT activity. Thiouracil fed rats w th high ovarian reactivity to gonadotrophin showed stim. GOT activity with serum gonadotrophin. |

H.C.Jones
3195. EFFECT OF NICOTINAMIDE ON THE METABOLISM OF NUCLEAR RNA IN RAT KIDNEY. P.Mandel, M.Revel and S.Dreyfus: C.R. Acad. Sci., Paris, 1962, 255, 406-408 (Inst. Chim. Biol., Fac. Med. Centre Rech. nucleaires, Strasbourg, France) The incorporation of [8-14C]adenine into nuclear RNA from rat kidney was studied in animals given 65 mg. nicotinamide/100 mg. body wt. 13 hr. before death and in controls. After incubation, extraction, and fractionation by centrifugation in sucrose soln, fractions with sedimentation coeff. of 5S, 8S, J3S, 18S, 20.5, 22S, 27S and 30S were obtained. Only ~~radioactive~~ at 8S and 13S were diminished by nicotinamide. They were also the most radioactive. Labile RNA passed out of the nuclei during incubation.

(French) S.A.Thistlewood
4196. TAKING UP OF [14C]NICOTINIC ACID AND [14C]-NICOTINAMIDE BY ASCITES CELLS IN VITRO. L.S.Dietrich and J.N.Ahuja: J. biol. Chem., 1963, 238, 1544-1547 (Dept. Biochem., Univ. Miami Sch. Med., Fla., U.S.A.) [14C]Nicotinamide readily penetrates various ascites cells at 4° and 30°, and the free ^{14C}nicotinamide and extracellular levels of the vitamin are ¹⁻⁵⁰%, but ¹⁻⁵⁰% cells can concentrate the acid at 30°. This ability to concentrate the acid depends on pH; very little, Jcid is taken up at neutral pH. Decrease of pH markedly increases the uptake. Fragmented cells do not concentrate nicotinic acid. J.N.Ashley

3197. ADRENOCORTICAL ALTERATIONS INDUCED BY DEFICIENCY AND EXCESS OF PANTOTHENIC ACID. T.Wirtschafter and J.R.Walsh: Endocrinology, 1963, 72, 725-734 (Res. Lab., V.A. Hosp., Portland, Ore., U.S.A.) A group of animals receiving excess of

pantethenic acid showed adrenocortical haemorrhage in a few hr. Pantethenic acid deficient animals showed adrenocortical haemorrhage after 6 weeks. H.C.Jones

3198. VITAMIN-COENZYMES AND AGEING IN RATS. S.Oeriuu Biokhimiia, 1963, 28, 3-8. Investigation of the biochemistry of ageing in rats showed that disturbances in the equilibrium of thio-amino and amino acids affected general metabolism, and in particular biocatalysts. Ageing was accompanied by a decrease in the content of vitamin-coenzymes PP, B₁, B₂, B₆ and pantethenic acid and by disturbances in the activity of some enzymes: a decrease in the activity of NAD, cocarboxylase, FAD and transacetylase, and an increase in that of GOT and GPT. Treatment with cysteine, vit. B₆, B₁₂ and folic acid restored the equilibrium of some of these vitamins and enzymes in ageing animals.

(Russian) B.J.Cooper

3199. FOLIC ACID-ACTIVE COMPOUND STRONGLY BOUND BY DEAE-CELLULOSE. D.G.Johns, I-H.Plenzleith and B.A.Coopen: Biochem. Pharmacol., 1963, 12, 388-391 (McGill Univ. Med. Clinic, Montreal Gen. Hosp., Montreal, Canada) Short comm.

L.G.Gillies
3200. ENZYMIC DEAMINATION AND AMIDE CLEAVAGE OF FOLIC ACID. W.S.McNutD: Arch. Biochem., 1963, 101, 1-6 (Dept. Pharmacol., Tufts Univ. Sch. Med., Boston, Mass., U.S.A.) A crude enzyme prep. from Alcaligenes faecalis cultured with xanthopterin catalysed the deamination and amide cleavage. 'Deaminated folic acid', pteroic acid and 'deaminated pteroic acid' were characterised as products. The prep. deaminated pteroic acid but not rhizopterin. B.M. Stevens

3201. CHROMATOGRAPHIC SEPARATION OF DIESTEREOISOMERS OF dl,L-5,10-METHYLENETETRAHYDROFOLATE. B.T.Kaufman, K.O.Donaldson and J.C. Keresztesy: J. biol. Chem., 1963, 238, 1498-1500 (Nat. Inst. Arthritis and Metabol. Dis., Bethesda, Md., U.S.A.) The 2 diastereoisomers of the chem. prep. compound are separated on di- or triethylaminoethyl cellulose ion exchange columns. The 1,L-isomer has almost 100% microbiol. activity and is fully active as a substrate for methylenetetrahydrofolic dehydrogenase and reductase. The d,L-isomer is inactive microbiol. and enzymically. It L-5-Methyltetrahydrofolate, prep. by reduction of the 1,1-5,10-methylene deriv. with NaBH₄ is identical with that isolated from horse liver.

J.N.Ashley
3202. MECHANISM OF BINDING OF FOLATE ANALOGUES BY FOLATE REDUCTASE. S.F.Zakrzewski: J. biol. Chem., 1963, 238, 1485-1490 (Dept. Expt. Ther., Roswell Park Mem. Inst., New York State Dept. Hlth., Buffalo, N.Y., U.S.A.) The effect of various diamino- and aminohydroxy-pteridines, purines, and pyrimidines on folate reductase is determined. All diamino analogues are bound to the enzyme. Both amino groups in the pyrimidine ring are needed for this binding. The pyrazine ring does not take part in complex formation with the enzyme. Among amino-hydroxy deriv. only folate and 2-amino-4-hydroxy-6-formylpteridine are bound to the reductase. Dissociation of folate from the enzyme is associated with increase of entropy of the system, but dissociation of all 2,4-diamino compounds is associated with decrease of entropy. A mechanism of binding of aminopterin and folate to the reductase is suggested; it explains why aminopterin is bound 100000 times more tightly than is folate. J.N.Ashley

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3203. ACTIVATION OF DIHYDROFOLIC REDUCTASE BY UREA AND FORMAMIDE. B.T.Kaufman: Biochem. biophys. Res. Comm., 1963, 10, 449-453 (Nat. Inst. Arthr. and Metabol. Dis., N.I.H., Bethesda, Md., U.S.A.) Dihydrofolic reductase from chicken liver is stim. in a qual. similar manner by salts, urea or formamide and possibly also by H⁺. B.Ketterer

3204. B12 VITAMINS AND METHIONINE IN THE METABOLISM OF PRYMNESIUM PARVUM (CHRYSMONADINA). M.Rahat and K.Reich: J. gen. Microbiol., 1963, 31, 203-209 (Dept. Zool., Hebrew Univ., Jerusalem, Israel) Methionine or ethionine may serve as sole N source for *P. parvum*, but cannot replace or spare the vit. B12 requirement for growth of the flagellate. Methionine will counteract inhibn. of growth by some B12 analogues substituted at the benzimidazole group in the presence of B12. Analogue Fin (0C(5-hydroxybenzimidazoly)-cobamide cyanide) replaced B12 in presence of methionine and to a lesser extent in presence of other methyl donors. It is concluded that for *P. parvum*, analogue Fin will replace B12 in all metabolic pathways other than methyl group synthesis. K.Brew

3205. VITAMIN B12 AND PURINE METABOLISM IN LACTOBACILLUS LEICHMANNII. [2-14C]GLYCINE INCORPORATION INTO RIBONUCLEIC AND DEOXYRIBONUCLEIC ACID. G.R.Craven and M.Downing: J. biol. Chem., 1963, 238, 1464-1466 (Dept. Chem., Univ. Colorado, Boulder, Colo., U.S.A.) Incorporation of purines synthesised de novo into RNA in *L. leichmannii* is not affected when deoxycytidine in the medium II replaced by vit. B12. The total amount of purine found in DNA is greater in cells grown in presence than in absence of the vitamin. With precursors labelled with 14c the substitution of vit. B12 causes a large increase in the sp. activity of the purines derived from DNA. There is also increased incorporation of purines synthesised de novo into DNA. [2-14C]Glycine is incorporated into all purine containing components of RNA and DNA in absence of vit. B12. Probably exogenous purine requirement in media devoid of vit. B12 is an indirect result of participation of the vitamin in reduction of ribonucleotide deriv. to deoxyribonucleotide deriv. rather than to involvement in purine synthesis de novo. J.N.Ashley

3206. BIOSYNTHESIS OF VITAMIN Bi2- DERIVATION OF CORRIN STRUCTURE FROM 6-AMINOLAEVULINIC ACID AND METHYL GROUP OF METHIONINE. R.C.Bray and D.Shemin: J. biol. Chem., 1963, 238, 1501-1508 (Dept. Biochem., Coll. Phys. Surg., Columbia Univ., New York, U.S.A.) [2,3-14C2]and [5-14c]-6-aminolaevulinic acid, and [methyl-14c]-methionine are studied for the synthesis of vit. B12 in growing actinomycete cultures. The pattern of utilisation of 6-aminolaevulinic acid shows that the basic corrin structure is synthesised from known porphyrin precursors. The 6 'extra' methyl groups are derived from the methyl group of methionine by C-alkylation. The methyl group in the a-position of ring A and the bridge C atoms are derived from the 6-C atom of 6-aminolaevulinic acid. These radioactive precursors labelled only the corrinst ructure. re. J. N. Ashley

3207. RELEASE OF INORGANIC TRIPOLYPHOSPHATE FROM ADENOSINE TRIPHOSPHATE DURING VITAMIN B12 COENZYME BIOSYNTHESIS. A.Peterkofsky and H.Weissbach: J. biol. Chem., 1963, 239, 1491-1497 (Lab. Biochem., Nat. Inst. of Dental Res., Bethesda,

Md., U.S.A.) The ATP-cobamide 5^{fl}-deoxyadenosyl transferase from *Clostridium tetanomorphum* is purified and is used to study the fate of ATP during the biosynthesis. Inorg. tripolyphosphate is the final phosphate product of the reaction. A rapid and sensitive assay for measurement of vit. B12 coenzyme synthesis is described. The similarities between this coenzyme synthesis and methionine activation are discussed. J.N.Ashley

3208. ACTION OF AN EXTRACT OF DIPHYLLOBOTRIUM LATUM ON COMBINED VITAMIN B12. W.Nyberg, R.Wolff and P.Nabet: C.R. Soc. Biol., Paris, 1962, 156, 1673-1675 (Dept. Med., Cental Hosp., Vasa, Finland) Purified aq. extract of *D. latum* increased the combination of [60Co]vit. B12 and gastric juice. This was accompanied by denaturation of the protein fraction which lost the ability to combine with vit. B12. The mixtures of extracts of *Diphyllobothrium* and free vit. B12 were ultrafiltrable and thermostable. The combination of vit. B12 and gastric juice was not ultrafiltrable or dialysable. (French) M.A.Price

3209. SERUM BINDING OF VITAMIN B12 ANALOGUES: IDENTIFICATION OF BINDING GROUPS IN THE B12 MOLECULE. L.M.Meyer, P.G.Reizenstein, E.P.Cronkite, L.F.Miller and C.W.Mulzac: Brit. J. Haemat., 1963, 9, 158-163 (South Nassau Communities Hosp., Oceanside, N.Y., U.S.A.) Protein-binding sites of the porphyrin moiety were studied by comparing the binding capacity of serum for radio-hydroxocobalamin with that for radio-cyanocobalamin. The effects of adding non-radioactive analogues, with substituted amide groups in the pyrrol ring sidechains, before testing the binding of radiocyanocobalamin showed that the amide groups appear to be involved. Two phases are present in cyanocobalamin binding. In phase I, the amide groups are probably involved. Differences between hydroxo- and cyanocobalamin binding and the effecting of NaCN on cyanocobalamin binding in phase II suggest that the Co-group is involved in phase n. J.Sneath

3210. EXCHANGE BETWEEN FREE AND GASTRIC JUICE-BOUND CYANOCOBALAMIN. R.M.Donaldson, jun. and J.H.Katz: J. clin. Invest., 1963, 42, 534-545 (Med. Radioisotope Services, Boston V.A. Hosp., Boston, Mass., U.S.A.) Exchange between free and gastric juice-bound [6^{Co}]cyanocobalamin was demonstrated in vitro, the exchange involving intrinsic factor, as studied with human and rat gastric juice. Exchange was also shown between the endogenous vit. B12 of rats and gastric juice-bound [60Co]cyanocobalamin. K.Jones

3211. EFFECT OF HIGHLY PURIFIED VITAMIN B12 BINDERS FROM HUMAN GASTRIC JUICE ON B12 ABSORPTION IN RATS. K.Okuda and R.Grasbeck: Proc. Soc. exp. Biol., N.Y., 1962, 111, 808-810 (Dept. Med., Yamaguchi Med. Coll., Ube, Japan) Two highly purified vit. Bi2-binding fractions prep., as their [60Co]Bi2 complexes from human gastric juice were tested in rats for intrinsic factor [IF] activity and biol. prop. The electrophoretically rapid binder showed no IF or inhibitory effect while the slow mobility fraction which has a higher B12 binding capacity exhibited IF activity upon [60Co]Bi2 which was bound to it. M.M.Shapland

3212. IMMUNOLOGIC IDENTIFICATION AND QUANTITATION OF HUMAN INTRINSIC FACTOR IN GASTRIC SECRETIONS. G.H.Jefferies and M.H.Sleisenger: J. clin. Invest., 1963, 42, 442-449 (Dept. Med., New

York Hosp. Cornell Med. Center, New York, U.S.A.) Intrinsic factor could be identified by in vivo vit. B12 test and by its sp. reaction in vitro with antihuman intrinsic factor y-globulin. Thus, an in vitro test for intrinsic factor and a method of measuring sp. intrinsic factor binding of vit. B12 were established. K.Jones

3213. EFFECT OF VITAMIN B32 DEFICIENCY ON CHOLESTEROL METABOLISM. E.E.Icayan and B.F. Chow: J. Nutr., 1962, 78, 109-114 (Johns Hopkins Univ., Sch. Hyg. and Public Health, Dept. Biochem., Baltimore, Md., U.S.A.) Vit. B12 deficiency in McCollum rats results in: low total cholesterol content of liver and serum in the c/ but not in the 9; an increase in the incorporation of [14C]acetate into the cholesterol of liver which is reversed by the administration of vit. B12*, and a higher sp. activity of liver cholesterol after administration of [14C]acetate. In the deficient state the oxidation of acetate is not impaired. A.Fleck

3214. ENERGY-REQUIRING REDUCTION OF NICOTINAMIDE NUCLEOTIDE BY ASCORBATE IN PRESENCE OF COENZYME Q OR MENADIONE. D.R.Sanadi: J. biol. Chem., 1963, 238, PC 482 (GetontoL Branch, Nat. Heart Inst., Bethesda, Md., U.S.A.) Mitochondrial fragments from ox heart catalyse reduction of NAD by ascorbic acid in presence of coenzyme Qi or J^enadione. The reduction is almost completely inhib. ^ DNP, dicoumarol and oligomycin. The activity of J^te system is markedly reduced by washing the fragments, but is restored when the sol. protein fraction is added. J.N.Ashley

3215. ACTIVE TRANSPORT OF ASCORBIC ACID IN ADRENAL CORTEX AND BRAIN CORTEX IN VITRO AND EFFECTS OF ACTH AND STEROIDS. S.K.Sharma, R.M.Johnstone and J.H.Quastel: Canad. J. Biochem., 1963, 41, 597-604 (McGill-Montreal Gen. Hosp. Res. Inst., 3619 Univ. St., Montreal, Que., Canada) The uptake of [1-14C]ascorbic acid by rat brain cortex slices and by guinea-pig adrenal cortex slices was studied in Warburg manometric apparatus. Ratios of tissue [¹⁴C]ascorbic acid to medium [1-14C]ascorbic acid greater than 4 were obtained with both tissues. The uptake of [1-¹⁴C]ascorbic acid was inhib. by ouabain and ACTH in brain cortex slices. ACTH inhib. the uptake of [1-14C]ascorbic acid in adrenal cortex slices but not in brain cortex slices; the presence of glucose was necessary for the inhibn. The uptake was inhib. also by small concn. of several steroids. J.B.Parish

3216. DEGRADATION OF DNA BY ASCORBIC ACID: INTERMEDIATE FORMATION OF OH RADICALS. K.Bernies: Helv. chim. Acta, 1963, 46, 57-60 (Chemische Forschungsabteilung der F.Hoffmann-La Roche and Co, AG, Basel, Switzerland) Ascorbic acid in soln. in titr. Presence of mol. O₂ causes a degradation of DNA. This degradation can be completely suppressed by the addition of catalase or of H₂O₂. It is concluded that the degradation of the DNA is due to the formation of H₂O₂ during the autoxidation of ascorbic acid. H₂O₂ itself is not very potent in degrading DNA, but it is reduced by ascorbic acid to OH radicals which degrade the DNA. A.D.Smith

3217. PROTECTION OF CHICKS AGAINST VITAMIN B DEFICIENCY BY ASCORBIC ACID AND SORBITOL. J.Calet and T.Terroine: Arch. Sci. physiol., 1962, 273-304 (Stat. Rech. Avicoles du C.N.R.Z.. Jouy-en-Josas, (S.-et-O.), France) Male chicks 10 days

to 3 weeks old (Rhode-Wyandotte crosses) were given diets deficient in riboflavin or all B vitamins and/or supplemented with 0'5, 1, 3 or 4% ascorbic acid or 4% sorbitol for 2-5 weeks. 1% ascorbic acid prevented or cured the drop in growth rate and appetite and increase in mortality due to riboflavin deficiency by maintaining normal hepatic concn. of riboflavin. 0-5-4% ascorbic acid and 4% sorbitol maintained normal growth and appetite despite a deficiency of all B vitamins. When added to a complete diet 0-5-4% ascorbic acid tended to decrease growth rate and appetite.

(French) S. A. Thistlewood
3218. BOUND ASCORBIC ACID IN LIVER. M.CMalakan

Nature, Lond., 1963, 198, 185 (Dept. Appl. Chem., Univ. Coll. Sci. and Technol., Calcutta, India) In fresh goat liver, the total and free ascorbic acid content were determined in ethanol extracts by paper chromatographic techniques. Bound ascorbic acid was released by hydrolysis with metaphosphoric acid. G.M.Lewis

3219. TRACER STUDIES ON ASCORBIC ACID FORMATION IN PLANTS. F.A.Loewus: Phytochemistry, 1963, 2, 109-128 (West. Reg. Res. Lab., Albany, Calif., U.S.A.) Tracer studies on detached ripening strawberries and detached parsley leaves have revealed 2 processes of L-ascorbic acid formation in higher plants.

In one process, D-glucose and related sugars are utilised as their hexose phosphates, C-1 of the sugar being oxidised to form the carboxyl carbon at C-1 of the ascorbic acid. Epimerisation occurs at C-5. Except for a partial equilibration of the hexose phosphate with triose and pentose phosphates, the C₆ chain is utilised without cleavage. In the second process, L-ascorbate is formed from exogenously supplied D-glucuronolactone or D-galacturonate methyl ester. Here the carboxyl C-6 becomes C-1 of L-ascorbate. There is no cleavage of the carbon chain in the conversion. D-glucuronic acid is not utilised for L-ascorbate synthesis. B.H.Davies

3220. PREPARATION OF 'KETONE 250' DERIVED FROM VITAMIN D OF LIVERS OF TUNNY FISH. Y.Raoul and M.le Boulch: Bull. Soc. Chim. biol., Paris, 1963, 45, 145-155 (Lab. Physiol., Fac. Pharm., 4, Paris, France) Note. (French) J.C.Crawhall

3221. IN VITRO STUDIES ON THE FATE OF 0C-TOCOPHEROL IN RAT LIVER HOMOGENATES. C.R.Seward and L.M.Corwin: Arch. Biochem., 1963, 101, 71-74 (Div. Biochem., Walter Reed Army Inst. Res., Walter Reed Army Med. Center, Washington, D.C., U.S.A.) Incubation under conditions shown to prevent a metabolic oxidative lesion did not lead to formation of new active vitamin metabolites. The tocopherol appeared to be bound to the protein during incubation. B.M.Stevens

3222. SYNTHESIS OF NAPHTHOTOCOPHEROL. L.H.Chen and R.D.Dallam: Nature, Lond., 1963, 198, 386 (Dept. Biochem., Univ. Louisville Sch. Med., Louisville, Ky., U.S.A.) A method is described for the synthesis of naphthotocopherol using p-dioxane as the reaction medium. This avoids ester formation and yields a product free of contamination by the acetate. G.M.Lewis

3223. CHEMISTRY OF VITAMIN E. I. INVERSION OF CONFIGURATION ON CARBON-2 OF NATURAL (2R,⁴R,⁸R)-a-TOCOPHEROL. P.Schudel, H.Mayer, J.Metzger, R.Ruegg and O.Islen: Helv. chim. Acta, 1963, 46, 333-343 (Chem. Forsch. F.Hoffmann-La Roche and Co. A.C., Basel, Switzerland)

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(2S,4^fR,8^fR)-a-Tocopherol with unnatural configuration at C-2 is prep, by oxidation of natural, so called (+)-(X-tocopherol, which has the (2R,4^fR, 8^fR)Reconfiguration, to Otocopherylquinone, followed by recyclisation of the corresponding Ot-tocopherylhydroquinone. The configuration of C-2 of natural CC-tocopherol is retained during the FeCl₃ oxidation and is predominantly inverted by Zn&2 cyclisation of CC-tocopherylhydroquinone.

(German) A.D. Smith

3224. TISSUE CONCENTRATIONS OF COENZYME Q, UBICHROMENOL AND TOCOPHEROL IN RELATION TO PROTEIN STATUS IN THE RAT. V.C.Joshi, J.Jayaraman and T.Ramasarma: Biochem. J., 1963, 88, 25-31 (Dept. Biochem., Indian Inst. Sci., Bangalore, India) Protein deprivation in the diet of adult and weanling rats resulted in lowering the amounts of coenzyme Q and ubichromenol in liver and heart. The amounts of coenzyme Q and ubichromenol in liver and heart of weanling rats increased with the increase in the % of protein in the diet. The coenzyme Q concn. in kidney, spleen and brain were little affected. Addition of phenylalanine or coenzyme Q to the diet with 6% of casein increased the coenzyme Q in the liver. The liver-succinoxidase activity markedly decreased as the protein concn. in the diet decreased. Addition of coenzyme Q or phenylalanine to the diet with 6% of casein did not increase the liver-succinoxidase activity.

3225. ISOLATION AND IDENTIFICATION OF A NAPHTHOQUINONE FROM ELECTRON TRANSPORT PARTICLES OF MYCOBACTERIUM PHLEI. M.M.Weber, G.Rosso and H.Noll: Biochim. biophys. Acta, 1963, 71, 355-363 (Dept. Microbiol., St. Louis Univ. Sch. Med., St. Louis, Mo., U.S.A.) The naphthoquinone was identified by chromatography as a vit. K(45) and by i.r. spectroscopy as a vit. K₂(45). The compound restored NADH₂ oxidase activity to isoctane extracted particles and reactivated the NADH₂ oxidase of a crude extract which had been exposed to 360 m/i light. NADH₂ oxidase activity was not restored to light exposed particles.

B.M. Stevens

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3226. EFFECT OF HORMONES ON LIPOLYSIS AND ESTERIFICATION OF FREE FATTY ACIDS DURING INCUBATION OF ADIPOSE TISSUE IN VITRO. M.Vaughan and D.Steinberg: J. lipid Res., 1963, 4, 193-199 (Lab. Metabolism, N.H.I. N.I.Hlth., Bethesda, Md., U.S.A.) Glycerol release, taken as a measure of the rate of lipolysis, was stim. by adrenaline, noradrenaline, glucagon, ACTH, TSH, and growth hormone. Esterification was accelerated by adrenaline and other lipolytic hormones. 10-2M NaF which did not interfere with glycerol release in the absence of hormone, markedly diminished glycerol release in the presence of adrenaline, ACTH or growth hormone.

J.R.Sargent

3227. RELEASE OF FREE FATTY ACIDS BY ADIPOSE TISSUE FROM RATS TREATED WITH TRIIODOTHYROIDINE OR PROPYLTHIOURACIL. D.Deykin and M.Vaughan: J. lipid Res., 1963, 4, 200-203 (Section on Metabolism, N.H.I. N.I.Hlth., Bethesda, Md., U.S.A.) Adipose tissue from propylthiouracil-treated rats released less free fatty acids [FFA] into the medium

and had lower concn. of FFA than tissue from euthyroid animals. Elevation of concn. of tissue FFA and enhancement of FFA release induced in normal tissues by addition of adrenaline to the medium was not observed in tissues from propylthiouracil-treated animals. Rate of lipolysis and rate of esterification of FFA in adipose tissue was increased in rats treated with triiodothyronine.

J.R. Sargent

3228. CHEMISTRY AND BIOCHEMISTRY OF INSECT HORMONES. P.Karlsorc Angew. Chem., 1963, 2, 175-182 (Physiologisch-chemisches Inst. Univ. MQnchen, Germany) Review. 73 ref. K.Brew

3229. BIOGENESIS OF ECDYSONE [INSECT MOULTING HORMONE]. I. TRANSFORMATION OF CHOLESTEROL INTO ECDYSONE. P.Karlson and H.Hoffmeisten Hoppe-Seylers Z. physiol. Chem., 1963, 331, 298-300 (Physiol.-Chem. Inst. Univ., Munich, Germany) By injecting [³H]cholesterol into *Calliphora* larvae it was shown that cholesterol is a precursor of ecdysone.

(German) L.Cornish

3230. PROTEIN NATURE OF THE BRAIN HORMONE OF INSECTS. M.Ichikawa and H.Ishizaki: Nature, Lond. 1963, 198, 308-309 (Zool. Inst., Coll. Sci., Univ.

Kyoto, Japan) The insect brain hormone extracted from *Bombyx* brains is non-dialysable, pptd. by acetone, (NH₄)₂SO₄ and TCA, inactivated by heat at pH more acidic or alk. than 6.0 and by 2 bacterial proteinases, although pepsin and trypsin were ineffective. It is assumed that the brain hormone is a protein: G.M.Lewis

3231. IMMUNOASSAY OF INSULIN WITH INSULIN-ANTIBODY PRECIPITATE. C.N.Hales and P.J.Randle: Biochem. J., 1963, 88, 137-146 (Dept. Biochem., Univ. Cambridge, England) Three new methods of immunoassay of insulin with anti-(human insulin) serum, ¹³¹I-labelled ox insulin and rabbit anti-(guinea-pig y-globulin) serum are described. With ¹²⁵I-labelled insulin of sp. activity 5-20 mc/mg., 6 x 10⁻⁶ I.U. (6 microunits) of human insulin/ml, can be detected with these methods. The plasma insulin concn. in 5 normal people was (in microunits/ml): after starvation, 16; and 30, 60 and 150 min. after the oral administration of glucose (50 or 100 g. respectively), 64 and 158, 65 and 49, and 22 and 21 respectively. *

3232. RATIOS OF TOTAL OXIDISED TO TOTAL REDUCED DIPHOSPHOPYRIDINE NUCLEOTIDES IN LIVERS OF NORMAL AND DIABETIC RATS. M.A.Spi and S.W.Milsteire Endocrinology, 1963, 72, 829-830 (Pharmacol. Dept., Hahnemann Med. Coll., Philadelphia, Pa., U.S.A.) When NAD and NADH₂ were extracted from rat livers at pH 7.4 the ratio NAD/NADH₂ was the same for normal and alloxan-diabetic rats. Total nucleotide content was slightly higher for diabetic animals.

H.C.Jones

3233. CHROMATOGRAPHIC SEPARATION OF GLUCAG^{0*} AND INSULIN FROM SERUM BY RESIN-EXCHANGE PAPER. L.L.Wiesel, V.Positano, Y.Kologlu and G.E. Anderson: Proc. Soc. exp. Biol., N.Y., 1963, 112, 515-518 (Dept. Med., Brooklyn Hosp., New York, U.S. A.) Resin exchange paper impregnated with 3jin Amberlite IRC was used to separate glucagon and insulin from mixtures with non-sp. serum and y-globulin. Relatively large amounts of the hormones were used and improvements in the technique are needed in order to demonstrate the hormones at normal serum concn.

D.N.Wheatley

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- 323** THE TM A A O N A L PECTS IN VITRO ON AMINO ACID INCORPORATION INTO RAT ADRENAL PROTEIN: ACTH AND GROWTH HORMONE. E.D.Bransome, jun. and W.J.Reddy: Arch. Biochem., 1963, 101, 21-30 (Dept. Biol. Chem., Harvard Med. Sch., Boston, Mass., U.S.A.) Either hormone separately increased uniformly labelled [^{14}C]glycine or [^{14}C]lysine incorporation but the 2 together inhib. A dose response relationship was obtained with both hormones. Either hormone ~~but neither~~ ^{the SIV ie in} $\text{K}^+ \text{-Wnger HCO}_3^-$ or phosphate buffer out 10mM glucose inhib. Significant amino acid incorporation occurred in 15 min. incubation; incorporation increased with time for 1 hr. Increasing the glycine concn. 20-fold did not decrease incorporation.

B.M.Steve

323 DISCUSSION OF OBSERVATIONS ON BLOCKAGE OF PITUITARYTM PRODUCTION OF ACTH AS INDICATED BY ADRENAL ASCORBIC ACID DEPLETION. M.C.Cann and nd Stephenson's Canada - J. Biochem., 1963, 41, 1084-1087 (Food and Drug Lab., Dept. of Nat. Health and Welfare, Tunney's Pasture, Ottawa, Ont., conf ^ a da ^) Blockage of the adrenal-pituitary axis could be achieved with prednisolone, dexamethasone, α -methylprednisolone acetate, 9CX-fluoroprednisolone acetate and triamcinolone. The log-dose of ACTH and the adrenal ascorbic acid depletion were related linearly in untreated rats, prednisolone-blocked rats and those given pentobarbital Na. Prelim, comm. J.B.Parish

323 ACTION OF ACTH ON CORTICOID SYNTHESIS IN VITRO. P.Jouaik C.R. Soc. Biol., Paris, 1962, 156, 1567-1569 (Lab. Chimie biol., Fac. Méd., Vitry, France) The corticosteroids, synthesised in fragments of rat adrenal, were identified chromatographically as steroid XI, X₂, aldosterone, steroid X3, of A¹sterone and 11-dehydrocorticosterone. Addition of ACTH to the incubation medium did not modify corticosteroid synthesis. No activation of aldosterone formation occurred. There was slight decrease in formation of steroid *2 and X3, aldosterone and corticosterone II, a slight increase in 11-dehydrocorticosterone.

324 EFFECT OF TRICHLORACETIC ACID ON B¹⁰-S³⁵ CORTICOTROPHIN CONTENT OF HUMAN PITUITARY GLANDS: EXTRACTION OF LOW MUSCULAR WEIGHT CORTICOTROPHIN. A.Currie (Padi, Davie K, Div. of Imperial Cancer Res. Fund., Lincoln's Inn Field, St London, England) 2-5% TCA causes loss of $\text{P}^{35}\text{A}-\text{C}^{10}\text{H}_2$ staining of basophil granules of the pituitary and some extraction of ACTH into the TCA. This forms a complex with ACTH, which is about 30% of the total. The content of the glands is a single component with a molecular weight at least 3200. The characterisation and column extraction was by ultrafiltration and Sephadex G-100. This method of extraction recovers 68% of the original activity in the TCA extract.

325 XYDANTIN TEST FOR OVARIAN ASCORBIC ACID DEPLETION TEST FOR LUTEINISING HORMONE. H.B.Waynfirth, E.Safiz, R-Gulllemin: Endocrinology, 1963, 72, 804-812 (Lab. Monol. exp. Endocrinol, Coll. de Pletz, Paris, France) The ovarian ascorbic acid assay is good for measuring LH activity was satisfactory but modifications are described using Wistar rats. H.C.Jones

326 XXTTM PITUITARY LACTOGENIC HORMONE. A.A. ANALYSIS OF STATE OF AGGREGATION OF OVINE HORMONE BY ULTRACENTRIFUGATION AND EXCLUSION CHROMATOGRAPHY. P. G. Squire. B.Starman and C.H.Li: J. biol. Chem., 1963, 238, 1389-1395 (Hormone Res. Lab., Univ. California, Berkeley, Calif., U.S.A.) Prep. of ovine prolactin obtained by sedimentation velocity from pH 1^{1/2} to 3^{1/2} and 7^{1/2} to 10-1 all contain appreciable amounts of high mol. wt. material. This consists of association products of the hormone that are not in equilibrium with monomer. Reversible association reactions of the monomer occur between pH 1^{1/2} and 8. Essentially pure monomer is obtained by ultracentrifugation and by exclusion chromatography on Sephadex. The mol. wt. of the monomer is 23300. J.N.Ashley

3240. EFFECT OF REPLACEMENT OF CARBONAMIDE GROUP BY HYDROGEN IN GLUTAMINE OR ASPARAGINE RESIDUE OF OXYTOCIN ON ITS BIOLOGICAL ACTIVITY. V.du Vigneaud, G.S.Denning, jun., S.Drabarek and W.Y.Chan: J. biol. Chem., 1963, 238, (Dept. Biochem., Cornell Univ. Med. Coll., New York, U.S.A.) 4- and 5-decarbonamido-oxytocin are synthesised. The latter compound is virtually inactive in the depressor, oxytocic, pressor, and antidiuretic tests, whilst the former analogue has some activity but it is considerably less active than oxytocin. The results show that the presence of the carbonamido group of the asparagine residue at position 5 of oxytocin is vital for activity of the hormone. J.N.Ashley

3241. IN VITRO RELEASE BY THE TOAD BLADDER OF AN INHIBITOR OF OXYTOCIN. A.Karlin: Biochem. biophys. Res. Comm., 1963, 11, 44-49 (Rockefeller Inst., New York, U.S.A.) Expt. are described showing the release of a non-dialysable inhibn. of oxytocin from the toad bladder in vitro. B.Ketterer

3242. SYNTHESIS AND BIOLOGICAL PROPERTIES OF 1-DESAMINO-8-LYSINE-VASOPRESSIN. R.D.Kimbrough, jun., W.D.Cash, L.A.Branda, W.Y. Chan and V.du Vigneaud: J. biol. Chem., 1963, 238, 1411-1414 (Dept. Biochem., Cornell Univ. Med. Coll., New York, U.S.A.) The synthesis of this peptide is described. This desamino analogue shows in a high degree the typical biol. effects of 8-lysine-vasopressin. The antidiuretic, avian depressor, and oxytocic activities are higher than those of 8-lysine-vasopressin. The milk-ejecting activity is approx. the same as that of the parent compound, whilst the pressor activity is approx. half that of the parent compound. Thus the free (X-amino group on the terminal half cysteine residue of 8-lysine-vasopressin is not essential for production of the biol. effects of this polypeptide hormone studied so far. J.N.Ashley

3243. COMPARISON OF SYNTHETIC AND NATURAL ARGinine-VASOPRESSIN. R.O.Studen Helv. chim. Acta, 1963, 46, 421-425 (Chem. Forsch. F.Hoffmann-La Roche and Co. AG., Basel, Switzerland) Synthetic arginine-vasopressin, obtained using the tosyl group for protection of the guanidino group of the arginine residue, proved to be identical with the freshly isolated natural hormone by physico-chem. and biol. methods. (German) A.D. Smith

3244. THYROID FUNCTION IN CHICKENS AND RATS. EQUILIBRATION OF INJECTED IODIDE WITH EXISTING THYROIDAL IODINE IN WHITE LEGHORN COCKERELS. L.L.Rosenberg, G.Laroche and M.K.Dimick: Endocrinology, 1963, 72, 759-763 (Anat. Dent., California)

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Univ., Berkeley, Calif., U.S.A.) 48 hr. after the injn. of 1311 into cockerels the relative distribution in the thyroidal iodo-amino acids was identical with 1271.

H.C.Jones

3245. IODOPROTEIN IN THE THYROID LYMPH OF PRIMATES. P.M.Daniel, M.M.Gale, L.G.Plaskett and O.E.Pratt: Nature, Lond., 1963, 198, 392-393 (Dept. Neuropathol., Inst. Psychiatry, Maudsley Hosp., Denmark Hill, London, England) Baboons were inj. with 50-100 (¹³¹I and the lymph draining the thyroid gland examined for radioactive compounds. The major component was an iodoprotein, which on hydrolysis yielded an amino acid pattern corresponding closely with that of thyroglobulin.

G.M.Lewis

3246. DIALYSABLE IODOCOMPOUNDS OF RAT THYROID GLAND. J.F.B.Haney and S.Lissitzky: Gen. comp. Endocr., 1963, 3, 139-148 (Biochim. Méd., Fac. Méd. Pharm., Blvd d'Alès, Marseilles, France)

The distribution of the free iodo compounds of the thyroid as a function of time after the injn. of a single dose of ¹³¹I was investigated by dialysis and chromato-electrophoresis. Analysis of the free iodo-org. fraction and bound iodotyrosines showed that the ¹³¹I was first incorporated into free iodopeptide, then free 3-iodotyrosine [IT], bound IT, free 3,5-diiodotyrosine [DIT], and bound DIT.

S. A.Carney

3247. COMPARATIVE METABOLISM OF RADIOISOTOPES IN MAMMALS. II. RETENTION OF IODINE-131 BY FOUR MAMMALIAN SPECIES. J.E.Furchner and CR-Richmonck: Health Physics, 1963, 9, 277-282 (Los Alamos Scientific Lab., Univ. California, Los Alamos, N.Mex., U.S.A.) Small doses (0.3 μ Ci for mice up to 4.0 μ Ci for monkeys) of ¹³¹I were given to mice, rats, dogs and monkeys, and whole body activities measured for 6-7 weeks. In rats and mice the retentions comprise 3 component equations, whilst in dogs and monkeys 2 component systems suffice. The majority of the body-load was equally distributed between the thyroid and the pelt. Much smaller amounts were found in the gut, muscle and bone. Certain small differences in retention and excretion were found in rats and mice after oral and I.p. administration.

M.S. Lave rack

3248. EFFECTS OF VARIOUS COMPOUNDS ON BINDING OF THYROXINE TO SERUM PROTEINS IN RAT.

J.M.Hershman: Endocrinology, 1963, 72, 799-803 (Med. Dept., Tufts Univ. Med. Sch., Boston, Mass., U.S.A.) Injns. of salicylate, DNP or oestradiol into rats inhib. the binding of L-thyroxine to serum proteins but diphenylhydantoin did not. When substances were added in vitro to pooled rat serum it was found that analogues of thyroxine containing a 3,5-diiodo-4-phenolate group and L-3,5,3'-triiodothyronine and 3,5,3'-triiodothyroacetic acid all inhib. thyroxine binding.

H.C.Jones

3249. FIXATION OF THYROID HORMONES BY NUCLEATED BLOOD CORPUSCLES FROM VARIOUS SOURCES. J.Roche, L.Covelli, V.Macchia and S.Aloj: CR. Soc. BioL, Paris, 1962, 156, 1746-1750 (Lab. Biochim. gen.. Coll. France, Paris, France)

Suspensions of nucleated blood corpuscles from Anas platyrhynchos, Scylloarinus canicula and Sipunpus nudus fixed the thyroid hormones, 3,5,3'-triiodo-L-thyronine and L-thyroxine. Uptake of triiodo-L-thyronine was more rapid than of L-thyroxine. No fixation of 3-monooiodo-L-tyrosine or 3,5-diiodo-L-tyrosine occurred. These compounds remained in the extracellular spaces of the blood corpuscle suspension.

(French) M.A.Price

3250. METABOLISM OF LABELLED 3,5,3'-TRIIDEO-THYRONINE BY MOUSE PITUITARY TUMOUR.

E.M.Volpert, J.Tierney and S.C.Werner: Endocrinology*, 1963, 72, 831-832 (Biochem. Dept., Columbia Univ. Coll. Phys. Surg., New York, U.S.A.) Inj. triiodothyronine collected and metabolised by mouse thyrotropic and adrenotropic tumours in the same way as by the normal tissues.

H.C.Jones

3251. OXIDATIVE PHOSPHORYLATION AND GLYCOLYSIS IN RAT HEART MUSCLE IN EXPERIMENTAL THYROTOXICOSIS. P.M.Samoylov: Vop. Med. Him., 1963, 9, 188-196 (Lab. Biochem., Inst. Pharmacol. and Chemotherapy, Acad. Med. Sci. of U.S.S.R., Moscow, U.S.S.R.) Oxidation of lactate occurred in

rat heart homogenates 3-7 months after administration of thyroid hormone but not in normal heart muscle homogenates. During oxidation of lactate NADH₂ was oxidised by mitochondria without coupled phosphorylation. Oxidation of other endogenous substrates was decreased in thyrotoxicosis, but phosphorylation was unaltered. In advanced thyrotoxicosis the total phosphorylating ability of mitochondria was slightly decreased.

J.R. Sargent

3252. ACTION OF THYROXINE ON OXIDATIVE PHOSPHORYLATION IN INSECT MITOCHONDRIA.

P.Karlson and A.Schulz-Enders: Gen. comp. Endocr., 1963, 3, 111-119 (Physiol.-chem. Inst. Univ. Munich** Germany) Uncoupling of oxidative phosphorylation occurred in mitochondria from the thoracic (flight) muscles of the desert locust, Schistocerca gregaria, and from rat liver both after injn. of thyroxine into intact animals and after incubation of mitochondria in 10~5M thyroxine soln. E.M. revealed no difference between normal and thyroxine-treated mitochondria.

(German) S.A.Carney

3253. ACTION OF L-THYROXINE AND OF CYANOGEN IODIDE ON MITOCHONDRIAL MORPHOLOGY AND OXIDATIVE PHOSPHORYLATIONS. J.Roche, R.Michel, J.E.Rall, O.Michel, M.Girard and S.Varrone: Biochim. gén. et comparée, Coll. de France, Paris, France)

Effects were studied after inhibn. of electron transport at various points in the respiratory chain and following restoration of oxidative phosphorylation by addition of appropriate electron acceptors or donors. Prelim, com^{pl} (French) B.M.Stevens

3254. THYROXINE STIMULATION OF AMINO ACID INCORPORATION INTO PROTEIN. LOCALISATION OR STIMULATED STEP. L.Sokoloff, S.Kaufman, P.L. Campbell, C.M.Francis and H.V.Gelboin: J. biol. Chem., 1963, 238, 1432-1437 (Lab. din. Sci. and Cell. Pharmacol., N.I.H., Bethesda, Md., U.S.A.)

Stimn. by L-thyroxine of incorporation of amino acid into protein in a cell-free rat liver system occurs at the stage that involves transfer of sol. RNA bound amino acid to microsomal protein. The effect on the transfer step is as great as or greater than that on the incorporation of & free amino acid. L-Thyroxine has no effect on incorporation of amino acid into amino-acyl-sol. RNA. The effect on the transfer step requires mitochondria and an oxidisable substrate. When these 2 components of the system are replaced by a creatine phosphate-ATP generating system, no thyroxine effects are observed. L-Thyroxine stimn. the transfer step occurs in presence of GTP, the only known essential nucleotide requirement for this step. Reduced glutathione stimulates the reaction markedly and only partially reduces the thyroxine effect.

J.N.Ashley

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3255. ADIPOKINETIC ACTION OF POLYPEPTIDE AND AMINE HORMONES UPON THE ADIPOSE TISSUE OF VARIOUS ANIMAL SPECIES. D.Rudman: J. lipid Res., 1963, 4, 119-129 (Columbia Univ. Res. Service, Goldwater Mem. Hosp. and Dept. Med., Columbia Univ., Coll. of Surg., New York, U.S.A.) Review. J.R.Sargent
198 ref.

3256. INFLUENCE OF SUBSTANCE RELEASED BY ACTING MUSCLE ON METABOLISM OF MUSCLE AND OTHER ORGANS. E.Wertheimer and S.Becte Bull. Res. Counc. Israel, A, 1963, 11, 359-372 (Dept. Biochem., Hebrew Univ., Hadassah Med. Sch., Jerusalem, Israel) The factor released in muscular action increased the glucose transport in vitro not only into muscle but also into brain, lung and especially into adipose tissue. It also increased the O₂ consumption in vitro by diaphragm, brain, lung, adipose tissue, kidney and liver. The factor retained its activity under anaerobic conditions. It increased (X-aminoisobutyric acid transport into diaphragm and the incorporation of several amino acids into muscle protein. L.G.Gillies

3257. NEW METHOD FOR THE PREPARATION OF SKELETAL MUSCLE RELAXING FACTOR. C.J.Parker, jun. and J.Yun: Biochem. biophys. Res. Comm., 1963, 11, 88-91 (Dept. Physiol. Chem., Wayne State Univ., Coll. Med. Detroit, Mich., U.S.A.) Prep. of relaxing factor of high activity, free of the enzyme activity producing it, were obtained by treating the relaxing factor granules with org. mercurials. B.Ketterer

3258. ACTION OF NORADRENALINE ON TRANSPORT OF FATTY ACIDS AND TRIGLYCERIDES BY ISOLATED PERFUSED RAT LIVER. M.Heimberg and N.B. Eizette: Biochem. Pharmacol., 1963, 12, 392-394 (Dept. Pharmacol., Sch. Med., Vanderbilt Univ., Nashville, Tenn., U.S.A.) Short comm. L.G.Gillies

3259. DETECTION OF INTERMEDIATE OXIDATION STATES OF ADRENALINE AND NORADRENALINE BY FLUORESCENCE SPECTROMETRIC ANALYSIS. W.H.Harrison: Arch. Biochem., 1963, 101, 116-130 (Dept. NeuroL, Coll. Phys. Surg., Columbia Univ., New York, U.S.A.) Cu²⁺, Fe³⁺/MnO₂. tyrosinase affected the formation of fluorescent intermediate oxidation states at near physiol. pH and redox. Prop. of P-ducts indicated that they were states of different reversible redox systems from the containing previously known oxidation intermediates. Compounds were stable in the oxidation system which disappeared but fluorescence disappeared on treatment with cyanide. Ascorbic acid reversed this oxidation. Ferric cyanide was the initial oxidising agent the by a nonfluorescent but were rendered fluorescent by treatment. All the intermediates were cursors of the same 3,5,6-trihydroxyindole deriv. B.M.Stevens

3260. INTRACELLULAR DISTRIBUTION OF BRAIN NORADRENALINE AND DE ROBERTIS' NON-CHOLINERGIC NERVE ENDINGS. A.Inouye, K.Kataoka and Y.Shinagawa: Biochim. biophys. Acta, 1963, 71, 491-493 (Dept. Physiol., Kyoto Univ. Sch. Med., Kyoto, Japan) Prelim. communication. B.M. Stevens

3261. RELEASE OF ADRENALINE FROM RABBIT MEDULLA CHROMAFFIN GRANULES. J.P.X⁷NAL McLean and F.Cohen: Life Sci., 1963, No. 4, 265 (Dept. Chem., Parke, Davis and Co., Ann Arbor, Mich., U.S.A.) The spontaneous release of adrenaline from the chromaffin granules was more marked in saline than in sucrose, and increased with increasing temp. Reserpine prevented the loss of adrenaline, while ascorbic acid and isoascorbic acid increased the loss of adrenaline and ATP from the granules. The results demonstrated the ability of reserpine to influence amine transport in chromaffin granules. K.Jones

Arbor, Mich., U.S.A.) The spontaneous release of adrenaline from the chromaffin granules was more marked in saline than in sucrose, and increased with increasing temp. Reserpine prevented the loss of adrenaline, while ascorbic acid and isoascorbic acid increased the loss of adrenaline and ATP from the granules. The results demonstrated the ability of reserpine to influence amine transport in chromaffin granules. K.Jones

3262. EFFECT OF TRIAMCINOLOLONE AND OTHER STEROIDS ON OXIDATIVE PHOSPHORYLATION REACTION. A.Gomez-Puyou, A.Pena-Dias, J.Guzman-Garcia and J.Laguna: Biochem. Pharmacol., 1963, 12, 331-340 (Dept. Biochem., Fac. Med., Univ. Nacional, Mexico, D.F., Mexico) The effect of hydrocortisone, triamcinolone and fluoromethyl-prednisolone on mitochondrial respiration, oxidative phosphorylation ATPase activity and the [32P]ATP exchange reaction was studied. Fluoromethyl-prednisolone did not affect any of the reactions. Hydrocortisone inhibited mitochondrial respiration but did not affect the other reactions. Triamcinolone increased respiration, depressed oxidative phosphorylation and the [32P]ATP reaction and increased the latent ATPase activity of fresh mitochondria. It also inhib. mitochondrial osmotic swelling. L.G.Gillies

3263. INHIBITION OF 19-HYDROXYLASE ACTIVITY IN GOLDEN HAMSTER ADRENAL BY SU 4885. K.Griffiths: J. Endocr., 1963, 26, 445-446 (Dept. Biochem., Univ. Edinburgh, Scotland) The 110-hydroxylase antagonist SU-4885 ('Metopirone') prevented the conversion of DOC to 19-hydroxy-11-deoxycorticosterone by golden hamster adrenal homogenates. G.F.Blane

3264. HYDROXYLATION OF 11-DEOXYCORTICOSTERONE BY ADRENALS OF VARIOUS ANIMAL SPECIES. K.Griffiths: J. Endocr., 1963, 26, 437-444 (Dept. Biochem., Univ. Edinburgh, Scotland) A comparison was made between the 19-hydroxylating systems of the 'fatty' type of adrenal characteristic of man and non-ruminants and the 'non-fatty' type found in ruminants and the golden hamster. Homogenates of non-fatty glands, especially those from golden hamster adrenals were active in converting DOC to 19-hydroxy-11-deoxycorticosterone but homogenates from fatty glands, for example man, dog and pig, were relatively inactive. There was no relationship between the 11p-hydroxylating activity of homogenates and the cortisol/corticosterone ratio reported for the adrenal vein blood of a given sp. G.F.Blane

3265. 8 (3-HYDROXYLATION OF REICHSTEIN'S SUBSTANCES BY MICRO-ORGANISM [CERCOSPORA MELONIS]. K.Tori and E.Kondo: Tetrahedron Letters, 1963, 10, 645-650 (Shionogi Res. Lab., Shionogi and Co. Ltd., Fukushima-ku, Osaka, Japan) Letter. R.H.Kimberlin

3266. SEX-INFLUENCED ACTIVITY OF 30-HYDROXYSTEROID DEHYDROGENASE OF RAT LIVER. B.L.Rubin, H.J.Strecker and E.B.Koff: Endocrinology, 1963, 72, 764-770 (Dept. Obstet. Gynec., Einstein Coll. Med., Yeshiva Univ., Bronx, N.Y., U.S.A.) At low concn. of rat liver tissue the 3@-hydroxysteroid dehydrogenase activity was the same for a and ? animals, but at high tissue concn. the activity of tissue from ? was lower than that of cf ? treated with testosterone, or androstan-3, 17-dione gave activity similar to that of cf and castration of cf reduced the activity to that of f. H.C.Jones

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3267. 20CL-HYDROXYSTEROID DEHYDROGENASE AND 30L-HYDROXYSTEROID DEHYDROGENASE IN HUMAN FOETAL LIVER. C.A.Villee and J.M.Loring: Endocrinology, 1963, 72, 824-828 (Biol. Chem. Dept., Harvard Med. Sch., Boston, Mass., U.S.A.) Human foetal liver homogenates were shown to have 2(XX)-hydroxysteroid dehydrogenase and 3 α -hydroxysteroid dehydrogenase activity by the 25th week. H.C.Jones

3268. STOICHEIOMETRY OF C-21 HYDROXYLATION OF STEROIDS BY ADRENOCORTICAL MICROSOMES. D.Y.Cooper, R.W.Estabrook and O.Rosenthal: J. biol. Chem., 1963, 238, 1320-1323 (Harrison Dept. Surg. Res., Sch. Med., Univ. Pennsylvania, Philadelphia, Pa., U.S.A.) The stoichiometry of C-21 hydroxylation of 17-hydroxyprogesterone by bovine adrenocortical microsomes is studied using an O₂ electrode to determine uptake of O₂ polarographically, whilst NADPH₂ is measured by a fluorimeter for use with turbid soln. The reaction causes increases in consumption of O₂ and oxidation of NADPH₂ that are equiv. to the amount of product formed. J.N.Ashley

3269. LOSS OF THE 4-3-HYDROGEN IN THE CONVERSION OF [4-p-3H]CHOLESTEROL TO CORTISOL BY THE GUINEA-PIG ADRENAL GLAND HOMOGENATE. H.Werbin and I.L.Chaikoff: Biochim. biophys. Acta, 1963, 71, 471-474 (Dept. Physiol., Univ. California, Berkeley, Calif., U.S.A.) B.M.Stevens

3270. GLUCOSE POLYMERISATION AND CORTISOL. H.Hilz, W.Tarnowski and P.Arend: Biochem. biophys. Res. Comm., 1963, 10, 492-497 (Physiol.-Chem. Ifost. der Univ. Hamburg, Germany) Injn. of cortisol acetate into adrenalectomised rats caused an increase in hepatic levels of glucose 6-PO₄ and glycogen synthetase. It is suggested that glucose 6-PO₄ is both an inducer and an activator of glycogen synthetase. B.Ketterer

3271. RELATION OF CORTISONE AND SYNTHESIS OF RIBONUCLEIC ACID TO INDUCED AND DEVELOPMENTAL ENZYME FORMATION. O.Greengard, M.A. Smith and G.Acs: J. biol. Chem., 1963, 238, 1548-1551 (Inst. Muscle Dis., Inc., New York, U.S.A.) Puromycin, an inhibitor of protein synthesis, inhibits the cortisone-induced increase of tryptophan pyrrolase and tyrosine-OC-oxoglutarate transaminase activity (as well as the substrate-induced increase of the latter) in livers of bilat. adrenalectomised rats. Actinomycin abolishes the cortisone induced rise in both enzymes but does not affect the tryptophan-induced increase in the pyrrolase. Development of liver tyrosine-a-oxoglutarate transaminase in newborn rats is inhib. by actinomycin. But neither the antibiotic nor adrenalectomy affects post-natal development of rat liver tryptophan pyrrolase. Probably accumulation of the pyrrolase, unlike that of the transaminase during early post-natal life, is not under the control of adrenal hormones and occurs in spite of marked inhibn. of synthesis of RNA. J.N.Ashley

3272. INFLUENCE OF SEX AND SEX HORMONES ON THE OXIDATION OF [26-14C]CHOLESTEROL BY RAT LIVER MITOCHONDRIA. D.Kritchevsky, S.A.Tepper, E.Staple and M.W.Whitehouse: J. lipid Res., 1963, 4, 188-192 (Wistar Inst. and Dept. Biochem., Univ. Pennsylvania Sch. Med., Philadelphia, Pa., U.S.A.) Mitochondria from 2 rats oxidised cholesterol more rapidly than mitochondria from d" rats. No sex difference occurred with oxidation of propionate. Surgical or chem. castration of

<S rats enhanced cholesterol oxidations while androgen treatment of ? rats depressed cholesterol oxidation. Ovariectomy was without effect in ? rats. Cholesterol oxidation by normal <? or ? rat liver mitochondria was inhib. in vitro by sex hormones. Results indicate that circulating androgen rather than oestrogen levels determine the efficiency of cholesterol oxidation.

J.R.Sargent

3273. IN VIVO METABOLISM OF STEROID HORMONES BY SOCKEYE SALMON. (A) IMPAIRED HORMONE CLEARANCE IN MATURE AND SPAWNED PACIFIC SALMON (ONCORHYNCHUS NERKA). (B) PRECURSORS OF 11-KETOTESTOSTERONE. D.R.Jdler and B.Truscott: Canad. J. Biochem., 1963, 41, 875-887 (Fish. Res. Board Canada, Technol. Stat., Halifax, N.S., Canada) Intra-arterially inj. [4-14C]cortisone and [4-14C]cortisol were cleared from the plasma of sexually mature and spawned sockeye salmon (*O. nerka*) at a much slower rate than from the plasma of immature sockeye salmon and spawned Atlantic salmon (*Salmo salar*). Testosterone and 17(X)-hydroxyprogesterone were precursors of 11-keto-testosterone, present in high concn. in the blood of mature sockeye salmon. Testosterone was formed in vivo from 17CL-hydroxyprogesterone and cortisol was converted to cortisone, but no conversion of the former to 11-keto-testosterone could be demonstrated. J.B.Parish

3274. EFFECT OF DEHYDROISOANDROSTERONE ON IN VIVO CONVERSION OF 17OL-HYDROXPREGNENOLONE TO URINARY II-DEOXY-17-KETOSTEROIDS. A.F.Clark and S.Solomon: J. clin. Endocr., 1963, 23, 481-488 (Dept. Expt. Med., McGill Univ., Montreal, Canada) The increase of circulating pool of dehydroisoandrosterone by oral administration had no significant effect on the total conversion of 17 α -[7 α -³H]hydroxy-pregnanolone to urinary dehydroisoandrosterone, andro* sterone and aetiocholanolone. The data supported the view that metastatic tissue in patients with adrenal carcinoma is responsible for the observed enhanced con* version. K.Jones

3275. VARIATIONS IN THE LEVELS OF ANDROGENS AND GONADOTROPHIC HORMONES IN THE BLOOD OF RATS DURING HEALING OF FRACTURES. A.H.Said. F.A.Soliman, M.S.Abdo and M.K.Soliman: Nature, Lond., 1963, 198, 294-295 (Dept. Surg., Fac. Vet. Med., Univ. Cairo, Egypt) In mature ♂ rats with expt. fractures of the tibia, the level of serum androgens (which have been shown to promote protein anabolism) rises during the 2nd and 3rd weeks post-fracture. Accompanying changes in the levels of luteinising and follicle-stimulating hormones were considered to be related to their function in stimulating the testis. G.M.Lewis

3276. MICROBIOLOGICAL CONVERSION OF 19-NORTES* TOSTERONE. I. 16-HYDROXYLATION. II. 10- AND 11-HYDROXYLATION. J.be Flines, W.F.Van Der Waall, W.J.Mijs and S.A.Szpilfogel. III. 12-HYDROXYLATIC[†] J.De Flines, W.F.Van Der Waard, W.J.Mijs, L.A.Van Dijck and S.A.Szpilfogel. IV. 15-a-HYDROXYLATI[†] J.De Flines, W.F.Van Der Waard, W.J.Mijs and S.A. Szpiifogel. V. 6 3- AND 140,-HYDROXYLATION. J.De Flines, W.F.Van Der Waard, W.J.Mijs, L.A.Van Dijck and S.A.Szpilfogel: Rec. Trav. chim. Pays-Bas, 1963, 82, 121-128, 129-138, 139-142, 143-148, 149-156 (Res. Lab., of Royal Netherlands Fermentation Industries, Delft, Netherlands) I. Using MycosEhSS[‡] ella latebrosa it has been possible to convert 19-nortestosterone to the 16p-hydroxy deriv. The 160C-hydroxy deriv.

was formed during fermentation by Hypomyces aurantius. The reaction was followed by separation of the products by Paper chromatography.

II. Fermentation of 19-nortestosterone with Cervularia iSuata or with Zotrytis paeonia yielded mainly the 10 α -hydroxy deriv. Aspergillus ochraceus produced the 11CX-hydroxy deriv. in good yield.

III. The microbial reaction of 19-nortestosterone with Qolletotrichum derridis yielded mainly 12 β -hydroxy-19 α -nortestosterone. Chem. and physical measurements were carried out to establish the identity of the product.

IV. During "fermentation with a Penicillium equal amount of 15 α -hydroxy-nortestosterone and 15 α -hydroxy-f9-nor-androst-4-one-3,17-dione were produced. The identification of these products is discussed.

V. Using Helminthosporium kusanoi 60-hydroxynortestosterone has been isolated as the main product. No appreciable amounts of products hydroxylated at other positions were detected. G.C.Barr

3277. INFLUENCE OF GONADOTROPINS IN VIVO

UPON THE BIOSYNTHESIS OF ANDROGENS BY HOMOGENATE OF RAT TESTIS. P.F.Hall and K.B.Eik-Nes: Biochim. biophys. Acta, 1963, 71, 438-447 (Dept. Biol. Chem., Univ. Utah Coll. Med., Salt Lake City, Utah, U.S.A.) Treatment of rabbits with gonadotrophins did not stimulate [4-14C]cholesterol conversion to $L^{14}C$ testosterone by testis homogenate. 24 hr., but after 1-12 hr., after treatment of hypophysectomised rats *TM human chorionic gonadotrophin or ICSH, conversion of cholesterol to androgens by testis homogenate was increased. B.M.Stevens

3278. 0-GLUCURONIDASE-RICH CYTOPLASMIC PARTICLES IN ANDROGEN-STIMULATED MOUSE KIDNEY. CYTOBIOCHEMICAL STUDY. A.G.Plaut and W.H.Fishman: J. cell Biol., 1963, 16, 253-258 (Dept. Pathology, Tufts Univ. Sch. Med., Boston, Mass., U.S.A.) Ajax (5 mice of 1-5-4 months received 2 i.p. injn. of 1-I.U. of Follutene. 0-Glucuronidase and acid and alk. phosphatase activity were assayed in the 5 distinct phases which appeared on centrifuging the homogenised kidney in sucrose + NaCl at 120000 fr. A 6-fold increase in total fr-glucuronidase was distributed in all the subcellular components but was greatest in the sedimentable particles. The sp. activity of S? ~ sedimentable p-glucuronidase is increased but that the Phosphatase is unchanged. The independence of response to the stimuli of the different enzymes is discussed. P.Barow

3279. PROSTAGLANDINS, GROUP OF HORMONAL COMPOUNDS OF WIDESPREAD OCCURRENCE.

¹Bergstrom: Biochem. Pharmacol., 1963, 12, 413-414 (Karolinska Inst., Stockholm, Sweden) The structure and potency was reported of 3 compounds from Drosophila Slandin extracts of sperm plasma of man and sheep of sheep ³⁰ the vesicular gland of sheep. A compound similar structure was isolated from normal lungs of sheep and pigs. L.G.Gillies

3280. ⁵CONVERSION IN VITRO OF [I7d-3H]ANDROSTEN-17 α -np,17 β -DIOL INTO [17 α -3H]TESTOSTERONE IN HUMAN ADRENAL AND PLACENTAL TISSUE. Ch-T^{Baileya} E.Wallace and S.Lieberman: J. biol. Chem., 1963, 238, 1316-1319 (Dept. Obstet. Gynec., Columbia Univ., New York, U.S.A.) Incubation of ⁵ys-⁸i of [17 α -3H]androst-5-ene-33,17p-diol with ^{17 α} of ³T^{nat}s ⁸ human placenta or adrenocortical carcinoma ^{WVc} « [17 α -3H]testosterone in 50% and 15% yield.

respectively. This is a possible biosynthetic route for testosterone that does not involve androst-4-enedione as precursor. J.N.Ashley

3281. GAS CHROMATOGRAPHIC IDENTIFICATION OF PROGESTERONE IN HUMAN PREGNANCY PLASMA.

W.Futterweit, N.L.McNiven and R.I.Dorfman²: Biochim. biophys. Acta, 1963, 71, 474-476 (Worcester Found, for Expt. Biol., Shrewsbury, Mass., U.S.A.)

B.M.Stevens

3282. CONVERSION OF PROGESTERONE INTO TESTOSTERONE BY MOUSE OVARY AND ITS RELATIONSHIP TO ADRENAL X ZONE DEGENERATION.

G.P.Vinson and L.Chester Jones: J. Endocr., 1963, 26, 407-414 (Zool. Dept., Univ. Sheffield, England)

Mouse ovaries incubated with progesterone were able to synthesise 16-oxoestrone, 17-epioestriol, 17(X)-hydroxyprogesterone, 20 α -hydroxyprogesterone, androstenedione and testosterone. Best yields of oestrogens were obtained from ovaries of mature virgin females and of testosterone from those of pregnant mice. It is concluded that this testosterone production by the gravid mouse ovary is responsible for the disappearance of the adrenal X-zone during the 1st pregnancy. G.F.Blane

3283. INFLUENCE OF PSEUDOPREGNANCY AND PROGESTERONE ON THE ACTIVITY OF 5-NUCLEOTIDASE IN THE UTERUS OF MICE.

F.B.Lammes and R.G.J. Willighagen: Nature, Lond., 1963, 198, 394-395 (Dept. Pathol., St. Univ. Leyden, Netherlands)

During pseudopregnancy and after progesterone administration to castrated mice resulting in deciduoma production, increased activity of 5-nucleotidase in the endometrial stromata is observed. G.M.Lewis

3284. INFLUENCE OF UTERINE SECRETIONS ON PHAGOCYTOSIS.

J.Killingbeck and G.E.Lamming: Nature, Lond., 1963, 198, 111-112 (Univ. Nottingham,

Sutton Bonington, Loughborough, England) The uptake of Amaranthus starch particles by rabbit w.b.c. was studied after their injn. into rabbit uterine horn under various hormonal conditions and also when cultured in vitro in the presence of flushings from the uterine horns. It was concluded that some factor in the uterine secretion, possibly a seromucoid, under the influence of progesterone inhibits the phagocytic activity of w.b.c. in vivo and in vitro. G.M.Lewis

3285. CORPUS LUTEUM AND STEROID HORMONE FORMATION. H. STUDIES ON HUMAN CORPUS LUTEUM IN VITRO.

W.Y.Huang and W.H.Pearlman: J. biol. Chem., 1963, 238, 1308-1315 (Dept. Biol. Chem., Harvard Med. Sch., Boston, Mass., U.S.A.)

Incubation of Na[3H]acetate with surviving slices of human corpus luteum of menstruation gives [3H]progesterone and other more polar metabolites. Similarly incubation with [7-3H]progesterone yields mainly [3H]-17 α -hydroxyprogesterone and some pregn-4-en-20CX-ol-3-one, whilst incubation with [7-3H]androst-4-ene-3,17-dione gives [3H]oestrone and 17 β -oestradiol. The results, and those of others, show that human corpus luteum of menstruation secretes oestrogen as well as progesterone. The apparent lack of oestrogen secreting function of luteal tissue in other mammals is discussed. J.N.Ashley

3286. METABOLISM OF [4-14C]PROGESTERONE AND [7<X-3H]PREGNENOLONE BY HUMAN ADRENAL TISSUE.

FORMATION OF [14C]16a-HYDROXYPROGESTERONE, [14C]CORTICOSTERONE, AND [14C, 3H]CORTISOL.

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I.Weliky and L.L.Engel: *J. biol. Chem.*, 1963, 238, 1302-1307 (Johns Collins Warren Lab. of Huntington Mem. Hosp. of Harvard Univ., Boston, Mass., U.S.A.) Human hyperplastic adrenal cortical slices convert pregnenolone into cortisol, apparently via 17-hydroxypregnolone, 17-hydroxyprogesterone and deoxycortisol. Progesterone is converted into 16 α -hydroxyprogesterone, corticosterone and cortisol. But pregnenolone is not converted into progesterone, DOC, corticosterone, or 16 α -hydroxyprogesterone. J.N.Ashley

3287. OESTROGENS. V. RELATIONSHIP OF OESTROGENIC ACTIVITY AND MOLECULAR STRUCTURE. T.L.Patton and L.Dmochowski: *Arch. Biochem.*, 1963, 101, 181-185 (Univ. Texas M.D. Anderson Hosp., Houston, Tex., U.S.A.) Changes in oestrogenic activity caused by substituents at positions 2 and 4 of oestrone and 17 β -oestradiol indicated that both the position and structure of the substituent determined oestrogenic activity. Low oestrogenic activity was shown by compounds with substituents large enough to shield the phenolic OH and by those with substituents capable of forming a strong intramolecular H bond with the phenolic OH. B.M.Stevens

3288. CHARACTERISATION OF OESTROGENS. T.H.Simpson and R.S.Wright: *Analyt. Biochem.*, 1963, 5, 313-320 (Dept. Scientific Ind. Res., Torry Res. Station, Aberdeen, England) The use of 2,7-dichlorofluorescein as a nondestructive locating reagent for phenolic steroids on chromatograms is described. A procedure is developed for the adequate characterisation of oestrogens from natural sources. Starting with less than 5 fig. of steroid, this is chromatographed, esterified (formate or acetate), chromatographed again, and saponified. The freed steroid is then chromatographed in a second solvent system, converted to the azo compound derived from Fast Black Salt K, and eluted and the dye rechromatographed. Finally the azo dyes of oestradiol and oestrone are respectively oxidised by chromium trioxide in pyridine and reduced by aq. Na borohydride to the corresponding deriv. of oestrone and oestradiol-17 β . A.D.Smith

3289. ENZYMIC FORMATION OF OESTRONE 3-GLUCURONIDE BY RABBIT-LIVER MICROSOMES. E.R. Smith and H.Breuer: *Biochem. J.*, 1963, 88, 168-172 (Courtauld Inst. Biochem., Middlesex Hosp. Med. Sch., London, England) Oestrone 3-glucuronide was identified as the reaction product after incubation of oestrone with a rabbit-liver microsomal prep., UDP-glucuronic acid being used as the glucuronic acid donor. The reaction showed a max. at pH 8.0-8.2, and Km for oestrone was 97 JJM. The reaction was only slightly affected by the propylene glycol used as solvent for oestrone. Oestrone 3-glucuronide had Rf 0.53 on paper chromatograms (25°) in the system 2-methylpropan-2-ol-1,2-dichloroethane-acetic acid-water (5:15:6:14, by vol.). The results are discussed in relation to the general problem of the physiol. production of oestrogen glucuronides. • A.D.Smith

3290. IDENTIFICATION OF SEX HORMONES IN THE OVARIAN EXTRACTS OF TORPEDO MARMORATA AND BUFO VULGARIS. G.Chielli and C.Lupo: *Gen. comp. Endocr.*, 1963, 3, 149-152 (Inst. Istologia, Fac. Med. e Chir., Univ. Cattolica S. Cuore, Rome, Italy) Methods of chromatography, deriv. formation, and u.v. spectrography were used to identify oestradiol-17 β , oestriol, and progesterone in ovarian extracts of

T. marmorata, and oestradiol-17 β , oestrofet, oestriol, and progesterone in ovarian extracts of B. vulgaris. S.A.Carney

3291. ANALYSIS OF OESTROGENS WITH BROMINE-82. W.R.Slaunwhite, jun. and L.Neely: *Analyt. Biochem.*, 1962, 5, 133-142 (Dept. Med. C, Roswell Park Mem. Inst., Buffalo, N.Y., U.S.A.) A new method for analysis of phenolic steroids is reported. It consists of dibromination with ^{82}Br , a γ -emitter with a half-life of 36 hr. This method is very sensitive (1 mfifg.), reasonably accurate (> 80% recovery from urine, > 95% recovery from plasma at the 10-mifg. level), quite precise ($\pm 3\%$), and highly sp. Specificity is assured by gradient elution chromatography, followed by dil. with carrier and recrystallisation to const. sp. activity. A.D.Smith

3292. DETERMINATION OF URINARY PREGNANEDIOL BY GAS CHROMATOGRAPHY. D.A.Turner, G.E. Seegar Jones, I.J.Sarlos, A.C.Barnes and R.Cohen: *Analyt. Biochem.*, 1963, 5, 99-106 (Biochem. Res. Div., Sinai Hosp., Baltimore, Inc., M.D., U.S.A.) A gas-liquid chromatographic method for the identification and quantitation of urinary pregnanediol [I] is described. Recovery and sensitivity are satisfactory, as little as 0.25 mg. in a 24 hr. urine sample being quant. recovered. Results indicate that I, allopregnanediol and pregnanolone can be separated on a 2 fjo SE-30 column. A.D.Smith

3293. BIOSYNTHESIS AND METABOLISM OF OESTROGENS IN THE RAT. I. THE CONVERSION OF [4-14C]-TESTOSTERONE INTO [14C]OESTRADIOL-17 β BY THE RAT OVARY. S.R.Stitch, R.E.Oakey and S.S. Eccles: *Biochem. J.*, 1963, 88, 70-76 (M.R.C. Radio-biol. Res. Unit, Harwell, Didcot, Berks., England) Sliced ovaries from albino rats were incubated for 5 hr. with [4-14C]testosterone in phosphate buffer containing glucose and gonadotrophin. Oestrone, oestradiol-17 β and oestriol carriers were added and a phenolic fraction was separated. Partition chromatography revealed at least 5 radioactive phenols, including oestradiol. The oestradiol-17 β carrier was isolated and sp. activity followed through pptn. with digitonin, recrystallisation to const. sp. activity and subsequent partition chromatography, and through methylation and purification of the methyl ether followed by chromatography in 2 successive systems. The const. sp. activity obtained showed that [14C]oestradiol-17 β is produced from [4-14C]testosterone by rat ovaries in vitro. Biosynthesis of oestradiol-17CX was not demonstrated. *

3294. ISOLATION AND CHARACTERISATION OF OESTRIOL 16CX-GLUCOSIDURONIC ACID FROM HUMAN PREGNANCY URINE. Y.Hashimoto and M.Neemaa: *J. biol. Chem.*, 1963, 238, 1273-1282 (Steroid Chem. Section, Dept. Med. C, Roswell Park Mem. Inst., Buffalo, N.Y., U.S.A.) The cryst. acid is isolated from third trimester human pregnancy urine. JNA*ley

3295. RAPID METHOD FOR MEASURING 17-OHCS IN URINE. M.G.Metcalf: *J. Endocr.*, 1963, 26, 415-422 (Princess Margaret Hosp., Christchurch, New Zealand) A modification of the Norymberski method for the estimation of 17-OHCS having a keto or hydroxyl group in the 20 position is described. The original procedure is much simplified and it was possible to make 8 determinations in duplicate within 5 hr. " GFBLane

METABOLIC INHIBITORS AND CARCINOGENS

3296. ACTION OF VARIOUS INHIBITORS OF L-dopa DECARBOXYLASE ON WATER INTAKE, DIURESIS AND URINARY ELIMINATION OF SODIUM AND POTASSIUM IN RAT. N.Barre, J.Cahn and M.Herold: C.R. Soc. Biol., Paris, 1962, 156, 1807-1809 (HSpital de la Pitié, Paris, France) Injn. of 100 mg./J* 3,4-hydroxycinnamic acid to rats for 3 days increased diuresis while m-hydroxy-benzylxoyamine (25 mg./kg.) and CC-methyl¹⁴opa (1*25 mg./kg.) decreased diuresis. These inhibitors and jn-hydroxy-jf bromobenzylxoyamine (20 mg./kg.) reduced urinary elimination of K and increased Na elimination. (French) M.A.Price

3297. DETERMINATION OF THE BIMOLECULAR RATE CONSTANT FOR THE REACTION BETWEEN ORGANO-PHOSPHOROUS INHIBITORS AND ESTERASES IN THE PRESENCE OF SUBSTRATE. A.R.Main and W.C. Dauterman: Nature, Lond., 1963, 198, 551-553 (Pesticide Residues Lab., North Carolina State Coll., Raleigh, N.C., U.S.A.) The following equation was derived to determine the bimolecular rate const, of the reaction between enzymes and their inhibitors in the Presence of substrates-

$$k_1 = \frac{2.303}{(t_2 - t_1)(X_1 - X_2)} \log \frac{V_1}{V_2}$$

where k_1 = rate const.; V_1 = velocity after inhibn. at time t_1 ; V_2 = velocity after inhibn. for time t_2 ; X_1 = fraction of uninhib. enzyme present under steady state conditions. The validity of the equation was demonstrated by studying rate const, for the reaction of acetyl cholinesterase with di-isopropyl fluorophosphate in presence of substrate. J.R. Sargent

3298. INHIBITION OF SEVERAL TRICARBOXYLIC ACID CYCLE ENZYMES BY γ -HYDROXY-a-KETOGLUTARATE. B. Pa yes and G.G.Laties: Biochem. biophys. Acta-Comm., 1963, 10, 460-466 (Dept. Bot. and Plant Biochem., Univ. California, Los Angeles, Calif., U.S.A.) γ -Hydroxy-a-ketoglutarate is an inhibitor for aconitase, isocitric dehydrogenase and Hetogutaric dehydrogenase. B.Ketterer

3299. EFFECTS OF DFLUORO-GXALOACETATE AND OFLUOROMALATE ON MALATE DEHYDROGENASE AND GLUTAMATE-ASPARTATE AMINOTRANSFERASE. E.Kun, L.K.Gottwald, D.W.Fanshier and J.E. Syling: J. biol. Chem., 1963, 238, 1466-1463 (Dept. Pharmacol., Sch. Med., Univ. California, San Francisco, Calif., U.S.A.) Syntheses of difluoroxaloacetic and difluoromalic acids are described. The kinetic const, of malic dehydrogenases from rat liver extracts of cytoplasmic and mitochondrial origin show relatively small differences with respect to substrates and fluorinated substrate analogues. Difluoromalate is a relatively weak inhibitor of the enzyme, whereas difluoroxaloacetate is a potent inhibitor of the enzymic reduction of difluoroxaloacetate by NADH₂. NADP-linked malate dehydrogenase is only slightly inhibited by difluoroxaloacetate and difluoromalate; the latter is 3 times more potent than the former. Difluoroxaloacetate is a powerful inhibitor of glutamate-aspartate aminotransferase. J.N.Ashley

3300. INACTIVATION OF a-AMYLASES BY SYNTHETIC DETERGENTS. Y.Pomeranz: Biochim. biophys. Acta, 1963, 73, 105-112 (Crops Res. Div., Agric. Res. Service, U.S. Dept. Agric, Manhattan, Kans., U.S.A.) Cryst. fungal or pancreatic (X-amylases were inactivated by incubation with high mol. quaternary NH₄ salts, cationic dyes or Na lauryl sulphate. Inactivation was slightly pH dependent. Inactivation was most effective after several hr. at room temp. Cryst. bacterial (X-amylase was only partially inactivated under these conditions. Detergent concn. above 0*1% were required but inactivation depended on detergent/enzyme wt. ratio rather than abs. detergent concn. Mixtures of cationic detergent with Na lauryl sulphate or of the anionic detergent with CaCl₂ produced an inactivation proportional to the amount of free synthetic detergent. Inactivation by quaternary NH₄ salts was not reversed by Na lauryl sulphate but inactivation by the anionic detergent was partially reversed by Cad2*. B.M.Stevens

3301. CHYMOPAPAIN. m. INHIBITION OF CHYMOPAPAIN BY DFP. M.Ebata and K.T. Yasunobu: Biochim. biophys. Acta, 1963, 73, 132-144 (Dept. Biochem. and Biophys., Univ. Hawaii, Honolulu, Hawaii, U.S.A.) The enzyme was consistently inhib. by DFP. Variables affecting the inhibn. were examined. A stable diisopropylphosphoryl-chymopapain was cryst. and shown to contain 1 g. atom P/mole of enzyme. Some prop. of this complex are reported. B.M.Stevens

3302. XANTHINE OXIDASE. L ACTIVATION OF MILK XANTHINE OXIDASE BY HISTAMINE. II MECHANISM OF SUBSTRATE INHIBITION AND US REVERSAL BY HISTAMINE. S.Muraoka: Biochim. biophys. Acta, 1963, 73, 17-26, 27-38 (Dept. Pharmacol., Okayama Univ. Med. Sch., Okayama, Japan) I. Histamine counteracted the inhibitory action of excess hypoxanthine or xanthine but had no effect at low substrate concn. Effects were more definite at alk. pH, with decreasing enzyme concn. and with increasing duration of incubation. The type of buffer greatly influence enzyme activity; histamine showed most effect in dil. K phosphate buffer. The effect of histamine varied with the batch of enzyme but practically all samples prep. by Ball's method showed some response. Purification of the enzyme raised the rate of activation; trypsin treatment had no effect. L-histidine, K cyanide and EDTA and, to a lesser extent, imidazoleacetic acid, riboflavin, 5HT, L-arginine, L-lysine and glycine showed similar effects to L-histamine.

II Substrate inhibn. was prevented in a dithizone treated medium. Addition of $6*6 \times 10^{-7}$ M Cu²⁺, Pb, Zn, Ca or Mg produced an inhibn. resembling the substrate inhibn. Antagonism between histamine and hypoxanthine was noncompetitive. When enzyme, Cu²⁺, histamine and substrate were added in this order the enzyme was active but when the order was enzyme, Cu²⁺, substrate and histamine the enzyme was inactive. Histamine had no effect on the fluorescence of riboflavin or its quenching by hypoxanthine. Cu²⁺-also markedly quenched die fluorescence. A large quantity of xanthine accumulated during oxidation of hypoxanthine to uric acid unless the reaction mixture was metal-free.

B.M.Stevens
3303. INHIBITION OF PSEUDOMONAS HISTIDASE. EVIDENCE FOR A METAL COFACTOR. A.Peterkofsky and L.N.Mehlen: Biochim. biophys. Acta, 1963, 73, 159-162 (Lab. of Biochem., Nat. Inst. of Dental Res., Bethesda, Md., U.S.A.) B.M.Stevens

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3304. INHIBITION OF KIDNEY MUTAROTASE ACTIVITY BY GLUCOSE, UREA AND GUANIDINE HCl. A.M.Chase, S.L.Lapedes and H.Cyon Meien J. cell, comp. Physiol., 1963, 61, 181-193 (Physiol. Lab., Princeton Univ., Princeton, N.J., U.S.A.) 0 \times 3M

Guanidine HCl caused 50% inhibn. of hog kidney, mutarotase activity using the α - and β -forms of D-glucose as substrates at pH 5 \times 3 in 0-04M acetate buffer. Urea produced a similar inhibn., about 4 mol. of either substance combining with each catalytic site. An inhibn. of the enzyme by glucose itself occurred through formation of an inactive complex involving 1 glucose mol. per enzyme mol. G.M.Lewis

3305. DOPA DECARBOXYLATION INHIBITORS IN VIVO BY USE OF 14C-CARBOXYL-LABELLED DOPA.

E.Hansson and W.G.Clark: Proc. Soc. exp. Biol., N.Y., 1962, 111, 793-798 (Dept. Pharm., Royal Vet. Coll., Stockholm, Sweden) Measurement of radioactivity in the respiratory CO₂ of mice after injn. of labelled dopa was used to study the inhibitory effects of certain compounds on decarboxylation. The most active inhibitors were DL-a-hydrazino-a-methyl,3,4-dihydroxyphenylbutyric acid and N(3-hydroxybenzyl)-N-methylhydrazine. Their inhibitory action is approx. 40 times higher than that of L-a-methyldopa. M.M.Shapland

3306. PROTEASE INHIBITOR FROM GROUNDNUT SKINS.

V.Cepelák, Z.Horáková and Z.Pádn: Nature, Lond., 1963, 198, 295 (Med. Clinic, Charles Univ., Plzen, Czechoslovakia) A thermostable protease inhibitor can be extracted with ethanol from defatted peanut (*Arachis hypogaea*) skins. It is partly sol. in water and not ptd. by acetone. It acts on the fibrinolytic system as an anti-plasmin. G.M.Lewis

3307. INHIBITORS OF IN VIVO ENZYMIC INACTIVATION OF BRADYKININ AND KALLIDIN. E.G.Erdfls and J.R.Wohlen: Life Sci., 1963, No. 4, 270-274

(Mellon Inst., Pittsburgh, Pa., U.S.A.) Compounds which inhibit the in vivo metabolism of bradykinin and kallidin in the guinea-pig increased the hypotensive effects of the peptides. K.Jones

3308. EFFECT OF OXIDATIVE PHOSPHORYLATION INHIBITORS ON SYNTHESIS OF LIVER MITOCHONDRIA PHOSPHOLIPIDS. J.N. Youngs and W.E.Cornatzer: Proc. Soc. exp. Biol., N.Y., 1963, 112, 308-311

(Guy and Bertha Ireland Res. Lab., Dept. Biochem., Univ. North Dakota Med. Sch., Grand Forks, N. Dak., U.S.A.) The synthesis of rat liver mitochondrial phospholipids was studied after Sprague-Dawley rats had received i.p. injn. of various oxidative phosphorylation inhibitors, arsenite, bilirubin, oligomycin and DNP. Synthesis was followed by pretreating animals 1 hr. before injn. of the inhibitor with [32P]NaH₂PO₄. Four hr. after the inhibitor had been administered the mitochondrial fraction of the liver was obtained and the incorporation of 32P into several of the phospholipids was studied. There was a significant decrease in synthesis of phosphatidyl inositol, sphingomyelin, lecithin, phosphatidyl-serine and ethanolamine with DNP; the 3 other inhibitors did likewise except they did not decrease incorporation of 32P into sphingomyelin or phosphatidyl inositol apart from oligomycin which could inhibit sphingomyelin synthesis and arsenite which could inhibit phosphatidyl inositol synthesis. D.N.Wheatley

3309. SPASMOlytic EFFECT OF PAPaverine AND INHIBITION OF OXIDATIVE PHOSPHORYLATION.

R.Santi, A.R.Contessa and M.Ferrari: Biochem., biophys. Res. Comm., 1963, 11, 156-159 (Pharmacol. Inst., Univ. Padova, Italy) Papaverine inhib. the oxidation of glutamate, but not succinate by isolated rat liver mitochondria. B.Ketterer

3310. INHIBITORY EFFECT OF THIOPHOSPHATE ON THE ATP-INORGANIC PHOSPHATE [Pi] EXCHANGE REACTION OF RAT LIVER MITOCHONDRIA. T.fcSato, J.F.Thomson and W.F.Danforth: Arch. Biochem., 1963, 101, 31-36 (Div. Biol. and Med. Res., Argonne Nat. Lab., Argonne, Ill., U.S.A.) With 0-005M thiophosphate and 0-005M initial Pi concn. the exchange rate declined from approx. 70% of control values in the first 20 min. to almost 0 in the next 40 min. 0*005-0-006M thiophosphate produced 50% inhibn.; 0*03M produced complete inhibn. The degree of inhibn. appeared to depend on thiophosphate, but not Pi concn. When 0-005M [32P] or [35S]thiophosphate was used no exchange with ATP was found and electrochromatograms showed no nucleotides other than ATP. B.M.Stevens

3311. EFFECTS OF ALIPHATIC ALCOHOLS ON METABOLISM OF GLUCOSE AND FRUCTOSE IN RAT LIVER SLICES. E.Majchrowicz and J.H.Quasteb: Canad. J. Biochem., 1963, 41, 793-803 (McGill-Montreal Gen. Hosp. Res. Inst., Montreal, Quebec, Canada)

Ethanol at 3mM had little inhibitory effect on the production of respiratory CO₂ by rat liver slices but suppressed the formation of 14CO₂ from labelled glucose by 57% in 1 hr.. the inhibn. being larger from [6-14C]glucose than from [1-14C]glucose. The inhibn. was probably due to isotopic diln. of the acetyl-CoA from glucose with that from the ethanol. The higher aliphatic alcohols had the same diminishing effect on 14CO₂ formation from [U-14C]glucose and [U-14C]fructose. The incorporation of 14C from the labelled sugars into liver protein and lipid was inhib. by ethanol and the higher alcohols to a similar extent. J.B.Parish

3312. EFFECT OF IMIPRAMINE AND DESMETHYLIMIPRAMINE ON LIPID BIOSYNTHESIS IN BRAIN AND LIVER. R.Fumagalli, E.Grossi and P.Paoletti: J. Neurochem., 1963, 10, 213-217 (Inst. Pharm., Univ. Milan, Italy) Rat brain and liver slices were incubated with [1-14C]acetate and (i) CO₂ production, (ii) incorporation of 14C into neutral fats and (iii) incorporation of 14C into cholesterol measured. The drugs at 10⁻³M stim. (ii) and decreased (i) and (iii). 32P incorporation into brain slice phospholipids was increased with 10⁻⁴M drug. In vivo the drugs (3-4 mg./kg.) stim. acetate incorporation into neutral fat and phospholipids.

R.J.Woodrⁿ

3313. [SYNTHESIS OF] 2'-DEQXYTHIOGUANOSINE AND ITS α -ANOMER. R.H.Iwamoto, E.M.Acton anf L.Goodman: Nature, Lond., 1963, 198, 285 (Life Sci-Stanford Res. Inst., Menlo Park, Calif., U.S.A.)

G.M.Lewis

3314. ACTION SPECTRUM OF PEROXYACETYL NITRATE DAMAGE TO BEAN PLANTS. W.M.Dugger, jun., O.C. Taylor, W.H.Klein and W.Shropshire, jun.: Nature, Lond., 1963, 198, 75-76 (Air Pollution Res. Center, Univ. California, Riverside, Calif., U.S.A.) When the action spectrum was determined for the damage to *Phaseolus vulgaris* by peroxyacetyl nitrate, max. were found at wavelengths corresponding to the carotenoids, but not the chlorophyll pigments. It is suggested that peroxy-

acetyl nitrate prevents the normal function of carotenoids
JJ Protecting chlorophyll pigments from photo-oxidation,
 fous causing damage. G.M.Lewis

3315. STEROLS OF SKIN IN NORMAL AND TRIPARANOL-TREATED RAT. L.Horlick and J.Avigan: *J. lipid Res.*, 1963, 4, 160-165 (Lab. Metabolism, N.H.I., N.I.H., Bethesda, Md., U.S.A.) Treatment with triparanol suited in increased skin concn. of cholesterol, methosterol and dihydrolanosterol and decreased concn. of desmosterol, lanosterol, and possibly dehydromethosterol and A⁷-24-cholestadienol. Squalene was an intermediate in sterol synthesis in both normal and triparanol-treated animals. Triparanol-treated animals showed a decreased incorporation of acetate into the A⁷-sterol fraction and increased incorporation into lanosterol and A⁷-sterols.
 * Paranol inhibits the enzymic reduction of the 24,25-doubble bond in sterols of rat skin. J.R. Sargent

3316. SKIN STEROLS OF NORMAL AND TRIPARANOL-TREATED RATS. R.B.Clayton, A.N.Nelson and I.D.Frantz, jun.: *J. lipid Res.*, 1963, 4, 166-176 (Conant Chem. Lab., Harvard Univ., Cambridge, Mass., U.S.A.) Skin sterols of normal rats and of rats treated with the drug triparanol have been analysed by means of chromatography on silic acid followed by gas-liquid chromatography. The results indicate the presence at skin of several previously undetected compounds, all of which causes accumulation of the A24-analogues of the intermediates in cholesterol biosynthesis that formally occur in the 24,25-dehydro form and causes marked alterations in the proportions of A⁷- to A⁰-isomers of these intermediates. J.R.Sargent

&317. INHIBITION OF RECOMBINATION AND HETERO-
 LYGOYSIS IN PHENYLETHYL ALCOHOL-TREATED
 PHAGE T4-E. COLI B COMPLEXES. C.E.Folsome:
Biochem. biophys. Res. Comm., 1963, 11, 97-101
 en (Univ. - Melbourne, Australia) Expt. are presented
 an ¹⁴C¹⁴ labeling of recombinant formation
 JV¹⁴C¹⁴ heterozygosis due to phenylethyl alcohol blockage of
 A synthesis. B.Kerter

3318. ^{Ax} 2-AZAADELINE AND 2,6-DIAMINOPURINE ANALOGUES OF ATP IN ACTIVE TRANSPORT OF POTASSIUM ACROSS THE HUMAN ERYTHROCYTE MEMBRANE. M.Tatibana, T.Hashimoto and ^Yoshikawa: *J. Biochem.*, Tokyo, 1963, 53, 214-218 i¹⁴P³² Physiol. Chem. and Nutr., Fac. Med., Univ. hum (Kyoto Jap) The analogues were accumulated in on in r.b.c. which had been preserved for 1 week, incubation with the appropriate base and inosine. Cells accumulating 2-azaadenosine triphosphate showed K influx and shape change; those accumulating 2,6-diaminopurine riboside triphosphate did not. 2-Aza-idi¹⁴P³² phosphate, but not 2,6-diaminopurine riboside, was attacked by the Na-K dependent, a sensitive ATPase of the r.b.c membrane. B.M.Stevens

3319. ACTION OF METHYL ORANGE ON THE OXYGEN CONSUMPTION OF VARIOUS RAT LIVER PREPARATIONS. P.Manchon, R.Lowy and S.Gradnauer: *R. Soc. Biol.*, Paris, 1962, 156, 1615-1619 (Lab. humaine, Ecole Pratique des Hautes Etudes, Paris, France) Methyl Orange inhib. by 31% the O₂ consumption of the supernatant of rat liver homogenate and inhib. O₂ uptake of homogenate by 11%. (X-O₂)¹⁴Orange decreased O₂ uptake in the presence of glutarate but increased the oxidation of succinate

by liver homogenate. These 2 effects increased with increased concn. of Methyl Orange. The oxidation of glucose 6-PO₄ and phenylalanine by homogenates and supernatant was inhib. by Methyl Orange.
 (French) M.A.Price

3320. INCREASE IN THE AZOREDUCTASE ACTIVITY OF THE SUPERNATANT OF LIVER HOMOGENATE OF RAT AFTER PROLONGED INGESTION OF METHYL ORANGE. P.Manchon and R.Lowy: *C.R. Soc. Biol.*, Paris, 1962, 156, 1619-1622 (Lab. de Nutrition humaine, Institut National d'Hygiène, Paris, France)

Liver homogenate supernatant from rats which had received Methyl Orange for 2-6 weeks showed increased azoreductase activity in the presence of Methyl Orange but not in the presence of Ethyl Orange. Addition of glucose 6-PO₄ dehydrogenase to the medium had less effect on the activity of liver from animals receiving Methyl Orange than normal rats.

(French) M.A.Price

3321. EFFECT OF SONIC DISRUPTION OF ERYTHROCYTE STROMATA ON THE GLUCOSE, PHLORIZIN AND PHLORETTIN INHIBITION OF THE STROMAL ATPase. A.C.Ewers, C.M.Haskell and R.A.Fineberg: *J. cell. comp. Physiol.*, 1963, 61, 195-199 (Dept. Biochem., Univ. California Med. Center, San Francisco, Calif., U.S.A.) The inhibn. of ATPase of rabbit r.b.c. stromata by glucose, phlorizin and phloretin was reduced by sonic fragmentation of the ghosts, indicating that the inhibn. is the result of a close topographical relation of the enzyme and inhibitor-binding sites which is disrupted by sonic fragmentation.

G.M.Lewis

3322. EFFECT OF MALEIC ACID ON THE KIDNEY. III. SUCCINATE AS HYDROGEN DONOR IN THE REDUCTIVE AMINATION IN RAT KIDNEY. IV. SYNTHESIS OF AMINO ACIDS IN THE KIDNEY OF MALEATE-TREATED RATS. J.Rogulski and S.Angielski: *Acta biochim. pol.*, 1963, 10, 125-132, 133-139 (Dept. Biochem. Med. Sch., Gdansk, Poland)

m. In kidney mitochondria the activation of ATP of amino acid synthesis from d-oxoglutarate and NH₃ is abolished by malonate. The effect of ATP is connected with the utilisation of H from succinate for the reductive amination. The main source of H for this amination in kidney is citrate, and in liver the second mol. of a-oxoglutarate. It was shown that maleate, instead of commonly used arsenite, can be employed to inhibit the oxidation of oxoglutarate in kidney mitochondria.

IV. Of 9 rat tissues tested only liver, kidney and brain synthesised considerable amounts of amino acids from a-oxoglutarate and NH₃. In the kidney of maleate-treated rats the oxidation of oxoglutarate is inhib. As urinary excretion of accumulating oxoglutarate is small, the reductive amination into glutamate is supposed to take place. Kidney homogenates of maleate-treated rats synthesised amino acids very efficiently, utilising for the reduction of oxoglutarate the H from isocitrate, succinate and in lesser degree, malate. It was calculated that the rat kidney during the first 24 hr. following intoxication may synthesise 1000-2000 (moles of amino acids more than normally. The excretion of this excess may be interpreted as the source of aminoaciduria observed in maleate-intoxication. M. Korbecki

3323. ROLE OF ADSORPTION IN CONTROLLING RATE OF REACTION OF CHLORAMBUCIL WITH PROTEIN. J.H.Linford: *Canad. J. Biochem.*, 1963, 41, 931-939 (Dept. Biochem., Univ. Manitoba, Winnipeg, Canada) The rates of alkylation of Hb and bovine serum albumin

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by chlorambucil were studied in vitro at 37° and pH 8*4. Although the proteins were of nearly the same mol. wt. and had the same free carboxylic acid content the alkylation of Hb was 30 times faster. The adsorption of chlorambucil by albumin however was 20 times greater than that by Hb_v suggesting that adsorption protects the chlorambucil from activation in the solvent.

J.B.Parish

3324. IDENTIFICATION OF INHIBINE. THE ANTI-BACTERIAL FACTOR IN HONEY. AS HYDROGEN PEROXIDE AND ITS ORIGIN IN A HONEY GLUCOSE OXIDASE SYSTEM. J.W.White, jun.. M.H.Subers and A.L.Schepartz: *Biochim. biophys. Acta.* 1963. 73. 57-70 (Eastern Reg. Res. Lab., Philadelphia. Pa. U.S.A.) A glucose oxidase producing gluconic acid and H₂O₂ from glucose was demonstrated in honey.

Activity increased markedly on diln. of honey. Inhibine was shown to be H₂O₂, a direct relationship being shown between inhibine no. and H₂O₂ production. B.M.Stevens

3325. ACTINOMYCIN INHIBITION OF IN VITRO PROTEIN SYNTHESIS IN RAT LIVER. A.Korner and A.J.Munro: *Biochem. biophys. Res. Comm.* 1963. 11. 235-238 (Dept. Biochem., Univ. Cambridge. England)

The cell sap, ribosome and polysome fractions from liver cells of rats which have been treated with actinomycin each have a reduced efficacy in an in vitro system for protein synthesis. B.Ketterer

3326. SELECTIVE INHIBITION OF BIOSYNTHESIS OF RNA IN MAMMALIAN CELLS BY CHROMOMYCIN A3.

G.Wakisaka, H.Uchino, T.Nakamura, H.Sotobayashi, S.Shirakawa, A.Adachi and M.Sakurai: *Nature. Lond.* 1963. 198, 385-386 (Dept. Int. Med., Kyoto Univ. Japan) The incorporation of [14c]adenine into the RNA of rabbit bone marrow cells was significantly inhibited by 10 μ g./ml. chromomycin A3 while DNA synthesis was unaffected. Similar results were obtained with peripheral leukaemic human w.b.c. G.M.Lewis

3327. CYTOSTATIC EFFECTS OF NITROGEN CONTAINING PEROXIDES. G.Weitzel, F.Schneider.

H.Pfeil and K.Seynsche: *Hoppe-Seylers Z. physiol. Chem.* 1963. 331. 219-238 (Physiol. Chem. Inst. Univ., Tübingen, Germany) The prep. and reactivity (in vitro) of heterocyclic and urea substituted peroxides is described. Some symmetrically substituted peroxides inhibit mouse ascites carcinoma in vivo, with increase in survival time, and anaerobic glycolysis in vitro. In native ascites, the peroxides cause a decrease in the concn. of ATP and NAD but increase the nicotinamide concn. The behaviour of some carbohydrate phosphates is also discussed. (German) L.Cornish

3328. EFFECT OF 5-BIS-(2-CHLOROETHYL)-AMINO-URACIL ON METABOLISM OF AMINO ACIDS IN NORMAL AND PRECANCEROUS RAT LIVER.

W.T.Burke: *Proc. Soc. exp. Biol. N.Y.* 1962, 111. 811-813 (Dept. Biochem., West Virginia Univ. Med. Cen., Morgantown, W.Va., U.S.A.) Results suggest that 5-bis(2-chloroethyl)-aminouracil is capable of inhibiting acid-sol, liver protein synthesis in liver of normal rats or livers undergoing azo-dye carcinogenesis. M.M.Shapland

3329. EARLY TEST FOR POSSIBLE SKIN CARCINOGENS IN THE MOUSE: EFFECTS OF A BENZACRIDINE AND OF SOME TRICYCLO QUINAZOLINES. O.H.Iversen: *Nature. Lond.* 1963. 198. 400 (Inst. for gen. og ekspr. patol., Univ. i Oslo, Norway) The specificity of a

tetrazolium reduction method for the detection of compounds carcinogenic for mouse skin is confirmed by examination of 7,9-dimethyl-benz-(c)-acridine, tricyclo quinazolines and its 2-methyl and 3-methyl deriv.

G.M.Lewis

3330. AZO-DYE CARCINOGENESIS IN RAT LIVER: THE EFFECT OF 4-DIMETHYLAMINO-3'-METHYLAZO-BENZENE ON THE INCORPORATION OF [14C]LEUCINE INTO RAT-LIVER MICROSOMAL PROTEIN. A.O.Hawtr. V.Schirren and J.Dijkstra: *Biochem. J.* 1963. 88. 106 114 (Nat. Chem. Res. Lab., South African Council Sci and Ind. Res., Pretoria, S. Africa) The incorporation of [14c]leucine by a system consisting of washed microsomes plus pH 5 enzyme was studied after a single injn. of 4-dimethylamino-3'-methylazobenzene. Both the rate of incorporation by and the sp. activity of the microsomes increased after 20 hr., reaching a max. at 40 hr., and thereafter returning to normal. Incorporation into the microsomal protein of mitochondrial supernatants, on the other hand, showed considerable inhibn. of incorporation at 4 hr. with a return to normal after this time. The binding of the dye to microsomes, pH 5 enzyme and pH 5 supernatant was studied at different times after a single injn. of die carcinogen. Max. binding of all fractions occurred at 40 hr. An inhibitor of the incorporation of [14c]leucine was found in both the normal pH 5-supernatant and 'azo'-pH 5-supernatant fractions. *

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3331. IMPROVED ISOLATION OF PURIFIED SIDERO-PHILIN FROM INDIVIDUAL SERA. A.L.Nagler.

S.Kochwa and L.R.Wasserman: *Proc. Soc. exp. Biol. N.Y.* 1962. 111. 746-749 (Dept. Haem., Mount Sinai Hosp., New York, U.S.A.) A method involving column chromatography on CM- and DEAE-cellulose is described for the isolation of over 95% of siderophilin from individual serum samples. The final product is contaminated with only small quantities of y-globulin. M.M.Shapland

3332. EVALUATION OF SERUM GLYCOPROTEINS IN THE DIFFERENTIAL DIAGNOSIS OF JAUNDICE.

R.Shields, R-A.McAlister and W.Burnett: *Scot. med. J.* 1963. 8. 185-196 (Univ. Dept. Surg., Western Infirmary, Glasgow, Scotland) The serum glycoprotein levels were estimated in 70 jaundiced patients and compared with blood donor controls. Total glycoprotein, seromucoid as a whole complex; seromucoid-bound carbohydrate; and seromucoid-bound tyrosine were all estimated. The last 2 are of most use in distinguishing hepatic and post-hepatic jaundice. A.M.Mackay

3333. STUDY OF HUMAN BLOOD LIPOPROTEINS BY AGAR-GEL ELECTROPHORESIS. L.LDelyamoure:

Vop. Med. Him. 1963. 9. 200-204 (Med. Service of Black Sea Fleet, Sebastopol, U.S.S.R.) Lipoprotein determination on agar-gel using pre-stained blood P_{Usm}* is described. Analysis of lipoprotein fractions of 300 case* revealed some individual variations possibly connected with the age of the donors. J.R.Sargent

3334. MEASUREMENT OF PLASMA-PROTEIN LOSS INT^o GASTROINTESTINAL TRACT USING 13H-LABELLED PROTEINS AND ORAL AMBERLITE RESIN. J.H.Jones

and D.B.Morgan: Lancet, 1963, i, 626-629 (Dept. JExp. Path., Univ. Birmingham, England) The salivary excretion of ^{131}I during observations on the turnover of [^{131}I]3-lipoprotein and albumin in normal subjects taking 'Amberlite' resin by mouth was sufficient to account for all the radioactivity measured in the faeces. The partition of ^{131}I excretion between stools and urine was the same after i.v. injn. of [^{131}T]p-lipoprotein, [^{131}I]albumin, and ^{131}I . The faecal excretion of ^{131}I in normal subjects tested in this way represents the dialysable radioactive products which are liberated during endogenous catabolism of the labelled protein and secreted in high concn. by the salivary glands, and probably by the stomach; normal exogenous catabolism is not measured.

G.H.Bell

³³35. DEMONSTRATION THAT R.B.C. SLOWING FACTOR FOUND IN CANCER SERUM BY MICROELECTROPHORESK IS AN (Xi) COMPONENT. A.Rottino, J_oAngers and A.Dool: Proc. Soc exp. Biol., N.Y., 1962, 111, 699-701 (Hodgkin's Dis. Res. Lab., St. Vincent's Hosp., New York, U.S.A.)

M.M.Shapland

³³36. METHOD FOR THE COLORIMETRIC DETERMINATION OF γ -GLUTAMYL TRANSPEPTIDASE IN HUMAN SERUM; ENZYMIC ACTIVITY IN HEALTH AND DISEASE. J.A.Goldberg, E.P.Pineda, E.E.Smith, O-M.Friedman and A.M.Rutenberg: Gastroenterology, 1963, 44, 127-133 (Surg. Res. Labs. of the Yamins Res. Lab., Beth Israel Hosp., Boston, Mass., U.S.A.) The reaction involved in the detection of γ -glutamyl transpeptidase is the liberation of aniline from the substrate (N -(DL- γ -glutamyl)aniline), then the subsequent diazotisation of the aniline. The product is estimated colorimetrically. γ -Glutamyl transpeptidase levels in various body fluids of diseased subjects were mostly in a similar range to that of the healthy subjects but in several cases the level was slightly higher. D.N.Wheatley

³³37. NON-SPECIFIC STREPTOLYSIN O INHIBITION IN DISEASES OF THE LIVER AND BILIARY SYSTEM. J-Ha Hen: Acta path. microbiol. scand., 1963, 57, 301-306 (Inst. Clin. Bact. Gen. Hosp. Malmo, Sweden) A non-sp. rise of titre is due mainly to higher concn. of the lipoproteins secondary to biliary stasis. L.Friedmann

³³38. FIBRINOLYSIN AND RELATED PLASMA ESTERASES IN PATIENTS WITH CIRRHOSIS. L.N.Pernokas and M.Brown: Gastroenterology, 1963, 44, 44-47 (Sears Surgical Labs., Boston City Hosp., Boston, Mass., U.S.A.) Fibrin, casein and esters of arginine and fibrin were used to study the esterases of plasma from patients. The plasma was activated by treating with streptokinase. It was found that there were lower levels of 'Pksmin' and plasminogen in these cases than in normal plasma. D.N.Wheatley

³³39. p- INHIBITION PHENOMENA IN FIBRIN FORMATION. Polf A'Syurin: Vop. Med. Him., 1963, 9, 167-172. After incubation of oxalated human plasma at 37° for 1 hr. there was an inhibition of fibrin formation after addition of fibrin or CaCl_2 was sometimes observed. Inhibition of fibrin formation may be due to spontaneous plasmin activation and antithrombin VI formation. Factors inhibiting fibrin formation may reflect to some degree state of protective anti-thrombotic mechanisms.

J.R.Sargent

³³40. CONVERSION OF LECITHIN TO LYSOLECITHIN AS A SOURCE OF FATTY ACIDS IN INCUBATED PLASMA OR SERUM. W.C.Vogel and L.Zieve: Proc. Soc. exp. Biol., N.Y., 1962, 111, 538-540 (Radioisotope Service, Minneapolis Veterans Hosp., Univ. Minnesota, Minneapolis, Minn., U.S.A.) Incubation of human serum or plasma at 38° for 4 hr. results in conversion of approx. 10% of lecithin to lysolecithin. No difference was found with serum from patients with acute pancreatitis or postheparin plasma. M.M.Shapland

³³41. THE EFFECT OF SERUM FROM PREGNANT AND NON-PREGNANT WOMEN ON UDP-GLUCURONIC ACID-TRANSFERASE AND ON THE α -AMINOPHENOL GLUCURONIDE FORMATION. M.Pulkkinen and L.Rauramo: Ann. Med., 1963, 41, 38-41 (Dept. Physiol., Univ. Turku, Finland) Female serum during menstrual cycle and pregnancy did not inhibit the guinea-pig liver enzyme or α -aminophenol glucuronide formation. G.Faulkner

³³42. RELATIONS BETWEEN SERUM ULTRAFILTRABLE CALCIUM, ACIDOSIS AND TETANIC SYMPTOMS IN URAEMIA. J.Harri, A.Kasanen and J.Pikk Arainen: Ann. Med., 1963, 41, 15-21 (Dept. Clin. Chem., Univ. Hospital, Turku, Finland) The relations between serum ultrafiltrable Ca [UFC], acid base balance and tetanic symptoms were studied in 14 patients with severe renal insufficiency and uraemia. 13 patients had metabolic acidosis and 7 had neurological symptoms. UFC was 2.75 mequiv./l. (range 1.95-3.15) and the % of total Ca which was ultrafiltrable Ca in [UF%] 69% (range 56-78%). The presence or absence of tetanic symptoms could not be related to increase UF% or uraemic acidosis. No definite correlation was found between UFC, tetanic symptoms and serum creatinine, K, P, and protein content. G.Faulkner

³³43. BIOLOGICAL HALF-LIFE OF VITAMIN B12 IN PLASMA. J.F.Adams: Nature. Lend., 1963, 198, 200 (Western Infirmary, Glasgow, Scotland) The biol. half-life in plasma of radioactive vit. B12 inj. into patients with pernicious anaemia was 5.14 days.

G.M.Lewis

³³44. IMPROVED TECHNIQUE OF α -AMINOBIPHENYL METHOD FOR DETERMINATION OF GLUCOSE IN SERUM. S.Shibata: Bull. Yamaguchi Med. Sch., 1962, 9, 13-17 (Dept. Clin. Pathol., Yamaguchi Med. Sch., Ube, Japan) In the improved method, a new colour reagent is used, which is a mixture of 880 ml. of 0.5 g. α -aminobiphenyl soln. and 120 ml. sat. aq. soln. of boric acid containing 360 mg. of NaF. 50 fil. blood serum is added to 5.0 ml. of the colour reagent, heated in a boiling water bath for 30 min., and the greenish colour thus developed in the soln. is compared in a photoelectric colorimeter. K.Jones

³³45. GLYCOLIPIDS OF HUMAN BLOOD SERUM. J.Polonovski and M.Petit: Bull. Soc. Chim. Biol., Paris, 1963, 45, 111-116 (Lab. Chim. Biol. Fac. de Med., Paris, France) Several glycolipids of plasma were separated by silicic acid column chromatography. Cerebromonosides represented 10-25% of total glycolipids. Some minor fractions containing galactolipids were obtained. The variations of glycolipids in Gaudier's, Tay Sachs and certain other diseases were determined.

(French) J.C.Crawhall

³³46. ESTIMATION OF CHOLESTEROL IN SFCVUM. H.H.Leffler and C.H.McDougald: Amer. J. Clin. Path., 1963, 39, 311-315 (1515U Street, N.W..)

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Washington, D.C., U.S.A.) Serum proteins are pptd. and cholesterol extracted with isopropanol. Colour is developed with FeCl₃. Free cholesterol is similarly estimated after pptn. with digitonin and acetone.

B.A.Woodger

3347. IDENTIFICATION OF PHOSPHOLIPIDS IN HUMAN THROMBOCYTES AND ERYTHROCYTES. R. Bloomstrand, F.Nakayama and L.M.Nilsson: J. Lab. clin. Med., 1962, 59, 771-778 (Dept. Int. Med., Univ. Lund, Sweden) Using neutron activation paper chromatographic analysis of the phospholipids in human thrombocytes and r.b.c. and comparing them with those in human plasma and liver; lecithin, phosphatidyl-ethanolamine, phosphatidylserine, phosphoinositide choline plasmalogen, ethanolamine plasmalogen and sphingomyelin were found in human thrombocytes and with the exception of ethanolamine plasmalogen all these were found in r.b.c. Relatively more phosphatidyl serine was found in human r.b.c. than thrombocytes.

C.Toothill

3348. CONCENTRATION OF GALACTOSE BY LEUCOCYTES. N.Kalant and R.Schuchen: Canad. J. Biochem., 1963, 41, 849-858 (Res. Lab., Jewish Gen. Hosp., Montreal, Quebec, Canada)

The uptake of [14C]-galactose was studied by incubating human w.b.c. for 30 min. at 37° in plasma followed by separation of the cells by centrifugation, breaking up of the cells by freezing and thawing and measurement and identification of radioactive material by paper chromatography. W.b.c. took up galactose so that the concn. inside the cells was 3-6 times greater than that in the plasma. This accumulation of galactose was not impaired in diabetes nor affected by insulin, and was increased by iodoacetate. Conversion of galactose to galactose 1-PO₄, UDP-galactose and other compounds occurred on incubation.

J.B.Parish

3349. VARIATION OF THE CONCENTRATION OF -SH GROUPS IN HUMAN ERYTHROCYTES INCUBATED WITH GLUCOSE OR INOSINE. AND VARIATION WITH AGE AND SEX. A.Bertolini, F.Quarto di Palo and H.Spinnelli Atti. Acad. med., Lombarda, 1962, 17, 127-130 (1st. Patol. speciale med., Univ. Milano, Italy)

The amount of reduced glutathione present in r.b.c. after incubation in buffer at 37° for 24 hr. with and without added inosine or glucose, was tested in cells taken from 39 young people < 30 yr. old and 70 old people > 70 yr. old. In the r.b.c. from old people, there was a greater loss of reduced glutathione than in the cells from young people and this loss was only partially corrected by glucose and not modified at all by inosine. (Italian) G.N. Godson

3350. HEXOKINASE AND NADP-DEPENDENT DEHYDROGENASE OF LEUCOCYTES IN LEUKAEMIA AND OTHER HAEMATOLOGICAL DISORDERS. G.Ghiotto, G.Perona, G.De Sandre and S.Cortesi: Brit. J. Haemat., 1963, 9, 345-350 (Inst. di Patalogia Med. dell'Univ. di Padova, Italy)

Hexokinase, glucose 6-PO₄ dehydrogenase, 6-phosphogluconic dehydrogenase and isocitric dehydrogenase activities were measured in w.b.c. from 68 patients with haematol. disorders (leukaemia, Hodgkin's disease, osteosclerotic anaemia). Dehydrogenase activity was greater in granulocytes than w.b.c., and greater in mature than immature cells. When the w.b.c. composition was noticeably changed the activity was decreased markedly. These results show a great contrast with neoplastic tissue where NAD-dependent dehydrogenases are very active.

J.Sneath

3351. STRUCTURE AND OXIDATIVE METABOLISM OF THE GRANULAR FRACTION ISOLATED FROM HUMAN BLOOD PLATELETS. N.B.Chernyak and A.A.Shozkaya: Vop. Med. Him., 1963, 9, 146-154 (Lab. Biochem. and Cytol., Central Inst. Haematol. and Blood Transfusion, Ministry of Public Hlth. of U.S.S.R., Moscow. U.S.S.R.) Small quantities of mitochondria were present in the granular fraction from human platelets. These mitochondria were relatively small and contained 1-2 cristae. Addition of hexokinase increased O₂ uptake by these mitochondria in the presence of succinate or CX-oxoglutarate. Oxidative phosphorylation was not detected in the presence of succinate and a-oxoglutarate.

J.R.Sargent

3352. ROLE OF THE PENTOSE PHOSPHATE PATHWAY IN THE REGULATION OF METHAEMOGLOBINAEMIA. J.D.Harley and H.Robin: Nature, Lond., 1963, 198, 397-398 (Children's Med. Res. Found., Royal Alexandra Hosp. Children, Camperdown, Sydney, Australia)

Aromatic agents were found to vary widely in their ability to enhance the production and reduction of metHb; compounds such as phenylhydrazine act on a stoicheiometric basis, others like naphthoquinones exert a catalytic effect. MetHb reduction in glucose 6-PO₄ dehydrogenase-deficient r.b.c. is not stim. by aromatic compounds, indicating that it is the NADPH₂-dependent pathway which plays the major part in metHb reduction.

G.M.Lewis

3353. METABOLISM OF FOLIC ACID IN PERNICIOUS ANAEMIA [PA]. A.H.Waters and D.L.Mollin: Brit. J. Haemat., 1963, 9, 319-327 (Dept. Haemat., Postgrad Med. Sch., London, England)

90 normal subjects and 107 patients with PA were studied. Their serum level of folic-acid-like material were measured by growth of Lactobacillus casei and the B12 concn. assayed with Euglena gracilis strain z. PA patients showed an accumulation of folic-acid-like material in the serum which was reduced after injn. of vit. B12. The metabolic relationship between enzyme systems in the pathogenesis of megaloblastic haemopoiesis is discussed.

J.Sneath

3354. BLOOD FOLIC ACID AND VITAMIN B12 ACTIVITIES IN HEALTHY INFANTS WITH NUTRITIONAL ANAEMIAS. G.Kende, B.Ramot and N.Grossowicz: Brit. J. Haemat., 1963, 9, 328-335 (Dept. Haemat.* Tel-Hashomer Government Hosp., Jerusalem, Israel)

Lactobacillus casei assay of folic acid activity in 89 healthy infants was 86*8 ±39*6 mjng./ml. Megaloblastic anaemia of infancy showed lower levels (17*5 ±12*4 mfig./ml.) as did the macrocytic non-megaloblastic anaemia group who showed decreased serum Fe and often low serum B12 levels also. 'Healthy*' infants with low-income backgrounds showed a decreased activity (46*6 ±38 mjig./ml.). The clinical response to folic acid was dramatic although the haematol. response was slower and often incomplete. r^ee therapy was often needed too.

J.Sneath

3355. UROCANIC ACID AND FORMIMINO-GLUTAMIC ACID EXCRETION IN MEGALOBLASTIC ANAEMIA AND OTHER CONDITIONS: EFFECT OF SPECIFIC THERAPY. L.Chanarin: Brit. J. Haemat., 1963, 9, 141-157 (M.R.C. Expt. Haemat. Res. Unit, Wright-Fleming Inst. Microbiol., St. Mary's Hosp. Med. Sci-t London, England)

15 g. histidine was administered orally to 24 patients (11 with megaloblastic anaemia due to vit. B12 deficiency, 8 with megaloblastic anaemia requiring folic acid and in 5 the haemopoiesis was

normoblastic). Changes in urinary excretion of histidine deriv* were studied. The normal excretion of histidine deriv. was effectively restored in most patients with B12 deficiency by vit. B12 and folic acid. Methionine produced a sharp fall in the excretion of abnormal products but the effect was transient. One patient excreted large amounts of formimino-glutamic and urocanic acids despite large doses of vit. B12 and folic acid. Folic acid therapy in patients with normal B12 serum levels usually stopped the excretion of abnormal histidine deriv. but again a few patients were resistant to this therapy.

J.Sneath

3356. NORMAL FORMIMINOGLUTAMIC ACID [FGA] EXCRETION IN MEALOBLASTIC ANAEMIA IN PREGNANCY. STUDIES ON HISTIDINE METABOLISM IN PREGNANCY. L.Chanarin, D.Rothman and E.J. Watson-Williams: Lancet, 1963, i, 1068-1072 (St. Mary's Hosp. Med. Sch., London, England) The urinary excretion of FGA used as a test for folic-acid deficiency was within the normal range in 7 of 15 Patients with megaloblastic anaemia of pregnancy studied in London, and in 5 of 26 patients studied in India. Observations on the utilisation of histidine - the precursor substance of FGA - in pregnancy showed that the amino acid was absorbed more slowly from the gut and that an average of 20% of the oral dose of histidine was lost in the urine. It was suggested that failure to excrete abnormal amounts of FGA in the urine in megaloblastic anaemia of pregnancy was due to these alterations in histidine metabolism, as well as to increased utilisation of the amino acid for protein synthesis; and that the excretion of this metabolite was an unsatisfactory test for interference with folic acid function in pregnancy.

G.H.Bell

3357. FOLIC-ACID DEFICIENCY IN PATIENTS WITH SKIN DISEASE. J.P.Knowles, S.Shuster and G.C.Wells: Lancet, 1963, i, 1138-1139 (Univ. Coll. Hosp., London, England) About a third of a group of Patients with various dermatoses had an abnormally increased urinary excretion of formiminoglutamic acid after oral histidine load. This was corrected by satn. with IOUN acid. This deficiency of folic acid was not associated with intestinal malabsorption, and appears to have been due to the skin disease.

G.H.Bell

3358. STARCH GEL ELECTROPHORESIS OF CEREBRO-SPINAL FLUID IN THE DIAGNOSIS OF INTRACRANIAL TUMOURS. Y.Manuel and J.De Rougemont: C.R. Soc. Biol., Paris, 1962, 156, 1859-1862
aiJ^ttitut Pasteur, Lyon, France) Starch gel electrophoresis of 20 ml. c.s.f. from 190 subjects showed the presence of 0-lipoproteins in the fluid of 19 subjects. These possessed intracranial tumours when examined (French) M.A.Price

3359. PROTEINS, LIPO- AND GLYCOPROTEINS OF CEREBROSPINAL FLUID IN HYDROCEPHALUS. R.P-Ushakova and A.Yu.Makarov: Vop. Med. Him., 1963, 9, 172-177 (State Res. Inst. for Psychoneurology, Cerigrad, U.S.S.R.) Of 87 patients with hydrocephalus normal protein levels were found in ventricular fluid. In 49 Patients and in lumbar fluid in 57 patients. Protein levels occurred in ventricular fluid in 3 patients and in lumbar fluid in 5 Patients. The normal was protein levels in ventricular and lumbar fluid present in only 26% of patients studied. Certain patients had increased y-globulin and 6-lipoprotein. Protein in c.s.f. No changes were encountered in glycoprotein levels in c.s.f.

J.R.Sargent

3360. USE OF PERIODATE OXIDATION IN THE CLINICAL ANALYSIS OF URINE CORTICOIDS.

H. Wilson and M.B.Lipsett: Analyt. Biochem., 1963, 5, 217-225 (Endocrinol. Branch, Nat. Cancer Inst., Bethesda, Md., U.S.A.) Reduction of 17-hydroxysteroids with K borohydride is followed by oxidation with Na metaperiodate, extraction with ether and estimation by the Zimmerman reaction. The advantages of the method are greater specificity of the oxidant, avoidance of hot acid hydrolysis, technical simplicity and removal of interfering chromogens from the final Zimmerman colour.

A. D. Smith

3361. EXCRETION OF p-AMINOISOBUTYRIC ACID BY MAN.

M.D.Armstrong, K.Yates, Y.Kakimoto, K.Taniguchi and T.Kappe: J. biol. Chem., 1963, 238, 1447-1455 (Fels Res. Inst., Yellow Springs, Ohio, U.S.A.) The inability to metabolise further

3-aminoisobutyric acid [AIBA] is responsible for the greatly increased excretion of this amino acid by Orientals who have this characteristic as a genetically determined trait. The oriental excretor of AIBA normally excretes it by an active tubular process. This is an adaptive trait that non-excretors develop rapidly after they ingest AIBA. The unnatural or L(+) isomer is destroyed more rapidly, and by a different enzyme, than the natural D(-) isomer, which is an intermediate in thymine catabolism, and the L(+) isomer is treated by the kidney in a different manner from the natural isomer. Human beings have only a limited ability to destroy AIBA. Occurrence of this amino acid in the urine of genetic non-excretors who do not have excessive tissue destruction may be due to impairment of liver function.

J.N.Ashley

3362. APPEARANCE OF 6-HYDROYSKATOLE SULPHATE IN THE URINE OF PATIENTS WITH INTERNAL DISEASES.

M.Oka and V.V.E.Leppanen: Ann. Med. exp. Fenn., 1963, 41, 1-6 (Med. Dept., Central Hosp., Kuopio, Finland) Urines of 338 patients with various internal diseases and 29 normal controls were studied for presence of 6-hydroxyskatole sulphate. A compound with similar paper chromatographic and staining prop, to 6-hydroxyskatole sulphate was detected in 19*2% of cases with internal diseases and 24*1% controls. Based on the findings that about 1/5th of the non-psychotic persons excreted 6-hydroxyskatole sulphate in their urine it was concluded that this was neither pathogenic in schizophrenia nor has psychotogenic activity.

G.Faulkner

3363. ORGANIC PHOSPHATE CONSTITUENTS OF URINE.

M.CBoissy-Colas: C.R. Soc. Biol., Paris, 1962, 156, 1776-1778 (Lab. Chim. biol.. Fac.

Pharmacie, Paris, France) Chromatographic and electrophoretic separation of human urine showed the presence of glucose I-PO₄. Inositol was also present. The urine of a woman in pregnancy contained glucose 6-PO₄. No phosphate esters of pentose or fructose were found in urine.

(French) M.A.Price

3364. ABNORMAL EXCRETION OF URINARY STEROIDS BY WOMEN WITH EARLY BREAST CANCER.

R.D.Bulbrook, J.L.Hayward, C.C.Spicer and B.S.Thomas: Lancet, 1962, ii, 1238-1240 (Breast Clinic, Guy's Hosp., London, England) Over half the patients with early breast cancer excrete subnormal amounts of 11-deoxy 17-oxosteroids and have neg. discriminants, which is characteristic of patients with advanced disease who fail to respond to adrenalectomy or hypophysectomy. The other patients have normal levels of 11-deoxy 17-oxo-

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steroids and pos. discriminants characteristic of patients with advanced disease who do not respond to endocrine ablation. This may mean that response to these operations is predictable at a very early stage in breast cancer. It is also suggested that these abnormalities may precede the clinical appearance of the disease. G.H.Bell

3365. DEHYDROGENASE ACTIVITY IN REACTIVE AND NEOPLASTIC ASTROCYTES. B.Smith: *Brain*, 1963, 86, 89-94 (Maida Vale Hosp. for Nervous Dis., London, England)

The activity of the diaphorases and some dehydrogenases was high in the human reactive astrocyte. In astrocytoma cells NAD diaphorase activity was much lower than has been found in somatic tumours, but except in the most malignant tumours, occasional cells had an unusually high activity different from the whole tumour. R-H.Kimberlin

3366. DETECTION OF N-ACETYL-DOPAMINE IN A CASE OF PHAEOCHROMOCYTOMA [TUMOUR OF ADRENAL MARROW]. C.E.Sekeris and P.Herrlich: *Hoppe-Seylers Z. physiol. Chem.*, 1963, 331, 289-291 (Physiol-Chem. Inst. Univ., Munich, Germany)

After a lengthy separation procedure of the patient's urine, noradrenaline, dopamine and N-acetyl-dopamine were isolated and identified. This appears to be the first report of an acetylated catecholamine metabolite in man. I.Cornish

3367. ANALYSIS OF LIPIDS FROM OVARIAN FLUID TUMOURS. K.Soiva and O.Castren: *Ann. Med. exp. Fenn.*, 1963, 41, 41-45 (Dept. Obstet. Gyne., Univ. Turku, Finland)

Lipids of 6 ovarian tumours were determined using thin layer chromatography and gas chromatography. Total lipid content varied from 44*5 to 100 mg./100 ml. except in dermoid cyst where the content was 80790 mg./100 ml. All the samples contained free cholesterol, triglycerides and sterol esters. Differences in fatty acid composition of the samples were qual. not very great, but quant. the variations in concn. were marked. These microanalytical methods may be used also for the analysis of steroid hormones in biol. materials. G.Faulkner

3368. EFFECTS OF LOW-CARBOHYDRATE DIET AND DIABETES MELLITUS ON PLASMA CONCENTRATIONS OF GLUCOSE, NON-ESTERIFIED FATTY ACID, AND INSULIN DURING ORAL GLUCOSE-TOLERANCE TESTS. C.N.Hales and P.J.Randle: *Lancet*, 1963, i, 790-794 (Dept. Biochem., Univ. Cambridge, England)

The effects of low carbohydrate diet and diabetes mellitus on the plasma concn. of glucose, non-esterified fatty acid, and insulin during oral glucose-tolerance tests have been studied. Normal people on a low-carbohydrate diet, and diabetics, show antagonism not only to the hypoglycaemic action of insulin but also to the important action of insulin in suppressing release of non-esterified fatty acids. The abnormalities of carbohydrate metabolism, (including insensitivity to insulin) which occur in these 2 conditions are considered to be due to release of more fatty acids for oxidation. G.H.Bell

3369. GLUCOSE FATTY-ACID CYCLE. ITS ROLE IN INSULIN SENSITIVITY AND THE METABOLIC DISTURBANCES OF DIABETES MELLITUS. P.J.Randle, P. B. Garland, C.N.Hales and E.A.Newsholme: *Lancet*, 1963, i, 785-789 (Dept. Biochem., Univ. Cambridge, England)

A higher rate of release of fatty acids and ketone bodies for oxidation is responsible for abnormalities

of carbohydrate metabolism in muscle to diabetes, starvation, and carbohydrate deprivation, and in animals treated with, or exhibiting hypersecretion of, growth hormone or corticosteroids. The interactions between glucose and fatty-acid metabolism in muscle and adipose tissue take the form of a cycle, the glucose fatty-acid cycle, which is fundamental to the control of blood-glucose and fatty* acid concn. and insulin sensitivity. G.H.Bell

3370. EFFECTS OF SIALIDASE ON PSEUDOCHOLIN-ESTERASE TYPES. D.J.Ecobichon and W.Kalow: *Canad. J. Biochem.*, 1963, 41, 969-974 (Dept. Pharmacol., Univ. Toronto, Ontario, Canada)

Sera from 11 persons were collected, 3 were characterised by high, 3 by intermediate and 3 by low dibucaine no. with corresponding fluoride no., and 2 sera of high dibucaine no. and low fluoride no., with respect to the % inhibn. of cholinesterase by dibucaine and fluoride. These enzymes were treated with sialidase and incubated at 37° for 48 hr. This did not affect the kinetic prop. of the enzymes but greatly affected their electrophoretic mobility on starch gel, the enzymes migrating towards the cathode instead of the anode. There were no differences in migration between the pseudocholinesterase types whether treated or not. J.B. Paris*

3371. RECESSIVE CONGENITAL METHAEMOGLOBIN-AEMIA. M.Lamy, J.Frezal, M-L.Jammet and N.Josso: *Nouv. Rev. franc. Hgmat.*, 1963, 3, 105-120 (ClinM de Génétique Médical, Hôpital des Enfants malades, Paris, France)

Three cases are described. MetHb h (max. absorption bands at 500 and 632 mp) levels ranged from 20-40% of the total Hb. Possible errors in the metabolic pathways of reducing metHb, which use either NADH₂ and diaphorase, or NADPH₂ and metHb-reducta* are discussed. Cases of the described type are due to a deficiency of diaphorase. The dissociation curve of oxyHb is normal. (French) V.Eisen

3372. BIOCHEMICAL IDENTIFICATION OF THE CARRIER STATE IN TAY-SACH'S DISEASE.

S.M.Aronson, G.Perle, A.Saifer and B.W.Volk: *Proc. Soc. exp. Biol.*, N.Y., 1962, 111, 664-667 (Isaac Albert Res. Inst., Jewish Chron. Dis. Hosp., Brooklyn*, N.Y., U.S.A.)

The absence of fructose 1-PO₄ aldolase was observed in the sera of children with Tay-Sach's disease. The enzyme was absent from the sera of parents and some of the relatives. The incidence of this state diminished with the remoteness of relationship to the affected child in approx. accordance with Mendelian ratios. M.M.Shapland

3373. BIOCHEMICAL REACTIONS OF COPPER WITHIN NEURAL MITOCHONDRIA WITH CONSIDERATION & ROLE OF THE METAL IN THE PATHOGENESIS OF WILSON'S DISEASE. F.S.Vogel and L.Kemper: *Lab-Invest.*, 1963, 12, 171-179 (Pathol. Dept., Duke Univ., Med. Cent., Durham, N.C., U.S.A.)

^{Natural} mitochondrial respiration in manometric chambers is markedly accelerated by minute quantities of Cu. The metal shows a marked toxicity for the electron transit system and oxidative phosphorylation and is chelated w succinate. These reactions show considerable spp. differences. A.M.Mackay

3374. SCINTILLOGRAM OF THE HUMAN SPLEEN, USING RED CELLS MARKED WITH CHROMIUM-51.

F.Spinelli Ressi and G.Luzzatti: *Atti. Acad. med. Lombarda*, 1962, 17, 130-132 (Ist. Radiol., Ospedale

Maggiore di MUano, Italy) A method of locating the spleen in human subjects is described. Human r.b.c., sensitive to anti-Rh₀ Ab or heat treated by warming at 50° for 20-30 min. were labelled with ⁵¹Cr, and then ³H i.v. into the patient. After 1 hr. the radioactivity could be localised by scintillation scanning. This method could reveal splenomegaly caused by chronic myeloid leukaemia and other abnormal spleen conditions.

(Italian) G.N. Godson

3375. METHOD FOR LIPASE DETERMINATION IN PANCREATIC JUICE AND DUODENAL CONTENTS. G.K.Shygin, L.S.Formina and Z.M.Pavlova: Vop. Med. Him., 1963, 9, 197-200 (Lab. Physiol. of Digestion, Inst. Nutr., Acad. Med. Sci. of U.S.S.R., Moscow, U.S.S.R.) Lipase was determined with triolein as substrate in the presence of gelatin and borate buffer pH 8*5. The min. amount of lipase necessary to cause a shift in pH to 6*8 (Neutral Red) was determined by serial diln. J.R.Sargent

3376. SECRETION OF PROTEOLYTIC ENZYMES IN GASTRIC JUICE IN DIFFERENT DISEASES. A.A.Pokrovsky and L.M.Bogdanova: Vop. Med. Him., 1963, 9, 217-218 (Acad. Med. ScL, Moscow, U.S.S.R.) (Russian) J.R.Sargent

3377. HUMAN INTESTINAL DISACCHARIDASES AND HEREDITARY DISACCHARIDE INTOLERANCE. HYDROLYSIS OF SUCROSE, ISOMALTOSA, PALATINOSA (ISOMALTULOSE) AND 1,6-a-OLIGOSACCHARIDE (ISOMALTO-OLIGOSACCHARIDE) PREPARATION. A.Dahlqvist, S.Auricchio, G.Semenza and A.Prader: J; clin. Invest., 1963, 42, 556-562 (Dept. Physiol. Chem., Univ. Lund, Sweden) The isomaltase and lactose activities were independent of each other, as shown by heat inactivation and mixed-substrate incubation expt. Isomaltase was responsible for the hydrolysis of Palatinose and the 1,6-d-oligosaccharide prep. The variants with hereditary intolerance for sucrose and isomaltose are thought to lack 2 enzymes. K.Jones

3378. IN VITRO BIOSYNTHESIS OF 17e-[4-14C]-OESTRADIOL BY SURVIVING NORMAL AND STEIN-LEVENTHAL-TYPE OVARIAN SLICES. A.Chapdelaine, T-Sandor and A.Lanthier: Canad. J. Biochem., 1963, 41, 635-647 (Laboratoire d'Endocrinologie, Hôpital Sainte-Étienne, Montréal, Quebec, Canada) The biotransformation of [4-14C]androstenedione, [4-14C]testosterone and t4-14c]dehydroepiandrosterone by surviving normal and Stein-Leventhal-type ovarian slices was investigated by incubating the slices in a Krebs-Ringer-phosphate-glucose medium of pH 7*4 in O₂ at 37° for 6 and 24 hr. As a cofactor 1000 I.U. of HCG was added to each vessel. Both normal and polymicrocystic 17R-α slices transformed the precursors partially to 17R-β-oestradiol which was identified by isotopic diln. There was no difference in the aromatization capacity of the 2 kinds of tissue. J.B.Parish

3379. TERMINATION OF HISTIDINE CX-DEAMINASE IN STRATUM CORNEUM AND ITS ABSENCE IN HISTIDINAEMIA. V.G.Zannoni and B.N.La Du: R. Metab. Dis., 1963, 88, 160-162 (Nat. Inst. Arthritis and Urology, Md., U.S.A.) A sensitive spectrophotometric assay for histidine-a-deaminase activity in the normal stratum corneum of normal human skin is described. The stratum corneum lacks urocanase activity.

The skin of 2 sibs with histidinaemia does not contain any detectable histidine-a-deaminase activity of measurable urocanic acid. This lack of histidine-a-deaminase activity would appear to be the biochem. abnormality responsible for histidinaemia. *

3380. RELATIONSHIP OF FLUORIDE AND IODINE IN DRINKING WATER IN OCCURRENCE OF GOITRE.

I.Gedalia and N.Brand: Arch. int. Pharmacodyn., 1963, 142, 312-315 (Dept. Preventive Med., Hebrew Univ.-Hadassah Med. Sch., Jerusalem, Israel)

2685 girls were examined for goitre in areas where drinking water contained widely differing I and F" concn. Low I was associated with a high goitre incidence. Where I was adequate, high F" concn. had no effect on thyroid function.

T. Sullivan

3381. ESTIMATION OF OESTROGENS IN THE UTERINE MUCOSA. ROLE OF THE ENDOMETRIUM IN THE BIOSYNTHESIS OF OESTRIOL.

L.Cedard, A.Granjon and J.Varangot: C.R. Soc. Biol., Paris, 1962, 156, 1764-1766 (Maternité de Port-Royal, Paris, France)

The uterine mucosa of human subjects during the follicular phase contained 81*4 fig. oestrogens/100 g. and 260 fig./100 g. during the luteal phase. The % of oestriol was 61% in the follicular phase and 88% during the luteal phase. Oestriol was present in uterus of women after menopause.

(French) M. A. Price

3382. SIGNIFICANCE OF ALTERATIONS OF ENZYME ACTIVITY IN PATHOGENESIS.

K.A.Korovnikov: Vop. Med. Him., 1963, 9, 137-142 (Chair Pathophysiol., State Med* Sch., Kalinin, Russia)

Histamine levels in muscles during intensive work and/or moderate cooling decreased significantly. At the same time histamine level in blood was unchanged. Histamine activity in blood increased slightly. After more prolonged and intensive stresses histamine levels in muscle decreased even more noticeably. Blood histamine level increased without any adequate change in histamine activity.

J.R.Sargent

3383. RETICULIN CONTENT OF BONE MARROW IN HAEMATOLOGICAL DISORDERS.

J.Burston and J.L. Pinniger: Brit. J. Haemat., 1963, 9, 172-184 (Dept. Path. and Louis Jenner Lab., St. Thomas's Hosp., London* England)

The reticulin content in these disorders may be normal, subnormal or increased. In the last case the increased content may be of 2 kinds: either an increase in the normal pattern, usually correlated with bulk or activity of haemopoietic tissue, or else distinctly abnormal. Myelofibrosis was the syndrome usually associated with the abnormal pattern which was sometimes found in cases of chronic myeloid leukaemia and multiple myeloma. It was nearly always associated with increased fibroblastic-cell activity. No precipitating factors could be found in the production of the abnormal pattern.

J*Sneath

3384. DIET, SERUM CHOLESTEROL, PROTEIN, Hb AND GLYCOSURIA IN W. INDIAN COMMUNITY.

(St. Kitts, W.I.) K.L.Stuart, R-E.Schneekloth, L.A.Lewis, F.E.Moore and A.C.Corcoran: Brit. med. J., 1962, ii, 1285-1288 (Univ. Coll. W. Indies, Jamaica)

Diets of negro labourers and their families are low in cal., protein and fat. Serum cholesterol concn. is lower in men than in women of like age and there is no menopausal rise in serum cholesterol or serum lipoprotein. Total serum protein concn. is higher than in N. Americans due to high y-globulin concn. and Hb concn. is lower, possibly due to slightly inadequate dietary protein. Glycosuria is present

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in 14/1000 at ages 20-49 yr. Ischaemic heart disease attributable to atherosclerosis or thrombosis occurred in 1% of men aged 40-49 and women aged 45-49 yr. Data confirm concurrence of low subsistence diets, largely vegetable, and of hard work, with low incidence of ischaemic heart disease.

M.E.Nutt

3385. VEGANISM: A CLINICAL SURVEY WITH OBSERVATIONS ON BI₁₂ METABOLISM. A.D.M.Smith: Brit. med. J., 1962, i, 1655-1658 (Middlesex Hosp. Med. Sch., London, England) A clinical investigation and study of vit. B₁₂ metabolism in 12 Vegans suggests that their comparative freedom from signs and symptoms of abnormality in the c.n.s. depends on most of the low serum B₁₂ being in the -OH form. Veganism and tobacco amblyopia are compared and discussed in relation to CN" metabolism and the intervention of endogenous and exogenous factors producing subsequent demyelination. E.g. suggest that this type of diet may produce occult damage to the c.n.s. in spite of clinical normality.

M.E.Nutt

3386. FAST-NEUTRON SOURCE FOR RADIOTHERAPY. P.D.Lomer and D.Greene: Nature, Lond., 1963, 198, 200-201 (Services Electronics Res. Lab., Baldock, Herts., England).

G.M.Lewis

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(See also Microbiology)

3387. MODE OF ACTION OF COLICIN F. B.L.Reynolds and P.R.Reeves: Biochem. biophys. Res. Comm., 1963, 11, 140-145 (Dept. Microbiol., Univ. Adelaide, S. Australia) Expt. with the system colicin F and *E. coli* 58161 show that the lethal action of colicin on growing cells can be reversed if cells are exposed to trypsin within a few min. after contact with the colicin, that colicin is not lethal to cells in which metabolic activity has been inhib. for at least 2 hr. after its absorption and that colicin does not immediately inhibit protein synthesis.

B. Ketterer

3388. PHOSPHORUS METABOLISM IN VIRAL-INDUCED NEOPLASIA. I. STRAINS OF MICE SUSCEPTIBLE TO MAMMARY TUMOUR VIRUS. R.F.McGregor and W.E. Cornatzer: Canad. J. Biochem., 1963, 41, 985-991 (Dept. Biochem., Univ. N. Dakota Sch. Med., Grand Forks, N.Dak., U.S.A.) Two strains of ? mice, susceptible to mammary cancer produced by the mammary tumour virus, were studied i.e. strain A and strain BALB/c high and low cancer strains respectively. 32p was inj. i.p. at 24, 31, 64 days of age and 10 months and older when mammary tumours developed. Chem. and radioactivity measurements of labelled phospholipids, nucleic acids and phosphoproteins in liver, kidney, spleen and mammary tissue showed uniform patterns of P metabolism in non target organs.

J.B.Parish

3389. REGULATORY MECHANISM OF SYNTHESIS OF EARLY ENZYME INDUCED BY BACTERIOPHAGE T4. M.Kozaka, K.Matsubara and Y.Takagi: Biochem. biophys. Res. Comm., 1963, 11, 244-248 (Dept. Biochem., Med. Sch., Kanazawa Univ., Kanazawa, Ishikawa, Japan) Synthesis of deoxy-CTPase activity

normally stops 15 min. after infection frith phage T4, but continues with u.v. irradiated phage. When non-irradiate* and irradiated phage are introduced simult. the u.v. irradiated phage was dominant in this effect.

B. Ketterer

3390. INHIBITORY EFFECTS OF PUROMYCIN AND FLUOROPHENYLALANINE ON INDUCTION OF THYMIDINE KINASE BY VACCINIA INFECTED L-CELLS. S.Kit, D.R.Dubbs and L.J.Pierkski: Biochem. biophys. Res. Comm., 1963, 11, 176-181 (Div. Biochem. Viro. Baylor Univ. Coll. Med., Houston, Tex., U.S.A.)

Expt. with fluorophenylalanine and puromycin support the thesis that the thymidine kinase induced in this system is synthesised de novo.

B. Ketterer

3391. ASSAY OF INFECTIOUS RNA FROM BACTERIOPHAGE R17. W.Paranchych: Biochem. biophys. Res. Comm., 1963, 11, 26-33 (Wistar Inst., Philadelphia! Pa., U.S.A.) Bacterial protoplasts have been shown to be susceptible to infection by RNA from phage R17 and therefore suitable for its assay. The infectivity yield was much increased in the presence of a suitable concn. of protamine sulphate.

B. Ketterer

3392. INDUCTION OF DEOXYCYTIDYLIC ACID KINASE ACTIVITY BY DINUCLEOTIDE FRACTION DERIVED FROM ENZYMIC DNA DIGEST IN PNEUMOCOCCI. W.Firschein: Biochem. biophys. Res. Comm., 1963, 1¹ 187-194 (Dept. Biol.. Wesleyan Univ., Middletown, Conn., U.S.A.) A fraction from an enzymic DNA digest consisting primarily of dinucleotides selectively stim. DNA synthesis in virulent, but not avirulent, *Pneumococci*. This effect was associated with an increase in deoxycytidylic acid kinase activity. The other 3 deoxy nucleotide kinases were not affected.

B.Ketterer

3393. RELATIONSHIP BETWEEN DNA SYNTHESIS AND CONJUGATION IN *E. COLI*. N.Bouck and E.A.Adef*¹: Biochem. biophys. Res. Comm., 1963, 11, 24-27 (Dept. Microbiol., Yale Univ., New Haven, Conn-i U.S.A.) The effect of phenethyl alcohol, a sp. inhibitor of DNA synthesis on recombinant formation in *E. coli* is described and its implications discussed.

B. Ketterer

3394. REPRESSION OF VALINE-ISOLEUCINE PATHWAY IN SALMONELLA. F.B.Armstrong and R.P. Wagner: Proc. nat. Acad. Sci., Wash., 1963, 49, 628-633 (Dept. Genetics, North Carolina State Coll., Raleigh, N.C., U.S.A.) Continued investigations of the a repression of the pathway for the synthesis of valine, ^{redund} isoleucine in wild-type *S. typhimurium* show that ^h line, a precursor of isoleucine, is required in addition to va isoleucine, and leucine to repress maximally the reduce isomerase (1 of the 2 repressible enzymes). Available evidence emphasises the unusual complexities associated with the regulatory mechanisms of the pathway. Several features of the repression phenomenon are discussed.

j.R.Sargent

3395. REPRESSION OF INDUCIBLE TARTRATE DEHYDRATASES IN PSEUDOMONAS STRAINS. R-P. 413-berger and M.Shilo: J. gen. Microbiol., 1963, 31, prew 420 (Lab. Microbiol. Chem.. Dept. Biochem.. Heh Univ.-Hadassah Med. Sch., Jerusalem, Israel) ^{ife} effect of various growth substances on the synthesis 01 ^{win} 3 inducible stereosp. tartrate dehydratases was followed strains of *Pseudomonas*. In the inhibn. of induction by * org. acids, synthesis of d- and l-tartrate dehydratase wa repressed more strongly than synthesis of meso-tartrate dehydratase. Pre-induction did not prevent subsequent

repression and a degree of correlation was found between growth rate supported by substrates and extent of repression. The significance of the different degrees of repression by substrates is discussed. K.Brew

3396. SIMPLE METHOD OF PURIFYING STAPHYLO-KINASE. K.L.A.Glanville: Biochem. J., 1963, 88, 11-14 (Dept. Pathol., Inst. Orthopaedics, Royal Nat. Orthopaedic Hosp., Brockley Hill, Stanmore, Middx., England) Staphylokinase present in broth-culture supernatant fluid of selected strains of *Staphylococcus 4HEgus* was cone, by pptn. with $(\text{NH}_4)_2\text{SO}_4$. A soln. of the dialysed, pptd. material in citric acid-phosphate buffer, pH 4, was adsorbed on a CM-cellulose column and could be eluted by 2 alternative methods. The first, relying on elution with citric acid-phosphate buffer. pH 7, accomplished a purification of about 10-fold. The second, which relied on elution with phosphate buffers. pH 6, of increasing ionic strength, was more time-consuming but resulted in a purification of about 44-fold with respect to protein content.

^{3397.} DEHYDROGENASE OBTAINED FROM CELL MEMBRANES OF MICROCOCCUS LYSODEIKTICUS. N.S.German, L.G.Zhukova and A.I.Qparin: Biokhimija, 1963, 28, 122-127. An enzyme prep, isolated from the cytoplasmic membrane of *M. lysodeikticus*, This prep, contained malic and NADH₂ dehydrogenases. Carotenoids and a component with a fluorescence characteristic of flavine nucleotides were found in the prep. (Russian) B.J.Cooper

3398. SEPARATION AND ISOLATION OF CYTOPLASMIC PARTICLES FROM NORMAL AND ANAEROBIC BAKER'S EAST. G.Schatz, H.Tuppy and J.Klima: Z. Naturforsch. B, 1963, 18, 145-157 (Inst. Biochem., Univ. Wien, Austria) Mitochondria were isolated from *Saccharomyces cerevisiae* and from a 'petite' mutant by ultracentrifugation in a sucrose density gradient. The activity of various enzyme systems was compared in the cell homogenates and isolated mitochondrial fractions of the 2 strains. The activity of enzymes related to electron transport was considerably reduced in the mitochondria of the mutant strain. The whole mitochondrial fraction was distributed throughout a sucrose density gradient. Two major peaks were obtained on the basis of total N content, the first of which contained almost of the M8-stim. ATPase whilst electron "sport enzymes were cone, in the second.

^{3399.} NATURE OF THE GRANULES OF THE GENUS *IRILLUM*. R.J.Martinez: Arch. Mikrobiol., 1963, 48, 334-343 (Dept. Bacteriol., Univ. California, Los Angeles, Calif., U.S.A.) Granular inclusions of ³⁵Sn and ³⁵S in *S. cerevisiae* did not contain significant amounts of polyphosphates. They are composed primarily of ³⁵S and ³⁵Sn. E.M.Ling

^{3400.} ACID PRODUCTION BY AZOTOBACTER VINE-LANDII. G.H.Cohen and D.B.Johnstone: Nature. Lond., 1963, 198, 211 (Dept. Agric. Biochem., Univ. Vermont, Burlington, Vt., U.S.A.) Growth of *A. vineelandii* on broth was associated with acid production in slime-forming strains, the degree of acidity attained being proportional to the amount of carbohydrate supplied. It is suggested that in strains that do not produce slime, carbohydrate is completely oxidised, while in slime-forming strains, a sp. polymerase may combine the partial oxidised intermediates into the acidic poly-

saccharide, which is composed mainly of galacturonic acid. G.M.Lewis

3401. BACTERIAL CONVERSION OF D-GLUCARATE TO GLYCERATE AND PYRUVATE. H.J.Blumenthal and D.C.Fish: Biochem. biophys. Res. Comm., 1963, 11, 239-243 (Dept. Bacteriol., Univ. Michigan, Ann Arbor, Mich., U.S.A.) It is shown that each mole of D-glucarate utilised by *E. coli* gives rise to 1 mole each of pyruvic acid and D-glyceric acid. This paper gives evidence for the participation of tartronate semialdehyde reductase in the reaction sequence. B.Ketterer

3402. OXIDATION OF GLYCOLS BY ACETIC ACID BACTERIA. K.Kersters and J.De Ley: Biochim. biophys. Acta, 1963, 71, 311-331 (Lab. Microbiol., Fac. Sci., State Univ., Ghent, Belgium) Resting cells of 14 strains oxidised 1,2-ethanediol, DL-1,2-propanediol, DL-1,3-butaneadiol, rxesc-2,3-butaneadiol and 1,4-butaneadiol. *Gluconobacter oxydans* (*suboxydans*) oxidised 22 glycals. Isolated end products of oxidation of 1,2-ethanediol, 1,3-propanediol, 1,6-hexanediol, 1,7-heptanediol, DL-1,3-butaneadiol, 1,4-butaneadiol and 1,5-pentanediol by either this strain of *Acetobacter aceti* (*liauefaciens*) were chem. identified. Oxidation of the last 2 occurred in 2 steps. DL-1,3-butaneadiol did not serve as C source for *A. aceti* and inhib. growth in ethanol or glycerol media. Particulate fractions oxidised all the glycals. A sol. NAD-linked primary alcohol dehydrogenase oxidised monohydric primary alcohols and diols. DL-1,3-butaneadiol was slowly oxidised at C-1. A sol. NAD linked sec. alcohol dehydrogenase oxidised monohydric jec. alcohols and the sec. alcohol function of meso-2,3-butaneadiol. DL-2r5-butaneadiol, DL-1,2-propanediol, L(+)-1,2-propanediol, meso-3,4-hexanediol and (-)-3,4-hexanediol. The dehydrogenases were purified chromatographically. B.M.Stevens

3403. ITACONATE METABOLISM. L ITACONYL CoA SYNTHESISING REACTION IN CELL FREE EXTRACTS OF PSEUDOMONAS FLUORESCENS. J.Nagai: J. Biochem., Tokyo, 1963, 53, 181-187 (Dept. Chem., Fac. Sci., Kyoto Univ., Japan) Acetate, lactate, citramalate and pyruvate were formed from itaconate in the presence of ATP, CoA and MgCl₂ by extracts of *P. fluorescens* grown on media containing itaconate. Itaconohydroxamate was formed if NH₂OH was also present. No degradation was observed by extracts of cells grown on glucose medium. The enzyme synthesising itaconyl CoA was purified approx. 10-fold. The ratio itaconyl CoA synthesising rate:succinyl CoA synthesising rate was const, throughout purification and was independent of the culture medium. B.M.Stevens

3404. COMPETITIVE INHIBITION OF d-METHYL-GLUCOSIDE UPTAKE IN E. COLI. D.P.Kessler and H.V.Rickenberg: Biochem. biophys. Res. Comm., 1963, 10, 482-487 (Dept. Bacteriol., Indiana Univ., Bloomington, Ind., U.S.A.) Glucose, glycerol, fructose, lactose, maltose, lactate and succinate all inhibit a-methylglucoside uptake competitively in cultures grown on these substrates. B.Ketterer

3405. TRANSPORT OF D-XYLOSE AND SUGAR SPACE IN BAKERS' YEAST. A.Kotyk and A.Kleinzel: Folia Microbiol., 1963, 8, 156-164 (Lab. Cell Metab., Inst. Microbiol., Czechoslovak Acad. Sci., Prague, Czechoslovakia) D-xylose space in *S. cerevisiae* corresponded to 100% of cell water space in

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resting yeast. Xylose space was reduced to 60% by N deficiency and to 82% by P deficiency. The space of N-deficient but not P-deficient cells was raised by treatment with NH₄Cl, amino acids, nucleotides from a yeast extract and ATP. Urea had a depressing effect on xylose space. Urea space was almost identical in size with xylose space.

J.R.Sargent

3406. LOCALISATION, FUNCTION AND FORMATION OF CAROTENOID PIGMENTS OF STRAIN OF MYCOBACTERIUM MARINUM. M.M.Mathews: Photochem. Photobiol., 1963, 2, 1-8 (Bacteriology Dept., California Univ., Berkeley, Calif., U.S.A.) This strain of *M. marinum* produces carotenoid pigments only when exposed to light. Only 1 pigment is produced and its intracellular location was found to be the cell envelope. It was active in protecting the cells against lethal photo-oxidations radiated by Toluidine Blue. Studies were carried out to investigate the characteristics of pigment production on exposure of the bacterium to light.

G.C.Barr

3407. ENZYMIC GLUCOSYLATION OF POLYGLYCEROPHOSPHATE. M.M.Burger: Biochim. biophys. Acta, 1963, 71, 495-497 (Dept. Biol. Chem., Washington Univ. Sch. Med., St. Louis, Mo., U.S.A.) A particulate enzyme prep. from *Bacillus subtilis* (ATCC 9945) which synthesised polyglycerophosphate from CDP-glycerol would also glucosylate the enzymically synthesised polymer using UDP-D-glucose as glucosyl donor. Prelim, comm.

B.M. Stevens

3408. MICROBIAL TRANSFORMATION OF n-OCTANE INTO DICARBOXYLIC ACIDS. M.Y.Ali Khan, A.N. Hall and D.S.Robinson: Nature, Lond., 1963, 198, 289 (Dept. Biochem., Manchester Coll. Sci. Technol., Manchester, England) A *Pseudomonas* grown on medium containing *n*-octane produced *n*-octanedioic acid and *n*-hexanedioic acid.

G.M.Lewis

3409. BIOSYNTHESIS OF METHANE FROM METHYL MOIETY OF METHYLCOBALAMIN. B.A.Blaylock and T.C.Stadtman: Biochem. biophys. Res. Comm., 1963, 11, 34-38 (Lab. Biochem., Nat. Heart Inst., Bethesda, Md., U.S.A.) Methylcobalamin when added in substrate level amounts to disrupted cell prep. of *Methanoscincus barkeri* served as a source of methane. Pyruvate was added as an electron donor.

B.Ketterer

3410. BIOSYNTHESIS OF NICOTINIC ACID BY MYCOBACTERIUM TUBERCULOSIS. D.Gross, H.R.Schutte, G.Hubner and K.Mothes: Tetrahedron Letters, 1963, 9, 541-544 (Inst. Biochem. der Pflanzen, Leipzig, Germany) It is shown with the BCG-strain, that aspartic acid is directly incorporated to form atoms 2, 3 and 4 of the nicotinic acid mol. and that the other 3 C-atoms could come from glycerol or glycerolaldehyde. Letter.

R.H.Kimberlin

3411. COURSE OF TRANSFORMATION OF BENZALDEHYDE BY S. CEREVIAE. H.Becvarova, O.Hanc and K.Macek: Folia Microbiol., 1963, 8, 165-169 (Res. Inst. Pharm. Biochem., Prague, Czechoslovakia) *S. cerevisiae* was capable of fermenting 0.2% benzaldehyde in the presence of a fermentable sugar. Benzaldehyde was fermented within 90-120 min. yielding 23-39% phenylacetylcarbinol and 40-24% benzyl alcohol. The presence of acetaldehyde in the media lowered transformation of benzaldehyde and raised the yield of phenylacetyl carbinol.

J.R.Sargent

3412. STRUCTURE OF CHORISMIC ACID, NEW INTERMEDIATE IN AROMATIC BIOSYNTHESIS. F.Gibson and L.M.Jackman: Nature, Lond., 1963, 198, 388-389 (Bacteriol. Sch., Univ. Melbourne, Australia) Analysis of chorismic acid and study of its i.r. and magnetic resonance spectra indicates that it can be formulated as the 3-enolpyruvic ether of *trans*-3,4-dihydroxycyclohexa-1,5-diene carboxylic acid.

G.M.Lewis

3413. [THE] METABOLISM OF PHENYLALANINE-CONTAINING PEPTIDE AMIDES IN E. COLI. S.Simmonds and D.D.Griffith: J. Bact., 1962, 83, 256-263 (Dept. Biochem., Yale Univ., New Haven, Conn., U.S.A.)

This is a study of the hydrolysis, by fresh and lyophilised cells of a phenylalanine auxotroph of *E. coli* of phenylalanylglycinamide and glycyl-L-phenylalaninamide. Despite the presence of intracellular activity towards the 2 dipeptides, neither permits as much growth as that observed with an equimol. concn. of free phenylalanine. The relatively small extent of growth on the dipeptide amides and also on L-phenylalaninamide, appears to result from the inability of the cells in a growing culture to take up all of the exogenous amide added to the growth medium. This, in turn, probably reflects the presence in the medium of the amides as a mixture of charged and uncharged forms, of which only the latter are readily taken into the cells.

C.Toothill

3414. BIOCHEMISTRY OF MICRO-ORGANISMS. IV. SYNTHESIS OF O, O-DIMETHYLCURVULINIC ACID.

A.Kamal and M.Akram Sandhu: Tetrahedron Letters, 1963, 10, 611-612 (West Regional Labs., Pakistan Council Sci. and Ind. Res., Ferozepur Rd., Lahore, Pakistan) The synthesis of O, O-dimethyl-curvulinic acid is reported as proof that the structure of curvulinic acid is 2-acetyl-3,5-dihydroxyphenylacetic acid.

R.H.Kimberlin

3415. FORMATION OF RESORCINOL AN INTERMEDIATE IN METABOLISM OF 2,4-DIHYDROXYBENZOIC ACID AND ITS CORRESPONDING ALDEHYDE. H.Halvorson: Biochem. biophys. Res. Comm., 1963, 10, 440-443 (Dept. Microbiol., Univ. Manitoba, Winnipeg, Canada) An *Aspergillus* sp. capable of converting 2,4-dihydroxybenzaldehyde to 2,4-dihydroxybenzoic acid, and the latter to resorcinol has been isolated.

B.Kettner

3416. MICROBIOLOGICAL DEGRADATION OF QUERICITRIN. D.W.S.Westlake: Canad. J. Microbiol., 1963, 9, 211-220 (Nat. Res. Council of Canada, Prairie Reg. Lab., Saskatoon, Sask., Canada)

A no. of moulds and bacteria were screened for their ability to degrade quercitrin. Quercitrin degradation is dependent upon the synthesis of an inducible glycosidase (quercitrinase) which is synthesised by only a few members of the *Aspergillus flavus* group. The enzyme is excreted into the culture medium and is induced by readily metabolised flavonols and flavonol-glycosides. The glycosidase liberates rhamnose from the 3-position of quercitrin and myricitrin and the 7-position of robinirin. The aglycone, quercetin, is subsequently metabolised to CO and the depside of phloroglucinol-carboxylic acid and protocatechuic acid.

S.L.Hoa*

3417. BIOSYNTHESIS OF PHENOLS. IV. NEW METABOLIC PRODUCT OF ASPERGILLUS TERREUS THOM. C.H.Hassall and D.W.Jones: J. chem. Soc., 1962, 4189-4191 (Dept. Chem., Univ. Coll., Swansea, Wales) A mutant strain derived from *A. terreus*, Thom

Produced 3,4-dihydro-6,8-dihydroxy-3,4,5-trimethyl-isocoumarin-7-carboxylic acid. The elucidation of the structure of this compound followed from degradative evidence and from comparison of a deriv. with a degradation product of citrinin. L. G. Gillies

3418. PURIFICATION OF STAPHYLOCOCCAL 0-LYSIN. A.W.Jackson: Canad. J. Biochem., 1963, 41, 755-761 (Lab. Hyg. Dept. Nat. Hlth. and Welfare, Ottawa, Canada) Staphylococcal β -lysin was purified 250 times with overall yields of 50-60% by the following procedure. Zn acetate was added to ice-cold, dialysed soln. of crude lysin followed by cold ethanol to ppt. the Zn-lysin complex. Zn was removed by dissolving the complex in water plus chelating agent, followed by dialysis at low temp. The β -lysin was re-ppt. by formation of the insol. complex Zn-mercuric-lysin and again resolved as a ter. salt at first pptn. Re-ppt'd lysin was further purified by chromatography, employing columns of hydroxyapatite. The final product was free of other known lysins, coagulase and phosphatase. J.B.Parish

3419. SOME PRODUCTS OF BACTERIAL DISSIMILATION OF STREPTOMYCIN. D.Klein and D.Pramer: J. Bact., 1962, 83, 309-313 (Dept. Agric Microbiol., Rutgers, State Univ., New Brunswick, N.J., U.S.A.) Products can be detected by Folin-Ciocalteau's reagent, ninhydrin (which is reagent; they also absorbed in the u.v. at $265 \text{ m}\mu$). Also a volatile base was detected, forming methamine. Urea and streptamine were found growing cultures and washed cell suspensions with streptomycin. More than 90% of the urea was recovered as urea or gen in culture filtrates. The bacterial dissimilation therefore involved hydrolysis of the amide group and the secondary amino-nitrogen of each and the products of the reaction were urea and streptamine. C.Toothill

3420. MECHANISM OF BIOSYNTHESIS OF CITRO-BISETIN. S.Gatenbeck and K.Mosbach: Biochem. Biophys. Res. Comm., 1963, 11, 166-169 (Inst. of Chem., Univ. Lund, Sweden) Evidence is given that citro-bisettin arises in its biosynthesis from the condensation of 2 distinct polyketochains. B.Ketterer

3421. SYNTHESIS OF PRODIGIOSIN IN SERRATIA LIQUESCENS. D.M.Shrimpton, G.S.Marks and R.S.Grad: Biochim. biophys. Acta, 1963, 71, 408-415 (Dept. Bot., Univ. Chicago, Ill., U.S.A.) It was demonstrated that Sraminolaevulinic acid was not used in prodigiosin. Prodigiosin precursor was apparently incorporated as a single unit; the dihydroxylic prodigiosin precursor produced ^{14}C and ^{3}H . Incorporation of uniformly labelled ^{14}C proline and [2- ^{14}C]proline into the prodigiosin precursor indicated that C-2, or the 2-oxo proline ring, was utilised mainly for the entire proline ring. Part of Prodigiosin. The oxynamoyl proline ring was not utilised in the formation of the 2-hydroxyproline ring of Prodigiosin. Incorporation of Ursolic acid into Prodigiosin and the dipyrrolic predane was rated that the glycine methyl C was incorporated efficiently into both parts of the prodigiosin. B.M.Stevens

3422. STIMULATION OF OXYTETRACYCLINE FORMATION BY N-ACETYL DERIVATIVES OF CERTAIN AMINO ACIDS. W.A.Zygmont: Nature, Lond., 1963, 198, 289-290 (Dept. Nutr. Res., Res. Center, Mead Johnson and Co., Evansville, Ind., U.S.A.) The yield of oxytetracycline in cultures of *Streptomyces rimosus* was markedly stim. by N-acetyl-DL-alanine or N-acetylglycine. The acetyl deriv. of methionine, leucine, valine, and glutamic acid did not stimulate antibiotic production above the level produced in the presence of the parent amino acid. G.M.Lewis

3423. SYNTHESIS OF DEGRADATION PRODUCT OF CEPHALOSPORIN C AND RELATED SULPHUR-CONTAINING α -TETRONIC ACIDS. E.Galantay, A.Szabo and J.Fried: Tetrahedron Letters, 1963, 7, 415-419 (Squibb Inst. Med. Res., New Brunswick, N.J., U.S.A.) The disulphide of β -mercaptomethyl- α -tetronic acid had antimicrobial activity against several organisms including *S. aureus* and *Trichophyton mentagrophytes*. Letter. R.H.Kimberlin

3424. DERIVATIVES OF α -TETRONIC ACID. A.G.Long and A.F.Turner: Tetrahedron Letters, 1963, 7, 421-427 (Glaxo Res. Ltd., Greenford, Middx., England) Letter. R.H.Kimberlin

3425. PRESENCE OF A MUCOPEPTIDE IN THE MEDIA OF AN E. COLI MUTANT AND ITS RELATION TO THE CELL WALL. A.M.Municio, T.Diaz and A.Martinez: Biochem. biophys. Res. Comm., 1963, 11, 195-200 (Inst. Chem., Madrid, Spain) When a lysine requiring mutant of *E. coli* is incubated in a lysine limited medium lysis occurs following depletion of the lysine. With the lysis a mucopeptide material is released into the medium which is chem. and immunol. related to the cell wall. B.Ketterer

3426. ISOLATION OF PROTOPLAST BURSTING FACTOR FROM PIG PANCREAS. K.Arima, T.Yamaguchi, K.Horikoshi and G.Tamura: Biochim. biophys. Acta, 1963, 71, 500-502 (Dept. Agric. Chem., Univ. Tokyo, Japan) The factor appeared to be a protein. Prelim. comm. B.M.Stevens

3427. ACRYLAMIDE ELECTROPHORESIS AND PROTEIN PATTERN DURING MORPHOGENESIS IN A SLIME MOULD. M.H.Zeldin and J.M.Ward: Nature, Lond., 1963, 198, 389-390 (Dept. Biol., Temple Univ., Philadelphia, Pa., U.S.A.) Extracts of protein from homogenates of *Physarum* were examined by acrylamide electrophoresis. Different patterns were obtained from the plasmodial and pre-sporangial stages and differences found in the activity of polysaccharidases A and B and α -amylase. G.M.Lewis

3428. BIOASSAY AND STANDARDISATION OF VENOM OF HONEY BEE. A.W.Benton, R.A.Moise and F.V.Kosikowski: Nature, Lond., 1963, 198, 295-296 (Dept. Entomol., Cornell Univ., Ithaca, New York, U.S.A.) The bacteriostatic effect of *Apis mellifera* venom can be assayed quant. by the inhibn. of growth of *Bacillus subtilis*. G.M.Lewis

3429. BIMODAL STIMULATION OF RETICULOENDOTHELIAL SYSTEM BY MYCOBACTERIUM PHLEI. F.J.Dicarlo, L.J.Haynes, S.G.Malam and G.E.Phillips: Canad. J. Biochem., 1963, 41, 731-736 (Biochem. Dept., Warner-Lambert Res. Inst., Morris Plains, NJ., U.S.A.) A variety of substances which stimulate the RE system in the mouse were rated in potency by employing active dry bakers' yeast as the reference stimulant.

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M. phlei Halpern was found to be a particularly effective RE stimulant, a single i.v. injn. eliciting a bimodal stimn. of global phagocytic activity. The peak rates of phagocytosis occurred at 1 and 21 days post administration. *M. phlei* Halpern also caused pronounced hypertrophy of liver and spleen; 6 weeks elapsed before these organs returned to normal size. J.B. Parish

PLANT BIOCHEMISTRY

3430. THE DISTRIBUTION OF SUCCINATE DEHYDROGENASE AND MALATE DEHYDROGENASE AMONG COMPONENTS OF TOBACCO-LEAF EXTRACTS.

W.S.Pierpoint: Biochem. J., 1963, 88, 120-125
(Rothamsted Expt. Station, Harpenden, Herts., England)

The distribution of 3 enzymes has been followed among fractions made from tobacco-leaf extracts by both differential and density-gradient centrifuging. Succinate dehydrogenase sedimented as if it were completely attached to mitochondria. Only small proportions of the total malate dehydrogenase and aconitate hydratase were recovered in fractions containing mitochondria, and small amounts of malate dehydrogenase in those containing chloroplasts. Both these enzymes could be partially removed from the sedimented particles by washing. It is suggested that some of the malate dehydrogenase and aconitate hydratase activity of the supernatant fraction originated in the particles. *

3431. OXYGEN FIXATION INTO HYDROXYPROLINE OF PLANT CELL WALL PROTEIN.

D.T.A.Lamport: J. biol. Chem., 1963, 238, 1438-1440 (RIAS,

Baltimore, Md., U.S.A.) The hydroxyl oxygen of hydroxyproline of die primary cell wall protein in a sycamore cell suspension is derived entirely by fixation of atm. O. The hydroxyproline-rich primary cell wall protein is termed *ex tens in*. J.N.Ashley

3432. LIPID AND PROTEIN IN GERMINATING AND DEVELOPING FLAXSEED LINUM USITATISSIMUM L.

R.E.Huber and S.Zalik: Canad. J. Biochem., 1963, 41, 745-754 (Dept. Plant Sci., Univ. Alberta,

Edmonton, Alberta, Canada) The pattern of fatty acid interconversions during lipid synthesis suggested that more-unsat. acids were formed from less-unsat. ones. The relative proportions of each fatty acids during germination remained const, suggesting that fatty acids were being broken down at a rate proportional to the amount originally present. Protein increased steadily during flaxseed development, and the total content of each amino acid increased until 4 weeks after blooming, but the free amino acid portion and amide N decreased; subsequently all remained at a const. level. During germination the protein content and proportions of amino acids remained const, but the free amino acid content rose. J.B. Parish

3433. FRACTIONATION OF LEAF CELLS IN NON-

QUEOUS MEDIA.

R.Thalacken: Biochim. biophys. Acta, 1963, 71, 477-480 (Staatliches Chem. Untersuchungsamt, Giessen, Germany) The dependence of the amount of lipid extracted from young *Elodea canadensis* leaves by petrol ether and by CCl₄ on temp, and time of extraction and, for petrol ether, on the vol used was examined. (German) B.M.Stevens

H.Reisener, AJ.Finlayson, W.B.McConnell and G.A.Ledingham: Canad. J. Biochem., 1963, 41, 737-743 (Nat. Res. Council of Canada, Prairie Reg. Lab., Saskatoon, Saskatchewan, Canada) Evidence is presented that propionate metabolism in rust spores involved conversion of C-1 to CO₂ and utilisation of C-2 and C-3 as acetate with C-2 behaving as the carboxyl C. Uredospores were shaken for 3 hr. with phosphate buffer pH 6*2, containing [1-¹⁴C]propionate, [2-¹⁴C]- or [3-¹⁴C]propionate, resulting in the removal of about 55% of the ¹⁴C from soln. With [1-¹⁴C]propionate most of the ¹⁴C taken up was released as ¹⁴cO₂t whereas about 20% and 31% of propionate C-2 and C-3 respectively was incorporated into the spores. The sp. activity of various fractions increased with increase in position no. of propionate in which the ¹⁴C was located. J.B. Parish

3435. BIOSYNTHESIS OF 0-PYRAZOL-1-YLALANINE.

P.M.Dunnill and L.Fowdeic: J. exp. Bot., 1963, 14, 237-248 (Dept. Bot., Univ. Coll., London, England)

Enzymic synthesis of the amino acid occurred by condensation of pyrazole and serine. The prop. and distribution of (3-pyrazole-1-ylalanine synthetase have been studied in c'ru'de extracts of cucumber seedlings*. The enzyme was detected in other cucurbit seedlings. Indirect evidence demonstrated the presence of pyrazole in cucumber and melon seeds. I.D.J.Phillips

3436. [¹⁴C]CARBAMOYL-3-ALANINE AS PRECURSOR OF PYRIMIDINES IN HIGHER PLANTS.

J.Buchowicz, L.Reifer and I.Geric: Acta biochim. pol., 1963, 10, 157-162 (Inst. Biochem. Biophysics, Polish Acad.

Sci., Warszawa, Poland) Excised wheat blades were fed for 0*5-24 hr. with a 20mM [carbamoyl-l¹⁴C] carbamoyl-[3-alanine [CBA]] The resulting radioactive products were isolated from the tissue, identified and determined. About 0*5% of ¹⁴C introduced was recovered in the various products of anabolism, with uracil showing the highest radioactivity. After 8 hr. of incubation the activity of uracil amounted to 50% of the sp. activity of the introduced CBA. Activities of uridine, 5'-UMP, 5'-CMP as well as of the pyrimidine mononucleotides obtained on acid hydrolysis of the polynucleotide fraction, were also distinct but of a much lower order. M.Korbecto

3437. CHEMISTRY OF ATTRACTION OF POLLEN TUBE TO OVULE OF OENOTHERA.

H.Schildknecht and N.Benoni: Z. Naturforsch. B, 1963, 18, 45-54 (Inst.

Org. Chem., Univ. Erlangen-NQrnberg, Germany) The ovules of 5 spp. of *Oenothera* were extracted with water and alcohol and the products separated by paper chromatography. Several amino acids:- lysine, argini⁰* asparagine, valine, phenylalanine and leucine, 5 pep* tides, an aliphatic amine, aif indole, 2 ninhydrin-neg* amines and 6 sugars:- sucrose, galactose, glucose, arabinose and fructose were obtained. A combination of amino acids, sugars and KCl was required to show ma^g chemotropic effect. (German) j.C.CrawhaU

3438. LEVEL OF ORGANIC ACIDS IN PLANT TISSUES*

J.Carles and A.Alquier-Bouffard: Bull. Soc. Chim.

biol., Paris, 1963, 45, 157-163 (Lab. Physiol.

Végétale, Inst. CathoUque, Toulouse, France) (French) J.C.Crawha¹

3439. SYNTHESIS OF [¹⁴C]SHIKIMIC ACID IN PJJ¹⁴ LA¹⁴ RESINOSA, AIT. FROM SOME CARBON-14 COMPOUNDS.

S.Yoshida and G.H.N.Towers: Canad.

I. Biochem., 1963, 41, 579-586 (Bot. Depu. McGill Univ., Montreal, Quebec, Canada) ^{14C}-Labelled compounds were administered to the cut ends of young *Eijesinow* plants which were then incubated at 25° for 24 or 72 hr. in the light. The shoots were extracted and chromatographed to produce a band of shikimic acid; this was extracted and estimated quant. by spectrophotofluorometry. of the compounds administered pyruvic acid gave shikimic acid of the highest sp. activity, [3-¹⁴C]pyruvate gave a product if higher sp. activity than either [1-¹⁴C]- or [2-¹⁴C]pyruvate. Sugars were the next most effective but ^{14C} from several org. acids was not readily incorporated into shikimic acid.

J.B.Parish

3440. NATURE OF STABLE ADAPTATION INDUCED BY SELENOMETHIONINE IN CHLORELLA VULGARIS.

A.Shrift and M.Sprout: Biochim. biophys. Acta, 1963, 71, 332-344 (Kaiser Found. Res. Inst., Richmond, Calif., U.S.A.) A strain induced to resist the growth uncoupling effect of selenomethionine even after removal of the analogue, absorbed L-[35S]methionine much more rapidly than normal cells but incorporated a greater proportion of the absorbed 35S into protein. ^{35SO₄2-} absorption and conversion to protein were normal. S starvation, which deadadapted, restored permeability to methionine. DNP inhib. methionine uptake.

B.M. Stevens

3441. BIOSYNTHESIS OF Se-METHYLSelenocysteine FROM SELENIUM IN SELENIUM ACCUMULATING PLANTS. A.Sairift and T.K.Virupaksha: Biochim. biophys. A, 1963, 71, 483-485 (Kaiser Found. Res. Inst., Richmond, Calif., U.S.A.) ^{75SeO₃2-}

Jensupped ~~to exercise~~ ^{75SeO₃2-} converted to Se-methylselenocysteine. Prelim.

B.M.Stevens

[^] 2. STRUCTURE OF SIKKIMOTOXIN. SYNTHESIS OF STEREOISOMERIC 6,7-DIMETHOXY-ANALOGUES OF PODOPHYLLOTOXIN. E.Schreien Helv. chim. Acta, 1963, 46, 75-117 (Pharmazeutisch-chemische Forschungslaboratorien, Sandoz AG., Basel, Switzerland) The total synthesis of several stereoisomeric dimethoxy-analogues of podophyllotoxin, the main component of the resin of *Podophyllum emodi* and *P. peltatum* is described*. These are compared with natural materials and give rise to some doubt as to the correctness of the structure proposed for isosikkimotoxin and acetyl-isosikkimotoxin, or the purity of the compounds from the natural source.

(German) A.D. Smith

[^] 3. METABOLISM OF LABELLED ETHYLENE IN AVOCADO. APPEARANCE OF TRITIUM IN METHYL GROUP OF TOLUENE. E.F.Janseru J. bioL Chem., 1963, 238, 1552-1555 (Western Reg. Res. Lab., Albany, Calif., U.S.A.) [3H]Ethylene (40 mc/mol.) is incorporated into avocado fruit from the surrounding atm. to a small extent in 4 hr. At levels of 250 p.p.m. and 2000 p.p.m., 0.015% and 0.042%, respectively, is incorporated by the fruit. Approx. 75% of the radioactive metabolites present in 70% alcohol extracts are volatile, and benzene and toluene are present. The toluene is labelled and 95% of the activity is in the methyl group.

J.N.Ashley

^{3444. RESPIRATION AND PHOSPHORYLATION IN CROTISED POTATO TISSUES.} B.A.Rubin and O.L. Dr. P. I. A. kovsk a k. Biokhimiia. 1963, 28, 80-88. Potato tubers which stimulate respiration of healthy *P. tuberosum* and susceptible *P. tuberosum* tubers contaminated with *Phytophthora infestans*, inhib. the respiration of necrotised

tissues of the resistant type. This was shown by the high respiratory quotient, appreciable ethanol level, and low ratio of CO₂ release in N as compared with that in air. In the necrotised tissues of the resistant type, respiration appeared to be uncoupled from phosphorylation. It is thought that this may be related to the resistance to *Phytophthora* infestation. (Russian) B.J.Cooper

3445. CAROTENOIDS OF CARROT ROOT CAMBIAL

TISSUE CULTURES. J.Naef and G.Turian: Phytochemistry, 1963, 2, 173-177 (Inst. Bot. gén., Univ. Geneva, Switzerland) The carotenoids of a normal green strain and of a mutant orange strain of carrot root cambial tissue culture have been examined. The green strain contains only small quantities of α- and β-carotene and lutein in addition to chlorophylls *a* and *b*. The orange strain is devoid of chlorophyll, but larger quantities of the 3 carotenoids are present.

(French)

B.H.Davies

3446. ACTION OF DITERPENIC ALCOHOLS IN BIOSYNTHESIS OF CAROTENOIDS AND OF PHYTOL FROM [2-¹⁴C]ACETATE IN MAIZE SEEDLINGS. C.Costes: C.R. Acad. Sci., Paris, 1962, 255, 355-357 (C.N.R.A., Station centrale de Physiologie vegetale, Versailles, France) Etiolated maize seedlings were infiltrated under vacuum with radioactive acetate and 0.5% phytol, isophytol, geranylgeraniol or geranylinalool in Tween 80 soln., exposed to light for 30 hr. and the radioactivity of the chlorophylls and carotenoids formed determined.

Phytol and isophytol were incorporated into the chlorophylls but not into β-carotene or lutein; geranylgeraniol into α-carotene, the phytol of chlorophyll A but not of chlorophyll *a*, and into lutein; geranylinalool into α-carotene and lutein. The C40 chain of the carotenoids may result from condensation of geranylgeraniol and geranylinalool, which are interchangeable in the biosynthesis as in vivo each can change reversibly to its allyl isomer.

(French)

S.A.Thistlewood

3447. CONSTITUTION OF MORELLIN. G.Kartha, G.N.

Ramachandran, H.B.Bhat, P.M.Nair, V.K.V.Raghavan and K.Venkataraman: Tetrahedron Letters, 1963, 7, 459-472 (Roswell Park Mem. Inst., Buffalo, N.Y., U.S.A.) The complete structure of morellin, an orange yellow pigment isolated from the seeds of *Garcinio morella* has been elucidated. Letter. R.H.Kimberlin

3448. RELATIVE CONFIGURATIONS BETWEEN VIROSECURININE, SECURININE AND ALLOSECURININE.

T.Nakano, T.H.Yang and S.Terao: Tetrahedron Letters, 1962, 10, 665-668 (Fac. Pharmacy, Kyoto Univ., Japan) The configuration of *CQ* in virosecurinine from Formosan *Securinega virosa* is established and also the relative configurations between virosecurinine and its related alkaloids. Letter. R.H.Kimberlin

3449. TRANSFORMATION OF KURCHI ALKALOIDS.

m. NEIGHBOURING GROUP EFFECTS IN DERIVATIVES OF HOLARRHIMINE. D.D.Godse, M.Ram and P.K. Bhattacharyya: Tetrahedron, 1963, 19, 784-788 (Nat. Chem. Lab., Poona, India). I.A.B.S.

3450. BIOGENESIS OF AMARYLLIDACEAE ALKALOIDS.

H. STUDIES WITH WHOLE PLANTS, FLORAL PRIMORDIA AND CELL FREE EXTRACTS. R.J.Suhadolnik, A.G.Fischer and J.Zulaliarc: Biochem. biophys. Res. Comm., 1963, 11, 208-212 (Res. Lab., Dept Biochem., Einstein Med. Center, Philadelphia, Pa., U.S.A.) Expt are described which suggest that the biosynthesis of

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rings A and B of the Amaryllidaceae alkaloids involves the deamination of phenylalanine to *trans*-cinnamic acid which is then converted to *β*-hydroxycinnamic acid and then further hydroxylated to give 3,4-dihydroxycinnamic acid.

B.Ketterer

3451. POSITION OF OH GROUP IN DISCRETIN*.

F.Bernoulli, H.Linde and K.Meyer: *Helv. chim. Acta*, 1963, 46, 323-327 (Pharmazeutisches Institut der Universität Basel, Switzerland) Discretin, (monodesmethyl-(-)-norcoralydin) is an alkaloid of *Xylopia discreta*. After ethylation and KMnO₄ degradation 6-ethoxy-7-methoxy-1-keto-1, 2,3,4-tetrahydroisoquinoline was obtained. Discretin is therefore 3-desmethyl-(-)-norcoralydin. (German) A.D. Smith

3452. LOCATION OF ALKALOIDS IN FRUIT AND NUT OF ARECA CATECHU L.

H.-P.Guérin: *C.R. Acad. Sci., Paris*, 1962, 255, 363-365 (Lab. des Travaux pratiques de Micrographie, Fac. Pharmacie, Paris, France) The location of alkaloids in the betel nut and fruit was studied by micrography and by 'contact impregnation' of chromatographic paper with the cut surface of the nut. Alkaloids occur only in the internal coating of the nut and in the internal and external regions of the pericarp. (French) S.A.Thistlewood

3453. GLYCOSIDES OF CAMBIAL SAP OF SPRUCE.

K.Freudenberg and J.M.Harkin: *Phytochemistry*, 1963, 2, 189-193 (Forschungsinstitut für die Chemie des Holzes und der Polysaccharide, Org.-Chem. Inst. Univ., Heidelberg, Germany) In addition to large amounts of coniferin, the cambial sap from spruce (*Picea excelsa* Link) also contains coniferyl alcohol and its main dehydrogenation products and small amounts of syringin and *β*-coumaryl alcohol 4-O-glucoside, both of which have been isolated in a pure state. These findings support the theory that conifer lignin is a copolymer obtained by enzymic dehydrogenation of a mixture of coniferyl alcohol, sinapyl alcohol and *β*-hydroxycoumaryl alcohol, in which coniferyl alcohol is predominant. B.H.Davies

3454. STEROIDAL COMPONENTS OF DOMESTIC PLANTS. XLI. CONSTITUENTS OF REINECKIA CARNEA KUNTH. STRUCTURE OF REINECKIAGENIN, ISOREINECKIAGENIN AND ISOCARNEAGENIN.

K.Takeda, T.Okanishi, H.Minato and A.Shimakawa: *Tetrahedron*, 1963, 19, 759-772 (Shionogi Res. Lab., Fukushima-ku, Osaka, Japan) Convallamorogenin, isorhodeasapogenin, isoreineckiagenin, reineckiagenin, and isocarneagenin were isolated from *R. carnea* Kunth. The 3 sapogenins, isoreineckiagenin, reineckiagenin, and isocarneagenin are new and the only known steroidal sapogenins isolated from a plant source containing a hydroxyl group in the F-ring.

3455. GLYCOSIDES OF SAP OF ANTIARIS TOXICARIA LESCH FROM BOGOR (JAVA).

C.Juslen, W.Wehrli and T.Reichstein: *Helv. chim. Acta*, 1963, 46, 117-141 (Inst. Org. Chem. Univ., Basel, Switzerland)

A new analysis of this sap revealed 29 Kedde-pos. substances on paper chromatograms. Some of these were cryst. All isolated substances were monoglycosides and contained as the sugar L-rhamnose, D-glucose or L-acrifiose. (German) A.D. Smith

3456. GLYCOSIDES OF LEAVES OF DIGITALIS CANARIENSIS L.

D.O. P.Studer, S.K.Pavanaram, C.R. Gavilanes, H.Linde and K.Meyer: *Helv. chim. Acta*,

1963, 46, 23-45 (Pharmazeutisches Inst. Univ., Basel, Switzerland) An extract of the dried leaves was subjected to strophantobiase degradation. A new aglycone, named canarigenin, was obtained. A new sugar was named D-(+)-canarose and is 2-desoxy-D-rhamnose. The genin content distinguishes *canariensis* from variety *isabelliana*. (German) A.D. Smith

3457. GLYCOSIDES OF XYSMALOBİUM UNDULATUM R*

Br. [I]. A.M.Kuritzkes, C.Tamm, H.Jager and T.Reichstein: *Helv. chim. Acta*, 1963, 46, 8-23 (Inst. Org. Chem. Univ., Basel, Switzerland) The roots of *X. undulatum* are very rich in cardenolide glycosides. The main genins are: urzagenin, xysmalogenin, a little 17oc-uzarigenin, coroglaucongenin and pachygenol*. These occur to a minor extent in the free form but mainly combined with D-glucose. A no. of unidentified genins occur. (German) A.D. Smith

3458. VOLATILE VEGETABLE MATTERS. CLXXXH.

ALCOHOLS PRESENT IN BAY OIL. D.Lamparsky: *Helv. chim. Acta*, 1963, 46, 185-187 (Lab. Recherches de Givaudan, Societe Anonyme, Vernier-Geneve, Switzerland) The bay oil contains low % of (+)-3-octanol; (-)-1-octen-3-ol; (+)-1-terpinen-4-ol and a -terpinol. (French) A.D. Smith

3459. REACTIONS OF INERTOGENIN AND LEPTOGENIN.

H.Tobias: *Helv. chim. Acta*, 1963, 46, 147-158 (Inst. Org. Chem. Univ., Basel, Switzerland) Di-O-acetyl-leptogenin and di-O-acetyl-invertogenin were degraded to the corresponding etio acid methyl esters. The reactions of the latter with thionyl chloride are described. (German) A.D.SrnW¹

3460. 1a, 11a-OXIDO-STROPHANIHIDOL (MONO-ANHYDRO-OUABAGENIN) AND OTHER 1a, 11a-OXIDO STEROIDS FROM OUABAGENIN. G.Volpp and C.Tamm: *Helv. chim. Acta*, 1963*, 46, 219-237 (Inst. Org. Chem. Univ., Basel, Switzerland)

On treatment with 0% HCl in aq. ethanol 1,19-isopropylidene-ouabagenin and ouabagenin yield respectively monoanhydro-ouabagenin and tetraanhydro-ouabagenin. The 1a, 11a-epoxide group is novel for dts¹ cardenolide series. (German) A.D.Srn¹

3461. [PREPARATION OF] 11a, 19,21-TRIACETOXY-14-HYDROXY-11, 4-140-PREGNADIENDIONE-(3,20) FROM 1a, 11a-OXIDO-STROPHANTHIDOL (MONO-ANHYDRO-OUABAGENIN). C.Tamm and W.Zurchen: *Helv. chim. Acta*, 1963, 46, 237-241 (Inst. Org. Chem. Univ., Basel, Switzerland)

(German) A.D.Srn¹
3462. CONSTITUTION OF BIFLORIN, α -QUINONE OF DITERPENE SERIES. J.Comin, O.Goncalves de Lima, H.N.Grant, L.M.Jackman, W.Keller-Schierlein and V.Prelog: *Helv. chim. Acta*, 1963, 46, 409-415 (Org. chem. Lab. der Eidg. Technischen Hochschule, Zurich, Switzerland) Chem. and spectroscopic evidence leads to the constitution 3-(2-methyl-pent-2-enyl)-6, 9-dimethyl-1-oxa-phenalene-quinone(7,8) ^{tot} the bluish-red antibiotic biflorin obtained from *CaEES*⁸ biflora. (German) A.D.Srn¹

3463. SYNTHESIS OF SOME 1-OXA-PHENALINE DERIVATIVES BY CHROMOPHORE SYSTEM OF BIFLORIN. H.N.Grant, V.Prelog and R.P.A.Sneeden: *Helv. chim. Acta*, 1963, 46, 415-421 (Org.-chem. Lab. Eidg. Technischen Hochschule, Zurich,

Switzerland) * Several deriv. of 1-oxaphenalenone and 1-oxaphenalenone-7,8-quinone have been synthesised in order to support the constitution of biflorin by comparison of absorption spectra. (German) A.D.Smith

3464. CONSTITUTION OF ADYNERIN. P.St.Janiak, E. Weiss, J.v.Euw and T.Reichstein: *Helv. chim. Acta*, 1963, 46, 374-392 (Inst. Org. Chem. Univ., Basel, QO Switzerland) The structure of adynerigenin as β -D-hydroxy-8,140-epoxy-5g-carda-2O: 22-enolide has been established by degradation and partial synthesis. Δ^4 -lynerin is the corresponding 0-D-diginoside. (German) A.D. Smith

3465. STRUCTURE OF GYPSOSIDE-TRITERPENIC SAPONIN FROM GYPSOPHILA PACIFICA KOM. N.K.Kochetkov, AJ.Khorlin and Ju.S.Ovodov: *Tetrahedron Letters*, 1963, 8, 477-482 (Inst. Chem. Natural Products, Acad. Sci., Moscow, U.S.S.R.) R.H.Kimberlin

3466. STRUCTURE OF 0-BERGAMOTENE. K.S.Kulkarni, S.K.Paknikar, A.S.Vaidya, G.R.Kelkar, R.B.Bates and S.C.Bhattacharyya: *Tetrahedron Letters*, 1963, 8, 505-511 (Nat. Chem. Lab., Poona, India) Δ^2 -Bergamotene is the major hydrocarbon component extracted from the oil of *Valeriana wallichii*. Letter. R.H.Kimberlin

3467. SOME CONSTITUENTS OF ULEX EUROPAEUS L. J.McLean and J.B.Thomson: *Phytochemistry*, 1963, 2, 179-181 (Dept. Chem., Roy. Coll. Sci. and Technol., Glasgow, Scotland) The unsaponifiable fraction of the wax of *U. europaeus* L. contains p-amyrin, lupeol and β -sitosterol. Soyasapogenol C is obtained from an alcoholic extract of the plant. B.H.Davies

3468. ISOLATION AND IDENTIFICATION OF LUPEOL FROM STRAWBERRY TREE (ARBUTUS UNEDO L.). A.Sosa: *Bull. Soc. Chim. biol.*, Paris, 1963, 45, 117-126 (C.N.R.S., Gif-sur-Yvette, S.-et-O., France)

Lupeol was isolated from leaves of the Strawberry tree (*Arbutus unedo* L.). The acetate and benzoate were prep. and subl. β -Pinene was determined. U.v. absorption spectra in had α -acid were characteristic. Lupeol and these deriv. have an absorption max. close to 310 m μ and the benzoate has an additional peak at 264 m μ . (French) J.C.Crawhall

3469. FORMATION OF POLYPHENOLS IN TREES. A. Willis and M.Hasegawa: *Phytochemistry*, 1963, 2, 5-199 (Div. Forest Products, C.S.I.R.O., Melbourne, Australia) After administration of uniformly labelled labelling agent a kino vein in *Eucalyptus sieberiana*. Polypheophenols were found in the kino. The distribution and radioactivity and the presence of labelled sugars in the sapwood, indicated in situ formation of polyphenols from sugars. B.H.Davies

3470. PARTIAL CHARACTERISATION OF PRINCIPAL POLYPHENOL FROM ROOTS OF LITHOSPERMUM RUDERALE. G.Johnson, S.G.Sunderwith, H.Gibian, D.W.Moulter and F.X.Gassner: *Phytochemistry*, 1963, 2, 150 (Chem. and Endocrine Section, Colorado State Univ., Fort Collins, Colo., U.S.A.) Lithospermum acid from *L. ruderale* is a polyphenolic carboxylic acid with an empirical formula believed to be C₁₆H₁₄O₇. The mol. has two 1,2,4-trisubstituted benzene rings, "sixning" dihydroxy groupings; and an olefinic

grouping which is conjugated with one of the rings. The last oxygen atom is probably present as a tert. alcohol. Optical activity indicates that the mol. has 1 or more asymmetric centres. The structure of the mol. is discussed. B.H.Davies

3471. FLAVONOIDS OF CITRUS [FRUITS]. VI. STRUCTURE OF NEOHESPERIDOSE. R.M.Horowitz and B.Gentili: *Tetrahedron*, 1963, 19, 773-782 (Fruit and Vegetable Chem. Lab., Pasadena, Calif., U.S.A.)

The flavanone glycosides naringin, poncirin and neohesperidin all contain the disaccharide neohesperidose, since, on treatment with alkali, they yield the same degradation product, phloiacetophenone 4'-neohesperidose. The structure of neohesperidose is 2-O-OL-L-thamnopyranosyl-D-glucopyranose, as shown by methylation studies and optical rotations. Citrus flavanones that contain neohesperidose are bitter, while the corresponding flavanones that contain the isomer disaccharide, rutinose (6-O-CX-L-rhamnopyranosyl-D-glucopyranose), are tasteless. *

3472. BIOSYNTHESIS OF COUMARINS. IV. FORMATION OF COUMARIN AND HERNIARIN IN LAVENDER.

S.A.Brown: *Phytochemistry*, 1963, 2, 137-144 (Prairie Reg. Lab., Nat. Res. Council, Saskatoon, Saskatchewan, Canada) Data are presented for a sequence of herniarin biosynthesis from cinnamic acid, which, like D-glucose and L-phenylalanine, is a common precursor of coumarin and herniarin in *Lavendula officinalis* Chaix. Coumarin and herniarin are formed from o- and β -hydroxy-cinnamic acids respectively. Improved methods for the syntheses of [14c-carboxyl]umbelliferone, \pm -[a -14c-methoxycinnamic acid and [a -4c]2-glucosyloxy-4-methoxy-trans-cinnamic acid and the prep. of [2-14c]-umbelliferone are described; the metabolism of these compounds has been studied. B.H.Davies

3473. TANNIN FROM ACACIA ARABICA. II. ISOLATION OF POLYHYDROXYPHENOLS FROM SEED PODS.

H.Endres and M.Hilal: *Phytochemistry*, 1963, 2, 151-156 (Max-Planck-Inst. Eiweiss- und Lederforsch., Munich, Germany) Freshly harvested *A. arabica* pods were successively extracted with ether, ethyl acetate, ethanol and water. The ethanol extract, which contained 24 chromatographically separable compounds, was chromatographed on polyamide and cellulose columns. Gallic acid, α -digallic acid and chlorogenic acid were isolated. One of 3 phenolic compounds in the aq. extract was identified as robidiodiol (7,3,4',5'-tetrahydroxy-flavan-3,4-diol). (German) B.H.Davies

3474. STUDIES OF LIGNIN BIOSYNTHESIS USING ISOTOPIC CARBON. XH. BIOSYNTHESIS AND METABOLISM OF SINAPIC ACID. XIII. PHENYLPROPANOID SYSTEM IN LIGNIFICATION. T.Higuchi and S.A.

Brown: *Canad. J. Biochem.*, 1963, 41, 613-620, 621-628 (Prairie Reg. Lab., Nat. Res. Council, Saskatoon, Saskatchewan, Canada) XII. Wheat plants 25 days old converted [2-14c]sinapic acid to sinapyl lignin 6 times as efficiently as to coniferyl lignin; in heading wheat plants this factor was 16, indicating a lessening ability to demethoxylate the sinapyl nucleus with age. Feeding expt. with 5-hydroxyferulic acid showed that it participated in the conversion of ferulic to sinapic acid. In plants at an early stage of lignification 5-hydroxy-ferulic acid was dehydroxylated to ferulic acid and was converted to coniferyl lignin. Demethylation of sinapic acid to 5-hydroxyferulic acid was demonstrated.

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[2-14C]ferulic acid was reduced to coniferyl aldehyde and coniferyl alcohol in heading plants.

XIII. The participation of a no. of org. acids in lignification was confirmed. Techniques of isotopic competition and trapping were used to study the phenyl-propanoid system of lignification. The feeding of coniferyl alcohol with [^{14}C]ferulic acid resulted in coniferyl and sinapyl-type lignin residues having lower sp. activities than those obtained after feeding [14C]ferulic acid alone. Feeding with coniferyl aldehyde or alcohol together with [14C]ferulic acid resulted in labelling of both compounds, that of the aldehyde being higher than that of die alcohol.

J.B.Parish

3475. ENZYMIC ASPECTS OF BIOSYNTHESIS OF LEAF-CUTINS BY LEAVES OF GASTERIA VERRICUOSA

AFTER INJURY. W.Heinen and Lv.d. Brand: Z. Naturforsch. B, 1963, 18, 67-79 (Bot. Inst., Univ.

Nijmegen, Netherlands) Stearic and oleic acid oxidases and lipoxygenase were considered to take part in cutin formation after damage to the top of a leaf of *G. verricuosa*. Pectinase also increased after injury. A formula for the constitution and a scheme for the synthesis of cutin were proposed.

(German) J.C.Crawhall

3476. NEW CYCLITOL, LEUCANTHEMITOL, ISOLATED FROM OX-EYE DAISY, CHRYSANTHEMUM LEUCANTHEMUM L. SURVEY OF OTHER COMPOSITAE (TRIBE ANTHEMIDEAE). V.Plouvier: C.R. Acad. Sci.. Paris, 1962, 255, 360-362 (Lab. de Chimie Appliquee aux corps organiques, Museum d'Histoire naturelle, Paris, France)

A new cyclitol, leucanthemitol, L-cyclohexene-tetrol configuration 1,2,4/3 was isolated from *C. leucanthemum*, *C. maximum* and *C. corymbosum*. It is most abundant in the stalks and heads. L-viburnitol occurs in the same plants and in *Achillea millefolium* and *Tanacetum vulgare*, but mainly in the leaves. L-inositol was isolated from *C. arcticum*, *C. uliginosum* and *Anthemis nobilis*. 13 other spp. were examined. Leucanthemitol, viburnitol, the quebrachitol of *Artemisia* and the L-pinitol of *Artemisia dracunculus* are all deriv. of inositol, the principle cyclitol of the Compositae.

(French) S. A. This tie wood

3477. IDENTIFICATION OF CHLOROGENIC ACID IN CASTOR BEAN AND ORANGES. A.L.Siddiqi and S.O.

Freedman: Canad. J. Biochem., 1963, 41, 947-952 (McGill Univ. Med. Clinic of the Montreal Gen. Hosp., Montreal, Quebec, Canada) Castor bean pomace and orange pulp were extracted by a new procedure with 70% isopropyl alcohol, cone, then pptd. with neutral lead acetate soln. and filtered through celite. The ppt. was suspended in water and stirred with amberlite to remove the lead. The resulting soln. was fractionated by column chromatography on dextran gel, eluted with water and chlorogenic acid identified by its u.v. absorption peak at 324 m μ . The fractions containing chlorogenic acid were subjected to paper chromatography and the material fluorescing in u.v. light was eluted with 50% ethanol and the chlorogenic acid cryst. by the K caffeine complex.

J.B.Parish

3478. CONSTITUTION OF JALARIC ACID. M.S.Wadia, V.V.Mhaskar and S.Dev: Tetrahedron Letters, 1963, 8, 513-517 (Nat. Chem. Lab., Poona, India)

Jalaric acid, obtained by the alk. hydrolysis of the resin secreted by the lac insect, *Laccifer lacca* has also been isolated as a hydrolysis product of *kusmi* seed lac. Letter.

R.H.Kimberlin

3479. CONSTITUENTS OF LEAVES OF FICUS CARICA L. I. ISOLATION OF PSORALEN, BERGAPten, tif-TARAXASTEROL AND P-SITOSTEROL. A.K.Athanasios, I.E.El-Kholy, G.Soliman and M. A.M.Shaban: J. chem. Soc., 1962, 4253-4254 (Chem. Dept., Fac. Sci., Univ., Alexandria, Egypt) Note. L.G.Gillies

3480. SYNTHESIS OF HIGH SPECIFIC ACTIVITY 14C-CARBOXYL INDOLEACETIC ACID AND OF 14C-NITRILE INDOLEACETONITRILE. B.B.Stowe: Analyt. Biochem., 1963, 5, 107-115 (Dept. Bot., J.W.Gibbs Lab., Yale Univ., New Haven, Conn., U.S.A.) A convenient one-day synthesis of pure IAA with sufficient sp. activity (16×10^9 mc./mmole) for use at physiol. concn. is described. Storage in acetonitrile minimises autoradio-sensitivity. A.D.Smith

3481. SUBSTANCES CAUSING WILTING, AND ANTI-BIOTICS. XXIV. CONSTITUTION OF LYCOMARASININ. E.Hardegger, P.Liechti, L.M.Jackman, A. Boiler and PL A. Planner: Helv. chim. Acta, 1963, 46, 60-74 (Org.-chem. Lab. der Eidg. Technischen Hochschule, Zurich, Switzerland) The functional groups and structures of lycomarasinin, lycomarasuric acid and anhydroylycomarasic acid, and the L-configuration of the aspartic acid moiety of these compounds, have been established. (German) A.D.Smith

3482. JG-HYDROXYLATION IN ISOLATED CHLOROPLASTS. A.Trebst and H.Ecte Z. Naturforsch. B, 1963, 18, 105-109 (Org.-diem. Inst., Tech. Hochschule, Mtlchen, Germany) Salicylaldoxime (10-2M) inhib. aerobic photophosphorylation in isolated chloroplasts of spinach. At a concn* of 10~3M or lower, salicylaldoxime acted as a cofactor in aerobic photophosphorylation after hydroxylation to the p-hydroquinone*. Various o- and j-hydroquinones with a carboxyl function on the benzene ring were reversibly oxidised and reduced during the photosynthetic phosphorylation by chloroplasts*. (German) J.C.Crawhall

3483. NITRITE REDUCTION BY ISOLATED CHLOROPLASTS IN LIGHT. A.Paneque, F.F.del Campo and M.Losada: Nature, Lond., 1963, 198, 90-91 (Sección de Bioquím. y Fisiol. Celular, Centro de Invest. Biol. Madrid, Spain) NO₂⁻ can be reduced by spinach grana in the presence of chloroplast extract both in the light when electrons are supplied by die ascorbate-dichlorophenol indophenol system, and in the dark when NADPH₂ is present. G.M.Lewis

3484. GENETICALLY CONTROLLED METABOLIC BLOCK IN PHOTOSYNTHETIC MUTANT OF VICIA FABA. U.Heber and W.Gottschalk: Z. Naturforsch. B, 1963, 18, 36-44 (Inst. Landwirtschaftliche Botanik, Univ. Bonn, Germany) The metabolism of a mutant of *V. faba* which was unable to reduce NADP was investigated. This mutant was able to reduce 2,6-dichlorophenolindole and to synthesize ATP from ADP plus P. No absence of soluble factors could be demonstrated and it was suggested that an insol. factor in the lamella structure of the chloroplasts which transferred electrons from chlorophyll a to NADP was absent. (German) J.C.Crawhall

3485. LIGHT-INDUCED BLEACHING OF PHOTOSYNTHETIC PYRIDINE NUCLEOTIDE REDUCTASE IN PRESENCE OF CHLOROPLASTS. B.Chance and A.San Pietro: Proc. nat. Acad. Sci., Wash., 1963, 49, 633-637 (Johnson Res. Fndn., Univ. Pennsylvania, Philadelphia, Pa., U.S.A.) Light-dark difference spectra

for photosynthetic pyridine nucleotide reductase reduction by illuminated chloroplasts, together with the kinetics of reduction of the pigment and its reduction of NADP, show that the pigment is a permissible intermediate in the photosynthetic pyridine nucleotide reductase activity.

I.R.Sargent

3486. PHOTOSYNTHETIC PHOSPHORYLATION IN MITOCHONDRIA FREE CHLOROPLAST SUSPENSIONS FROM LEAVES OF Vicia faba L. R.M.Leech:

Biochim. biophys. Acta. 1963, 71, 253-265 (Dept. Bot., Imperial Coll. Sci. Technol., London, England)

M. showed that crude chloroplast suspensions prep. by the classical differential centrifugation procedure were contaminated with mitochondria. The latter were completely removed by further centrifugation through a sucrose density gradient, after which all the chloroplasts were devoid of external membranes and thylakoids. Such chloroplast suspensions mediated photophosphorylation, in the presence of 3×10^{-5} M FMN and 10^{-4} M ADP, producing ATP. The rate of photophosphorylation and the nonadditive effect of the cofactors are similar to results obtained by other workers using Pmash chloroplasts.

B.M.Stevens

^{3487. SPECTROPHOTOMETRIC DETERMINATION OF DOX ENZYMES AND CO-ENZYMES IN CHLOROPLASTS.} H.Lundegardh: Physiol. Plant, 1963, 16, 454-465 (Penningby, Sweden) Spectrophotometric terminations were made in whole chloroplasts of cytochrome, flavoprotein, and pyridine nucleotide.

LD.J.Phillips

3488. CONVERSION OF PROTOCHLOROPHYLLIDE INTO CHLOROPHYLL. L.Vlasenok and A.A.Shlyk: Biokhimiia, 1963, 28, 57-69. Expt. with green algae involving the use of labelled CO₂, darkening illumination at pos. temp, and at -2° indicated that chlorophyllide was an intermediate product in the conversion of protochlorophyllide to chlorophyll.

(Russian) B.J.Cooper

3489. FORMATION OF STABLE FREE RADICAL IN ILLUMINATED CHLOROPHYLL COMPLEX. M.B.AUen? X! J-CMurchio: Biochem. biophys. Res. Comm., 1963, 11, 115-119 (Kaiser Fdn. Res. Inst., Lab. of Biomed. Res., Richmond, Calif., U.S.A.) A chlorophyll complex, non-sedimentable at 144000 g. at 5° settles sedimentable at 25-28% which enables it to be separated from other soluble constituents. Illumination with ³²P & ³²P resonance signal which is similar to that produced in intact cells, but which does not decay in the dark.

B.Ketterer

3490. PHOTOSYNTHESIS AND RESPIRATION. G.Hoch, H.Owens and B.Kole: Arch. Biochem., 1963, 101, of 180 MAS, Baltimore, Md., U.S.A.) Effects of O₂ production and uptake by algae were examined. Illumination with low light intensities inhibits O₂ uptake; illumination with medium or high intensities accelerates O₂ uptake. Inhib. of uptake was mainly sensitive to chlorophyll a. Effects of starvation, glucose, in Hesration and 3-(3,4-dichlorophenyl)-1,1-dichloro-urea inhibn. on O₂ uptake rates in light are described.

B.M.Stevens

3491. FUNCTION OF DIFFERENT CHLOROPHYLLS IN PHOTOSYNTHESIS AND ACTION SPECTRA OF ACTED LIGHT REACTIONS. A.Muller, D.C.Fork (IS-H-T-Witt: 2. Naturforsch. B, 1963, 18, 142-145 (J.Wolmer-Inst., Rysikalisch-chem. Inst., Tech. Univ. Berlin, Germany) By observing die changes

of light absorption at various max. during photosynthesis process it was deduced that there were 7 different chlorophylls in green plants. Five of these chlorophylls belonged to energy donor systems and only 2 representing only 1/1000 part of the total were energy acceptor mol.

J.C.Crawhall

3492. SEPARATION OF LIGHT AND DARK STAGES IN PHOTOPHOSPHORYLATION. G.Hind and AJ.Jagendorf: Proc. nat. Acad. Sci., Wash., 1963, 49, 715-722 (McCormick-Pratt Inst. and Biol. Dept., Johns Hopkins Univ., Baltimore, Md., U.S.A.) ADP,

phosphate, Mg and a pH of 8*0 are required for the dark stage of photophosphorylation. The redox cofactor must be present for photophosphorylation during the light stage. A pH of <6-0 during light stage photophosphorylation produces much higher energy yields partly by inhibiting the dark decay rate of a labile intermediate and apparently in part by an increase in the total amount of that intermediate which can be produced in the light. The intermediate is neither a purely photochem. entity, nor a high energy phosphate compound, nor an activated form of the redox factor. Max. yields of ATP formed are 1 mole per 15 moles of chlorophyll present.

J.R.Sargent

3493. INTRACELLULAR DISTRIBUTION OF SOLANESOL AND PLASTOQUINONE IN GREEN LEAVES OF TOBACCO PLANT. J.Stevenson, F.W.Hemming and F.A.Morton: Biochem. J., 1963, 88, 52-56 (Dept. Biochem., Univ. Liverpool, England) Fresh tobacco leaves were fractionated into chloroplasts, mitochondria and a supernatant fraction containing cell sol. material. Both solanesol (86 micromoles/kg. of leaf tissue) and plastoquinone (424 micromoles/kg. of leaf tissue) were found to be cone, in the chloroplasts. Each contained 9 isoprenoid units. The results are discussed together with recent work on the biosynthesis of quinones in animal tissues. Almost all of the solanesol isolated was unesterified.

J.C.Crawhall

3494. FUNCTION OF PLASTOQUINONE IN ELECTRON TRANSPORT SYSTEM OF PHOTOSYNTHESIS. J.Weikard, A.M.Qller and H.T.Witt: Z. Naturforsch. B, 1963, 18, 139-145 (Max-Volmer-Inst. Physikalisch-chem. Inst., Tech. Univ., Berlin, Germany) It was proposed that plastoquinone (2,3-dimethyl-5-solanesylbenzoquinone) acted as an electron acceptor substance at the end of the photosynthetic energy chain in chloroplasts as an additional link to the NADP-NADPH₂ reaction and substrate reduction. Plastoquinone II may have been an additional electron transfer compound earlier in the chain.

J.C.Crawhall

GENERAL BIOCHEMISTRY

3495. CYCLIC FUNCTIONS AND METASTABLE MOLECULES. A.Lwoff and M.Lwoff: J. theor. Biol., 1962, 2, 48-62 (Inst. Pasteur, Paris, France) With ref. to the polio virus, the problem of cyclical functions and factors controlling or disturbing them have been considered. This includes those initiating cell division and those controlling the phases of life cycles. The hypothesis that cyclic functions imply feed-back mechanisms and are controlled by reversible structural alterations of metastable mol. is considered.

(French)

J.A.Dawson

BIOCHEMISTRY

- 3496. MITOCHONDRIAL CHANGES IN LIVER OF ESSENTIAL FATTY ACID [EFA]-DEFICIENT MICE.** J.W.Wilson and E.H.Le Due: *J. cell Biol.*, 1963, 16, 281-296 (Dept. BioL, Brown Univ., Providence, R.I., U.S.A.) Livers of weanling mice fed essential fatty acid deficient diets for up to 80 days were studied in the E.M. and light microscope. Enlarged mitochondria in the periportal region of the lobule with additional cristae arranged in stacks in the central cavity are described. It is suggested that the uncoupling of oxidative phosphorylation in EFA-deficient mitochondria may be due to a mol. defect in the structure that determines the spatial relationship between the electron transport chain and phosphorylation due to lack of ATP. P. Barrow
- 3497. MITOCHONDRIAL FACTOR CONFERRING OLIGOMYCIN SENSITIVITY ON SOLUBLE MITOCHONDRIAL ATPase.** E.Racken *Biochem. biophys. Res. Comm.*, 1963, 10, 435-439 (Dept. Biochem., Publ. Res. Inst. of the City of New York, Inc., N.Y., U.S.A.) A factor conferring oligomycin sensitivity on sol. mitochondrial ATPase has been obtained in the supernatant obtained from submitochondrial particles treated first with trypsin, followed by exposure to urea and then sonic oscillation. B.Ketterer
- 3498. OXIDATIVE PHOSPHORYLATION BY PEA SEEDLING MITOCHONDRIA.** N.Rosa and S.Zalilev *Canad. J. Biochem.*, 1963, 41, 533-541 (Dept. Plant Sci., Univ. Alberta, Edmonton, Alta., Canada) Etiolated pea seedlings were homogenised in buffered sucrose soln. and fractionated to obtain the mitochondria. The addition of DNP at 10⁻⁴M uncoupled phosphorylation and the addition of malonate at 10⁻⁵M completely inhib. oxidation and phosphorylation but at 10⁻⁵M increased phosphorylation. Mitochondrial prep, from seedlings pre-soaked in standing water gave higher phosphorylative and oxidative activities than those presoaked in a stream of aerated water. J.B. Parish
- 3499. EFFECT OF COLD ON OXIDATIVE PHOSPHORYLATION IN MICE.** V.P.Skulachev, S.P.Maslov, V.G. Sivkova, L.P.Kalinechenko and G.M.Maslova: *Biokhimiia*, 1963, 28, 70-79. Expt. showed that exposure of albino mice to air temp. of -15° for 2 hr. resulted in an apparently reversible uncoupling of oxidative phosphorylation in their skeletal muscles. (Russian) B.J.Cooper
- 3500. INFLUENCE OF PHENOTHIAZINE ADMINISTRATION ON CYTOCHROME OXIDASE ACTIVITY IN LAMB BRAIN TISSUE.** R.B. Williams, W.R.Humphries and C.F.Mills: *Nature*, Lond., 1963, 198, 387-388 (Rowett Res. Inst., Bucksburn, Aberdeen, Scotland) Lambs born to ewes treated with 10 g. doses of phenothiazine during pregnancy showed lowered cytochrome oxidase levels in the brain stem. Cu concn. was not affected. It is suggested that phenothiazine be used as an anthelmintic with extreme caution in areas where Cu deficiency may produce 'swayback', also associated with lowered brain cytochrome oxidase. G.M.Lewis
- 3501. RIBONUCLEOTIDES AND ENZYMES OF PENTOSE PHOSPHATE CYCLE IN EXPERIMENTAL MYOCARDIAL INFARCTION.** A.L.Kolotilova, B.F.Korovkin, S.N. Lyzlova, V.K.Vagner, E.T.Vasilenko and N.K.Dzutsov: *Biokhimiia*, 1963, 28, 113-121. The free ribonucleotide level and the activity of individual enzymes of the pentose phosphate cycle were studied in the cardiac muscle of dogs with expt. infarction induced by ligation

of the descending branch of the left coronary artery. Various changes were observed, and these were most pronounced shortly after ligation, with return to approx* normal by day 13. (Russian) BJ.Cooper

- 3502. PAPER ELECTROPHORESIS OF SOLUBLE PROTEINS OF RABBIT HEART MUSCLE IN EXPERIMENTAL DIPHTHEROID INTOXICATION.** Ye.A.Michovicova and L.G.Ter-Sarkisyan: *Vop. Med. Him.*, 1963, 9, 204-206 (Chair of Animal Biochem., State Univ. Moscow, U.S.S.R.) Paper electrophoresis showed the presence of 5 distinct protein fractions in expt. with sol* a. proteins of normal rabbit heart muscle. During diphtheroid intoxication slight changes were observed in 3 of the fractions. J.R. Sargent

- 3503. SODIUM. POTASSIUM. NITROGEN. PHOSPHOR^ AND LIPID IN MUSCLE MITOCHONDRIA ISOLATED W SUCROSE MEDIA OF VARYING CONCENTRATIONS.** A.RXraston and J.F.Manery: *Canad. J. Biochem.*, 1963, 41, 831-847 (Dept. Biochem., Univ. Toronto, Ontario, Canada) Mitochondrial pellets isolated in 0⁰25M sucrose from pigeon breast muscle and washed one* contained 77 g. water/100 g. pellet, 7⁸ mequiv. K and 4³ mequiv. Na/kg. dry wt. The Na:K ratio for mitter chondria was nearly 5 times that of muscle. Comparisons were made of the Na, K, and water content of mito-chondria isolated in 0-25M, 0-45M and 0-88M sucrose when washed once and twice. Washing always resulted in loss of Na and K. A 'floating' layer, believed to be washed out of die mitochondria by resuspension, was unique in being high in lipid and Na content. J.B.Parish

- 3504. TISSUE STUDIES DURING RECOVERY FROM ^a IMMOBILISATION ATROPHY.** L.Eichelberger, M.*⁰¹*¹* and P.V.Moulden *J. appl. Physiol.*, 1963, 18, 623-628 (Div. Orthopedic Surgery, Surgery Dept., Univ. Chicago, 111, U.S.A.) Biochem. analysis and Uf⁰ chem. methods were used to study changes occurring during recovery from atrophy in the leg muscles of puppies. Partial recovery had occurred by 91 days and full recovery by 300 days after remobilisation of the limb. H.C.Jones

- 3505. REVERSAL OF THE INHIBITORY ACTION OF ^{trit}N¹⁴ AMMONIA ON THE RESPIRATION OF RAT LIVER N¹⁴ CHONDRIA.** M.Erecinska and A.Worcel: *Biochim. biophys. Acta*, 1963, 71, 305-310 (Neurochem. L^b, Dept. Neuropsychiatry, Univ. Texas Med. Sch., Galveston, Tex., U.S.A.) Glutamate reversed by preventing further amination of CX-oxoglutarate. Succinate also abolished the inhib., but without interfering with reductive amination of OL-oxoglutarate. A method of calculating the ratio of reduced: oxidised mitochondria, pyridine nucleotides, based on the equilibrium const. of the glutamate dehydrogenase reaction, is discussed. B.M.Stevens

- 3506. FIXATION OF TETANUS TOXIN BY FROG BRAIN.** W.E.van Heyningen and RJ.Woodman: *J. gen. Microbiol.*, 1963, 31, 389-392 (Dunn Sch. Pathol., Univ. Oxford, England) The apparent non-fixation of tetanus toxin by frog brain emulsion has been re-examined. Frog brain emulsion does fix tetanus toxin, but only w*^u 1/2000th the capacity of mammalian brain emulsion. The toxin-fixing capacity may be connected with the observation that the ganglioside in frog brain, unlabeled, in mammalian brain, is extractable with aq. solvent. Jijifrew

- 3507. ATP AND PHOSPHOCRZATENE [PC] LEVELS IN BRAIN AND MUSCLES OF ANIMALS ADAPTED AND**

NON-ADAPTED TO COLD. L.A.Gousseva: Vop. Med. Him., 1963, 9, 180-184 (Lab. Ind. Microclimate. Inst. Industrial Hygiene and Occupational Dis. Acad. Med. Sci. Moscow, U.S.S.R.) After cooling for * hr. at -5°, ATP and PC levels in brains of mice adapted to cold varied significantly. ATP and PC levels were decreased in muscles, PC levels being decreased more than ATP levels. Body temp. in cold-adapted animals did not alter. Under similar expt. conditions accumulation of ATP and PC occurred in brain and muscles of non-adapted mice. At the same time body temp. decreased by 6°. J.R.Sargent

3508. THIOL GROUPS OF BLOOD PLATELETS IN RELATION TO CLOT RETRACTION. P.Fantl: Nature, Lond., 1963, 198, 95 (Baker Med. Res. Inst., Commercial Rd., Prahran, Victoria, Australia) The presence of thiol groups in platelets is proved by the reaction with N-ethylmaleimide; this prevents normal gel retraction. G.M.Lewis

3509. THE OXIDATION OF VARIOUS PRECURSORS IN NORMAL AND TUMOUR-BEARING MICE IN VIVO. J.Kabara and G.Okita: Biochem. J., 1963, 88, 187-191 (Biochem. Res. Dept., Univ. Detroit, Mich., U.S.A.) The oxidation of 14c-labelled nutrients to CO_2 was studied in animals bearing a Seuich solid tumour or a lymphatic leukaemia (P-1534). Animals bearing the Ehrlich solid tumour showed a CO_2 production of 14CO₂ from [1-14C]acetate and [B-T¹⁴C]ucose no differences from [2-14C]acetate and Tr^{14}C glucose, and an increase from [1-14C]glucose. This agrees with the idea that tumour animals activate C2 fragments less than normal. The demonstration of hexose monophosphate for glucose metabolism! Leukaemic animals failed to show any deviation from their normal controls.

3510. NON-ENZYMIC HYDROXYLATION OF AROMATIC COMPOUNDS. J.H.Green, B.J.Ralph and P.J.Schofield: Nature, Lond., 1963, 198, 754-756 (Univ. New South Wales, Australia) Conversion of aniline to O_2H^+ in phenol was studied in the presence of ascorbic acid and metal cation, EDTA and O₂. Evidence is presented via to substantiate the hypothesis that the oxidation precedes a radical mechanism which may be represented: (1) iron-catalysed oxidation of ascorbic acid resulting in formation, (2) formation of an active radical intermediate with the substrate leading to oxidation of the latter to α -aminophenol. J.R.Sargent

3511. METABOLISM OF ACETALDEHYDE BY THE BRAIN IN VIVO. J.W.Ridge: Biochem. J., 1963, 88, 100 (Dr. Psychol. Med., Med. Sch., King's Univ. Durham, Newcastle-upon-Tyne, England) Administration of ethanol to the normal rat was followed by a series of wave-like fluctuations in the acetaldehyde concn. of blood and brain which lasted about 1 hr. before settling down to a steady decay, similar situations in the concn. of lactate, pyruvate, and α -oxoglutarate in the brain occurred simultaneously. These oscillations could be abolished by pretreatment with thylthiuram disulphide. It is suggested that the brain contains an aldehyde dehydrogenase and that oxidation of acetaldehyde in the brain is linked through NADH₂ to pyruvate reduction.

3512. ACTION OF ADENOSINE-5-MONOPHOSPHORIC ACID ON PORPHYRIA INDUCED IN WHITE RATS BY ALLYLISOPROPYLACETYLCARBAMIDE. A.Gajdos and M.Gajdos-Torok: C.R. Soc. Biol., Paris, 1962, 156, 1565-1566 (Clin. méd. l'Hôtel Dieu, Paris, France) 18 rats received 400 mg. allylisopropylacetylcarbamide (Sedormid)/kg. daily for 18 days. Expt. animals also received 20 mg. AMP per day. Sedormid increased the renal excretion of O-aminolaevulinic acid, porphobilinogen and coproporphyrin. In animals receiving AMP the urinary level of these compounds was decreased. The effect of AMP was also seen in rabbits.

(French) M.A.Price
3513. METABOLISM OF VANILLIN INGESTED WITH PHTHIVAZIDE. L.L.Grebennik, T.V.Gnevkovskaya and G.A.Smirnova: Vop. Med. Him., 1963, 9, 127-133 (Dept. Chem., All-Union S.Ordzhonikidze Inst. Pharmaceutical Chem., Acad. Med., Sci. of U.S.S.R., Moscow, U.S.S.R.) Up to 12% of vanillin ingested together with phtivazid was excreted as vanillin and vanillic acid. Up to 73% of vanillin ingested in the absence of phtivazide was excreted as vanillin and vanillic acid. J.R.Sargent

3514. IN VITRO INSTABILITY OF A COMMONLY USED TRICARBOCYANINE DYE. D.D.Michie, R.S.Goldsmit and A.D. Mason, jun.: Proc. Soc. exp. Biol., N.Y., 1962, 111, 540-543 (U.S. Army Surg. Res. Unit, Brooke Army Med. Center, Fort Sam Houston, Tex., U.S.A.) Significant increase in the absorbance of the dye, dissolved in solvent and whole blood, was observed over a period of 8 hr. Failure to correct this change when measuring cardiac function can introduce a significant error. M.M.Shapland

3515. GLYCOGEN AND SUCCINIC DEHYDROGENASE IN WOUND HEALING OF THE ORAL MUCOSA OF THE RAT. E.O.Butcher and J.Klingsberg: Proc. Soc. exp. Biol., N.Y., 1962, 111, 783-786 (Dept. Anat., Coll. Dentistry, New York Univ., N.Y., U.S.A.) Epithelial proliferation in wound healing appears to be associated with the disappearance of glycogen. Lack of growth causes a build up of glycogen. The metabolism of epithelial basal cells as indicated by the presence of succinic dehydrogenase appears to be related to epithelial and connective tissue continuity. Presence of this enzyme in the basal cells confirms that metabolic activity is highest where there is no glycogen.

M.M.Shapland
3516. TOTAL NITROGEN CONTENT IN MARTESSIA FRAGILIS. A WOOD BORING PHOLAD OF MADRAS. V.V.Srinivasan: Comp. Biochem. Physiol., 1963, 9, 31-36 (Zool. Res. Lab., Univ. Madras, India) The total N of *M. fragilis* amounts to 1.8-2.8% of wet wt. whilst *M. striata* contains 2.3-3.9%. Abs. values are greater for *M. striata*, the larger sp. In juvenile *M. fragilis* N content increases with size, but then remains const, during the o phase of the life history, increasing again after a sex change to the ? has occurred. The N content of immature forms actively burrowing is greater than that of non-active forms. M.S.Laverack

3517. NEMATODE BIOCHEMISTRY. I.E. EXCRETION PRODUCTS. M.Rothstein: Comp. Biochem. Physiol., 1963, 9, 51-59 (Lab. Comp. Biol., Kaiser Found. Res. Inst., Richmond, Calif., U.S.A.) Cultures of *Caenorhabditis briggsae* were incubated in flasks containing various labelled substrates: glycine, aspartic acid acetate and alanine. Creatinine, urea, uric acid, and "

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allantoin obtained in small quantities by analysis at the end of incubation do not contain label and are not produced as major excretory products. NH₃ and free amino acids account for most of the excreted N, whilst considerable amounts of acidic and neutral material are also excreted with label. These results for a free-living nematode are in general agreement with those obtained for parasitic spp.

M.S.Laverack

3518. ENZYMIC CHEMICAL INVESTIGATION AFTER BURNS. R.RUenauer, H.KrOner and W.Staib: Hoppe-Seylers Z. physiol. Chem., 1963, 331, 143-153 (Physiol.-Chem. Inst. Med. Acad., DQsseldorf, Germany) Surface burns on rats and guinea-pigs resulted in considerable increase in the serum levels of aspartate and alanine transaminase, and aldolase and lactate dehydrogenase. The muscle-sp. creatine kinase was increased but the enzyme patterns of the kidney and liver were unchanged. (German) I.Cornish

5519. CHEMISTRY OF INSECT HAEMOLYMPH. IV. ACID-SOLUBLE PHOSPHATES. G.R.Wyatt, R.B. Krope and F.G.Carey: J. insect Physiol., 1963, 9, 137-152 (Dept. Biol., Yale Univ., New Haven, Conn., U.S.A.) The acid-sol. phosphate compounds in the haemolymph plasma of several lepidopterous insects were fractionated quant. by ion-exchange chromatography, and the principal components identified. The total acid-sol. P ranged from 26-44mM in Hyalophora cecropia. The main components were inorg. phosphate, OL-glycerophosphate, phosphorylcholine, and phosphorylethanolamine. Also present were UDP N-acetylgalactosamine and other UDP deriv., though in smaller amounts. The presence of phosphagen was indicated. During diapause, orthophosphate and the basic phosphates tended to be more abundant than during the active stages, while glycerophosphate changed in the reverse manner. Inj. ³²PO₄¹⁻ was incorporated into various esters at all stages, but incorporation using cell-free haemolymph was negligible. The distribution of phosphates in Antheraea Polyphemus, Samia cynthia, and Protoparce sexta was similar to that in H. cecropia. There was little cx-glycerophosphate in Bombyx mori whereas sorbitol 6-PQ4 was abundant and glucose 6-PO₄ was also present. R.J.Walker

3520. PHOTOLABILE PIGMENT FROM OCELLI OF SPIROCODON, AN ANTHOMEDUSA. M.Yoshida: Photochem. Photobiol., 1963, 2, 39-48 (Tamano Marine Lab., Shibukawa, Tamano, Okayama, Japan) Ocelli are morphol. specialised photoreceptors and contain photosensitive pigments. The prop. of the pigments from S. saltatrix resemble those of other known visual pigments. G.C.Barr

3521. STEREOCHEMICAL THEORY OF OLFACTION. J.E.Amoore: Nature, Lond., 1963, 198, 271-272 (Dept. Z00L, Univ. California, Berkeley, Calif., U.S.A.) G.M.Lewis

3522. THERMODYNAMICALLY BOUND WATER OF COTTON CELLULOSE, SILK FIBROIN, WOOL KERATIN AND INSULIN. J.L.Morrison: Nature, Lond., 1963, 198, 84-85 (Dept. Chem., Ontario Res. Foundn., Toronto, Ont., Canada). G.M.Lewis

3523. HISTOAUTORADIOGRAPHIC AND BIOCHEMICAL STUDY OF THE PREHYPOPHYSIS OF CARASSIUS AURATUS AFTER ADMINISTRATION OF Na₂³⁵SO₄. M.Deminatti: C.R. Soc. Biol., Paris, 1962, 156,

1924-1926 (Inst. His to L, Fac. M&L* Strasbourg, France) Histoautoradiographic study of die hypophysis of C. auratus, 24 hr. after injn. of Na₂³⁵SO₄, showed that max. radioactivity was associated with cells which were Gomori-pos., Schiff-pos. and Alcian Blue-pos. Electrophoresis of homogenate of hypophysis showed no free 35SO₄. The radioactivity was associated with a band at the origin of the paper. After acid hydrolysis this area contained free 35SO₄.

- (French) M.A.Price
3524. CRITICAL MICELLE CONCENTRATIONS OF DOUBLE LONG-CHAIN ELECTROLYTES (AMINE SOAR IN AQUEOUS SOLUTION. A.Packter and M.Donbrow: J. Pharm., Lond., 1963, 15, 317-324 (Chelsea Coll* Sci. and TechnoL, London, England) Micelle formation and 'gegenion*' binding were studied in aq. soln. of primary and quaternary NH₄ dodecyl sulphates by the conductivity method. Critical micelle concn. decrease markedly with increase in the cation chain length, due mainly to increase in the free energy of micelle formad⁰¹ 'Genenion' binding also increases with increasing cation chain length, reaching 95% for the octyl and higher NH₄₊ salts. J.M.Whitmarsh

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3525. SIMULTANEOUS DISTILLATION OF WATER AND EXTRACTION OF FAT FROM MOUSE CARCASSES AND TISSUES. G.L.Wolff and B.Bakay: Proc. Soc. exp. Biol., N.Y., 1963, 112, 524-526 (Inst. for Cancer Res., Philadelphia, Pa., U.S.A.) The apparatus is described for the simult. extraction of water and lipids from liver tissue or mouse carcasses. It involves the use of a Soxhlet apparatus attached to a flask of refluxing toluene; water collects over the toluene whilst lipids are removed from the mouse tissue and are found in the toluene in the Soxhlet extractor. A 98% yield of extractable fat is obtained in a 20 hr. refluxing period.

- D.N.Wheatley
3526. BLOTTING PROCEDURE FOR ADEQUATE DRYING OF ISOLATED TISSUE PREPARATORY TO CHEMICAL ANALYSES. R.R.Paradise: Nature, Lond., 1963, 198V 112 (Dept. Pharmacol., Sch. Med., Univ. S. CeMfott^A Los Angeles, Calif., U.S.A.) A blotting procedure recommended for isolated tissues which removes superfici^{WP} but not intercellular fluid. G.M.L^{WP}

3527. INTERFERENCE BY MENADIOL IN COLORXMETRIF. ESTIMATION OF NITRITE. C.K.Ramakrishna Kurup f C.S.Vaidyanathan: Biochim. biophys. Acta, 1963, 74*. 465-467 (Dept. Biochem., Indian Inst. Sci., Bangalore*, India). B.M. Steve*

3528. MICROMETHOD FOR SIMULTANEOUS DETERMINATION OF NITROGEN AND PHOSPHORUS IN SINGLE SAMPLES OF NUCLEOPROTEINS AND THEIR DERIVATIVES. B.Filipowicz, M.Gross and B.Skoczylas: Analyt. Biochem., 1963, 5, 187-194 (Dept. Physio* Chem., Acad. Med., Lodz, Poland) A method for mineralisation of samples of nucleoproteins and their cie^{MV} aimed at the simult. determination of N and P, has been described. The influence of different metallic catalyst* and H₂O₂ upon mineralisation and correct determinate^{MV} of P has been examined. Good results for pyrimidines,

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purines. and proteins, using Se as catalyst, have been obtained. The recovery of lysine was 97.79%.

A.D.Smith

352. DETERMINATION OF PARTICIPATE ACID IN TOWN AIR. B.T.Commins: Analyst, 1963, 88, 364-67 JM.R.C., Air Pollution Res. Unit, St. Bartholomew's Hosp. Med. Coll., London, England.

L.A.B.S.

353. FLUOROMETRIC ASSAY OF 2-DIMETHYLAMIN(ROXYPURINE (DIMETHYLAMINOQUANINE) IN THE PRESENCE OF GUANINE. S.Udenfriend, Zaltzman-Nirenberg and G.L.Cantoni: Analyst, 1962, 87, 258-260 (N.I.H., Bethesda, Md., estimated). A 2,6-dimethylamino-6-hydroxypurine can be assayed in the presence of guanine, by converting the uric acid with HNO_2 to xanthine which is not fluorescent at the conditions employed. A direct fluorometric assay of 0.01 μ g/ml. of rabbit liver s-RNA gave a value within 2.5% of 100 moles guanine, comparing the figure of 4 per 100 obtained after chromatographic separation. A.D. Smith

354. CLEAVAGE OF ORGANICALLY BOUND IODINE BY ELECTROLYTIC OXIDATION. G.Hillmann and J.Kuhlmann: Hoppe-Seylers Z. physiol. Chem., 1963, 331, 287-288 (Chem. Lab. Med., Univ. Clinic, Tübingen, Germany). (German) LComish

355. DETERMINATION OF FLUORIDE BY COMPLEXOMETRIC TITRATION. M.A.Leonard: Analyst, 1963, 88, 404-405 (Boots Pure Drug Co. Ltd., Analytical Group, Standards Dept., Station St., Nottingham, England).

I.A.B.S.

356. PHOSPHORIMETRY AS QUANTITATIVE MICRO-ANALYSIS WITH APPLICATION TO SOME SUB-STANCES OF BIOCHEMICAL INTEREST. S.Freed and M.H.Vise: Analyst. Biochem., 1963, 5, 338-344 (Chem. Div., Brookhaven Nat. Lab., Upton, Long Island, N.Y., U.S.A.) Spectra at low temp. exhibit greater sharpness, resolution and intensity. Spectrophosphorimetry at liquid nitrogen temp. was chosen for the quant. analyses of α -chymotrypsin and N-acetyl-L-tyrosine ethyl ester in methanol:water:ethanol (55:25:20). A precision of 5 to 10% was achieved. A.D. Smith

357. MASS SPECTROMETER INLET SYSTEM FOR SAMPLING GASES DISSOLVED IN LIQUID PHASES. G.Hoch and B.Koks: Arch. Biochem., 1963, 101, 160-171 (BAS, Baltimore, Md., U.S.A.) The system permitted continuous sampling of gases dissolved in liquid low density using a semipermeable membrane which allowed gases but not the liquid phase to enter the mass spectrometer. Rapid time response and high sensitivity were achieved. Application to the study of H_2O_2 kinetics is described. B.M. Stevens

358. SEDIMENTATION AND PROPERTIES OF ROUGH AND SMOOTH MEMBRANES FROM RAT LIVER. G.Dallner, 426-SK and A.Bergstrand: J. cell Biol., 1963, 16, 121-128 (Inst. Pathol., Sabbatsberg Hosp., Karolinska on of JMS 01*0111!. Sweden) Differential centrifugation of rat liver components of the endoplasmic reticulum revealed microsomes at 250000 g resulted in 2 fractions differing in structure and function. The specific enzymes and glucose 6-phosphatase activity occur mostly in the rough vesicles. RNA and DT diaphorase activity to AT?A deconjugating enzyme, reacting equally with ^{35}S and ^{32}P (DPH₂) activity occur mostly in the smooth vesicle fraction. P.Barlow

359. APPARATUS FOR SAMPLING AFTER CESIUM CHLORIDE DENSITY GRADIENT CENTRIFUGATION IN THE PREPARATIVE ULTRACENTRIFUGE.

S.A.Ellison and H.S.Rosenkranz: Analyst. Biochem., 1963, 5, 263-265 (Dept. Microbiol., Coll. Phys. Surg., Columbia Univ., New York, U.S.A.)

A simple apparatus is described, which uses a 10 ml. syringe or metering pump, tygon tubing, 3 way stopcock and a disposable needle. This is used to apply controlled pressure to the top of the tube, to give a predetermined flow rate from the bottom. A.D. Smith

360. PHOTOMETRIC SCANNING OF CENTRIFUGED DENSITY GRADIENT COLUMNS. M.K.Brakke:

Analyst. Biochem., 1963, 5, 271-283 (Crops Res. Div., Agric. Res. Service, United States Dept. of Agric., Lincoln, Neb., U.S.A.) Results obtained with an apparatus for recording the u.v. absorbance at all depths in a centrifuged density gradient column and for collecting consecutive samples are presented. A heavy sucrose soln. is forced from a motor-driven syringe into the bottom of a gradient column. The gradient column floats on the heavy sucrose soln. and is slowly forced up through a plastic adaptor shaped like an inverted funnel and through a cell 1 cm. thick with silica windows. As the soln. passes through the cell, the light absorption at 253*6 mjj is measured and automatically recorded on a chart as absorbance. A.D. Smith

361. ZONAL ULTRACENTRIFUGE. NEW INSTRUMENT FOR FRACTIONATING MIXTURES OF PARTICLES.

N.G.Anderson: J. phys. Chem., 1962, 66, 1984-1989 (Biol. Div., Oak Ridge Nat. Lab., Oak Ridge, Tenn., U.S.A.) A new technique for carrying out zone ultracentrifugation is described. The rotor is a hollow cylinder with a capacity of 1625 ml. and the density gradient is established and the sample introduced while the rotor is spinning. Particle separation is achieved at 30000 r.p.m. and subcellular components, TMV and polio virus have been recovered in a high state of purity from crude extracts. G.C.Barr

362. STUDY BY INTERFERENCE OPTICS OF SEDIMENTATION IN SHORT COLUMNS. F.E.Labar and R.L.

Baldwin: J. phys. Chem., 1962, 66, 1952-1959 (Biochem. Dept., Stanford Univ. Sch. Med., Palo Alto, Calif., U.S.A.) Sedimentation equilibrium can be achieved more quickly by using short columns of soln. Interference optics were used here to carry out more accurate measurements. The accuracy of the method has been estimated from the behaviour of a sucrose soln. The method of computing the diffusion coeff. from the rate of approach to equilibrium has been reinvestigated and discussed. G.C.Barr

363. MOLECULAR WEIGHT DETERMINATIONS WITH MAGNETICALLY SUPPORTED ULTRACENTRIFUGE.

P.E.Hexner, R.D.Boyle and J.W.Beams: J. phys. Chem. 1962, 66, 1948-1951 (Physics Dept., Univ. Virginia, Charlottesville, Va., U.S.A.) The technique of using a magnetically suspended ultracentrifuge is described. This technique is particularly suitable for low speed equilibrium studies on the ultracentrifuge and can therefore be applied to macromol. with a mol. wt. in the range of 105 to 107. CC.Barr

364. SUBFRACTIONATION OF Sf 20-10 & LIPOPROTEINS IN SWINGING BUCKET ROTOR. F.T.Lindgren, A.V. Nichols, F.T.Upham and R.D.Wills: J. phys. Chem.,

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1962. 66, 2007-2011 (Lawrence Radiation Lab., Univ. California, Berkeley, Calif., U.S.A.) Human serum lipoproteins have been sub-fractionated on a NaCl density gradient and a specially designed swinging bucket rotor which provides an increased radial flotation path (8*89 cm.). The various fractions differed in their glyceride content. G.C.Barr

3542. SIMPLE DESIGN FOR A FRACTION COLLECTOR. J.W.Mehl: *Analyt. Biochem.*, 1963, 5, 170-174 (Dept. Biochem., Univ. S. California, Los Angeles, Calif., U.S.A.) A very simple design of fraction collector is reported which can be made without demanding machine work and occupies very little space. The device collects 100- to 500-ml. samples at flow rates up to 450 ml./hr. A.D.Smith

3543. PAPER CHROMATOGRAPHIC SEPARATION OF ACETYL AND 3-HYDROXYBUTYRYL HYDROXAMATES. S.Kumar and R.M.Avena: *Analyt. Biochem.*, 1963, 5, 265-267 (Chem. Dept., Georgetown Univ., Washington, D.C., U.S.A.)

These hydroxamates were satisfactorily resolved using methylene chloride:n-butanol:acetic acid:water (80:20:15:30), giving Rf of 35 and 23 respectively. A.D.Smith

3544. APPARATUS FOR AUTOMATIC APPLICATION OF SPOTS TO CHROMATOGRAPHIC PAPER. M.M.Zaalishvili and F.O.Shraibman; Biokhimia, 1963, 28, 9-12. Description of a universal apparatus for the application of spots and streaks to chromatographic paper. The apparatus is controlled by an electronic device which regulates the duration of the application, thus providing spots of appropriate diam. The rate of application, and therefore the width, of streaks is also regulated, as is the interval between applications according to the drying time of the soln. being applied. (Russian) B.J.Cooper

3545. DETECTION AND DETERMINATION OF GLYCEROL IN TOBACCO: USE OF PAPER AND CELLULOSE-COLUMN CHROMATOGRAPHY FOR DETERMINING GLYCEROL IN PRESENCE OF SUGARS. S.J.Patterson: *Analyst*, 1963, 88, 387-393 (D.S.I.R., Lab. Government Chemist, London, England). I.A.B.S.

3546. FILTRATION CAPACITY OF ION EXCHANGE COLUMNS. C.E.Mellish and J.A.Payne: *Nature*, Lond., 1963, 198, 283 (Wantage Res. Lab. U.K. Atomic Energy Authority, Wantage, Berks., England) Very efficient removal of particulate matter from water by mixed bed ion exchange columns is described. G.M.Lewis

3547. IMPROVED TECHNIQUE FOR PREPARATION AND SCANNING OF THIN-LAYER CHROMATOGRAMS. R.L.Squibb: *Nature*, Lond., 1963, 198, 217 (Lab. Disease and Environmental Stress, Bureau Biol. Res., Rutgers St. Univ., New Brunswick, N.J., U.S.A.)

A satisfactory technique for thin layer chromatographic separation and scanning of free amino acids uses a clear plastic plate instead of glass; the stain used penetrates the silica gel without disturbing the spots. G.M.Lewis

3548. FAST SEPARATION OF RADIONUCLIDES BY THIN-LAYER CHROMATOGRAPHY. A.Breccia and F.Spalletti: *Nature*, Lond., 1963, 198, 756-758

(Inst. Chimica Fisica, Univ. Bologna, Italy) Thin layer chromatography on silica gel has been used to separate ^{95}Zr from ^{95}Nb and ^{90}Sr from ^{90}Y . A variety of solvent systems suitable for these separations are described. j. R. Sargent

3549. MICROANALYTICAL DETERMINATION OF DIHYDROXYAROMATIC ACIDS BY GAS CHROMATOGRAPHY. C.M.Williams and R.H.Leonard: *Analyt. Biochem.*, 1963, 5, 362-366 (Depr. Radiol., Univ. Florida Coll. Med., Gainesville, Fla., U.S.A.)

The acids are acetylated on the phenolic group with acetic anhydride and trifluoroacetic acid followed by methylation of the carboxyl group with diazomethane. They are then separated on a 15% silicone column at 190°. The method is of use in investigating cases of suspected neuroblastoma in which excretion of homoprotocatechic acid has been found to be elevated.

A.D.Smith

3550. ANALYSIS OF STEROID METABOLITES BY GAS CHROMATOGRAPHY. J.Chamberlain, B.A.Knights and G.H.Thomas: *J. Endocr.*, 1963, 26, 367-387 (Depr. Anat., Univ. Birmingham, England) Three stationary phases suitable for use in gas chromatography of urinary steroids and their respective selectivities are described. Data are given from an investigation of 17-oxosteroids and progesterone metabolites in human pregnancy and in rhesus monkey urine. G.F.Blane

3551. EFFECT OF STABILISING MEDIA ON ZONE MOBILITY AND SPREADING IN ELECTROPHORESIS. J.C.Giddings and J.R.Boyack: *J. theoret. Biol.*, 1962, 2, 1-6 (Chem. Dept., Univ. Utah, Salt Lake City, Utah, U.S.A.) Mathematical formulation of the 2-step process for migration of charged particles in a stabilising medium, gives an expression for apparent mobility, which is a function of the field strength. The process also results in zone spreading, important at high voltages for migrants with large effective charge. These conclusions are compared with expt. evidence.

J.A.Dawson

3552. HIGH VOLTAGE ELECTROPHORETIC AND PAPER CHROMATOGRAPHIC IDENTIFICATION OF BIOGENIC AMINES IN FAECES OF NORMAL DAIRY CATTLE. D.L.Van Rheezen: *Rec. Trav. chim. Pays-Bas*, 1963, 82, 225-227 (Lab. Vet. Biochem., State Univ., Utrecht, Netherlands) By using high voltage electro* phoresis followed by chromatography in various solventSt a method has been presented for separating and estimating quant. 24 amines of biol. importance. G.C.Barr

3553. LOW-LEVEL ^{14}C DETERMINATION BY IMPROVED SCHONIGER COMBUSTION AND IONISATION CHAMBER. S.Von Schuching and C.W.Karickhoff: *Analyt. Biochem.*, 1963, 5, 93-98 (Radio-isotope Service, V.A. Center, Martinsburg, W.Va., U.S.A.) A procedure for measuring low levels of ^{14}C radioactivity, dil. with large amounts of inactive C in heterogeneous samples, has been developed. The apparatus consists of a combustion apparatus with a specially designed ignition head, and an ionisation chamber. After combustion the $\pm\text{CO}_2$ formed is liberated with lactic acid into the ionisation chamber. The procedure is useful for all types of heterogeneous samples encountered in biol. expt. A.D.Smith

3554. MONOLAYER PERMEABILITY AND PROPERTIES OF NATURAL MEMBRANES. M.Blink: J. phys. Chem., 1962, 66, 1911-1918 (Physiol. Dept., Coll. Phys. Univ., New York, U.S.A.) The enz. monolayer permeation is described in terms of an \bar{W}^2 barrier theory where the energy depends on mono-layer thickness, the compressibility, the surface pressure, the size of the Permeant. The permeation of natural membranes can be formulated as a monolayer. Proc. 15th and me conclusions indicate that current for I on the structure of natural membranes can account for many of their prop. G.C.Barr

3555. SOME COMMENTS ON CORRELATION BETWEEN DIFFUSION, SEDIMENTATION, OSMOTIC PRESSURE AND LIGHT SCATTERING OF MACROMOLECULAR SUBSTANCES IN SOLUTION. I.Steinberg and t-Katchalski: Bull. Res. Coun. Israel, A, 1963, 11, 379-383 (Dept. Biophys.. Weizman Inst. Sci. of耶路撒冷, Israel) A theoretical analysis was made of the correlation between the diffusion and sedimentation coefficients and osmotic pressure and turbidity of high mol. wt. substances in soln. The treatment presented included macromolecules uncharged as well as electrically charged derivatives. For uncharged macromol. equations were derived. For polyelectrolytes diffusing or sedimenting in concn. containing 10^4 mol. wt. supporting salt of Bon^+ - Cl^- . Potential, correlations were predicted by j_{H_2O} assuming Donnan equilibrium along the diffusion and sedimentation paths, it was possible to evaluate off-resistance and sedimentation hydrodynamic friction L.G.Gillies

3556. EFFECT OF MAGNETIC FIELDS ON TISSUE RESPIRATION. V.R.Reno and L.G.Nutini: Nature, Lond., 1963, 198, 204-205 (Div. Biol., Inst. Divi Thomae, Cincinnati, Ohio, U.S.A.) The O₂ uptake of adult mouse tissues and tumour cell suspensions was affected by exposure to a magnetic field of 7300 Gaus, the effect being related to the type and age of the tissue. G.M.Lewis

***57. RELAYING MODEL OF SELF-REPRODUCING PROCESS.** Iu.N.Krol': Tsitologiya, 1962, 4, 580-584. Description of a machine performing the self-reproducing process of technical material. It is simpler than Neumann's machine and has greater possibilities than Ericse's machine. (Russian) B.J.Cooper

3558. FORMATION OF ADENINE BY ELECTRON RADIATION OF METHANE, AMMONIA AND WATER. M.onnarnperuma, R.M.Lemmon, R.Mariner and J.Calvin: Proc. nat. Acad. Sci., Wash., 1963, 49, 740 (Exobiol. Div., Nasa, Ames Res. Center, Moffett Field, Calif., U.S.A.) Adenine is a product of electron irradiation of a mixture of methane, ammonia and water. Amounts of adenine formed are inversely proportional to the amount of H₂ gas present. Of the 5' leucine bases adenine is the one most readily synthesized under prebiotic conditions. J.R.Sargent

3559. DIRECT ACTION OF X-RAYS ON AMINO ACIDS. I.Q. RaJewsky: Z. Naturforsch. B, 1963, 18, 110-114 (Max-Planck-Inst. Biophysik, Frankfurt am Main, Germany) Indirect irradiation of sparingly soluble amino acids in water gave rise to glycine, alanine, tyrosine, phenylalanine, tryptophan, 3-hydroxykynurenin, 3-hydroxyanthranilic acid and tryptamine were also formed. Mechanisms for this reaction involving HO₂ radicals were proposed. (German) J.C.Crawhall

acid and tryptamine were also formed. Mechanisms for this reaction involving HO₂ radicals were proposed.

(German) J.C.Crawhall

3560. PHOTOLYSIS AND PHOTO-OXIDATION OF AMINO ACIDS AND PEPTIDES. VI. INITIATION OF DISULPHIDE INTERCHANGE BY LIGHT IRRADIATION. J.E.Eager and W.E.Savage: Photochem. Photobiol., 1963, 2, 25-38 (Div. Protein Chem., C.S.I.R.O., Wool Res. Labs., Parkville, Victoria, Australia)

Disulphide interchange (RSSR -fR¹SR²) does not occur spontaneously in the pH range 1-6, but it can be initiated by the addition of a small amount of a thiol or by irradiation with u.v. or visible light. These reactions were investigated by the use of cystine, homocysteine, cystamine and related unsymmetrical disulphides. This work is extended to a consideration of the importance of these reactions during irradiation of proteins containing cystine residues. G.C.Barr

3561. EFFECT OF SUBLETHAL DOSES OF ARTIFICIAL SUNLIGHT ON ADAPTIVE ENZYME SYNTHESIS BY E.COLI. S.J.Webb: Canad. J. Biochem., 1963, 41, 859-866 (Depr. Bacteriol. Univ. Saskatchewan, Saskatoon, Canada) The oxidation of lactose by *E.coli* was the test system; into Warburg manometric flasks were placed suspensions of *E.coli* cells, lactose soln. and casein hydrolysate. Measurements of O₂ uptake were made over 2-3 hr. periods after mixing the contents of the flasks. A sunlamp was placed 1 or 2 ft. away from the flasks and filters consisting of dye soln. were used to obtain various wavebands of light. Direct sunlight inhibited enzyme synthesis but did not affect the action of pre-formed enzymes. Blue and yellow light were both effective in preventing enzyme synthesis but no effect was seen with red light. J.B.Parish

3562. γ -IRRADIATION AND WHEAT GLIADIN STRUCTURE. M.S.Reznichenko, E.E.Rydalevskii and E.S. Gankina: Biokhimia, 1963, 28, 52-56. Samples of wheat grain with varying amounts of moisture were subjected to γ -irradiation in vivo. Gliadin was extracted afterwards, and the amino acids and S were studied.

Aspartic and glutamic acids were found as terminal amino acids, as well as serine, threonine, lysine, phenylalanine and leucine. Quant. assay of aspartic and glutamic acids and serine showed that irradiation depressed their content. The decrease in the level of N-terminal amino acids was proportional to the radiation rate. In gliadin isolated from irradiated wheat with increased moisture, a decreased mol. wt. was found as compared with that isolated from dry irradiated wheat. (Russian) 3J.Cooper

3563. SECONDARY PROCESSES IN PROTEINS IRRADIATED AT ROOM TEMPERATURE. T.Henriksen, T.SanneSd A.Pihl: Radiat. Res., 1953, 18, 147-162 (Norsk Hydro's Inst., Montebello, Oslo, Norway) Secondary processes occurring in proteins irradiated in cryst. form at room temp. have been studied by electron spin resonance [ESR] spectroscopy after stepwise heat treatment. ESR patterns indicated that formation of sulphur radicals which appear just below room temp, coincided with increase in total no. of radicals. The extent of S resonance depended upon cysteine-cystine/glycine ratio, and was more pronounced when S was present in sulphhydryl rather than disulphide form. Radical yield for proteins was of the same order as that for many amino acids, and heat denaturation did not alter yields significantly. B.Payne

BIOPHYSICS

3564. URINARY EXCRETION OF 32-PHOSPHORUS AND DEOXYRIBOSE IN RATS FOLLOWING IRRADIATION OR ADMINISTRATION OF SINGLE DOSE OF METHIONINE SULFOXIMINE. J.Kolousek and Z.Dienstbien Inst. J. rad. Biol., 1963, 6, 271-280 (Inst. Biophys., Fac. Gen. Med., Charles Univ., Prague, Czechoslovakia) After i.p. administration of 50 mg. or 150 mg. L-methionine sulphoximine 32p excretion rose by an amount depending on the dose. 600 r of X-radiation or DNP administration produced similar effects. Scalding of 50% of the body surface reduced 32p excretion. Excretion of Dische pos. substances was increased after methionine sulphoximine or irradiation. B.M.Stevens
3565. SYNTHESIS OF PROTEIN, RNA, DNA AND INDUCED ENZYME IN BACTERIUM CADAVERIS AFTER X-IRRADIATION. H.Pauly: Int. J. rad.Biol., 1963, 6, 221-231 (Max-Planck-Inst. ftr Biophys., Frankfurt a.M., Germany) The rates of total protein synthesis, induced lysine decarboxylase synthesis and RNA formation immediately after irradiation were exponential functions of the dose, with inactivation doses all close to 30 kr. Colony forming ability also showed an exponential curve but the inactivation dose was approx. 10 kr. DNA formation showed a prolonged time lag after irradiation. The O₂ enhancement factor was approx. 4 for all the functions tested. B.M.Stevens
3566. EFFECT OF OXYGEN IN MAMMALIAN CELLS SENSITISED TO RADIATION BY INCORPORATION OF 5-BROMODEOXYURIDINE INTO DNA. R.M. Humphrey, W.C.Dewey and A.Cork: Nature, Lond., 1963, 198, 268-269 (Dept. Physics, Univ. Texas, Houston, Tex., U.S.A.) The mean lethal dose (D₀) of X-irradiation for mouse fibroblast cells in the presence of oxygen was 126 rads for normal cells and 89 rads for cells grown in die presence of 5-bromodeoxyuridine. Do values for cells irradiated under anoxic conditions were 350 rads for normal cells and 254 rads for cells grown in the presence of 5-bromodeoxyuridine. J.R.Sargent
3567. FATE OF TRITIATED NATIVE LIVER DNA INJECTED INTO LETHALLY IRRADIATED RATS. A.Popović, A.Becarević, D.Kanazir, N.Stošić and V.Pantić: Nature, Lond., 1963, 198, 165-167 (Inst. Nuclear Sci. 'Boris Kidrich', Belgrade, Yugoslavia) Autoradiographic evidence is presented concerning the incorporation of native homologous liver [³H]DNA into the nuclei of some cell lines of the testes, intestines, spleen and liver of X-irradiated rats. The macrophages seemed to be involved in the transport of the inj. DNA. G.M.Lewis
3568. ROLE OF DNA IN RADIATION DAMAGE OF THE CELL. A.M.Kuzin: Int. J. rad. Biol., 1963, 6, 201-209 (Inst. Biophys., Acad. Sci. U.S.S.R., Moscow, U.S.S.R.) A review. 21 ref. B.M.Stevens
3569. IDENTIFICATION OF ULTRAVIOLET-INDUCED THYMINE DIMERS IN DNA BY ABSORBANCE MEASUREMENTS. R.B.Setlow and W.L.Carrier: Photochem. Photobiol., 1963, 2, 49-58 (Biol. Div., Oak Ridge Nat.Lab., Oak Ridge, Tenn., U.S.A.) Native and heated DNA from calf thymus, *Micrococcus lysodeikticus* and phage T4 have been exposed ilfsolnt to u.v. light and thymine dimers have been isolated from the treated DNA. At high doses 50% of all the TT sequences can be made to form dimers and an incident dose of 100 erg/mm.² of 280mjj radiation will cause the formation of one dimer per mol. of calf thymus DNA. G.C.Barr
3570. INDUCTION BY X-RAYS OF DESTRUCTION OF DNA OF ESCHERICHIA FREUNDH. I. INFLUENCE OF COMPOSITION OF IRRADIATION AND INCUBATION MEDIUM. P.M.Osterrieth: Int. J. rad. Biol., 1963, 6 289-296 (Lab. Microbiol. Gén. et Méd., Univ. Liège Belgium) DNA destruction occurred when *E.freund* was irradiated with 54000 r and then incubated at 37° for 2 hr. in a medium which did not allow multiplication. Destruction was of the order of 25% in distilled water; addition of salts at various concn. modified the proportion of DNA destroyed. One type of protection was observed whenever the suspension medium was sufficiently concentrated, irrespective of its nature. Another type of protection was a function of the reducing ability of the suspension medium. Some substances at concn. of 6×10^{-2} - 5×10^{-3} M increased DNA destruction. This effect appeared to depend on the nature of the anion and became more intense with multivalent anions. (French) B.M.Stevens
3571. EFFECTS OF IN VITRO INCUBATION AND X-IRRADIATION ON RNA FRACTIONS OF RABBIT LYMPHATIC CELLS. K.Kumura: Bull. Yamaguchi Med. Sch., 1962, 9, 31-37 (Cytochem. Lab., Yamaguchi Med. Sch., Ube, Japan) The amount of the major component of the phenol-released fraction, pRNA, was kept const., while the yield of the residual fraction with a very high turnover rate [rRNA] decreased during the in vitro incubation. The in vitro incorporation of [32p]orthophosphate into pRNA-B was not affected by 800 r X-irradiation in vitro of lymphatic cells but that into rRNA was depressed to the same extent as that into DNA. K.Jones
3572. REACTIVATION OF IRRADIATED *E. COLI* BY RIBONUCLEASE. F.T.Gardner: Biochem. biophys. Res. Comm., 1963, 10, 454-459 (Dept. Mol. Biol. Biophysics, Yale Univ., New Haven, Conn., U.S.A.) The reactivation of irradiated *E. coli* by RNase is described. There is evidence that this effect may be due to degradation of damaged ribosomal RNA. B.Ketterei
3573. MOLECULAR ENVIRONMENT EFFECTS IN RADIATION DECOMPOSITION OF CL-D-GLUCOSE. G.O.Phillips and P.Baugh: Nature, Lond., 1963, 198, 282-283 (Dept. Chem., Univ. Coll., Cardiff, Wales) Ext. on the γ-radiation of (X-D-glucose in the polycrystalline or freeze-dried state, showed that the products of decomposition depend on the physical state of the sugar*. G.M.Levi
3574. EFFECT OF CULTURE MEDIUM ON RADIATION SENSITIVITY OF GLUCOSE OXIDATION IN BACTERIUM CADAVERIS. H.Pauly. Z. Naturforsch. B, 1963, 18, 23-25 (Max-Planck-Inst. Biophysik, Frankfurt am Main, Germany) *B. cadaveris* was cultured in a bactotryptone medium and in a synthetic salt medium respectively. Irradiation with 1*2 and 6 million r did not affect O₂ uptake in the former medium but progressively decreased it in the latter medium. TM effect of increasing doses of radiation on the 2 systems after 1 hr. was also studied and similar inhibition effects were observed at doses above 6 million r. (German) J.C.Crawhall
3575. LIPID PEROXIDE IN LIVERS OF IRRADIATED RATS. P.B.McCay, M.G.Macfarlane and E.Boyland: Nature, Lond., 1963, 198, 98-99 (Lister Inst., London, England) In rats irradiated with between 2-16000 r & X-rays, the fatty acid ester content of the liver, lipid P₂/P₁₂ value, peroxide content and proportion of triglycerid⁶, cephalin and lecithin fractions was not significantly

different from the values in the liver of non-irradiated animals. There was a slight increase in peroxide-like material extracted with saline in the liver of irradiated rats.

G.M.Lewis

3576. EFFECT OF IONISING RADIATION ON LIPID METABOLISM IN BLOOD CELLS IN VITRO.

B.Malamos, C.Miras and J.Mead: *Nature*, Lond., 1963, 198, 401-402 (Dept. Clin. Therapeutics, Univ. Athens, Sch. Med., Athens, Greece) Incorporation of Li-14Cacetate into the lipids of w.b.c. and platelets « not significantly affected by exposure to 1000 r ionising fediation.

G.M.Lewis

3577. CHANGES IN PHOSPHOLIPIDS OF MOUSE SKIN AFTER ULTRAVIOLET IRRADIATION IN VITRO.

A.Tickner: *Biochem. J.*, 1963, 88, 80-84 (Dept. PathoL, Croydon Group Lab., Mayday Hosp., Thornton Heath, Surrey, England) The skins of stain A mice were removed and irradiated in vitro. The Riospholipids were extracted and analysed. Ethanolamine Nasmalogen was decreased to 28% and phosphatidyl-¹⁴thanolamine to 78% of control values. Other phospho-¹⁴Pid fractions were not significantly affected.

3578. EFFECT OF X-RAY IRRADIATION ON PHOSPHOLIPIDS OF LIVER MITOCHONDRIA. H.P.Schwarz, L.Dreisbach and A.Kleschick: *Arch. Biochem.*, 1963, 101, 103-107 (Div. Biochem., Philadelphia Gen. Hosp., Philadelphia, Pa., U.S.A.) Whole body

Radiation increased total lipid P as well as changing ³²TM³phospholipid distribution in fasted rats. Phosphatidyl-Styceol increased more than 4-fold to become a significant component of irradiated mitochondria. Cardiolipin ³²as if anything, reduced in amount by irradiation. The ³²J¹ value of phosphatidylethanolamine dropped almost enough to balance the increase in phosphatidylglycerol. ³²I¹osphatidylcholine, phosphatidylserine, phosphoinositide ³²d sphingomyelin % values were slightly lower or unchanged. The actual amount of mitochondrial phosphatidylglycerol/g. wet liver increased more than 4-fold, while that of phosphatidylcholine increased by 21% and amounts of other phosphatides were almost unchanged.

B.M.Stevens

3579. BIOSYNTHESIS AND METABOLISM OF OESTROGENS IN RAT. H. CONVERSION OF [4-14C]TESTOSTERONE INTO [14C]OESTRADIOL-17_β BY THE OVARY AFTER WHOLE-BODY IRRADIATION.

S.R.Stitch, R.E.Oakey and S.S.Eccles: *Biochem. J.*, 1963, 88, 76-80 (M.R.C. Radiobiol. Res. Unit, Harwell, Didcot, Berks., England) Female albino rats were given 400 rads of whole-body X-irradiation at 50 days ^{ab} age. ^{ab} e CSL¹SLC¹y ^{ab} f¹te ovaries of the ^{ab}uated animals to produce oestrogen in vitro was compared with sham-irradiated controls at times varying from 4 to 180 days after irradiation or after sham-irradiation. After an initial lag, the biosynthesis of oestradiol-17_β by ovaries of the irradiated animals appeared to be as high as with tissue from the non-irradiated controls. The biosynthesis of oestrogen by ovarian tissue after destruction of the follicular structures by high doses of irradiation is discussed.

3580. CHANGES IN HISTAMINE CONTENT OF VARIOUS TISSUES AFTER MASSIVE DOSES OF Y-IRRADIATION. L.Mariani, F.Fornasari and M.Giorgi: *Atti. Acad. Med., Lombarda*, 1962, 17, 221-225 (1st. Farmacol., Univ. Milano, Italy) High, rapid doses of y rays ^{ab} 250 r in 35 sec.) killed guinea-pigs within 4 days.

10 min. after the irradiation, the histamine level of the blood and various organs, particularly the lungs and liver, was greatly reduced, but the animals did not show shock phenomena. A similar depletion of histamine was observed after anaphylactic shock. After massive irradiation, the guinea-pigs could still show anaphylactic shock, even though the histamine levels were already lowered.

(Italian) G.N.Godson

3581. CHEMICAL TRANSFORMATION OF CATECHOLAMINES INDUCED BY U.V. IRRADIATION. E.Walaas: *Photochem. Photobiol.*, 1963, 2, 9-24 (Inst. Med. Biochem., Oslo Univ., Oslo, Norway) The conversion of catecholamines exposed to u.v. irradiation has been investigated by a spectrophotometric technique which allows the elucidation of the nature of intermediates. At neutral pH and in the presence of O₂ «adrenaline is converted to adrenochrome and then polymerised to melanin. At alk. pH different products are formed and melanin production is low. The corresponding reactions for nor-adrenaline were investigated.

G.C.Barr

3582. X-RADIATION AND 5HT CONTENT IN BRAIN OF RATS AND MICE. D.Palaic, M.Randić and Z.Supek:

Int. J. rad. Biol., 1963, 6, 241-246 (Biol. Div., Inst. Ruder Bosković, Zagreb, Yugoslavia) High doses of whole body X-radiation increased the 5HT content. Smaller doses produced this effect only in adrenalectomised rats. Shielding the head or body or pretreatment with iproniazid or reserpine did not suppress the phenomenon.

B.M.Stevens

3583. EFFECT OF X-IRRADIATION ON HAEMOPOIETIC FUNCTION OF MOUSE LIVER. J.F.Duplan: *Nouv. Rev. franc. Hemat.*, 1963, 3, 121-132 (Laboratoire Pasteur, Inst. Radium, Paris, France)

Foetuses of strain XVII were exposed to a single dose of 240, 580 or 960 r on the 13-16th day of intrauterine life. The radiation technique avoided damage to the mother and to other foetuses in the same uterus. The haemopoietic structures of the foetus liver showed greatest sensitivity on the 14th day, but seemed less sensitive than in the adult animal. This may be due to a 'radioresistant' phase of development, or to maternal protection from radiation and infection. The hepatic cells were most sensitive on the 13th day.

(French) V.Eisen

3584. ELECTROPHORESIS OF BLOOD FROM IRRADIATED MICE. K.P.Kashkin, P.LGrabar and Z.Kurkon:

Biokhimiia, 1963, 28, 89-99. Immunoelectrophoresis was used to study changes in the serum proteins of non-inbred mice subjected to X-irradiation (1000 r). Irradiation caused a fall in protein concn. immediately afterwards, and recovery about day 5-6. Recovery was linked with an increase of (X2- and fe-globulins, together with a decrease in serum albumins, y-, P3- and p-proteins, even a disappearance of some fractions. The increase in 0,2-globulins was associated with the appearance within this zone of new and degraded old Ag with the mobility of ag-globulins.

(Russian) BJ.Cooper

3585. RECOVERY OF ERYTHROPOIESIS AFTER IRRADIATION: A QUANTITATIVE STUDY IN THE RAT.

E.V.Hulse: *Brit. J. Haemat.*, 1963, 9, 365-375 (Med. Res. Council, Radiobiol. Res. Unit, Harwell, Didcot, Berks., England) Erythropoietic activity recovered in die rat after single exposures of 100, 200 or 400 r of X-rays. Quant. studies on blood and bone marrow showed a profound fall in r.b.c. precursors in the first 24 hr. after irradiation followed by a rapid increase during the first week. This produced an increase in all cells of the normoblast series.

above normal, being earlier after the smaller irradiations. After 400 r doses the haemopoietic picture did not revert to normal until after 10 weeks. 21 days after this dosage the reticulocyte count showed a temporary max. 5 times greater than normal. Macrocytic anaemia developed in the 5th week. Early normoblasts take 3-4 days to develop into circulating reticulocytes in the rat. J.Sneath

3586. LYMPHOCYTIC RECOVERY AFTER IRRADIATION AND ITS RELATION TO OTHER ASPECTS OF HAEMOPOIESIS. E.V.Hulse: Brit. J. Haemat., 1963, 9, 376-384 (M.R.C. Radiobiol. Unit, Harwell, Didcot, Berks., England) Marrow lymphocytes return quickly after a single dose of radiation, in inverse rate to the radiation dose. After a dose of 200 r no. exceeded the normal count temporarily (but not after 100 r or 400 r). Blood lymphocytes took longer to return to normal (longer than 6 weeks after 200 r, 10 weeks after 400 r). Comparison with erythropoietic and myelopoietic cell counts lead to the conclusion that the lymphocytes are not multi-potential stem cells but have a trephocytic function. J.Sneath

3587. METHAEMOGLOBIN FORMATION BY X-RAYS IN HAEMOLYSATES AND INTACT ERYTHROCYTES OF VARYING CATALASE CONTENT. J.P.Heiniger and H.Aebi: Helv. chim. Acta, 1963, 46, 255-268 (Med.-chem. Inst. Univ. Bern, Switzerland) Radiation induced metHb-formation in haemolysates and in r.b.c. suspensions of normal and acatalatic human blood has been studied under various expt. conditions. The abs. amount of metHb produced by a given X-ray dose depends on Hb concn., the nature of die gas phase, catalase activity of the blood sample and the presence of catalase inhibitors (azide). (German) A.D.Smith

3588. PARTIAL MARROW SHIELDING AND TOTAL-BODY IRRADIATION. W.D.Noyes, C.A.Finch, H.Wasserman and K.Glickman: J. appl. Physiol., 1963, 18, 629-632 (Med. Dept., Univ. Washington Med. Sch., Seattle, Wash., U.S.A.) When rat femurs were shielded from whole-body irradiation of 550 r there was no depopulation of nucleated cells in the shielded marrow as there was in irradiated bone marrow. Hb synthesis following artificial haemorrhage was greater in shielded animals than in those with unshielded femurs. H.C.Jones

3589. SOME EFFECTS OF LONG-TERM ALPHA IRRADIATION ON COMPOSITION AND STRUCTURE OF BONE. B.J. Stover and W.S.SJee: Health Physics, 1963, 9, 267-275 (Divn. Radiobiol., Dept. Anat., Univ. Utah, Salt Lake City, Utah, U.S.A.) Dogs were inj. i.v. with 3 fie 239Pu/kg. and the composition of their humeri and third lumbar vertebrae analysed after 3-5 yr. These dogs showed severe skeletal degeneration, with anaemia and liver damage. Their wt. were only 70% of control dogs non-inj. There is decrease in fractional water content, about 1%/year and mineral content also rises slightly. There is an increase in marrow content reflected by an increase in the fractional water content in the humeri, with a simult. decrease in org. and inorg. material representing loss of ossified material.

M.S.Lavrack

3590. DEMONSTRATION OF MORPHOLOGICAL NUCLEAR CHANGES IN PYKNOTIC IRRADIATED THYMOCYTES. J.F.Scaife: Canad. J. Biochem., 1963, 41, 823-825 (Defence Res. Chem. Lab., Defence Res. Board, Dept. Nat. Defence, Ottawa, Canada) Thymocytes from rats and rabbits were

examined 4 hr. after the animals received 800 rads of 60co y or X-irradiation by fixing in either Susa fixative or osmic acid and then either staining in Mayer's haemalum for light microscope studies or treating for E.M. study; pyknotic cells were observed best in Susa fixative when stained with haemalum and in osmic acid fixative when viewed by the E.M. Prelim, comm.

J.B.Parish

3591. ROLE OF DISTURBANCE OF METABOLIC PROCESSES IN RADIATION DAMAGE OF THE CELL. A.M.Kuzin: Int. J. rad. Biol., 1963, 6, 211-220 (Inst. Biophys., Acad. Sci. U.S.S.R., Moscow, U.S.S.R.) A review. 21 ref. B.M.Stevens

3592. SYSTEMATIC MICROSCOPIC STUDY OF THE ACTION OF IONISING RADIATION ON ANIMAL CELLS IN CULTURE. I. ACTION OF LARGE DOSES OF X-RAYS. J.Driessens, P.Cappelaere, G.Giaux and G.Decoster: C.R. Soc. Biol., Paris, 1962, 156, 1650-1653 (Inst. Recherches Cancer, Lille, France)

Application of 38000 r X-rays to a culture of striated muscle from 9-day chick embryos resulted in decreased mitoses, fragmentation of the mitochondria and decrease in contractions of the cell membrane. Later the cytoplasm of certain cells fragmented, with secondary reunification and displacement of the nuclei from the cell* (French) M.A.Price

3593. EFFECT OF COOLING UPON IRRADIATED CELLS. E.Wendfc: Z. Zellforsch., 1963, 59, 309-325 (Zool. Inst. Univ. Bonn, Germany) In order to evaluate the biol. effect of ionising radiation upon individual cells and cell complexes, tissue cultures of chicken heart cells, ascites tumour of mice and 8-day-old chicken embryos were irradiated with X-rays (60 kV, 10 mAmp), and cooled immediately after irradiation down to 10° and then again incubated at 37°. In chicken heart cells which had been irradiated with 3000 r only slight cellule damage was seen; the same effect was also observed in the cells of the ascites tumour after a dosage of 1500 r t 8-day-old chick embryos irradiated with 3000 r and kept at a low temp, afterwards for 5 hr., died when incubated again. The author concludes that direct radiation damage can be strongly decreased in single cells, but that the damage caused to the higher biol. systems is undiminib^ and merely delayed by cooling*

(German) J.E.Linder

3594. EFFECTS OF X-IRRADIATION UPON POSTNATAL GROWTH IN MOUSE. D.J.Nash and J.W.Gowen: Bid. Bull. Woods Hole, 1962, 122, 115-136 (Dept. Genetics, Iowa State Univ., Ames, Iowa, U.S.A.)

Changes in body wt., after irradiation, were studied during post-natal growth in 3 strains of mice, Ba, K and S and all their possible hybrids. Pregnant females were exposed to single whole body dosages of X-rays at 6, 10, 14, 20 and 17i days gestation, timed from the appearance of & vaginal plug. Weighing was carried out at birth and 12i, 26, 40, 60 and 75 days after birth. Body wt. response was found to be dependent on the level of irradiation and embryological age at irradiation. Max. effect of these treatments was not usually evident until 40 days post-partum. Little recovery was evident at 75 days.

G.J.Peakin

3595. IMMEDIATE RETINAL RESPONSE TO X-RAYS AT MILLIROENTGEN LEVEL. C.S.Bachofen and S-E-Wit¹⁵: Radiat. Res., 1963, 18, 246-254 (Dept. Biol., Univ. Notre Dame, Ind., U.S.A.) The retina of frog (Rana pipiens) responded immediately to flashes of X-rays and were recorded as an electroretinogram. The lower level of sensitivity was 7 mr per flash, and sufficient

time for recovery between flashes was about 1 min. When rapid stimm. was applied, e.g. every 2 sec. all prop. of electroretinogram such as amplitude, rate of rise etc. were immediately modified, but were restored after efficient time for recovery of retina. B. Payne

3596. ULTRASTRUCTURAL CHANGES INDUCED IN FASCICULATE ZONE OF ADRENAL CORTEX OF ANIMALS BY LOCALISED AND GENERALISED IRRADIATION. G.Poggi Longostrevi and L.Lombardi: Atti. Acad. med., Lombarda, 1962, 17, 179-194 (1st. Farmacol., Univ. Milan, Italy) Morphol. changes occurring in the fasciculate zone of the adrenal cortex of rats after X-irradiation of 1000 r, locally or generalised (same dose), were studied with the E.M. Within 24 hr. localised irradiation and 3 days after generalised Radiation, submicroscopic alteration were observed in the mitochondria and endoplasmic reticulum. The mitochondria had developed irregular shape and sometimes fused with each other and the endoplasmic reticulum had developed vesicles and distortions. These abnormalities partially regressed within 7 days.

(Italian) G.N.Godson

***597. MOLECULAR RADIobiOLOGY OF HUMAN CELL LINES. IV. VARIATION IN U.V. LIGHT AND X-RAY SENSITIVITY DURING DIVISION CYCLE.** RX.Erikson and W.Szybalski: Radiat. Res., 1963, 18, 200-212 (McArdle Mem. Lab., Univ. Wisconsin, Madison, Wis., U.S.A.) The transient inhibition of thymidylate acid synthesis in D98/AG strain of human cell culture synchronises all cells into the same phase of division. The sensitivity of such cells to u.v. and X-rays was found to vary during replication cycle according to a sp. pattern. The period of greatest radioresistance follows completion of DNA synthesis preceding cell division. 5-Bromodeoxyuridine incorporated into DNA radiosensitises cells quite independently of phases of the division cycle. B.Payne

***598. AGE AT EXPOSURE AND ACCELERATION OF INTERCAPILLARY GLOMERULOSCLEROSIS [IGS] IN MICE.** P.H.Guttmann and H.L.Kohn: Lab. Invest., 1963, 12, 250-256 (Cancer Res. Inst., California Univ. San Francisco, Calif., U.S.A.) A marked acceleration of progressive IGS in mice was obtained by irradiating body shortly before and after birth. In a rat at 12-13 days of age produced a lesser effect, whereas the effect occurred earlier and was more marked in older mice. Glomerular injury was evident on the dose. A.M.Mackay

3599. T⁹A COMPARISON OF RADIATION INDUCED GRANULOCYTOPENIA IN SEVERAL MAMMALIAN SPECIES. J.Patt and M.A.Malone: Radiat. Res., 1963, 18, 223-235 (Div. Biol. and Med. Res., Argonne Nat. Lab., Lemont, Ill., U.S.A.) Study of early granulocytopenia in mouse rat, hamster, rabbit, dog and monkey. Parallel irradiation showed similar rate of decline which was similar to normal rate of disappearance of neutrophilic granulocytes from circulation. The time between onset of granulocytopenia and radiation varied and may be attributed to differences in non-mitotic differentiating pool. B.Payne

3600. PARTIAL-BODY X-RAY EXPOSURE AND PROGRESSION OF PROGRESSIVE INTERCAPILLARY GLOMERULOSCLEROSIS IN THE BALB/c MOUSE. H.L.Kohn: Radiat. Res., 1963, 18, 241-250 (Cancer Res. Inst., Univ. California, Los Angeles, Calif., U.S.A.) BALB/c mice were sub-

jected to partial and whole-body irradiation (37-56 rad/min.) at the age of 58-93 days, and were killed about 500 days later. Their kidneys were examined microscopically and were graded for intercapillary glomerulosclerosis which is accelerated by irradiation. High X-ray dose (750-900 rad) received by kidneys in partial-body irradiation resulted in most severe lesions and was associated with early renal arteriosclerosis. B. Payne

3601. MECHANISM OF PRODUCTION OF TERMINAL AND LETHAL ANAEMIA IN CHRONICALLY IRRADIATED GUINEA-PIGS. P.W.Edmondson and J.E.Morris: Brit. J. Haemat., 1963, 9, 351-364 (M.R.C. Radiobiol. Res. Unit, Harwell, Didcot, Berks., England)

Measurement of red cell mass [RCM] and estimation of haemorrhage in irradiated guinea-pigs was made possible by injn. of ⁵¹Cr-labelled red cells. The guinea-pig received 10 r per day and developed typical lethal anaemia which was sudden and late in onset. The RCM was correlated with a very low platelet count. Haemorrhage was gastrointestinal and after 1000-1400 r accumulated dose the r.b.c. production was only half that of the control group. Thus the anaemia is due to haemorrhage and an inability to increase erythropoietic activity. The ⁵¹Cr-labelled red cells were unaffected by the irradiation. Extravascular retention of Cr in the spleen was observed.

J.Sneath

3602. ACTION OF GENERAL IRRADIATION WITH X-RAYS OF DIFFERENT DOSES ON APPEARANCE OF METASTASES OF TRANSPLANTABLE MAMMARY EPITHELIOMA OF RAT. M.R. Riviere, L.Chouroulinkov and M.Guerim: CR. Soc. Biol., Paris, 1962, 156, 1607-1611 (Lab. Méd. exp., Inst. Recherches Cancer, Villejuif, Seine, France) General irradiation with X-rays of ^aWistar rats carrying a graft of transplanted mammary epithelioma G6 had a direct effect on the appearance of metastases. There was a decrease in the no. of pulmonary metastases while the total lymphatic metastases increased by ^{1/2}Pf in irradiated rats.

(French) M.A.Price

3603. INFLUENCE OF HISTAMINE AND OF CYSTEINE ON EXCRETION OF NITROGEN COMPOUNDS IN SPLEEN ISOLATED FROM IRRADIATED GUINEA-PIG. A.Dekleva-Likan: Radiat. Res., 1963, 18, 133-136 (LStephan Inst., Ljubljana, Yugoslavia)

1ml. 10⁻²M cysteamine injn. i.p. or i.v. before irradiation reduced excretion of nitrogen from an isolated perfused rat spleen. Similarly 1 ml. 10⁻³M histamine gave a less pronounced protection against irradiation. B. Payne

3604. RADIATION PROTECTION BY SULPHUR IN MODEL SYSTEM. P.G.Garratt and M.G.Ormerod: Int. J. rad. Biol., 1963, 6, 281-287 (Hqs. Branch, Royal Military Coll. Sci., Shrivenham, Nr. Swindon, Wilts., England) The protection of polymethylvinylsiloxane by colloidal S during γ -radiation at room temp. was estimated by measuring the increase in the gelation dose. The free radical concn. was measured using electron spin resonance. It was confirmed that the S was a good protector and this was attributed, at least in part, to its efficiency as a radical scavenger. B.M.Stevens

3605. RADIOPROTECTION OF MICE BY HYPO-OXIA AND CHEMICAL AGENTS. W.E.Rothe, M.M.Grenan and S.M.Wilson: Nature, Lond., 1963, 198, 403 (Walter Reed Army Inst. Res., Washington, D.C., U.S.A.) The 30-day survival of mice irradiated while breathing 5% O₂ is compared with that when irradiated while protected by combinations of hypo-oxia and

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chem. agents. It appeared that radioprotection by δ -aminopropiophenone, 5HT, and probably diethyldithiocarbamate and dimethyl sulphoxide, is associated with hypo-oxia of radiosensitive tissues. The action of thiol agents is also concerned with intercellular hypo-oxia, but is probably also associated with metabolic factors, which may be O₂-dependent.

G.M.Lewis

3606. IN VIVO MEASUREMENT OF ^{131}I IODINE IN THYROID OF DAIRY COW AS AID FOR MONITORING MILK. N.Yamagata and K.Iwashima: Nature, Lond., 1963, 198, 169-170 (Inst. Publ. Hlth., Tokyo, Japan)

In vivo measurements of ^{131}i levels in cattle thyroid by use of a scintillation receptor in direct contact with skin are apptox. correlated with actual ^{131}I levels in thyroid and also with ^{131}I levels in milk.

J.R.Sargent

3607. FOETAL METABOLISM OF CAESIUM-137 IN THE RAT. W.Moore, jun. and C.L.Coman: Int. J. rad. Biol., 1963, 6, 233-239 (Dept. Phys. Biol., New

York State Vet. Coll., Cornell Univ., Ithaca, N.Y., U.S.A.) ^{137}Cs appeared rapidly in the foetus after oral administration to the mother, reaching equilibrium with maternal blood in approx. 16 hr. % dose/g. foetal tissue appeared to be independent of foetal age or wt. The general pattern of distribution in the foetus was the same as that in the mother but the accumulating ability of foetal tissues was lower. The $^{137}\text{Cs}/\text{K}$ ratio was greater in the mother than in the foetus.

B.M.Stevens

3608. PATHOCHEMISTRY OF LIVER AFTER ADMINISTRATION OF PLUTONIUM-239. N.I.Yolkina and Z.B.Tokarskaya: Vop. Med. Him., 1963, 9, 154-160 (Inst. Biophys., Acad. Med. Sci., Moscow, U.S.S.R.)

Administration of ^{239}Pu to rabbits and dogs caused a gradual decrease in total plasma proteins, particularly albumin. A gradual increase in transaminase activity occurred in dogs. Reduction of urea biosynthesis occurred in dogs during the development of pronounced liver cirrhosis. Plasma alk. phosphatase activity was increased only in cases of distinct liver cirrhosis and jaundice. Decrease in albumin levels and increase in transaminase levels in plasma were noted before any morphol. manifestation of intoxication occurred.

J.R.Sargent

3609. PLUTONIUM INHALATION STUDIES. III. EFFECT OF PARTICLE SIZE AND TOTAL DOSE ON DEPOSITION, RETENTION AND TRANSLOCATION. W.J.Bair and D.H.Willard: Health Physics, 1963, 9, 253-266 (Biol. Lab., Hanford Labs., G.E.C., Richland, Wash., U.S.A.) Dogs were exposed to aerosol particles of PuO_2 .

The particle sizes were either 0[#]086, 0-43 or 0^{*}60 (μ in diam., with activities of 10["]7 to 10⁻³ pe/cm.^{*}) The amount of Pu deposited in lungs amounted to 4, 30 and 60% of total $^{239}\text{PuO}_2$ inhaled respectively. For a particular wt. of Pu deposited the % deposited in alveoli increased with particles of largest diam., whereas pulmonary clearance, translocation and excretion in urine and faeces was greatest for the smallest diam. particles.

M.S.Laveick

IMMUNITY TO INFECTION

3610. RELATIONSHIP OF PROPERDIN LEVELS TO THE BACTERICIDAL ACTIVITY OF HUMAN SERA. O.Ovsthus and J.Bøe: *Acta path. microbiol. scand.*, 1963, 57, 307-312 (Med. Dept. B., Univ., Bergen, Norway) In 3 groups of persons, one with consistently high properdin levels, another with consistently low properdin levels, and a third group whose properdin titre rose from low values in the acute phase of an infection to normal values during convalescence, there was no correlation between the properdin levels and the bactericidal activity of the sera. L.Friedmann

3611. IMMUNOLOGY OF TUBERCULOSIS. II. GUINEA-PIG EXPERIMENTS WITH FRACTIONS OF TUBERCULIN PARENT SUBSTANCE. H.Micke. in. **FRACTIONS OF TUBERCULIN PARENT SUBSTANCE TESTED WITH ISOLATED GUINEA-PIG INTESTINE. IV. ANTIGENIC COMPOSITION OF TUBERCULIN PARENT SUBSTANCE, OLD TUBERCULIN AND PURIFIED TUBERCULIN.** H.Micke and H.G.Oing: *Z.Immun.-Forsch.*, 1962, 124, 287-301, 302-314, 315-324 (Paul Ehrlich Inst., Frankfurt a.M., Germany) II. Fractions of tuberculin parent substance (unheated culture filtrate) prep, by paper electrophoresis were given i.v. to tuberculous guinea-pigs. Three kinds of shock reaction were seen: (1) an immediate acute reaction to unheated tuberculoprotein, (2) a protracted reaction to purified* tuberculin, (3) a delayed reaction to the carbohydrate fraction. Certain polysaccharides from human tubercle bacilli inhib. anaphylactically and local reactions, even those due to unrelated Ag. III. Electrophoretic fractions of tuberculin mother substance were tested against isolated guinea-pig intestine by the Schultz-Dale technique. An anaphylactic reaction, destine from tuberculous guinea-pigs, was proved by tuberculopolysaccharides, but not by proteins. V. Electrophoretic fractions of tuberculin culture filtrates were used, with Freund's incomplete adjuvant, to immunise guinea-pigs. The carbohydrate fraction evokes Ab against itself and also against the protein C fraction, protein fractions evoke Ab against themselves only. Results are compared with the responses to 'old tuberculin' and purified tuberculin. It is concluded that the isophoretic fractions are not pure Ag. (German) D.P.Winstanley

3612. SERUM AND SERUM FRACTIONS IN THE FORMATION AND INHIBITION OF STREPTOLYSIN S. K.Klinge: *Z.Immun.-Forsch.*, 1962, 124, 346-358 (Hyg. Inst., Univ. Saarland, Germany) The conditions for optimum production of streptolysin S in horse serum by resting cells of a Group A streptococcus were investigated. The serum protein fraction pptsd. by 68-80% sat. (NH₄)₂SO₄ best shift from the inhibitor of streptolysin S and was the by RMJJ*1*1®. Lipids played no part. Egg-white digested the first and half the activity of serum as a substrate for inactivation of streptolysin S.

3613. ACTIVITY OF COMPONENTS OF BORDETELLA PERTUSSIS CELL WALLS. I.W.Sutherland: *Immunology*, 1963, 6, 246-254 (Bacteriol. Dept., Univ. Edinburgh, Scotland) Cell walls of *B. pertussis* O₄ a P- and purified by treatment with sodium lauryl xonate & trypsin digestion. Such material gave protection wat. & st expt. intracerebral infection. This prep. was toxic and contained no histamine-sensitising factor. Antisera PreP- by inj. of cell wall material oits conferred passive protection in mice. The

product of detergent and trypsin treatment remained chem. complex. Agar gel diffusion tests indicated that it contained at least 2 antigenic components. One of these, the sp. lipopolysaccharide of *B. pertussis* had an apparently minor role in protection.

3614. CLOSTRIDIUM PERFRINGENS AGGLUTININS AND HOMOLOGOUS INCOMPLETE ANTIBODIES IN SERA OF IMMUNISED AND NON-IMMUNISED RABBITS. H.Meisel, B.Pogorzelska and P.Trembowler: *Bull. Acad. pol. Sci.*, 1963, 11, 57-60 (State Inst. Hyg., Warsaw, Poland) No *C. perfringens* agglutinins were present in sera of non-immunised rabbits. The time after which agglutinins became first demonstrable in rabbits inj. with suspensions of *C. perfringens* varied between animals.

J.E.Hobbs

3615. MEASLES ANTIBODIES IN MULTIPLE SCLEROSIS. J.M.Adams and D.T.Imagawa: *Proc. Soc. exp. Biol., N.Y.*, 1962, 111, 562-566 (Dept. Ped., Sch. Med., Univ. California, Los Angeles, Calif., U.S.A.) Elevated levels of measles Ab were found in serum and c.s.f. of patients suffering from multiple sclerosis.

M.M.Shapland

3616. INFLUENZA ANTIBODY LEVELS DURING T.A.B. IMMUNISATION. H.J.Gerth and W.Wundt: *Z. Immun.-Forsch.*, 1962, 124, 370-381 (Hyg. Inst., Univ. Tübingen, Germany) Haemaggl.-inhibg. and CF Ab to several influenza strains were followed in a group of 8 students who were undergoing T.A.B. immunisation. The Ab litres showed no relation to the typhoid/paratyphoid agglutinin curve. The authors cast doubt on the existence of truly nonsp. anamnestic reactions and believe that those previously reported are due to common Ag shared between the micro-organisms in question.

(German) D.P.Winstanley

3617. HI [HAEMAGGLUTINATION INHIBITING]-ANTIBODIES IN FERRETS CROSS-INFECTED WITH DISTANTLY RELATED INFLUENZA VIRUSES. A.Harboe: *Acta path. microbiol. scand.*, 1963, 57, 211-221 (Virus Dept., Nat. Inst. Publ. Hlth., Oslo, Norway) Ferrets infected with influenza A2-strains and cross-infected half a yr. later with different A-strains, the Dutch '56 Ai-strains' produced a greater anamnestic A2-titre rise than the other strains. In cross-infected ferrets Dutch '56 Ai and horse influenza virus produced a marked anamnestic iAb increase. After cross-infection cross-absorbing Ab could be demonstrated. Swine influenza Ab appeared after cross-infection with PR-8 and FM-1, and also with FM-1 and Dutch '56 Ai-strains.

L.Friedmann

3618. ANTIBODY RESPONSES AFTER INJECTION OF AQUEOUS AND EMULSIFIED INFLUENZA VIRUS VACCINES IN MICE CHRONICALLY EXPOSED TO Y-RAYS. B.S.Berlin: *Radiat. Res.*, 1963, 18, 223-230 (Sch. Publ. Hlth., Univ. Michigan, Ann Arbor, Mich., U.S.A.) Haemaggl.-inhib. Ab levels induced by aq. and emulsified influenza vaccines (PR 8 strain) were compared in mice continuously exposed to y-rays, beginning either 8 months or 1 day before vaccn. Continuous exposure to low-level radiation almost completely suppressed Ab production. In 1 day y-irradiated mice emulsified vaccine induced higher Ab levels at 21 and 42 days of treatment than aq. vaccine, and only slightly higher levels in 8 month Y-irradiated mice. Mercaptoethylamine by mouth did not protect the Ab forming mechanism to prolonged Y-irradiation.

B.Payne

3619. EFFECT OF HETEROLOGOUS ANTIBODIES ON THE SEROLOGICAL CONVERSION RATE AFTER 17D YELLOW

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FEVER VACCINATION. A.Fabiyi and F.N.Macnamara: Amer. J. trop. Med. Hyg., 1962, 11, 817-821 (Virus Res. Unit, W. African Council Med. Res., Yaba, Lagos, Nigeria) The presence of CF Ab to viruses serol. related to yellow fever interfered, in a small proportion of persons, with the Ab response after vaccn. with 17D mouse brain yellow fever virus.

A.A.Zimmerman

3620. ANTIBODY RESPONSES TO BRITISH TRIVALENT ORAL POUOVACCINE [O.P.V.]. D.S.Dane, G.W.A. Dick and E.M.Briggs: Lancet, 1963, i, 940-942 (Dept. Microbiol., Queen's Univ., Belfast, Ireland) Poliovirus-neutralising Ab levels were measured in groups of children immunised with O.P.V. according to the recommended schedules. Satisfactory primary immunisation of infants against poliomyelitis was obtained under field conditions with 3 doses. Comparatively poor results were found when the primary course of immunisation had consisted of 2 doses of Salk-type vaccine followed by 1 of trivalent O.P.V. CH.Bell

3621. IMMUNOLOGICAL RESPONSES TO HKTOMONAS MELEAGRIDIS IN THE TURKEY AND FOWL. M.J. Clarkson: Immunology, 1963, 6, 156-168 (Sch.

Trop. Med., Liverpool, England) Turkeys or fowls were infected intra-rectally with H. meleagridis. The turkeys were treated with a drug after infection so that the protozoa were destroyed. The fowls recovered spontaneously by resolution of the lesions in the liver and caeca. Both the turkeys and fowls developed a protective resistance to further infections with H. meleagridis. Serum precipitins were found in the birds and the development of Ag in the caecal contents studied. It was not possible to transfer a passive protective immunity by inocn. of serum from the immune to susceptible birds. *

3622. DIAGNOSIS OF LIVER FLUKE (FASCIOLA HEPATICA) INFECTION IN HUMAN BEINGS BY MEANS OF IMMUNOELECTROPHORESIS. D.Todorović, I. Berkes and M.Milovanović: Nature, Lond., 1963, 198, 204 (Clin. Lab., Children's Hosp., Titograd, Yugoslavia) Blood serum of a child infected with F.hepatica was subjected to electrophoresis in agar gel; application of F.hepatica Ag revealed a characteristic pptn. arch in the y-globulin region. CM.Lewis

3623. PLASMA CARD TEST FOR RAPID SERODIAGNOSIS OF SCHISTOSOMIASIS. E.H.Sadun, FUJVndeisoii and MJ.Schoenbechler: Proc. Soc. exp. Biol., N.Y., 1963, 112, 280-283 (Army Inst. Res., Washington, D.C., U.S.A.) A rapid method of testing for Schistosoma mansoni utilised an Ag-cholesterol-lecithin complex with charcoal in plasma as a spot on a card. Suspect blood was added and mixed with the wetted plasma: aggln. denotes a pos. reaction. The test did not give 100% pos. reaction with cases of schistosomiasis and gave pos. results with some cases of trichinosis, filariasis and leishmaniasis so it was only valid where there was prevalent endemic schistosomiasis. D.N.Wheatley

3624. ACQUIRED IMMUNITY TO ECHINOCOCCUS GRANULOSUS IN SHEEP. G.K.Sweatman, RJ.Williams, K.M.Moriarty and T.CHenshall: Res. vet. Sci., 1963, 4, 187-198 (N.Z. M.R.C., Otago Univ. Med. Sch., Dunedin, New Zealand) 10 groups of 3 lambs were given doses of E.granulosus eggs varying from 10 to 10⁵, and challenged 9 months later with 7000 eggs. Abs. resistance to superinfection was not stim., but the high initial doses produced partial resist-

ance. A decreased serum albumen/globulin ratio occurred in the superimposed infections. Indirect haemaggl. tests with hydatid fluid Ag gave titres of greater than 1:400 in infected sheep, and the titres were raised by the superimposed infections in sheep which received a low initial dose. Only low titre cross-reactions occur red with T.hydatica, T.ovis, M.multiceps and L.serrata.

J.B.Derbyshire

HYPERSENSITIVITY

3625. IN VITRO STUDIES OF REVERSED ANAPHYLAXIS WITH RAT CELLS. J.H.Humphrey, K.F.Austen and H.J.Rapp: Immunology, 1963, 6, 226-245 (Nat. Inst' Med. Res., Mill Hill, London, England) Rabbit anti-rat Y"globulin Anti-RGG] was used to bring about reversed anaphylaxis in vitro using rat mesentery, peritoneal cells, or a suspension of isolated peritoneal mast cells. Histamine and 5HT were released but not slow reacting substance. The effects of numerous org. substances and of Ca and Mg on the reaction were studied* The addition of Ag to mesentery or peritoneal mast cells from actively sensitised rats did not produce histamine release even though the donor animals had high levels of circulating Ab and exhibited anaphylactic shock with each Lv. booster dose of alum-ptd. Ag. These finding? indicate that either the cells did not carry the y-globul¹ identical with the circulating Ab or that the Ab was bio-inert in terms of releasing histamine after interaction with Ag. •

3626. NON-PERSISTING DYES IN ANAPHYLACTIC INVESTIGATION. J.G.Feinberg and J.M.Dewdney: Immunology, 1963, 6, 189-203. Coomassie Blue, which was completely eliminated in 3-6 hr., was used for visualising local anaphylactic phenomena in mice or guinea-pigs. It was suitable in active and passive cutaneous and pinnal anaphylaxis, and could be given either i.v. or i.p. *

3627. ANAPHYLACTIC SHOCK AND BRADYKININ: COMPARISON BETWEEN THE CHARGES IN THE COB₂TICO-PIAL CIRCULATION OF GUINEA-PIGS AFTER ANAPHYLACTIC SHOCK AND AFTER BRADYKININ; G.Breda, M.Concioli and L.Mariani: Atti. Acad. Me¹ Lombarda, 1962, 17, 235-241 (1st. di FarmacoL, ... Univ. Milano, Italy) Using a microcinematograph¹ technique the cordeco-pial circle of guinea-pigs showed a remarkable vasodilation, at the arteriolar level, after induction of anaphylactic shock. This effect increased with the seriousness of the shock. Similar pictures were obtained after i.v. injn. of bradykinin. Very dissimilar pictures were obtained after treatment with 5HT, hist' amine or ACh. Anaphylactic shock, induced arteriolar vasodilation may be due to a release of bradykinin-U²* substance. (Italian) CN.Godson

3628. ANAPHYLAXIS IN PIGS AND ITS RELATIONSHIP TO THE PATHOGENESE OF OEDEMA DISEASE AND GASTRO-ENTERITIS ASSOCIATED WITH E. COLI J.R.Thomlinson and A.Buxton: *Immunology*, 1963, 6, 126-139 (Dept. Vet. Path., Univ. Liverpool, England) Pigs were subjected to active anaphylactic shock using egg albumen and to reversed passive anaphylaxis using *E. coli* (0138). The symptoms and lesions closely resembled those of oedema disease and haemorrhagic gastroenteritis. Catarrhal enteritis was also observed. There was a relationship between the character of the lesions and the severity and duration of the anaphylactic symptoms. Clinically normal pigs developed hypersensitivity to those serotypes of *E. coli* which were associated with these conditions. It is considered that the diseases develop from anaphylactic hypersensitivity to *E. coli* rather than from direct toxæmia due to sudden absorption of increased quantities of bacterial polysaccharide.

3629. PASSIVE ACUTE GLOMERULONEPHRITIS INDUCED BY ANTIGEN-ANTIBODY COMPLEXES SOLUBILISED IN HAPten EXCESS. R.T.McCluskey, B.Benacerraf and F.Miller: *Proc. Soc. exp. Biol.*, N.Y., 1962, 111, 764-768 (Dept. Path., New York Univ. Sch. Med., N.Y., U.S.A.) Acute glomerulonephritis was produced passively in normal mice by sol. Ag/Ab complexes TMP. from rabbit anti-DNP bovine yglobulin which was Pptd. at equiv. with DNP-bovine serum albumin and dissolved in excess hapten (fNH_2 DNP lysine). Three injn. 24 hr. resulted in acute disease, with marked accumulation of complexes in glomeruli 24 hr. after injn. Purified Ab did not localise in the glomeruli.

M.M.Shapland

3630. DELAYED HYPERSENSITIVE REACTIONS IN BUR-SEC TXtylSED CHICKENS. B.DJanković, M.Jsvaneski, ^Milosević and L.Popeskić: *Nature*, Lond., 1963, 200, 298-299 (Univ. Belgrade, Yugoslavia) Removal of ^{fe} ^{re} ^b ^{rea} ^{et} ^{their} ^{en} ^{et} ^{their} ^{en} ^{ce} ^{Phalomyelitis}, ^{spinal} ^{cord} ^{old} ^{tuberculin}, ^{skin} ^{homograft}. CM.Lewis

3631. FATE OF 1311 LABELLED ANTIGENS IN THE SKIN OF NORMAL GUINEA-PIGS AND THOSE WITH DELAYED TYPE HYPERSENSITIVITY. J.Oort and J.L.Turk: *Immunology*, 1963, 6, 140-147 (Nat. Inst. Med. Res., London, England) Labelled PPD was eliminated more rapidly from the skin of normal guinea-pigs than human skin. It was concluded that retention of PPD was probably not sp. to delayed type hypersensitivity but was related to the difference in character and severity of die ^{err} ¹¹¹³¹⁰ Process, which itself was related to the nature of the Ag involved.

3632. INFLUENCE OF TUBERCULOLIPIDS ON THE TYPE OF HYPERSENSITIVITY. G.Bendixen: *Acta path. microbiol. scand.*, 1963, 57, 222-234 (Inst. Gen. Path. Univ., Copenhagen, Denmark) Ag mixtures of varied composition containing whole tubercle bacteria, de-oiled ^{de} ^{Dercle} bacteria, 'purified wax' or 'crude phosphatides', ^{or tube} ^{tube} ^{rele} bacteria, tuberculin, egg albumin, ^o ^t ^{Pa} ^{Vr} ^{or tube} Win oil were inj. or implanted s.c. in guinea-pigs.

The wax fraction was of no importance for the type of hypersensitivity and merely enhanced the existing ability to induce immediate or delayed hypersensitivity. Lipid solvents, including paraffin oil rendered the bacteria capable of inducing immediate hypersensitivity. After delipidation with neutral, org. solvents the ability of tubercle bacteria to induce delayed hypersensitivity decreased. The ability to induce delayed hypersensitivity was probably associated with some quality in the bacterial body itself, and not with any single fraction. LFried ma nn

3633. THE LOSS OF MACROPHAGES FROM PERITONEAL EXUDATES FOLLOWING THE INJECTION OF ANTIGENS INTO GUINEA-PIGS WITH DELAYED TYPE HYPERSENSITIVITY. D.S.Nelson and S.V.Boyden: *Immunology*, 1963, 6, 264-275 (Dept. Expt. Path., Australian Nat. Univ., Canberra, Australia) The cell content of the exudates induced by glycogen was examined after 4 days in normal and hypersensitive animals. In animals uninj. with Ag, there was a high proportion of macrophages, with lymphocytes and polymorphs. In BCG vaccinated animals, s.c. i.v. or i.p. injn. of tuberculin resulted in a profound fall in the macrophage content within an hr. of i.p. injn. and after very small doses of tuberculin. No such effect occurred after the i.p. injn. of tuberculin into guinea-pigs with Arthus hypersensitivity to tuberculin. Similar results were obtained in animals sensitised to ovalbumin. Bacterial endotoxin inj. i.p. caused a similar fall in the macrophage contents of exudates of both normal and BCG vaccinated animals.

3634. RADIOAUTOGRAPHIC STUDY OF CELLULAR MECHANISMS IN DELAYED HYPERSENSITIVITY. I. DELAYED REACTIONS TO TUBERCULIN AND PURIFIED PROTEINS IN THE RAT AND GUINEA-PIG. T.U.Kosunen, B.H.Waksman, M.H.Flax and W.S.Tihen: *Immunology*, 1963, 6, 276-290 (Dept. Bacteriol., Harvard Med. Sch., Boston, Mass., U.S.A.) In delayed skin reactions to PPD or bovine serum albumin in the rat and to old tuberculin and diphtheria toxoid in the guinea-pig, i.v. injn. of [³H]thymidine shortly before skin testing produced labelling of a high proportion of the cells entering the perivascular infiltrates 12-18 hr. later. The majority of the cells in the infiltrates were haematogenous. They were synthesising DNA before entering the lesions, and many did so in the lesion itself. The principal cell type labelled in both expt. resembled medium-sized lymphocytes of the lymphoid tissues or large lymphocytes of the blood. Over several hr. many of these became typical histiocytes. In non-sp. reactions, a similar pattern of labelling was observed, but the total no. of infiltrating cells was very small.

3635. ASSOCIATION OF SKIN-SENSITISING ANTIBODY WITH fe A' GLOBULINS IN SERA FROM RAGWEED-SENSITIVE PATIENTS. P.Fireman, W.E.Vannier and H.C.Goodman: *J. exp. Med.*, 1963, 117, 603-620 (Children's Hosp., Boston, Mass., U.S.A.) Removal of feA-globulin from sera of treated ragweed-sensitive individuals by immune absorption resulted in the loss of skin-sensitising Ab detectable by the Prausnitz-Kustner test. Gel filtration with Sephadex G-200 indicated that the macroglobulin fractions did not contain skin-sensitising Ab activity. Immune absorption of the yglobulins did not remove Ab activity from a serum fraction containing P2A, y-globulins and a trace of pgM-globulins. The removal of a portion of the albumin from the allergic sera by immune absorption, with no change in skin-sensitising activity, indicated that the loss of Ab was not due to non-sp. absorption on an Ag-Ab ppt.

H.E.H.Jones

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TISSUE ANTIGENS (EXCLUDING TUMOURS)

3636. EFFECT OF TANNIN ON ABH(O) RED CELL ANTIGENS. A.Majsky: Z.Immun.-Forsch., 1962, 124, 464-475 (Inst. Haematol. Prague, Czechoslovakia)

After treatment with 1:40000 tannin for 1 hr. at 20°, A₁A₂ and B cells were no longer agglutinable by ordinary non-immune antisera, though their agglutinability by immune sera was little reduced (not more than 3 diln.). This could be used as a test for immune anti-A and anti-B. Aggltn. by anti-H lectin from *Qononis spinosa* and the absorbing power of the cells were not much affected.

(German) D.P. Winstanley

3637. TEMPORARY SUPPRESSION OF LEWIS BLOOD-GROUP ANTIBODIES TO PERMIT INCOMPATIBLE TRANSFUSION. P.L.Mollison, M.J.Polley and P. Crome: Lancet, 1963, i, 909-912 (M.R.C. Expt. Haemat. Res. Unit., St. Mary's Hosp. Med. Sch., London, England) In order to bypass the problem of finding enough group B, Le (a-b-) donors, the anti-Le^b in a patient's serum was temporarily suppressed by injecting Le^b substance; large amounts of group B, Le(b+) blood were then transfused. There was a rapid and striking immune response, but no signs of a haemolytic reaction, apparently because the transfused Le(bf) cells rapidly lose Leb substance and within 3 or 4 days of transfusion were behaving as if they were virtually Le(b-).

CH.Bell

3638. PHYTAGGLUTININS. IV. SPECIFIC ANTIGENICITY OF THE AGGLUTININ-ACTIVE GLYCOPROTEIN FRACTION OF POTATO. M.Krtlpe and A.Engsgraber: Z. Immun.-Forsch., 1962, 124, 359-367 (64 Fulda, M.Irquardstr. 31, Germany) A rabbit was given a long course of injn. of 'raw substance' from potatoes, together with Freund's adjuvant. It produced sp. precipitins against the agglutinin-active glycoprotein fraction and also against inactive protein fractions.

(German) D.P.Winstanley

3639. AGGLUTININ RESPONSE TO SHEEP R.B.C. IN MICE FOLLOWING INTRAPERITONEAL INJECTION OF ALLOGENIC SPLEEN CELLS. G.O.Bain: Canad. J. Biochem., 1963, 41, 573-578 (Dept. Path., Univ. Alberta, Edmonton, Alta., Canada) C3H mice were inj. with spleen cells from C57BL mice and 24 hr. later with sheep r.b.c. The recipients of spleen cells from C57L donors which had previously been inj. with C3H tissue developed lower sheep haemagglutinin titres than control mice, neither donor serum nor saline extracts of lyophilised donor spleen cells had any cytotoxicity in vitro, but both heat-killed spleen cells and lyophilised spleen cells inj. in vivo depressed the anti-sheep haemagglutinin titre. The injn. of spleen cells from donors not previously exposed to C3H Ag did not lower the anti-sheep haemagglutinin titre.

J.B.Parish

3640. IMMUNISATION AFTER INTRAVENOUS INJECTION OF SMALL AMOUNTS OF SICr-LABELLED R.B.C. P.L.Adner, S.Adner, S.Foconi and S.Sjolin: Brit. J. Haemat., 1963, 9, 288-298 (Dept. Clin. Chem., Univ. Hosp., Uppsala, Sweden) Compatibility between donor and recipient in the ABO and D blood groups only resulted in immunisation in 16 out of 45 cases, judged by the incidence of curtailed SICr-labelled r.b.c. survival curves, although Ab were detected serol. in only 4 cases. K-recipients receiving K+ blood responded by making anti-K in 1 case out of 14, and the survival of

K+ cells in this patient showed very variable results. The 51cr-method is recommended as a useful serol. technique.

J.Sneath

3641. PROPERTIES OF THE PLATELET-CONNECTIVE TISSUE MIXED AGGLUTINATION REACTION. T.H. Spaet, J.Cintron and M.Spivack: Proc. Soc. exp. Biol., N.Y., 1962, 111, 292-295 (Dept. Haem., Lab. Div., Montefiore Hosp., N.Y., U.S.A.) Aggltn. of platelets by a suspension of connective tissue fragments or by Polybrene of mol. wt. 6000 was inhib. by Polybrene mol. wt. 2800, hypertonic electrolyte soln., pH extremes or trypsinisation of platelets. It is suggested that this mixed aggltn. is an electrostatic charge reaction.

M.M.Shapland

3642. FATE OF INJECTED BENCE-JONES PROTEIN.

F.Meyer and F.W.Putnam: J. exp. Med., 1963, 117, 573-581 (Chem. Dept., Harvard Univ., Cambridge, Mass., U.S.A.) Bence-Jones protein inj. into rabbits was excreted rapidly into the urine. The excreted protein was not altered physicochem. or immunochem. In spite of the rapid excretion much of the inj. Bence-Jones protein was metabolised. After re-injn. of radioactive Bence-Jones protein into the donor patient only a little radioactivity was recovered in the urinary protein.

H.E.H.Jones

3643. SIGNIFICANCE OF THE 'SENSITIVITY TO INHIBITION¹' OF THE TEST SYSTEM IN Gm SERUM GROUP DETERMINATIONS. V.Sachs and R.Maltzan: Z. Immun.-Forsch., 1962, 124, 325-336 (Hyg. Inst., Univ. Kiel, Germany) Two-dimensional inhibn.

titrations of 23 anti-Gm^a sera under standard conditions showed that the inhibn. systems fell into 3 groups as regards their suitability for Gm(a+) determinations. Eight rheumatoid sera aggl. the sensitised r.b.c. in high diln., but were inhib. only by high concn. of Gm(a+). Twelve other sera, mostly rheumatoids, were intermediate in both respects. Three non-rheumatoid sera aggl. sensitised r.b.c. in moderate or high diln. and were inhib. by Gm(a+) in low concn. Sera of this last group were the most suitable for Gm(a+) grouping.

(German) D.P.Winstanley

3644. HUMAN, RABBIT AND BOVINE Y GLOBULINS IN DETECTING OF RHEUMATOID FACTOR. D.Skakba:

Bull. Acad. pol. Sci., 1963, 11, 65-68 (Dept. Microbiol., Univ. Lodz, Poland) In the haemaggltn. re* action of BDB-globulin r.b.c. human, rabbit and bovine y-globulins enabled sera containing rheumatoid factor to be divided into groups reacting with all three y-globulins* with human and rabbit y globulins, or with y globulins of only one of the three spp. In diagnosis of rheumatoid disease human, rabbit and bovine y globulins raise the % of pos. tests. The expt. results confirm the view that rheumatoid factor is composite in character.

J.E.Hobbs

3645. SEROLOGICAL REACTIONS OF RHEUMATOID FACTOR AND ANTI-GLOBULIN SERUM WITH HEATED Y-GLOBULINS. D.Skakba: Bull. Acad. pol. Sci., 1963, 11, 69-70 (Dept. Microbiol., Univ. Lodz, Poland)

y-Globulins heated to 63-67° inhib. rheumatoid factor more than normal yglobulin: anti-globulin serum had the reverse effect. At 7(T), yglobulins became large* inactive towards rheumatoid factor and anti-globulin serum. Serol. differences between rheumatoid factor and anti-globulin serum were demonstrable in haemaggltn. inhibn. tests, with const. quant. of heated Y" S1°buli^ *? progressive diln. of serum. The results show that rheumatoid factor reacted more strongly with partly denatured y globulins, whereas anti-globulin serum reacted mo*e weakly with heated yglobulins.

J.E.Hobson

3646. • RHEUMATOID FACTOR¹ -LIKE PROPERTIES OF ISOLATED CRYOGLOBULINS. V.Balázs, M.M.FrO-Uch and M.Csáti: Amer. J. med. Sci., 1963, 245, 206-209 (1st Dept. Med., Univ. Med. Sch., Szeged, Hungary) The cryoglobulins obtained from 10 different cases were studied by immuno-electrophoresis and ultracentrifugation. In addition, their ability to aggl. sensitised sheep r.b.c. latex particles coated with human Y^gglobulin and tanned r.b.c. sensitised with human y-globulin was investigated. E.E.Hobbiger

3647. IMMUNOLOGICAL METHOD FOR DEMONSTRATING FIBRIN DEGRADATION PRODUCTS IN SERUM AND ITS USE IN THE DIAGNOSIS OF FIBRINOLYTIC STATES. H.C.Ferreira and L.G.Murat: Brit. J. Haemat., 1963, 9, 299-310 (Univ. São Paulo, Haemat. Clin. Rua Leoncio de Carvalho 98, São Paulo, Brazil) Anti-human fibrin serum was prepared in rabbits and after absorption to remove Ab to the Y^gglobulin fraction antiH^{Cle d s P ecific ally} with human fibrin and fibrinogen, hrv^{A i T A ? leir} digestion products after incubation with B(S^{Sin})^{*? b}rinolysin and the proteolytic venom from YP&rops;jararaca. The reaction is detected by means of *ccn. (Fibrin Degradation Flocn. Test) and gave pos. reactions in 20 cases of abruptio placentae uterine rup-S^A and trauteilne foetal death associated with abnor-jj^{ai} Weeding. A few other cases possibly associated with increased fibrinolysis were also pos. (myocardial infarct with thrombo^oPblebitis, snake-bite and cardiac surgery *m extra corporeal circulation). 120 control cases *ete neg. J.Sneath

3648. NORADRENALINE AND MONOAMINEOXIDASE CONTENT IN IMMUNOSYMPAIHECTOMISED ANIMALS. R.Levi-Montalcini and P.U.Angeletti: Int. J. Neuropharm., 1962, 1, 161-164 (Zool. Dept., Washington Univ., St. Louis, Mo., U.S.A.) Permanent destruction of sympathetic ganglia was obtained by inj. new hou mice of rats wit** an antiserum to nerve growth thmi^{at d} from mouse submaxillary salivary glands. Al-though there was no detectable difference between the t^Tl^{ev}s of noradrenaline and monoamineoxidase of sur^{ed} and co^{ntrol} animals, peripheral levels of these stances were low in the treated animals. CF.Blane

3649. COMPLEMENT FIXATION IN DISEASED TISSUES. II. FIXATION OF GUINEA-PIG COMPLEMENT IN RENAL LESIONS OF SYSTEMIC LUPUS ERYTHEMATOSUS. P.M.Burkholder: Amer. J. Path., 1963, 42, 201-215 (Dept. Pathol., New York Hosp., New York, N.Y., U.S.A.) Frozen sections of human kidney from 7 patients were examined after exposure to fluorescein labelled human globulin and also after exposure to g^g-Pig C followed by fluorescein labelled anti-f3^a-Pig C. Sites where both Ab became specifically thirS^{inclu}led glomerular capillary wire loops, diffusely somp^{ened} glomerular capillary walls, and the walls of petioles. Sites where only anti-globulin became fixed eluded hyaline droplets in tubular cells and tubular casts. It is concluded that immunol. or physico-chem. reactions with prop, indistinguishable from immunol. re-actions, are involved in the pathogenesis of systemic L.E.

3650. FDnSS[^]ULATING ANTIBODIES TO COWS MILK PROTEINS AND GLUTEN IN THE NEWBORN. R.Wright, ¹B¹:aylor, S.C.Truelove and R.J.schaffenburg: Brit. J. 1962, ii, 513-515 (Radcliffe Infirmary, Univ. of England) Determination of levels of circu-⁸¹uten^{te} to cows mil^k Protein and to proteolysed wheat bettyn^{ce} in titres in cord blood of 100 newborn infants and

in the blood of their mothers. The titre of Ab to 3-lactoglobulin and fraction IE was usually higher in cord than in maternal blood. The source of the cord blood Ab and their influence on development of sensitivity to dietary proteins are discussed. M.E.Nutt

3651. SPONTANEOUS AUTO-IMMUNE DISEASE IN NZB/BLMICE. BJ.Helyer and J.B.Brown: Brit.J.Haemat., 1963, 9, 119-131 (Dept.Path., Otago Univ. Med. Sch., Dunedin, New Zealand) Early splenectomy and injn. of ACTH diminished the severity of the syndrome, which is described with details of morbid anatomic, clinical and haematol. features. The syndrome had 100% incidence with reduced survival time. A small proportion had pos. L.E. tests and in a majority of the animals the glomeruli showed obliterative lesions, resembling human lupus nephritis. Cross-breeding with another inbred strain greatly reduced the incidence of the disease but offspring showed a high incidence of florid changes resembling lupus nephritis, associated with renal failure and about a third showed pos.L.E.tests. J.Sneath

3652. RELATIONSHIP BETWEEN AETIOLOGY, L.E. CELL PHENOMENON AND ANTI-NUCLEAR ANTIBODY IS DISSEMINATED LUPUS ERYTHEMATOSUS : A HYPOTHESIS. A.J.Sbarra, W.A.Bardawil and W.Shirley: Nature, Lond., 1963 198, 159-161 (Dept. Pathol., St. Margaret's Hosp., Boston, Mass., U.S.A.) Serum from patients with disseminated L.E. increased the respiration of rabbit polymorphs, increased the uptake of glucose, production of lactic acid and the DNase activity of the leukocytic granules. It is suggested that the aetiological agent is phagocytosed, intracellular DNase is liberated and freed to attack nuclear DNA. The attacked nuclear material is ejected, opsonised and phagocytosed or picked up by immunol. competent cells, producing in the former case, L.E. cells, and in the latter, anti-nuclear Ab. G.M.Lewis

3653. DEVELOPMENT OF THE FOETUS IN FEMALE RATS INJECTED WITH HOMOLOGOUS HEART TISSUE. L.P.Cawley, A.Riner and C.P.Houser: Nature, Lond., 1963, 197, 1307-1309 (Dept. Lab., Wesley Hosp., Wichita, Kans., U.S.A.) Attempts to immunise rats against homologous heart tissue failed to interfere with normal cardiac development in the foetus. There was no serol. evidence of immunization. G.M.Lewis

3654. GASTRO-INTESTINAL SPECIFIC ANTIGEN: AN IMMUNOHISTOLOGICAL AND SEROLOGICAL STUDY. R.C.Naim, J.E.Fothergill, M.G.McEntegart and I.B. Porteous: Brit. med. J., 1962, i, 1788-1790 (Dept. Path., Univ., Aberdeen, Scotland) Immunofluorescent and serol. methods, using antisera from rabbits immunised with a microsomal fraction of normal human gastric mucosa, showed a gastrointestinal-sp. Ag in the secretory region of the mucosal cell. The Ag was a mucopolysaccharide and was present in the intestines of sheep, cattle, dogs and cats, but not in rodents and not in any other organ studied. M.E.Nutt

3655. AUTO-IMMUNE PHENOMENA IN PERNICIOUS ANAEMIA: GASTRIC ANTIBODIES. K.B.Taylor, I.M. Roitt, D.Doniach, K.G.Couchman and CShapland: Brit. med. J., 1962, ii, 1347-1352 (Nuffield Dept. Clin. Med., Oxford, England) Sera of 143 patients with pernicious anaemia were tested for auto-Ab to intrinsic factor [IF] by in vivo inhibn. of vit. B12 absorption, electrophoretic retention of IF-B12 complex and by radioactive copm. Results of the 3 methods correlated

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well and the electrophoretic method was most convenient. Ab to gastric parietal cells, were shown by CF and immunofluorescence. The CF Ab was a 7S-Y"globulin and cross-reacted with mucosal extracts of other spp. The Ag was present in the paniculate fraction of gastric mucosal homogenates and confined to parietal cells. Auto-Ab to IF were present in 44% of patients with pernicious anaemia. Immunofluorescent Ab were present in 86% of patients and in 93% of those aged < 60 yr. Comparable control values for this Ab were 11% and 5%.

M.E.Nutt

3656. AUTOIMMUNITY IN PERNICIOUS ANAEMIA AND IRON-DEFICIENCY ANAEMIA. A COMPLEMENT-FIXATION TEST USING HUMAN GASTRIC MUCOSA. J.L. Markson and J.M. Moore: Lancet, 1962, ii, 1240-1243 (Stobhill Gen. Hosp., Glasgow, Scotland) A

CF test, with saline extracts of human gastric mucosa as Ag, was applied to sera from 72 patients with pernicious anaemia, 34 patients with Fe-deficiency anaemia, and 41 patients with Hashimoto's disease. The test was pos. in 41.7%, 17.6% and 12.2% of these groups respectively, and in 4.5% of controls. Achlorhydria was not invariably associated with a pos. test. The test is thought to indicate an Ag-Ab reaction and is not due to an Ab to intrinsic factor.

CH.Bell

3657. LIVER 'AUTOANTIBODIES' IN A CASE OF DRUG-INDUCED JAUNDICE. M.G. Okcen and H.J. Zinneman: Gastroenterology, 1963, 44, 69-72 (Dept. Med., Univ. Minnesota Med. Sch., Minneapolis, Minn., U.S.A.)

Immunol. methods detected autoAb, di"globulins which reacted with the cytoplasm of liver parenchyma cells and Y"globulins which reacted with bile duct cells, in a patient suffering from jaundice induced probably with PAS and perhaps INH.

D.N.Wheatley

3658. AUTO-ANTIBODY PRODUCTION IN TOE RABBIT. HI. EFFECT OF INFECTION WITH EIMERIA SUEDAE AND ITS RELATION TO NATURAL ANTIBODY. G.L. Asherson and M.E. Rose: Immunology, 1963, 6, 207-216 (Nat. Inst. Med. Res., Mill Hill, London, England)

Expt. infection of rabbits with E. stiedae, the cause of hepatic coccidiosis, led to a rise in the titre of CF factors present in normal rabbit serum when tested with rabbit liver or kidney. The rise was statistically significant 14, 21 and 28 days after infection. The factors were regarded as Ab because they behaved as macroglobulins on DEAE-cellulose chromatography or sucrose gradient centrifugation, and as auto-Ab because they fixed C with the kidney of the rabbits in which they occurred. The Ab reacted with widely distributed Ag with high activity in brain and low activity in skeletal muscle. *

3659. GLOMERULONEPHRITIS INDUCED IN MONKEYS BY INJECTIONS OF HETEROLOGOUS GLOMERULAR BASEMENT MEMBRANE AND FREUND'S ADJUVANT.

R.W. Steblay: Nature, Lond., 1963, 197, 1173-1176 (Dept. Obstet., Univ. Chicago, Ill., U.S.A.) Chronic glomerulonephritis was produced in Rhesus monkeys by repeated injn. of glomerular basement membrane prep, from human, rabbit, rat or dog kidneys together with Freund's adjuvant. The glomerular lesion presumably occurred by an auto-immune mechanism. The monkeys showed delayed hypersensitivity to the Ag used for injn.

G.M.Lewis

3660. PRODUCTION OF A HIGHLY TISSUE-SPECIFIC ANTIGEN AGAINST A PARTICULAR SUB-FRACTION SEPARATED FROM KIDNEY MICROSOMES. T.S. Oka da and A.G. Sata: Nature, Lond., 1963, 197, 1216-1217

(Zool. Inst., Fac. Sci., Univ. Kyoto, Japan) The microsomal fraction from chicken kidneys treated with deoxycholate was fractionated with (NH₄)₂SO₄.

Antisera to the subfractions were produced in rabbits and examined by ring precipitin and double diffusion tests. Each antiserum contained relatively a high concn. of the Ab to the homologous Ag.

G.M.Lewis

3661. ENZYMIC ACTIVITIES OF THE SOLUBLE ANTIGENS IN KIDNEY MICROSOMES. K.Ozato and T.S. Okada: Nature, Lond., 1963, 197, 1310-1311 (Zool.

Inst., Fac. Sci., Univ. Kyoto, Japan) Rabbit antisera were prep, against various fractions of microsomes from chicken liver or kidney. The activities of esterase and the phosphatases resided respectively in immunol. different components of the microsomes.

G.M.Lewis

3662. EFFECTS OF HEPARIN, NICOTINIC ACID AND ACTH ON EXPERIMENTAL NEPHROSB. K.G. Wakim, B.F. McKenzie, W.F. McGuckin, A.L. Brown, jun. and A.J. Baggenstoss: Amer. J. med. Sci., 1963, 245, 259-276 (Sect. Physiol., Mayo Clin., Rochester, Minn.* U.S.A.) Renal lesions corresponding to the nephrotic phase of chronic glomerulonephritis could be produced in dogs or rats by injecting with the serum of rabbits sensitised to dog or rat kidney respectively. ACTH ameliorated the biochem. and clinical manifestations in the nephrotic animals, whereas heparin and nicotinic acid did not.

E.E. Jobbiger

3663. IMMUNOCHEMICAL STUDIES ON KIDNEY HYPER-

TROPHY OF THE RAT. F.J. Hiramoto, J. Bernecke and J. Jurand: Proc. Soc. exp. Biol., N.Y., 1962, 111, 648-651 (Dept. Biochem. Res., Roswell Park Mem. Inst., Buffalo, N.Y., U.S.A.) Rabbit anti-rat kidney globulin was used as a marker to demonstrate that after unilat. nephrectomy no new functional glomeruli were formed in the remaining kidney during the period of compensatory hypertrophy.

M.M. Shapland

3664. E.M. STUDIES OF EXPERIMENTAL NEPHRITIS WITH FERRITIN-CONJUGATED ANTIBODY [Fer-Ab]. LOCALIZATION OF ANTIGEN-ANTIBODY COMPLEXES IN RABBIT GLOMERULI FOLLOWING REPEATED INJECTIONS OF BOVINE SERUM ALBUMIN [BSA].

G.A. Andres, B.C. Seegal, K.C. Hsu, M.S. Rothenberg and M.L. Chapeau: J. exp. Med., 1963, 117, 691-704 (Inst. Med. Pathol., Univ. Rome, Italy) The development of glomerulonephritis in rabbits repeatedly inj. with BSA was dependent on the development of a suitable ratio of Ab to Ag. Fer A^P was used to show the presence of Ag aggregates from the blood, crossing the endothelium and the basement mem" brane, and in deposits between the basement membrane ?? the epithelial cytoplasm. In rabbits dying of anaphylactic shock after injn. of BSA Ag-Ab could be demonstrated with in glomerular capillaries.

H.E.H. Jones

3665. IMMUNOLOGICAL SPECIFICITY OF AUTOLOGOUS Y-GLOBULIN IN GLOMERULI OF RABBITS WITH EXPERIMENTALLY INDUCED GLOMERULONEPHRITIS. A.L. Sherwin, A. Leznoff, M. Richter and B. Rose: Canad. J. Biochem., 1963, 41, 897-904 (Div. Immunochem., McGill Univ. Clin., Royal Victoria Hosp., Montreal, Que., Canada)

Expt. glomerulonephritis was induced in rabbits by the i.v. injn. of chicken anti-rabbit glomerulus serum. These rabbits were simult. immunised, either actively or passively, with bovine serum albumin [BSA] or ovalbumin. Autologous y-globulin was identified in the glomeruli of these nephritic rabbits by immunofluorescence. The presence of an anti-BSA or anti-ovalbumin component

could not be shown in the y globulin in the glomeruli although they were present in high titre in the blood.

J.B.Parish

366. INFLUENCE OF RICE DIET ON EXPERIMENTAL NEPHROSIS IN RATS. J.E.Dutra de Oliveira and W.A. Hadler: Arch. int. Physiol., 1962, 70, 459-468 (Fac. Med., Ribeirão Preto, Estado de São Paulo, Brazil) Nephrosis was produced in Wistar rats by inj. of rabbit anti-kidney serum. Diseased animals were randomly selected for stock or rice diet. Control groups of animals were also maintained on the 2 diets. Proteinuria and high blood cholesterol, with low albumin and high (X-Sabulin, persisted in nephrotic animals on the stock diet and histol. examination revealed severe damage to kidney Parenchyma. Animals on the rice diet tended to recover, *in decrease in proteinuria and return of blood proteins and cholesterol to normal values. Histol. examination showed normal kidneys in 11 of 22 rats and lesions of only moderate degree in the others after 4 months on the rice diet. The influence of dietary Na and quantity and quality of dietary protein is discussed in relation to the above results. M.E.Nutt

366? TRANSFER OF EXPERIMENTAL AUTO-IMMUNE NEPHROSIS IN RATS. W.Heymann, J.L.P.Hunter, D.B.Hackel and F.Cuppige: Proc. Soc. exp. Biol., N.Y., 1962, 111, 568-573 (Dept. Ped., Western Res. Sch. Med., Cleveland, Ohio, U.S.A.) Induction of auto-immune nephrosis in normal rats was effected by paraparapiosis and by i.v. inj. of spleen emulsions of rats with infant renal disease into littennates made immunological at birth. M.M.Shapland

366 8. ANTIGEN DISTRIBUTION PATTERN OF THE HUMAN PLACENTA. AN IMMUNOFLUORESCENT MICROSCOPIC STUDY USING THE KIDNEY AS AN EXPERIMENTAL MODEL. J.J.Bass: Lab. Invest., 1963, 12, 332-342 (Pathol. Dept., Med. Sch., Pittsburgh, Pa., U.S.A.) Human placental Ag capable of producing rabbit Ab was localised to foetal vascular trophoblast basement membranes. It was very similar to Kidney basement membrane Ag immunol. Free antigen in the serum of normal or pre-eclamptic pregnant women was not demonstrable. A.M.Mackay

366 9. IMMUNOLOGICAL STUDIES WITH COMMERCIAL REPARATION OF HUMAN CHORIONIC GONADOTROPHIN [HCG]. S.Hamashige and E.R.Arquilla: J. clin. Invest., 1963, 42, 546-555 (Dept. Pathol., Univ. California Sch. Med., Los Angeles, Calif., U.S.A.) Ab to HCG were demonstrated immunol. by haemagglutination and neutralisation of the biol. activity of HCG in the 3jjd rat. The HCG prep. was not pure, as shown by electrophoretic and immunoelectrophoretic studies. K.Jones

3670. EXPERIMENTAL ALLERGIC THYROIDITIS IN GUINEA-PIG. I. RELATIONSHIP OF DELAYED HYPERSENSITIVITY AND CIRCULATING Ab TO DEVELOPMENT OF THYROIDITIS. M.H.Flax, B.D.Iankovic and S.Sell. U. MORPHOLOGICAL STUDIES OF DEVELOPMENT OF DISEASE.

M.H.Flax: Lab. Invest., 1963, 12, 119-129, 199-213 (Pathol. Dept., Harvard Med. Sch., Boston, Mass., U.S.A.) I. Thyroiditis was induced in guinea-pig by inj. of homologous thyroid extract in Freund's adjuvant. The severity of thyroiditis was correlated with intensity of delayed hypersensitivity to thyroglobulin, but not with thyroglobulin Ab titres.

n. The early lesion consisted of perivenous inflammation. Mononuclear cells invaded follicles and progressively destroyed them. Adjacent acini underwent hyperplasia. Plasma cells appeared later. A.M.Mackay

3671. ANTITHYROID ANTIBODIES; THEIR UTILISATION IN INVESTIGATION OF ANTIGENIC THYROID SUBSTANCES IN MATERIAL OBTAINED BY CYTOLOGICAL ASPIRATION. P.Paseyro, E.Negrin, J.Moraté-Manaro and O.F.Grosso: J. clin. Endocr., 1963, 23, 387-390 (List. Clin. Endocr., Montevideo, Uruguay). K.Jones

3672. IMMUNOPATHOLOGY OF CHRONIC NON-SPECIFIC THYROIDITIS [AUTO-IMMUNE THYROIDITIS]. R.C. Mellors, W.J.Brzosko and L.S.Sonkin: Amer. J. Path., 1962, 41, 425-430 (Hosp. Special Surg., P.D.Wilson Res. Fdn., New York, N.Y., U.S.A.) The direct fluorescent Ab method was used to detect human thyroglobulin and Ab to human thyroglobulin in this study of thyroid tissue obtained surgically from a 32 yr. old woman with a 2 yr. history of chronic non-sp. thyroiditis. Thyroglobulin was found not only within follicles but also amongst the cellular infiltrate between follicles. Cells containing 7S Ab to thyroglobulin formed part of the infiltrate. Thyroglobulin intimately associated with 7S Ab globulin was found within macrophages, and extracellularly both within and between the follicles. It is suggested that the mixture of thyroglobulin and Ab to thyroglobulin represents immune complexes. D.G.Scott

3673. IMMUNOASSAY OF BOVINE AND HUMAN PARATHYROID HORMONE. S.A.Berson, R.S.Yalow, G.D. Aurbach and J.T.Potts: Proc. nat. Acad. Sci., Wash., 1963, 49, 613-617 (Bronx V.A. Hosp., New York, N.Y., U.S.A.) The principle of competitive inhibbn. of binding of [¹³¹I]parathyroid hormone to sp. hormone Ab was used to assay bovine and human parathyroid hormones in the fiftig.-mpg. range. The results were comparable to those obtained using bioassay methods. Human parathyroid hormone extracted from a parathyroid adenoma reacted sufficiently well with guinea-pig Ab to bovine parathyroid hormone to be detectable at concn. of 1-5-6 mU/ml. (250-1000 fiftig./ml.). Endogenous parathyroid hormone was detected in plasma from 2 hyperparathyroid subjects and in plasma from normal subjects but not in plasma from 9 hypoparathyroid subjects. J.R.Sargent

3674. IMMUNOLOGICAL STUDIES ON ADRENAL GLANDS, in. INTERSPECIES RELATIONS OF THERMOSTABLE ADRENAL-SPECIFIC ANTIGENS. F.Milgrom, M.Tuggac and E.Witebsky: Immunology, 1963, 6, 105-118 (Dept. Bacteriol., Sch. Med., Buffalo, N.Y., U.S.A.) Rabbit antisera were prep. against human, equine and porcine adrenal prep. obtained by extraction at 100° then ethanol ptn. With these antisera it was shown that man, horse and pig contain adrenal-sp. Ag of similar physicochem. prop. to the Ag previously described in ox. Two adrenal-sp. Ag were found in each spp. tested. One, represented by heavier ptn. lines, had distinct serol. prop. in ox, man, horse or pig and could be detected only by the homologous immune serum. The other, represented by a thinner ptn. line, had very similar serol. prop. in all 4 spp. *

3675. THYROID AUTO-ANTIBODIES IN PERNICIOUS ANAEMIA. J.L.Markson and J.M.Moote: Brit. med. J., 1962, ii, 1352-1355 (Stobhill Gen. Hosp., Glasgow, Scotland) The incidence of thyroid auto-Ab was significantly greater in patients with pernicious anaemia than in control subjects. M.E.Nutt

IMMUNOLOGY AND EXPERIMENTAL PATHOLOGY

3676. ENCEPHALITOGENIC FACTOR IN EXPERIMENTAL 'ALLERGIC ENCEPHALOMYEUTIS. E.A.Caspari and E.J.Field: Nature, Lond., 1963, 197, 1218 (M.R.C. Group Demyelinating Dis., King's Coll., Newcastle-upon-Tyne, England) A material capable of producing encephalomyelitis in guinea-pigs when 1 fig. was inj. with Freund's adjuvant was isolated from human brain. Fractionation on a Sephadex column produced material which, although apparently homogeneous electrophoretically and in the ultracentrifuge, was immunol. heterogeneous. No circulating Ab to the encephalomyelitic factor could be found in allergic encephalomyelitis. Skin sensitivity reaction occurred in response to inactive material as well as to the encephalomyelitic factor.

G

M.Lewis

3677. IMMUNOLOGY OF COLLAGEN. I. PREPARATION OF AN ANTIBODY AGAINST SOLUBLE COLLAGEN PREPARATIONS. C.Steffen, R.Timpl and I.Wolff: Z. Immun.-Forsch., 1962, 124, 476-492 (Hanusch Krankenhaus, Vienna, Austria) Hydroxam-collagen, soL at pH 7-3, prep, from calves' joints, was used to immunise rabbits and to sensitise tanned r.b.c. All the rabbit sera gave pos. results by the passive haemagglutination technique; these were inhib. by adding hydroxam-collagen but not by human albumin or y-globulin. Insol. collagen cross-reacted with hydroxam-collagen Ab. The relationship of these to collagen Ab in rheumatoid arthritis is discussed.

(German)

D.P.Winstanley

3678. ROLE OF INFLAMMATORY CELLS IN REJECTION OF SKIN HOMOGRAFTS IN RABBITS. C.M.C.Chen and H.L.Chang: Nature, Lond., 1963, 198, 158-159 (Dept. Surg., Nat. Def. Med. Centre, Taipei, Taiwan, Formosa) Eosinophils and histiocytes were rarely seen, but small lymphocytes were the most active cells participating in the reaction, their population being proportional to the extent of revascularisation of the graft and in reverse proportion to the immune status of the host after initial sensitisation. Plasma cells were confined to the recipient bed and reached their peak 2 days before epidermal breakdown. Neutrophils were seen secondary to cellular degeneration. Cytotoxic humoral Ab are thought to be directly responsible for homograft destruction.

G.M.Lewis

3679. ASSOCIATION OF TRANSPLANTATION ANTIGENS WITH MICROSOMAL LIPOPROTEINS OF NORMAL AND MALIGNANT MOUSE TISSUES. L.A.Manson, G.V.Foschi and J.Palm: J. cell. comp. Physiol., 1963, 61, 109-118 (Wistar Inst. Anat., Philadelphia, Pa., U.S.A.) The microsomal lipoproteins from DBA/2 mouse spleen and DBA/2 lymphoblast (L-5178Y) contained homograft sensitising Ag when tested against C57BL/6 mice, whereas non-microsomal lipoproteins did not, nor did lipoprotein fractions from DBA/2 liver homogenates. The active lipoproteins were also sp. inhibitors of DBA/2 haemagglutinins and elicited anti-DBA/2-haemagglutinins in C3H mice. The role of the endoplasmic reticulum as a major intracellular site of transplantation Ag is suggested.

G.M.Lewis

3680. SERUM HAEMAGGLUTININS IN HETEROLOGOUS CHIMAERAS. E.M.Uyeki: Nature, Lond., 1963, 198, 196-197 (Biol. Lab., Hanford Lab., Gen. Electric Co., Richland, Washington, U.S.A.) LAF mice were inj. within 2 hr. of 950 r total body X-irradiation with viable bone marrow cells from Sprague-Dawley rats, either normal or immunised against LAF by spleen implantation

and injn. of lymphoid tissue. Serum haemagglutinin determination revealed the presence after 3 weeks of both host anti-graft and graft anti-host reactions. G.M.Lewis

3681. TRANSPLANTATION ANTIGENICITY OF LYMPHOE CELLS GROWN IN VITRO. J.A.Mannick, H.R.Cress, H.M.Lee and R.H.Egdahl: Amer. J. Surg., 1963, 105, 167-173 (Dept. Surg., Med. Coll. Virginia, Richmond, Va., U.S.A.) Doses of 2-20 x 10⁶ spleen cells from adult New Zealand rabbits, grown in Eagle HeLa medium with 20% rabbit serum for 2, 3 or 6 weeks, were inj. i.d. into 18 allogeneic animals, followed 8 days later by a skin homograft from the same donor and a skin autograft*. The mean survival time of the homografts was 4[#]4 ± 1[#]1 days, whereas 20 first set homografts in controls survived 7-4 ± 1-2 days and 15 second set homografts for 4-1 ± 2[#]1 days. Similar expt., in which the medium used for culturing spleen cells was inj. prior to homografts in 12 animals, gave a mean survival time of 5^{*9} ± 1-0 days: in 3 instances the time was 4-5 days.

B.Cruickshank

3682. SURVIVAL OF SKIN HOMOGRAFTS AS A FUNCTION OF QUANTITY AND FREQUENCY OF RNA INJECTIONS. F.L.Ashley, D.Berman and J.Jessamy: Amer. J. Surg., 1963, 105, 174-176 (Dept. Surg., Univ. California, V* Angeles, Calif., U.S.A.) RNA prep, from spleens of adult Wistar rats was inj. into Long-Evans rats 7 times on alternate days from birth in total doses of 0^{*}022-0^{*}11 mg^{*} The animals received skin homografts of uniform size ft⁰P¹ Wistar rats at 21 days of age. 88-100% of the grafts were viable after 13 days and 6-73% after 20 days. In control animals 42% of the grafts were viable after 13 days and none after 20 days.

B.Cruickshank

3683. ANTIBODY RESPONSE TO HOMOGRAFTS. VIII. RELATION OF MOUSE HAEMAGGLUTININS AND CYTO TOXINS. P.I.Terasaki and J.D.McClelland: J. exp. Med., 1963, 117, 675-690 (Surg. Dept., Univ. California Med. Center, Los Angeles, Calif., U.S.A.) TM> differences between certain inbred strains of mice which could not be revealed by haemagglutination techniques were disclosed by lymphocyte cytotoxicity. Though both activity were absorbed from antisera proportionally by r.b.c. and lymph node cells, 100 to 1000 times as many r.b.c. as lymphocytes were necessary to produce an equiv. reduction in Ab activity. This suggests that r.b.c. may possess only min. amounts of certain Ag which are present in detectable levels on lymphocytes. Lymphocyte cytotoxicity may therefore assay a wider range of alloigenic Ag than haemagglutination.

H.E.H.Jones

3684. LIVER AND SPLEEN PHOSPHATASE ACTIVITY IN BONE MARROW TRANSPLANTATION. E.J.M.Uyeki: Int. J. rad. Biol., 1963, 6, 247-255 (Biol. Lab., Hanford Lab., G.E. Co., Richland, Wash., U.S.A.) T^{*}, acid phosphatases of spleen and liver of C3H x 101 hyb^o [C31] mice showed a max. 14 days after i.p. injn. of spleen cells from C57L x A hybrids [LAF]. Q values, i.e. organ wt. x 1000/body wt., were also max. after 14 days* If 400 r whole-body X-irradiation preceded injn. acid phosphatase was max. after 30 days. I.v. injn. of LAF bone marrow suspension after 950 r whole-body irradiation doubled liver acid phosphatase after 14 days. Without radiation, injn. of LAF or C31 bone marrow produced no changes in liver acid phosphatase; rat bone marrow produced a 50% increase in 14 days. Alk. phosphatase was not associated with the Q value. The acid phosphatase response pattern after inocn. of foreign haemopoietic tissue resembled that after introduction of PVP. B.M.Stevens

ANTIBODY FORMATION

3685. SYNTHESIS OF ANTIBODIES BY BLOOD LEUCOCYTES OF THE RABBIT. L.Hulliger and E.Sorkin: Nature, Lond., 1963, 198, 299 (Schweizerisches Forschungsinst., Med. Abteilung, Davos, Switzerland) w.b.c. from rabbits hyperimmunised against human γ -globulin contained large amounts of Ab 4 days after a poster injn.; their role may be as important as that of the spleen. CM.Lewis

3686. HETOPHYSIOLOGY OF THE ANTIBODY RESPONSE. I. HISTOGENESIS OF PLASMA CELL REACTIONS IN RABBIT SPLEEN. H.L.Langevoort. H. ANTI-BODY RESPONSES AND SPLENIC PLASMA CELL REACTIONS IN SUBLETHALLYX-IRRADIATED RABBITS. r.J.Kernig, J. vanderMeer and P.Oudendijk: Lab. Invest., 1963, 12, 106-118, 156-170 (Histol. Dept., Univ. Groningen, Netherlands) I. Rabbit splenic biopsies were performed following one injn. of Ag. Asmablasts were first seen in the periarteriolar lympho-sheaths after 24 hr. The plasma cells migrated to the sinusoids and disappeared in 6 days. At 4 days, γ -globulin cells appeared in the follicles. From 5-10 days after γ -globulin mitosis lymphocytes and cell death associated with follicular enlargement were noted. II. Rabbits were given 500 r total body irradiation before or after i.v. Ag. The Ab response was depressed if radiation was given 12 hr. before injn. Although γ -globulin follicles degenerated periarteriolar sheaths survived irradiation and, in animals irradiated after Ag γ -globulin normal plasma cell reactions were noted. Plasma cells seemed to arise from small lymphocytes.

3687. HETEROLOGICAL RESPONSE OF RABBITS TO TWO INJECTIONS OF PURIFIED PROTEIN ANTIGEN. P.A. Johnston and M.R.Abell: Lab. Invest., 1963, 12, 180-192 (Pathol. Dept., Michigan Univ., Ann Arbor, Mich., U.S.A.) The histological changes in rabbit spleen and lymph nodes following 2 injns. of Ag 7 weeks apart were germinal centre hyperplasia and prominent modified reticular cells. Mature plasma cells apparently from the latter, arose in red pulp node medulla after the Ab titre started to drop. Differences between primary and secondary immune response are discussed. A.M.Mackay

3688. ANTIBODY PRODUCTION BY IMMUNOLOGICAL CELLS OF COMPETENT CELLS TRANSFERRED TO A HETEROLOGOUS HOST. T. A.Zlotnicfc: Lab. Invest., 1963, 12, 306-315 (Expt. Pathol. Div., Scripps Clin., La Jolla, Calif., U.S.A.) Lymph node cell suspensions from rabbits sensitised to bovine albumin or γ -globulin were stimulated in vitro with the same Ag and injected into the cheek pouch of X-irradiated hamsters. There produced Ab identical with rabbit γ -globulin. Morphology and mitotic index after colchicine are described and discussed. A.M.Mackay

3689. RABBIT V-GLOBULIN ALLOTYPES AS GENETIC MARKERS FOR THE SOURCE OF ANTIBODY PRODUCED IN RECIPIENTS OF SHIGELLA-INCUBATED LYMPH NODE CELLS. T.N.J.larris, S.Dray, B.Ellis (C.Mi/nd - Harris: Immunology, 1963, 6, 169-178) and Univ. Pennsylvania, Philadelphia, Pa., U.S.A. Rabbits, homozygous for each of an allelic pair of allotypes of γ -globulin (A4 and A5), were used as donor and recipients of transferred Ag-incubated

lymph node cells, the cells of donors of one allotype being in each case transferred to recipients of the other. When Ab appeared in the sera of the recipient animals, its allotype was determined by treatment with fluorescein-conjugated rabbit anti-A5-Y^g globulin and anti-A4-Y^g globulin, respectively. In each case the reactions of the recipients' sera were pos. for Y^g globulin of the donors' allotype but not of their own. *

3690. ANTIBODY FORMATION INITIATED IN VITRO. H. ANTIBODY SYNTHESIS IN X-IRRADIATED RECIPIENTS OF DIFFUSION CHAMBERS CONTAINING NUCLEAR ACID DERIVED FROM MACROPHAGES INCUBATED WITH ANTIGEN. M.Fishman and F.L.Adler: J. exp. Med., 1963, 117, 595-602 (Immunol. Dept., Publ. Hlth. Res. Inst., New York, N.Y., U.S.A.) Rats

which had been treated by X-irradiation developed sp. Ab when implanted i.p. with diffusion chambers containing normal lymph node cells and a cell-free homogenate of macrophages which had been incubated in vitro with T2 bacteriophage. The cell-free homogenate could be replaced effectively by its RNA fraction isolated by the phenol method. Ab was not formed if this RNA fraction was treated with RNase. The question of the possible presence of Ag complexed to the RNA is discussed.

H.E.H.Jones

3691. ANTIBODY ABSORPTION, RETENTION AND PRODUCTION BY THE BABY PIG. E.R.Miller, B.G.Harmon, D.E.Ullrey, D.A.Schmidt, R.W.Luecke and J.A.Haefen: J. anim. Sci., 1962, 21, 309-314 (Michigan State Univ., Mich., U.S.A.) Absorption of Ab to *Salmonella pullorum* or immune globulin by piglets from colostrum declined logarithmically from birth to 24 hr. and then practically ceased. Absorbed serum Ab and immune globulin titres reached max. in 24 hr. and diminished with age logarithmically with half lives of 4.7 and 7.5 days, respectively. Production of the Ab in the piglets began at approx. 3 weeks of age and had increased 20-fold at 6 weeks. Early weaning of the pigs (4 days) delayed their growth, the maturation of the serum-protein profile and lowered the Ab response.

A.C.Pollard

3692. ROLE OF THYMUS AND RELATED ORGANS IN IMMUNITY. M.Bumet: Brit. med. J., 1962, ii, 807-811 (Hall Inst. Med. Res., Melbourne, Victoria, Australia) Report of a lecture. 18 ref. M.E.Nutt

3693. INDUCTION OF TOLERANCE TO HETEROLOGOUS PROTEINS AND THEIR CATABOLISM IN C57BL/6 MICE. F.M.Dietrich and W.O.Weigle: J. exp. Med., 1963, 117, 621-631 (Expt. Pathol. Dept., Scripps Clin., La Jolla, Calif., U.S.A.) Mice were made tolerant to a sol. Ag by a single injn. of 20 mg. of the protein within 24 hr. of birth. In these mice there was no correlation between the duration of the tolerant state and the persistence of labelled Ag after injn. so that the tolerant state was not dependent on the rates of catabolism of the Ag.

H.E.H.Jones

3694. INHIBITION OF LESIONS OF PRIMARY VACCINIA AND OF DELAYED HYPERSENSITIVITY THROUGH IMMUNOLOGICAL TOLERANCE IN RABBITS. J.A.Flick and W.B.Pincus: J. exp. Med., 1963, 117, 633-646 (Microbiol. Dept., Grad. Sch. Med., Univ. Pennsylvania, Philadelphia, Pa., U.S.A.) Newborn rabbits inj. with 0.5 mg. of purified inactive vaccinia virus failed to respond with a typical local lesion when inj. on the skin a few days later, though virus could be isolated from their tissues. Skin allergy to the active virus failed to develop in these tolerant animals as it did in normal controls. The probable

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allergic nature of the primary lesion is indicated by these results. The tolerant group showed a high mortality rate, associated with generalised vaccinal infection. Normal animals rapidly developed an active immunity which prevented virus leaving the site of the infection to any great extent.

H.E.H Jones

3695. MECHANISMS OF END OT OX IN TOLERANCE.

I. RELATIONSHIP BETWEEN TOLERANCE AND RETICULO-ENDOTHELIAL SYSTEM PHAGOCYTIC ACTIVITY IN RABBIT. S.E.Greisman, F.A.Carozza jun. and J.D.Hills: *J. exp. Med.*, 1963, 117, 663-674 (Med. Dept., Univ. Maryland Sch. Med., Baltimore, Md., U.S.A.) Pyrogenic tolerance following 7 daily i.v. injn. of 2 fig./kg. *E. coli* endotoxin was associated with increased phagocytosis of colloidal C by the RE system. Four hr. after blockade of the RE system with thorotrast the tolerant rabbits developed lower fever than in i.v. endotoxin challenge than the controls, though C clearance was similar in the 2 groups. This passive protection extended to heterologous endotoxins. The tolerant animal appeared to possess a dual endotoxin defence system, one which could be blocked by thorotrast, whereas the other was possibly humoral and consistent with an opsonin with high endotoxin specificity. H.E.H.Jones

3696. TOLERANCE TO TWO SUCCESSIVE HOMOGRAFTS IN GUINEA-PIG. A.Rebel and J.Marescaux: *C.R. Soc. Biol.*, Paris, 1962, 156, 1690-1691 (Inst. Histol. Fac. Méd., Strasbourg, France)

A graft of a fragment of guinea-pig adenohypophysis on the thyroid of testis of the same or a different animal showed no antigenic prop, capable of rejecting a second graft of the same or different tissue. These results were obtained when the second graft was from the same animal and when it was placed near the first. (French) M.A.Price

3697. A GERMPLASM-TRANSMITTED ALTERATION OF HISTOCOMPATIBILITY IN THE PROGENY OF HOMOGRAFT TOLERANT MICE. R.D.Guttmann and J.B.

Aust: *Nature*, Lond., 1963, 197, 1220-1221 (Dept. Suig., Univ. Minnesota Med. Sch., Minneapolis, Minn., U.S.A.) A *C3H* mouse, made immunol. tolerant to A strain by injn. of spleen cells within 24 hr. of birth, was crossed with (A x C3H)F₁ mice. The offspring showed an altered response to injn. with an A strain or hybrid spontaneous mammary adrenocarcinoma. G.M.Lewis

3698. PROLONGED SUPPRESSION BY X-RAY OF ADAPTATION FOR THE SECONDARY ANTIBODY RESPONSE. R.J.Porter: *Proc. Soc. exp. Biol.*, N.Y., 1962, 111.

583-584 (Dept. Epidemiol., Univ. Michigan Sch. Publ. Hlth., Ann Arbor, Mich., U.S.A.) Rabbits previously sensitised to bovine Y" globulin lost this sensitisation after sublethal X-irradiation. Challenging with Ag 24 weeks after exposure gave only primary responses. M.M.Shapland

3699. ABILITY OF LARGE DOSES OF ANOL2 PLASMA PROTEIN TO INHIBIT ANTIBODY PRODUCTION.

J.F.Mowbray: *Immunology*, 1963, 6, 217-225 (Med. Unit, St. Mary's Hosp., London, England) An(X2~glycoprotein fraction separated from bovine serum inhib. Ab production to a no. of Ag in a high % of animals. It acted in the early stages of Ab production. It did not affect an established Ab level, and was ineffective if given after Ab production had been initiated. Other sources of the fraction, from other spp., were also effective.

IMMUNOCHEMISTRY

3700. ADJUVANT EFFECT OF DIFFUSION CHAMBERS ON SOLUBLE ANTIGENS. F.L.Adler and M.Fishman: *Proc. Soc. exp. Biol.*, N.Y., 1962, 111, 691-695 (Pub. Hlth. Res. Inst., City of New York, N.Y., U.S.A.)

The presence of diffusion chambers had a marked adjuvant effect on the antigenicity of 2 sol. Ag (haemocyanin and ferritin) in rats and mice. This effect occurred not only when Ag were placed in the chamber but also after insertion of a saline-filled chamber followed by i.p. injn. of Ag. Chamber components were not responsible for the enhanced Ab production. M.M.Shapland

3701. ANTIGEN CONFORMATION DURING ANTIBODY PURIFICATION. J.C.Bennett and E.Haber: *J. biol. Chem.*, 1963, 238, 1362-1366 (Dept. Med., Harvard Med. Sch., Boston, Mass., U.S.A.)

Fluorescent labelling of Ag was used for determination of the degree of dissociation of RNA from its Ab as the helical structure was altered over a sp. temp. range. With full unfolding, complete separation of Ag from antibody was possible. Standard procedures, such as heat, M-acetic acid, 2°/o Na lauryl sulphate, or large excess of hapten, were insufficient to dissociate fluorescent lysozyme p-aminohippurate completely from anti-p-aminohippurate Ab. Dissociation of a fraction of Ab more tightly bound to Ag probably needs a conformational change in either the Ag or the Ab. J.N.Ashley

3702. ALUM-PRECIPITATED PROTEINS AFTER INTRAMUSCULAR INJECTION. J.D.Hawkins: *Immunology*, 1963, 6, 179-188 (Dept. Biochem., Med. Coll., St. Bartholomew's Hosp., London, England)

After i.m. injn. of alum-ppt. bovine serum albumin, trace-labelled with 131I into rabbits there was a single peak in the plasma-PBISli concn. 4-6 days later. There were 2 peaks in the plasma non-PB¹³¹I concn. and the urinary excretion of 131I, one coincident with the plasma P#L31I peak and the other a few days later when there was no PB¹³¹I* in the plasma. It is concluded that these 2 peaks were caused by non-immune phases of catabolism of the Ag. Alum-pptd., trace-labelled bovine serum albumin was also inj. into rabbits in the anamnestic state. *

3703. IMMUNOLOGICAL PROPERTIES OF ISONICOTYL PROTEINS. E.Neuzil and R.Camain-Giacibani: *C.R. Soc. Biol.*, Paris, 1962, 156, 1678-1681 (Lab. BiocWj' méd., Fac. Méd., Dakar-Fann, Senegal)

The action of INH on serum albumins produced isonicotylproteins which had a lower solubility and isoelectric point than the original proteins. Rabbit antisera to isonicotyl proteins did not ppt. the original proteins. The antigenic prop. of human serum isonicotylproteins were slight or absent. (French) M.A.Piice

3704. PYRIMIDINE-SPECIFIC ANTIBODIES WHICH REACT WITH DNA. S.W.Tananbaum and S.M.Beiser: *Proc. nat. Acad. Sci.*, Wash., 1963, 49, 662 (Dept. Microbiol., Columbia Univ., New York, N.Y., U.S.A.)

Synthesis of polyfunctional Ag containing uracil-1 (3)¹⁴-5-acetyluracil-1(3)-residues is described. The latter Ag was used to elicit sp. Ab in rabbits. Antisera thus obtained cross-reacted with thermally denatured DNA and to a considerably lesser extent with native DNA, as measured by CF reactions. Their reaction with DNA could also be demonstrated by PCA in the guinea-pig. Possible uses for these antisera in the investigation of the biol. functions of nucleic acids are discussed. J.R.Sargent

3705. IMMUNOLOGICAL REACTIONS OF SNAKE VENOM BY CROSSING PAPER ELECTROPHORESIS. S.Nakamura, A.Katsuno, S.Tbminaga and N.Yamamoto: Bull. Yamaguchi Med. Sch., 1962, 9, 45-53 (List. Med. Chem., Yamaguchi Med. Sch., Ube, Japan) The venom of Akistrodon halys (Pallas) contained 7 electro-Pnoretic fractions, and the purified antisera [3- and/or y Wobulins. Over 20 Ag were detected in the venom im-Jjunol., and the distribution of these Ag in the electro-PQoretic fractions was studied by the crossing paper electro-phoresis. K.Jones

3706. LOSS OF IMMUNOLOGICAL REACTIVITY OF AN O₂ GLOBULIN AFTER PROLONGED FREEZING OF SERUM. W.J.Fessel: Nature, Lond., 1963, 197, 1307 (Dept. Med., Univ. California Sch. Med., San Francisco, Calif., U.S.A.) Immunoelectrophoretic studies Jith rabbit antiserum to pooled human serum proteins showed that a-2 globulins lost their immunol. reactivity after prolonged storage in the deep freeze; one of the ^mponents was thought to be the Sf 0-400 lipoproteins. Mother was not identified. G.M.Lewis

3707. IMMUNE HAEMOLYSIS IN ALKALINE MEDIA. S.Ueno and Iishiyama: Z. Immun.-Forsch., 1962, 124, 447-463 (Dept. Legal Med., Univ., Tokyo, Japan) Sensitised sheep r.b.c. were not lysed by C if PH exceeded 9.3. The binding of C'1 was blocked at PH at 37°, but could occur at 0°. Reaction with C'4 C'2 was little affected by alkali, but C'3 binding was completely blocked at 37° and partly at C'. D.P.Winstanley

3708. EFFECT OF IONIC STRENGTH ON THE HAEMOLYTIC ACTIVITY OF COMPLEMENT. A.C.Wardlaw and H.G.Walker: Immunology, 1963, 6, 291-300 (Connaught Med. Res. Lab., Univ., Toronto, Ont., Canada) The haemolytic activity of guinea-pig C' was measured in isotonic soln. of various ionic strengths in the range 0.034 to 0.28 and was max. at an ionic strength of 0.08. Haemolytic activity was virtually abolished at ionic strength 0.034, whereas at 0.28, the C' titre ion. Only about 20% of the value found at the physiol. ionic strength 0.155. NaCl, KC1, LiBr and K₂SO₄ were used to provide ionic strength, and sucrose, mannitol and glucose to maintain isotonicity. Nine permutations of the 8 electrolytes with the 3 mm-electrolytes were tested and similar results. Human and rabbit C' also showed a haemolytic activity at ionic strength 0.08 to 0.10. D.P.Winstanley

3709. MECHANISM OF IMMUNE HAEMOLYSIS. I. RELATIONSHIP OF RATE OF DESTRUCTION OF RED CELLS TO THEIR AGE, FOLLOWING THE ADMINISTRATION TO RABBITS OF AN IMMUNE HAEMOLYSIN. F.B.Gower and W.M.Davidson: Brit. J. Haemat., 1963, 132-140 (Dept. Clin. Path., King's Coll. Hosp. Med. Sch., Denmark Hill, London, England) Conditions resembling those found in patients with acute haemolytic anaemia have been simulated in rabbits by injn. of goat anti-rabbit-cell immune sera. Subsequent labelling of rabbit r.b.c. of different ages with ¹⁴C, ⁵⁹Fe or ¹⁴C + ⁵⁹Fe in the same rabbit showed that the relative resistance to haemolysis is shown by young r.b.c. was a major factor in limiting haemolytic anaemia. L.Sneath

3710. SIMPLE METHOD OF OVERCOMING ANTI-COMPLEMENTARY ACTIVITY. R.Wigand: Z Immun.-Forsch., 1962, 124, 368-369 (Hyg. Inst., Univ. Saarland, Germany) Anticomplementary activity in serum

and cs.f. can be removed by 30 min. heating at 60° after the usual 30 min. inactivation at 56°

(German) D.P.Winstanley

3711. MICROMETHOD FOR COMPLEMENT ESTIMATION. E.J.Cuwert, K.Mai and T.Mesten: Z. Immun.-Forsch., 1962, 124, 428-446 (Stiftung Z.Erfoischungspinale Kinderlähmung, 2 Hamburg 20, Germany) A method for C estimation in 0.2 ml. of capillary blood is described. It gave results consistently about one-third lower than those obtained by a macromethod when tested on 78 healthy adults. (German) D.P.Winstanley

EXPERIMENTAL ONCOLOGY

3712. CARCINOGENESIS AND CANCER PREVENTION.

P.R.J.Burch: Nature, Lond., 1963, 197, 1145-1151 (M.R.C. Environmental Res. Unit, Dept. Med. Physics, Univ., Leeds, Yorks., England) The role of gene mutation, viruses, hormones and immune reactions in malignant transformations are discussed. The theoretical possibility of limiting the incidence of post-zygotic cancer is considered. J.R.Sargent

3713. SARCOMA INDUCED REMOTELY IN RATS FED 3-METHYLCHOLANTHRENE.

CHuggins and L.C.Grand: Cancer Res., 1963, 23, 477-480 (B. May Lab. Cancer Res., Univ. Chicago, Ill., U.S.A.) Repeated feeding of large but tolerable doses plus reiterated injn. in a given area of sesame oil or NaCl soln., with or without dissolved hormones, frequently evoked a fibrosarcoma at the injn. site but nowhere else in \$ albino rats. B.M.Stevens

3714. CARNOGENICITIES OF FLUORO DERIVATIVES OF 10-METHYL-1,2-BENZANTHRACENE.

H. SUBSTITUTION OF THE K REGION AND THE 3-, 6- AND 7-POSITIONS. J.A.MiUer and E.C.MiUer: Cancer Res., 1963, 23, 229-239 (McArdle Mem. Lab., Med. Sch., Univ. Wisconsin, Madison, Wis., U.S.A.) Substitution of F in the 4 position of the K region had little effect on carcinogenic activity towards mouse skin or mouse or rat s.c. tissue. The 3-, 6- and 7-fluoro deriv. had considerable carcinogenic activity in 2 or more of the 4 tests used. 1,2-Benzanthracene and its 3-fluoro deriv. showed little or no activity. 4'-Fluoro-1,2-benzanthracene showed considerable carcinogenic activity towards rat s.c. tissue. The role of the K region in carcinogenesis by poly cyclic aromatic hydrocarbons is reviewed. B.M.Stevens

3715. SARCOMA INDUCTION BY Fe-CARBOHYDRATE COMPLEXES.

J.Jielding: Brit. med. J., 1962, i, 1800-1803 (Paddington Gen. Hosp., London, England) Sarcoma was induced locally in mice by s.c. injn. of Fe-dextran and Fe-dextrin in doses smaller than previously described. Fe complexes were given in weekly doses of 1 mg. Tumours developed in 2 of 20 animals given 28 mg. Fe-dextran after a latent period of approx. 1 yr. Twenty animals were given Fe-dextrin: one of these developed a tumour after a latent period of 6 months, having received 28 mg. Fe, and 2 given 30 mg. Fe after 12 and 13 months. Forty mice were given 30 mg. Fe-sorbitol s.c.: 28 of these survived more than 12 months and none had developed tumours 17 months after the start of the expt. Sarcoma induction probably depended on the amount of Fe remaining at the injn. site. This was greater for compounds of higher mol. wt. which were mainly absorbed via the lymphatics. M.E.Nutt

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3716. ADRENAL IMBALANCE IN MOUSE SKIN CARCINOGENESIS. N.Trainin: *Cancer Res.*, 1963, 23, 415-419 (Dept. Expt. Biol., Weizmann Inst. Sci., Rehovoth, Israel)

All the SWR mice were fed 7,12-dimethylbenz(a)anthracene once and thereafter were painted twice weekly with 5% croton oil for 20 weeks. The initial tumour incidence was 77% in controls, 16% in hydrocortisone fed animals and 69% in adrenalectomised animals, the tumour yields/animal being 2.0 ± 0.2 , 1.3 ± 0.2 and 1.2 ± 0.3 respectively. In the promoting phase, however, hydrocortisone reduced the tumour incidence to 11% whereas adrenalectomy increased it to 100%.

B.M.Stevens

3717. ADULT LEUKAEMIAS AND DIAGNOSTIC X-RAYS.

A.Stewart, W. Penny backer and R.Barber: *Brit. med. J.*, 1962, ii, 882-890 (Dept. Social Med., Univ., Oxford, England) A survey was made of 963 cases of leukaemia (512 lymphatic and 511 others), 1011 cancers (60 lymphosarcomas, 951 others) and 974 control subjects in order to discover possible associations between diagnostic X-rays and adult leukaemias. It was modelled on a recent survey of childhood leukaemias. Findings are reported in detail. It was concluded that 8% of leukaemias, other than lymphatic leukaemias, were caused by diagnostic X-rays and a further 3.6% by therapeutic X-rays.

M.E.Nutt

3718. INFLUENCE OF FOSTER-NURSING ON VIRUS-

INDUCED AND SPONTANEOUS LEUKAEMIA IN [C3H] MICE. L.W.Law: *Proc. Soc. exp. Biol., N.Y.*, 1962, 111, 615-623 (Nat. Cancer Inst., Bethesda, Md., U.S.A.) Reciprocal foster-nursing expt. revealed

that transmission of the leukaemogenic virus, MLV, could occur from mother to offspring during the prenatal period. Low freq. and later age at death from the disease were observed in litters born to 'infected' ♀ but foster-nursed upon normal mothers of the C3H strain. Foster-nursing upon low leukaemic (C3Hf/LW) mothers combined with thymectomy through successive generations of high-leukaemic (C3Hf/Fg) strain mice did not influence the freq. or mean age at death from the disease.

M.M.Shapland

3719. VIRAL STUDIES ON GENERALISED FRIEND DISEASE AND A TUMOUR VARIANT IN BALB/c AND RELATED HYBRID MICE. A.J.Fieldsteel, P.J.Dawson and W.L.Bostick: *Cancer Res.*, 1963, 23, 355-362 (Dept. Pathol., Univ. California Sch. Med., San Francisco, Calif., U.S.A.) Viruses passed in BALB/c and

Swiss mice were antigenically identical. Virus titres were equiv. after 25 passages in BALB/c. BALB/c mice were more uniformly susceptible when inoc. with more than the median infective dose, but more Swiss mice were susceptible with lower doses. Strain A and (BALB/c x A) first generation [F¹] hybrids were resistant to virus passed in Swiss mice but they and other BALB/c and A back-crosses and second generation mice were susceptible to virus passed in BALB/c mice. C57BL mice were immune to virus passed in BALB/c or Swiss mice but (BALB/c x C57BL)F₁ hybrids were susceptible. The virus in induced transplantable tumours and spleens of tumour bearing BALB/c or (BALB/c x A)F₁ mice was equiv. to that in spleens of mice inoc. with virus.

B.M.Stevens

3720. PATHOLOGIC STUDIES OF FRIEND VIRUS LEUKAEMIA AND THE DEVELOPMENT OF A TRANSPLANTABLE TUMOUR IN BALB/c MICE. P.J.Dawson, A.H.

Fieldsteel and W.L.Bostick: *Cancer Res.*, 1963, 23, 349-354 (Dept. Pathol., Univ. California Sch. Med., San Francisco, Calif., U.S.A.) The pathol. was

similar to that in other highly susceptible strains. 328 mice received grafts of liver or spleen from other mice inoc. with virus 43-124 days previously. Two tumour lines, established from the liver and spleen, respectively, of 1 mouse, grew rapidly and were readily transplantable. The incubation period fell from 46 to 7 days. Virtually all mice developing a tumour showed signs of generalised Friend disease. Microscopically the 2 lines were identical reticulum-cell sarcomas. Spleens and livers of tumour-bearing animals contained nodules of reticulum cells. Cells from the spleen nodules produced tumours histol. and genetically indistinguishable from the original. Tumours were produced only by injn. of living cells. Virus was consistently associated with tumour. B.M.Stevens

3721. BRONCHIOLAR PROLIFERATION AND METAPLASIA ASSOCIATED WITH THROMBO-EMBOLISM. S.W.Berk' heisen: *Cancer, Philad.*, 1963, 16, No.2, 205-211 (Lab. Dept., Harrisburg Polyclin. Hsp., Pa., U.S.A.)

The incidence and type of bronchiolar proliferation in human cases of thrombo-embolism without infarcts and that observed in expt. produced lesions of rabbits were similar. The single common factor responsible appeared to be localised anoxia. It is suggested that the occurrence of multifocal proliferations of this variety may be an important aetiological factor in the genesis of lung cancer particularly that of peripheral origin. D.I.Connell

3722. BIOCHEMICAL STUDIES OF RESISTANCE TO 6-THIOGUANINE [TG]. D.B.Ellis and G.A.LePage:

Cancer Res., 1963, 23, 436-443 (Life Sci. Res., Stanford Res. Inst., Menlo Park, Calif., U.S.A.) Several TG-resistant mouse ascites tumours were developed. Susceptible cells incorporated significant amounts of TG int° nucleic acids, whereas resistant sublines incorporated only minor amounts. An in vitro assay for synthesis of thioguanine acid by the nucleotide pyrophosphorylase TO' action in sol. enzyme prep, is described. Two resistant Ehrlich sublines were developed, 1 retaining its capacity for thioguanine acid synthesis whereas the other had a greatly decreased capacity. The former responded to combined therapy with azaserine and TG. Azaserine treatment greatly increased the amounts of thioguanine acid formed and the amounts of TG in nucleic acid. The second subline did not respond to azaserine in this way*

B.M.Stevens

3723. EFFECTS OF NITROGEN MUSTARD [(METHYLBS (g-CHLOROETHYL)AMINE)] ON THE PHYSICO-CHEMICAL PROPERTIES OF MOUSE FIBROBLAST & \$.

H.B.Brewer and L.Aronow: *Cancer Res.*, 1963, 23, 285-290 (Stanford Univ. Sch. Med., Palo Alto, Calif., U.S.A.) No differences in base ratios, hyperchromicity on heating, renaturation on slow cooling or capacity to serve as substrate for pancreatic DNase were found between a prep. of DNA from a normal culture and a prep. from a culture treated with 10⁻⁶ M N mustard. The DNA from treated cells was slightly more viscous than normal DNA. DNA which had reacted with a high concn. of N mustard in vitro differed markedly from normal DNA & all the above respects.

B.M.Stevens

3724. EFFECT OF STEROIDS AND FLUOROPYRIMIDIN^O ON LYMPHOMAS. H. IN VIVO STUDIES ON TUM^A RESISTANCE AND COLLATERAL SENSITIVITY.

Lampkin-Hibbard, K.L.Mukherjee and C.Heidelberger: *Cancer Res.*, 1963, 23, 468-476 (Cancer Res. Lab., Univ. Miami, Coral Gables, Fla., U.S.A.) In & bearing both 9-a-fluorohydrocortisone [9-AFH] resistant 5-fluorouracil [FU] sensitive P1798 and 9-AFH sensitive

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[^]792^{*}7 times more [2-14c]FU was incorporated into the 9-AFH resistant than the 9-AFH sensitive lymphoma. [2-14c]FU rac⁺ incorporation was twice as great in the 9-AFH resistant, as in the sensitive line. The % of nucleo-^dles in acid-sol, extracts after [2-14c]FU were the same, 9-AFH inhib. [14c]fornate incorporation into DNA thy-^{ine} 2-5 times more in the 9-AFH sensitive than in the r⁺tant line. 15 mg./kg. each of 9-AFH and FU inhib. C¹⁴Cjuracil incorporation into acid-sol, uracil in both lines better than either drug alone and produced complete regression. 9-AFH inhib. [2-14c]juracil incorporation into RNA uracil in 9-AFH sensitive, but not resistant, tumours. FU x^ab^{*} me incorporation in 9-AFH resistant, but not sensitive, tumours.

B.M.Stevens

3725. VINBLASTINE IN NEOPLASTIC DISEASE. Midwest Cooperative Chemotherapy Group: Cancer Res., 1963, 23, 169-179. Of 265 patients treated the best and frequent responses were obtained in those with Hodges disease, often after they were refractory to other drugs of therapy. Patients with other types of neoplastic disease obtained worthwhile objective responses infrequently. It is suggested that which produces leukopenia without severely depressing the bone marrow. Recovery from leukopenia was usually prompt.

B.M.Stevens

3726. CYTOTOXIC EFFECTS OF MALEURIC ACID [(N-CARBAMYLMALEAMIC ACID)] AND THE STRUCTURALLY RELATED COMPOUNDS ON EHRLICH ASCITES TUMOUR CELLS. T.A.Okada and E.Roberts: Cancer Jfs, 1963, 23, 217-222 (Dept. Biochem., City Hope Center, Duarte, Calif. U.S.A.) The most active compounds were ethylenebis(maleurate) and the allyl hydroxyethyl, allyl, 2-chloroethyl, isopropyl esters of maleuric acid. All produced pykninatin masses, severe cytoplasmic Mebbing and normalities at all stages. Effective esters disrupted spindle fibres and prevented spindle entering mitosis. Glutathione given counteracted the cytotoxic effects.

B.M. Stevens

3727. EFFECTS OF HEAT AND RADIATION ON CANCERS PLANTED ON THE FEET OF MICE. G.Crile, jun.: Heart Clin. Fdn., Cleveland, Ohio, U.S.A.) 1963, 23, 372-380 (Dept. Gen. Surg., Cleveland Clin. Fdn., Cleveland, Ohio, U.S.A.) Styrene S⁹¹ melanoma in DBA/1 mice or Sarcoma-180 in ion of 86 to 100 for 30-40 min* destroyed a high proportion of mice without damaging the feet. Heat and X-irradiation Siven within a few hr. of each other showed moderate effects regardless of which was given first. Small doses thus cured some radio-resistant tumours, and large ones were more radiosensitive than large ones. Ones ^{the} tumour K were more heat-sensitive than small *W^P tumours and normal tissues became heat-resistant to 33% of the lethal heat dose. Tumour was transplantable immediately after otherwise lethal heat treatments * in. of 5HT into-tumours greatly increased heat sensitivity. Repeated 5HT injn. alone inhib. the S⁹¹ melanoma growth rate.

B.M.Stevens

3728. EFFECT OF YEAST POLYSACCHARIDES ON MOUSE TUMOURS. I.C.Diller, Z.T.Mankowski and M.E.Fisher: Cancer Res., 1963, 23, 201-208 (Inst. Cancer Res., Philadelphia, Pa. U.S.A.) I.v. injn. of hydroglucan induce^a regression of 90-95% of weU established Sarcoma 180 and 83% of Krebs-2 carcinoma with no Letia Uty[#] ^J of same amount i.P. i.m.* or ynik^c ^aer regression % Neither hydroglucan nor ynik^c ai*ected the ascites* forms of the tumours nor

Carcinoma 755, Rhabdomyosarcoma MC-1a, spontaneous mammary tumours in C3H mice or a transplantable tumour derived therefrom. Tumour resorption and necrosis occurred without haemorrhage. Phagocytic elements of liver and spleen were stimulated.

B.M.Stevens

3729. TUMOUR NEUTRALISATION BY ANTI-EHRLICH TUMOUR AND ANTE-MOUSE TISSUE SERA. D.W.Garrison and W.J.Nungester: Proc. Soc. exp. Kol., N.Y., 1962, 111, 743-745 (Dept. Bact., Univ. Michigan Med. Sch., Ann Arbor, Mich., U.S.A.)

Sera from rabbits inj. with Ehrlich ascites cells had 3-4 times the tumour neutralising power of sera from animals inj. with normal mouse tissues. The peak of neutralising titres was reached after 3 injn. of Ag and dropped significantly following injn. Dutch Pee Wee rabbits produced higher Ab titres than did either New Zealand or Ginger Giant rabbits.

M.M.Shapland

3730. EFFECT OF BCG INFECTION ON LEUKAEMIA AND POLYOMA IN MICE AND HAMSTERS. P.Lemonde and M.Clode: Proc. Soc. exp. HLoL, N.Y., 1962, 111, 739-742 (Inst. Microbiol., Univ. Montreal, Que., Canada)

In AK mice inj. with live BCG and submitted to isologous transplantation of leukaemic tissue, body wt. was maintained longer, partial regression of local implanted tumours was observed, development of leukaemia was delayed and survival prolonged, as compared with controls without BCG infection. In hamsters inj. with live BCG and later with polyoma virus, development of polyoma was delayed and survival prolonged.

M.M.Shapland

3731. INTERACTION OF VACCINIA VIRUS WITH ADENOCARCINOMA 755. F.E.Durr and B.A.Briody: Cancer Res., 1963, 23, 410-414 (Dept. Microbiol., Seton Hall Cool. Med. and Dent., Jersey City, NJ., U.S.A.)

The most significant degree of oncolysis was produced with virus strains IHD-T and IHD-E. 107 pock-forming units of virus incubated with tumour fragments produced almost complete suppression of tumour growth. Diln. of virus decreased tumour inhibn. Extensive virus multiplication accompanied tumour inhibn. but virus multiplication did not ensure oncolysis. Haemagglutinin inhibiting Ab to virus were not found in sera of tumour bearing mice. Virus, shown to persist in tumour for up to 1 month, was successfully transferred with tumour tissue through 11 transplants with min. effect on tumour growth. Virus multiplication and oncolysis were abolished when virus-treated tumours were implanted into vaccinia-immunised mice.

B.M.Stevens

3732. IMMUNOLOGICAL TOLERANCE, INFECTIVE TOLERANCE AND VIRUS-INDUCED NEOPLASTIC TRANSFORMATION. P.G.Stansly: Nature, Lond., 1963, 198, 110-111 (Detroit Inst. Cancer Res., Wayne State Univ., Detroit, Mich., U.S.A.) The phenomena of immunol. and infective tolerance and virus-induced neoplasia are discussed in relation to data on lymphocytic choriomeningitis in mice and lymphomatosis in chickens.

G.M.Lewis

3733. IMMUNOLOGICAL PROPERTIES OF TUMOURS. N.Molomut, L.Gross and M.Padnos: Nature, Lond., 1963, 198, 38-39 (Waldemar Med. Res. Fdn., Inc., Port Washington, N.Y., U.S.A.)

The immunisation of mice against homologous and isologous tumours was effected best by X-irradiated tumour cells, followed by a live challenge, next by X-irradiated cells, then dead cells, then lyophilised material, and lastly by passive immunisation. The level of induced protection was affected by the site of injn. and challenge. X-irradiation did not alter the antigenic prop. of lyophilised tumour, presumably causing only attenuation of the cells.

G.M.Lewis

3734. MOUSE FIBROSARCOMA FRACTIONS AS ANTIGENS BY LATEX AGGLUTINATION REACTIONS. J.M. Cruse, W.W.Germany and A.D.Dulaney: *Z. Immun.-Forech.*, 1962, 124, 419-427 (Div. Path., Univ.

Tennessee, Tenn., U.S.A.) Ab were prep, in rabbits against various fractions extracted from a transmissible fibrosarcoma of mice. The fractions included DNA, nucleoprotein, acid-stable and heat-stable components. The antisera were tested against their respective Ag adsorbed on latex particles and a variety of results are recorded.

D.P.Winstanley

3735. TUMOUR-SPECIFIC ANTIGENS AND THE HOMOGRAFT REACTION. R.T.Prehn: *Amer. J. Surg.*, 1963, 105, 184-191 (Dept. Path., Univ. Washington, Seattle, Wash., U.S.A.) Review. 28 ref. B.Cruickshank

3736. LOSS OF GASTROINTESTINAL-SPECIFIC ANTIGEN IN NEOPLASIA. R.C.Nairn, J.E.Fothergill, M.G.McEntegart and H.G.Richmond: *Brit. med. J.*, 1962, i, 1791-1793 (Dept. Pathol., Univ., Aberdeen, Scotland)

A mucopolysaccharide gastrointestinal-sp. Ag was absent from 45 of 54 gastrointestinal carcinomas. In the remaining 9, 5 before mucoid, immunofluorescent staining occurred in a small no. of cells scattered amongst unstained acini. Four pre-malignant polyps stained similarly, but the scattered fluorescent cells were more numerous. In 8 benign polyps staining was dimmer than in normal mucosa, but similar in distribution. Lymph node metastases from 10 cases did not stain. Staining may indicate intrinsic differences between benign and malignant states and thus aid diagnosis.

M.E.Nutt

3737. OPSONKATION OF CELLS BY ISOANTBODY IN VITRO. B.Bennett, L.J.Old and E.A.Boyse: *Nature*, Lond., 1963, 198, 10-12 (Div. Expt. Chemother., Sloan-Kettering Inst., New York, N.Y., U.S.A.)

Peritoneal macrophages from non-immunised mice were highly phagocytic for a wide range of types of mouse tumour cells in the presence of sp. isoimmune serum; no significant phagocytosis occurred in the absence of antiserum. Phagocytosed tumour cells were entirely surrounded by a rim of macrophage cytoplasm and were viable at the time of ingestion as determined by their stainability with Trypan Blue. The phagocytic capacity of macrophages from immunised animals was abolished by washing the cells; the activity could be restored by cell-free peritoneal washings from immunised animals.

G.M.Lewis

3738. ACTION OF γ GLOBULIN ANTIBODIES ON THE INCORPORATION OF [14c]GLYCINE BY CELLS OF WALKER AND YOSHIDA TUMOURS. P. De Gregorio: *C.R. Soc. Biol.*, Paris, 1962, 156, 1569-1573 (Inst. Gen. Path., Univ. Turin, Italy)

Anti-Walker γ -globulins inhib. by 44% the incorporation of glycine to Walker tumour cells in suspension. Anti-Walker γ -globulin adsorbed on tumour cells did not modify glycine incorporation but when adsorbed on r.b.c., incorporation was inhib. by 24%. Anti-Walker γ -globulins inhib. by 23% the incorporation of glycine in Yoshida tumour cells and by 22% when adsorbed on r.b.c. Anti-Yoshida γ -globulins inhib. by 28% glycine incorporation into Walker cells and by 35% in Yoshida cells. These γ -globulins adsorbed on to Yoshida cells did not modify glycine incorporation in either group. (French) M.A.Price

3739. NEUTRALISATION OF THE MOUSE MAMMARY TUMOUR VIRUS BY RABBIT ANTISERA AGAINST C3Hf TISSUE. P.B.Blair: *Cancer Res.*, 1963, 23, 381-384 (Dept. Zool., Univ. California, Berkeley, Calif.,

U.S.A.) An antigenic similarity was found between C3H mammary tissue extracts containing mammary tumour virus and an extract of genetically similar tissues containing abundant virus-like particles but no biol. active mammary tumour virus. B.M.Stevens

3740. ENZYMIC DEDIFFERENTIATION OF NEOPLASTIC CELLS. M.Thiery and R.G.J.Willighagen: *Nature*, Lond., 1963, 197, 1312-1313 (Dept. Gynaecol., State Univ., Ghent, Belgium) An invasive squamous cell carcinoma induced by painting the mouse cervix with 3⁴ benzpyrene showed a high 5-nucleotidase activity which was maintained during prolonged transfer and contrasted with the low 5-nucleotidase activity of the normal cervico-vaginal epithelium. In the ascites line of this tumour, the enzyme was absent and did not reappear when die cells were grown as solid s.c. nodules.

CM.Lewis

3741. GUANASE ACTIVITY IN NORMAL AND NEOPLASTIC HUMAN TISSUE. R.Levine, T.C.Hall and C.A.Harris: *Cancer*, Philad., 1963, 16, No.2, 269-272 (Publ. Hlth. Dept., Pondville Hosp., P.O.Box H[Walpole, Mass., U.S.A.) An adaptation of the R³² Norris spectrophotometer method for the determination of guanase is described. The deletion hypothesis received no support from the examination of tumours, except in case of brain tumours, although few tumour tissues have been obtained from tissues normally high in guanase. Determination of guanase activity in heart muscle and r.b.c. of human, dog, rabbit, rat, mouse and hamster showed marked spp. difference.

D.I.Conne

3742. COMPARATIVE ENZYMOLOGY AND CELL ORIGIN OF RAT HEPATOMAS. IV. PYRIMIDINE METABOLISM IN MINIMAL-DEVIATION TUMOURS. T.Ono, D.G. Blair, V-R.Potter and H.P.Morris: *Cancer Res.*, 1963, 23, 240-249 (McArdle Mem. Lab., Med. Sch., I¹ Wisconsin, Madison, Wis., U.S.A.) Morris 7316, Morris 7800, Reuber H-35 and Morris 5123 were classified as "minimal-deviation" hepatomas since they all possessed significant though reduced levels of liver 'marker' enzymes, such as carbamyl phosphate synthetase, ornithine transcarbamylase, uracil reductase and thymine reductase, in contrast to Novikoff hepatoma which possessed little or none of the 'marker' enzymes. Other pyrimidine enzymes studied included aspartic transcarbamylase, orotic decarboxylase and enzymes converting orotic acid via orotidylic acid to the uridine nucleotides. These enzymes were found in almost normal amounts in the hepatomas.

B.M.Steven

3743. PLASMA LACTIC DEHYDROGENASE [LDH] IN MICE WITH MYELOID LEUKAEMIA. I. RELATION OF ENZYME LEVEL TO COURSE OF DISEASE. K.Nishimura, K.B.Jacobson, V.K.Jenkins and A.C.Upton. II. ³²P³²f³²C³² PRODUCTION OF THE ENZYME.

K.B.Jacobson and K.Nishio: *Cancer Res.*, 1963, 23, 340-343, 344-345 (Biol. Div., Oak Ridge Nat. Lab., Oak Ridge, Tenn., U.S.A.) I. LDH activity was increased in R.F. mice with primary or transplanted X-irradiation induced leukaemia. The increase in mice with transplanted ³²P³²f³²C³² varied irregularly with time after transplantation and the transplant generation, the mean of all values being approx. 14 times normal. The extent of increase in transplant generation was correlated with the severity of leukaemic infiltration of liver and other organs.

Whole-body X-irradiation in normal mice also produced transition increase in LDH activity. II. The LDH of normal organs was characterised using

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analyses of NAD and differed from the LDH of leukaemic Plasma. The most likely source of the leukaemic plasma enzyme appeared to be the tumour cell. B.M. Stevens

3744. METABOLIC ADAPTATIONS IN RAT HEPATOMAS. m. GLUCOSE 6-PHOSPHATE DEHYDROGENASE AND PYRIMIDINE REDUCTASES. T.Ono, V.R.Potter, H.C. Pitot and H.P.Morris. IV. REGULATION OF THREONINE AND SERINE DEHYDRASE. R.H.Bottomley, H.C. Pitot and H.P.Morris. V. RECIPROCAL RELATIONSHIP BETWEEN THREONINE DEHYDRASE AND GLUCOSE 6-PHOSPHATE DEHYDROGENASE. R.H.Bottomley, H.C. Pitot, V.R.Potter and H.P.Morris: Cancer Res., 1963, 23, 385-391, 392-399, 400-409 (McArdle Mem. Lab., Med. Sch., Univ. Wisconsin, Madison, Wis., U.S.A.)

All 3 enzymes increased on a high protein diet and decreased on a low protein diet in normal livers from Buffalo or Holtzman rats. These changes were remarkably suppressed in livers of Buffalo rats bearing Morris Hepatoma 5123. In the hepatoma the pyrimidine reductase did not change at all. Distinct sex differences were shown in hepatoma enzyme levels, the differences being opposite to those found in control and host livers. The differences were not reversed by feminisation of hosts.

IV. The capacities of several hepatomas to respond to a high protein diet with increased dehydrase activities varied. The response in one tumour depended on the presence of the adrenals. The effect of portal vein ligation on the capacity of hepatic tissue to respond to a high protein diet with increased dehydrase levels was also studied.

In normal liver under various dietary and hormonal conditions both enzymes could not be induced to high levels at the same time. In a series of "minimal deviation" hepatomas a wide range of values of both enzymes was found. One tumour had fairly high levels of both enzymes after high protein feeding. B.M.Stevens

3745. METABOLISM OF ETHIDIUM BROMIDE [(3, 8-DIAMINO-5-ETHYL-6-PHENYL-PHENANTHRIDIUM BROMIDE)] IN NORMAL AND NEOPLASTIC TISSUES. T.S.Kandaswamy and J.F.Henderson: Cancer Res., 1963, 23, 250-253 (Dept. Pharmacol., G.Washington Univ. Sch. Med., Washington, D.C., U.S.A.)

Ethidium bromide was rapidly cleared from the blood after i.p. in mice. 50% of the dose was excreted in 24 hr. by normal mice and 24% by mice bearing Ehrlich ascites carcinomas. After an initial period of high concn. the drug gradually left most tissues, but appeared to be accumulated in muscle. High levels were found in ascites fluid soon after injection, but the drug disappeared rapidly in time. All the drug could be accounted for unaltered. B.M.Stevens

3746. DEAMINATION OF DEOXYNUCLEOTIDES AND DEOXYNUCLEOSIDES BY NORMAL RAT LIVER HEPATOMAS. J.S.Roth, B.Sheid and H.P.Morris: Cancer Res., 1963,

454-461 (Inst. Cell. Biol., Univ. Connecticut, Storrs, Conn., U.S.A.) Normal liver was shown, by a PMR assay diffusion technique of NH₃ determination, to have even tissues with low deaminase activity, to about 46 Mmoles of deoxycytidylate/g. protein/hr. in the Patoma and a no. of Morris 5123 sublines showed V high activity; Dunning hepatoma had 50% of this activity. MDAB and Novikoff hepatomas had extremely high activities. Deoxyadenylate and deoxyguanylate deaminase, by the liver and the hepatoma but up to 0.3% may have been involved. Deamination of deoxyuridine and deoxyguanosine varied greatly in different Patomas. B.M.Stevens

3747. IN VITRO SYNTHESIS OF ACID-SOLUBLE THYMINE COMPOUNDS BY HUMAN NEOPLASTIC TISSUES. G.D.Bimie and C.Heidelberger: Cancer Res., 1963, 23, 420-430 (McArdle Mem. Lab., Med. Sch., Univ. Wisconsin, Madison, Wis., U.S.A.) [14c]Formate

was the most effective precursor when tumour minces were incubated in Eagle's medium with ATP, phosphoglycerate, glucose, deoxyuridine and pH 7.0 phosphate buffer. [14c]Formaldehyde or, to a lesser extent, [2-14c]uracil were also incorporated but not L-[3-14c]serine, [6-14c]orotic acid, [2-14c]deoxyuridine, [3H]deoxyuridine or L³H]deoxyuridylic acid. The synthesis was inhibited by 5-fluorouracil, 5-fluoro-2'-deoxyuridine or 3', 5'-diacetyl-5-fluoro-2'-deoxyuridine, considerable variations in responses by the various tumours being observed.

B.M.Stevens

3748. SIALIC ACID CONTENT OF THE R.B.C. AND OF AN ASCITES TUMOUR CELL OF THE MOUSE. A.Miller, J.F.Sullivan and J.H.Katz: Cancer Res., 1963, 23, 485-490 (Radioisotope Serv., V.A.Hosp., Boston, Mass., U.S.A.) Neuraminidase released 36 times more sialic acid/cell from Ehrlich cells than from r.b.c. If all located on the surface the sialic acid density on Ehrlich cells was calc. to be approx. 4 times greater than that on r.b.c. Trypsin released a fragment containing bound * sialic acid from both. The sialic acid thus released from Ehrlich cells was only approx. 15% of that released by neuraminidase, although the 2 enzymes released approx. equal amounts from r.b.c. The r.b.c. sialic acid-containing compound was nondialysable and not pptd. by TCA. Paper chromatography showed that 30% of the tumour cell sialic acid was in N-glycolneuraminic acid whereas the other 70% and virtually all the r.b.c. sialic acid was in N-acetylneuraminic acid.

B.M.Stevens

3749. DISTRIBUTION OF TRITIUM LABELLED 0-3-THIENYL-Irr ALANINE IN TISSUES OF ADULT MALE RATS BEARING MURPHY-STURM LYMPHOSARCOMA. A.B.A. Samal, L.E.Frazier, G.Monto, A.Slesers, Z.Hruban and R.W. Wissler: Proc. Soc. exp. Biol., N.Y., 1963, 112, 442-445 (Dept. Pathol., Univ. Chicago, IL, U.S.A.)

Holtzman c² rats bearing Murphy-Sturm lymphosarcomata were for. ft ft H ft A. Aaw iit Vi Q-o-^---t-T -- -

L-aiaiunc. 1 ney were Killed 5, 29 or 53 hr. later. The greatest concn. were present in the kidney and liver at any of die times studied. High concn. occurred in the jejunal mucosa and the pancreas after 29 hr. There was little concn. in the tumour. D. N. Wheatley

3750. METABOLISM OF [36c]DICHLOROMETHOTREXATE [DCM] BY TRANSPLANTABLE LIVER TUMOURS. R.H.

Adamson, T.L.Loo and H.P.Morris: Proc. Soc. exp. Biol., N.Y., 1962, 111, 566-568 (Nat. Cancer Inst., N.I.H., Bethesda, Md., U.S.A.) In vitro metabolism of [36ci]-DCM in liver neoplasms, 5123, 7800, 5123TC and Reuber hepatoma occurred at a rate similar to that of normal liver. The Novikoff tumour had no activity whereas tumour 3683 had only slight activity.

M.M.Shapland

3751. ELECTROPHORETIC MOBILITY OF HUMAN TUMOUR CELLS. P.S.Vassar: Nature, Lond., 1963, 197, 1215-1216 (Dept. Pathol., Univ. British Columbia, Vancouver, B.C., Canada)

Fine cell suspensions were made from tumour tissues freshly excised from human patients and their electrophoretic mobility measured. Epithelial malignant cells tended to have a rather low electrophoretic mobility, whereas that of connective tissue tumour cells was fairly high.

G.M.Lewis

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1963, 44, 410-418 (Dept. Path., Med. Coll., Albany, N.Y., U.S.A.) The most significant features found on E.M. of 4 tumours were the irregular nature of the basement membranes and the sparsity and irregularity of microvilli on tumour cells which bordered the lumen of the colon.

D.N.Wheatley

3753. FACTOR FROM HeLa CELLS PROMOTING COLONIAL GROWTH OF HUMAN FIBROBLAST LIKE CELLS IN CULTURE. J.F.Foley, BJ.Kennedy and J.D.Ross: Cancer Res., 1963, 23, 368-371 (Dept. Med., Univ. Minnesota, Minneapolis, Minn., U.S.A.) Irradiated

HeLa cells, lysed HeLa cells and medium from irradiated HeLa cultures all contained a substance stimulating colonial growth of cells derived from human amnion cultures. The substance appeared to be non-dialysable, inactivated by acid or alk. hydrolysis, resistant to boiling, DNase or RNase but susceptible to trypic digestion.

B.M.Stevens

3754. A NEW CELL CONCENTRATION METHOD FOR CANCER CYTOLOGY OF SPUTUM. M.Takahashi and M.Urabe: Cancer, Philad., 1963, 16, No.2, 199-204 (Path. Dept., Central Hosp. Japanese Nat. Railways, Tokyo, Japan) A marked improvement in diagnostic accuracy was reported using the new method of concentrating cellular elements in sputum by liquefaction and centrifugation. The stock soln. used preserved the cells without autolysis.

D.I.Connell

3755. IMMEDIATE DESTINATION OF CANCER CELLS INJECTED INTRAVENOUSLY TO NORMAL ANIMALS.

I. MICROSCOPIC AND RADIOACTIVE STUDY OF THE EPITHELIOMA OF GUERIN FROM WHITE MICE.

L.Driessens, G.Giaux, L.Adenis and P.Quandalle: OR. Soc. Biol., Paris, 1962, 156, 1653-1656 (Inst. Rech. sur le Cancer, Lille, France) 1-30 min. after injn. of tumour cells into rats, few cancer cells were found in the circulating blood. There was a lower level of tumour cells in muscle, brain and genital organs. Uptake of cells by the spleen continued at a const. rate for 30 min. Fixation by the adrenal and bone was marked during the first few min. The liver and lung showed the greatest accumulation of tumour cells.

(French) M.A.Price

3756. RECENT ADVANCES IN THE KNOWLEDGE CONCERNING CHEMOECTOMAS. I.Costera Lab. Invest., 1963, 12, 270-284 (Nat. Inst. Cardiol., Mexico City, Mexico) Silver impregnation histol. studies and assure culture of a carotid body tumour are described in detail. The main tumour components were pyriform chief cel¹ with single long processes ending round blood vessels; nerve fibres and synaptic complexes; and argentaffin cells.

A.M.Mackay

3757. USE OF SERUM GLYCOPROTCIN LEVELS IN SELECTION OF PATIENTS WITH ADVANCED BREAST CANCER FOR ENDOCRINE SURGERY. W.Burnett, R.A.McAllister and R.Shields: Scot. Med. J., 1963, 8, 197-203 (Univ. Dept. Surg., Western Infirmary, Glasgow, Scotland)

Serum glycoproteins were estimated in 41 women with advanced breast cancer before and after endocrine ablation (ovaries, adrenals or pituitary). A high level was present initially which fell with remission. Very high levels had a poor prognosis and on this basis only 23 of the patients would have had endocrine ablation. The remission rate would then have been 70%. Seromucoid-bound carbohydrate was the most useful index.

A.M.Mackay

3758. SUPRARENAL FUNCTION IN MICE INJECTED WITH HOMOGENATES OF SARCOMA 180. E.Mascitelli-

Corfandoli and F, Di Re: Atti Acad.. med., Lombarda, 1962, 17, 89-93 (1st. di Anat. e Istologia Patologica, Univ. Pavia, Italy) Mice were inj. i.p. with 0.5 ml. of a homogenate of Sarcoma 180 and killed after various time intervals. Compared with a control group which were inj. with a homogenate of normal tissue (liver, kidney, heart, etc.) the wt. of the thymus gland in the expt. animals decreased constantly with time, and the adrenal and plasma CoA and corticosterone levels decreas^{ed} to about 50% normal within 2 weeks. A 'toxohomone' present in the neoplastic tissue was implicated as the causative agent. (Italian) G.N.Godson

3759. VARIATIONS OF THE CONTENT OF LYSOZYME IN NORMAL RATS AND IN RATS BEARING JENSEN SARCOMA FOLLOWING SURGERY. G.C.Peni, J.G.Cappuccino, M.Faulk, J.Mellors and C.C.Stock: Cancer Res., 1963, 23, 431-435 (Div. Expt. Chemother., Sloan-Kettering Inst., New York, N.Y., U.S.A.) Lysozyme activity increased in sarcoma-bearing rats, especially in the kidney. Levels in lung and intestine were little affected. Surgical removal of the tumour restored renal lysozyme to normal rapidly. A decrease also occurred if the tumour regressed spontaneously. Splenectomy reduced renal lysozyme activity in normal rats and, to a lesser extent, in tumour-bearing rats.

B.M.Stevens

3760. PITUITARY ROLE IN THE OESTROGEN DEPENDENCY OF EXPERIMENTAL MAMMARY CANCER.

A^terental, J.M.Dominguez, C.Weissman and O.H. Pearson: Cancer Res., 1963, 23, 481-484 (Dept. PathoL, Western Res. Univ. Sch.Med., Cleveland, Ohio, U.S.A.) Mammary tumours were induced in 50 day old albino Sprague-Dawley rats by feeding 20 mg² of 7,12-dimethylbenz(a)anthracene. Adrenalectomy and ovariectomy or hypophysectomy within 10-20 days of tumour appearance produced regression in all cases. Oestrogen reactivated tumour growth after adrenalectomy and ovariectomy but not after hypophysectomy, even when thyroid and cortisone replacement therapy was employed.

B.M.Stevens

3761. TREATMENT OF ANAEMIA IN THE TUMOUR BEARING HAMSTER WITH CORTISONE AND SODIUM SALICYLATE. J.D.Sherman and G.H.Friedell: Cancer Res., 1963, 23, 180-183 (Dept. Pathol., Massachusetts Mem. Hosp., Boston, Mass., U.S.A.) Both cortisone acetate and Na salicylate given from the time of, or 1 week after, fibrosarcoma transplantation inhib. tumour growth and prevented the concomitant anaemia and splenomegaly. In anaemic hamsters bearing large ad^{vanced} fibrosarcomas cortisone prevented profound spleen changes and restored the Hb to normal. Tumour necrosis was increased somewhat, but abnormal splenic haemolysis was inhib. Na salicylate gave transient benefit in¹ correcting the haemolytic anaemia and the spleen mot^{ility} was less abnormal than in untreated tumour bearing animals.

B.M.Stevens

3762. EFFECT OF PROGRESSIVE SARCOMA 180 GROWth UPON THE UTEROTROPHIC RESPONSE TO OESTROGEN IN MICE. R.Hill, L.J.Lemer, E.Lang and A.Bor man: Cancer Res., 1963, 23, 304-309 (Squibb Ins^{titute} Med. Res., New Brunswick, N.J., U.S.A.)

response to various doses of oestradiol benzoate, oestriol or oestriol in ovariectomised mice decreased as tumour growth progressed. Tumour-free ovariectomised mice showed an unaltered uterine response to oestradiol when food intake was restricted, but pair-fed tumour-bearing ovariectomised mice showed a reduced uterine growth response.

B.M.Stevens

- 3763. OUTLINE OF A GENERAL PATHOLOGY OF HUMAN TUMOURS.** R.De Riuyck: C.R. Acad. ScL, Paris, 1962, 255, 426-428. When the log of human body wt. was plotted against the log of age from conception in menstrual cycles a 3-part curve was obtained covering infancy to 18 months, pituitary controlled growth ³²P to 19 yr. and maturity and senescence. If the rate of Occurrence of tumours was plotted on a similar graph ³²P showed inhibn. between 11 and 19 yr., but in every case all tumours of the same organ gave the same curve. The origin of all cancer in a virus infection in embryo is Postulated. (French) S.A.Thistlewood

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3766. LOCAL RELEASE OF ADRENALINE-LIKE SUBSTANCE DURING INFLAMMATION. D.A.Willoughby and W.G.Spector: Int. J. Neuropharmac., 1962, 1, 217-220 (Dept. Morbid Anat., University Coll. Hosp., London, England) MAO inhibitors suppressed certain ~~and~~ ^{and} responses in the rat. This effect may be like $\times T^{10}$ Presivation of locally released adrenaline-distance in the injured area. G.J.F.Blane

- ⁶⁷, HTO TAMINE AND 5HT AND THE INFLAMMATORY
PROCESSSES. K.G.S.Bhatt and R.K.Sanyal: J. Pharm.
Lond., 1965, 15, 78-79 (MaulanaAzad. Med. Coll.,
New Delhi, India). A letter. J.M.Whitmarsh

3768. SERUM HAPTOGLOBIN IN RABBITS AFTER SUB-
OR V^{IT} INJECTION OF FREUND'S ADJUVANT
ex^sPENTINE. J.B.Miale and J.W.Kent: Proc. Soc.
thniv "X" N? Y- 1962 » n* 589-590 (Dept. Path.,
Institute of Miami Sch. Med., Miami, Fla., U.S.A.)
The level^r tⁱp^te injn. of turpentine significantly raised
reund V^o serum haptoglobin. Similar treatment with
adjuvant did not have this effect.

- 3769. EXPERIMENTAL LATHYRISM. MODEL OF A GENERAL MESENCHYMAL DISEASE.** F.Hartmann, K.Siefert and F.Bolsing: Z. ZeForsch., 1963, 59, 358-394 (Path.Inst., Univ. Kiel, Germany) Expt.osteango-lathyrism was produced by giving 3 g. of p - aminopropionitile[BAPN] orally to 3 piglets for 12,19 and 38 days. Two control animals were used. Expt. and control animals were killed at the same time. The osteolathyrism caused disturbance of endochondrial ossification; cartilage cells were swollen; acid mucopolysaccharides in cartilage and in the aorta were decreased. This generalised lathyrogenic change of the connective tissues is regarded as an expression of an impediment in the biosynthesis of acid mucopolysaccharides in the local connective tissue cells.

(German) J.E.Linder

- 3770. ALKALINE PHOSPHATASE, FEATHERING AND BONE ASH IN CHICKS AS AFFECTED BY HEMIN.**
W.O.Pollard, M.S.Shorb and R.D.Creek: Proc. Soc. exp. Biol., N.Y., 1963, 112, 478-480 (Dept. Poultry Sci., Univ. Maryland, College Park, Md., U.S.A.)
The alk. phosphatase level in the serum of White Rock chicks treated with 5 mg. of haemin daily after the 8th day of hatching was considerably lower than in the controls. The birds which did not die within 10 days had feather abnormalities as well in some cases. The development of the barbs and barbules was suppressed.

D.N.Wheatley

- B.N.Wheatley

3771. ACUTE HYPERVITAMINOSIS A IN GUINEA-PIGS.

I. EFFECTS ON ACID HYDROLASES. G.Weissman,
J.W.Uhr and L.Thomas. II. EFFECTS ON DELAYED-
TYPE HYPERSENSMIVITY. J.W.Uhr, G.Weissmann
and L.Thomas: Proc. Soc. exp. Biol., N.Y., 1963,
112, 284-287, 287-291 (Dept. Med., N.Y. Univ. Med.
Sch., New York, N.Y., U.S.A.) I. Acute hyper-
vitaminosis was induced in guinea-pigs by oral vit.A.
There was probably a release of acid phosphatase, 3-
glucuronidase and cathepsin from lysosomes for these en-
zymes were lost from the lysosome prep, obtained by ultra-
centrifuging homogenates of the livers.

II. Treatment of guinea-pigs with vit. A and oils or palmitate resulted in a greater depression of the delayed hypersensitivity and Arthus reactivity than in controls which had a normal vit. A level. The inflammatory response to diphtheria toxin was also reduced. Clearance of phage from the circulation was unaffected by hypervitaminosis. The explanation is sought on the basis of the suppression of lysosome activity by excess vit. A.

D.N.Wheatley

- 3772. REGENERATION OF BONE MARROW IN IRRADIATED PARABIONT RATS.** S.Warren and E.M.Farrington: Lab. Invest., 1963, 12, 193-198 (Cancer Res. Inst., New England Deaconess Hosp., Boston, Mass., U.S.A.)
Castrate of rats in parabiosis with castrate ? were given supralethal total body X-irradiation. The *d* survived, with functional marrow recovery. Female w.b.c. appeared transiently in greater no. than usual in the *p* peripheral circulation but rarely in the regenerating *s* marrow.

A.M.Mackay

3773. FUNCTIONAL DEVELOPMENT OF THE RE SYSTEM
OF THE CHICK EMBRYO. K.Karthigasu and C.R.Jenkin:
Immunology, 1963, 6, 255-263 (Dept. Bacteriol.,
Univ., Adelaide, Australia) A quant. study has been
made of the phagocytosis of various particles by the de-
veloping chick embryo. The phagocytosis of rough strains
of bacteria was much more efficient compared with that
of smooth strains. The importance of serum opsonins in
promoting phagocytosis and the possible origin of these
factors in the chick embryo is discussed. *

IMMUNOLOGY AND EXPERIMENTAL PATHOLOGY

3774. COMPARATIVE PROTECTIVE ACTION OF UNSATURATED FATTY ACIDS FOR MICE AGAINST EXOTQXIN, ENDOTQXIN AND SNAKE VENOM. W.W. Spink and C.K.Su: Proc. Soc. exp. Biol., N.Y., 1963, 112, 463-466 (Dept. Med., Univ. Minnesota Med. Sch., Minneapolis, Minn., U.S.A.) *Staphylococcus* or *QL¹Iridium* endotoxins were used and inj. i.v. in lethai¹ doses into Swiss-Webster mice. Inj. of the toxin along with 0*05% oleic or linoleic acid gave complete protection. The antidote effect of these unsat. fatty acids on snake venom was similar. No protection was obtained against endotoxins of *E. coli* and *Brucella melitensis*. D.N.Wheatley

3775. RIGHT VENTRICULAR HYPERTROPHY IN SPONTANEOUS AND EXPERIMENTAL PULMONARY EMPHYSEMA. H.T.Strawbridge: Amer. J. Path., 1963, 42, 173-184 (Gen. Hosp., Winnipeg, Manitoba, Canada) In this study a decrease in the ratio left/right ventricular wt. was taken to indicate right ventricular hypertrophy [RVH]. Spontaneous generalised chronic emphysema was not associated with RVH in rabbits. The i.v. inj. of Caledon Blue into rabbits produced widespread pulmonary embolism with or without generalised emphysema. In rabbits showing RVH after the inj. of Caledon Blue, RVH was not related to the degree of emphysema, nor did a direct relationship exist between die degree of RVH and of vascular obstruction. D.G.Scott

3776. PRODUCTION OF ARTERIAL LESIONS BY A HUMORAL FACTOR IN PARABIOTIC RATS. P.R.Patek, S.Bernick and D.K.MacCallum: Circulat. Res., 1963, 12, 291-297 (Dept. Anat., Sch. Med., Univ. S. California, Los Angeles, Calif., U.S.A.) Coronary artery lesions were observed in both members of the pair when one had been treated before parabiosis with colloidal C to block the RE cells. R.E.Moore

3777. ATHEROSCLEROSIS IN THE RAT. EFFECT OF X-RAY AND A HIGH FAT DIET. H.Gold: Proc. Soc. exp. Mol., N.Y., 1962, 111, 593-595 (Beaumont Mem. Res. Lab., Mt. Sinai Hosp., Cleveland, Ohio, U.S.A.) Exposure to X-rays accelerated the development of atherosclerotic lesions in the coronary arteries of rats fed on a high fat diet. M.M.Shapland

3778. INDUCTION OF ATHEROSCLEROSIS BY CHOLESTEROL FEEDING IN THE HYPOPHYSECTOMISED RAT. P.R.Patek, S.Bernick, B.H.Ershoff and A.Weils: Amer. J. Path., 1963, 42, 137-145 (Dept. Anat., Sch. Med., Univ. S. California, Los Angeles, Calif., U.S.A.) The hypercholesterolaemia following the feeding of 1% cholesterol to hypophysectomised rats was reduced by desicated thyroid. Intact rats fed cholesterol developed thyroid hyperplasia; hypophysectomised rats did not. Cholesterol given to hypophysectomised rats was associated with the development of coronary and aortic atherosclerosis. D.G.Scott

3779. PREVENTION OF EXPERIMENTAL HYPERTENSION AND ARTERIOSCLEROSIS WITH TUBERCULIN, BCG OR MYCOBACTERIAL EXTRACTS. I.Somogyi, J.Rigo and J.Sos: Acta med. Acad. Sci. hung., 1962, 18, 423-428 (Pathophysiol. Inst., Med. Univ., Budapest, Hungary) Rats were made hypertensive and arteriosclerotic by feeding a diet containing large amounts of vit. D2. Treatment with BCG vaccine, tuberculin, extracts of bacterial cell wall or cell contents was effective in inhibiting the pathol. effect of the diet. (German) CF.Blane

3780. EXPERIMENTAL STRANGULATION OBSTRUCTION IN GUINEA-PIGS. C.E.Floyd, CH.Bomside and I.Cohn, jun.: Amer. J. Surg., 1963, 105, 228-232 (Dept. Surg., Louisiana State Univ., Sch. Med., New Orleans, La., U.S.A.) Segments, 6-8 cm. long, of the proximal intestine of adult guinea-pigs were strangulated by ligation of a branch of the mesenteric vein; in some animals the affected loop was also ligated (closed loop). Average survival times were 24 * 3 hr. after closed loop and 30-9 hr. after open loop strangulation. S.c. inj. of saline prolonged the survival times to 29*2 and 39-7 hr.; additional i.p. or intraluminal inj. of kanamycin to 37-2 and 57-6 hr. I.p. inj. of loop fluid was lethal to mice but non-toxic if gas gangrene antitoxin was inj. into the mice 24 hr. previously. Loop fluid from guinea-pigs treated with kanamycin was uniformly non-toxic. B.Cruickshank

3781. LIMITED USEFULNESS OF SERUM LACTIC DEHYDROGENASE [LDH] AS A TEST FOR STRANGULATION OBSTRUCTION. H.Laufman, P.F.Nora and J.J. Bahuth: Amer. J. Surg., 1963, 105, 233-238 (Dept. Surg., Northwestern Univ. Med. Sch., Chicago, Ill., U.S.A.) Serum LDH activity in 64 control patients was 100-620 units/ml. In 25 patients with acute abdominal conditions other than strangulation the value was < 600 in 24 and 940 in one. In 3 out of 9 patients with proved intestinal obstruction of 6-30 hr. duration the value was > 700, but in the other 6 it was < 600. B.Cruickshank

3782. SEX DIFFERENCE IN INDUCTION OF FATTY LIVER IN RAT BY DIETARY OROTIC ACID. H.Sidransky: Endocrinology, 1963, 72, 709-714 (Pathol. Dept., Med. Sch., Pittsburgh, Pa., U.S.A.) A diet containing 1% orotic acid fed to rats resulted in a greater degree of fatty liver development in ♀ than in ♂. Ovariectomy of ♀ did not affect fat deposition but castration of the ♂ resulted in a fatty liver similar to that of the ♀. H.C.Jones

3783. THE EFFECTS OF HEPATIC VEIN OCCLUSIONS. W.D.Widman, M.R.Hales and R.H.Greenspan: Amer. J. Path., 1962, 41, 439-447 pept. Pathol., Yale Univ. Sch. Med., New Haven, Conn., U.S.A.) Tubes placed so as to block the ostium of most of the hepatic veins were successfully introduced into 11 dogs. Four dogs developed portal hypertension and ascites associated with centrilobular necrosis, central or translobular fibrosis diminution of the portal venous system and enlargement of the hepatic arterial system. In 7 cases die development of collateral veins prevented the onset of portal hypertension. It is suggested that the opening up of collateral venous channels, the origin of which is discussed, accounts for asymptomatic cases of the Budd-Chiari syndrome. D.G.Scott

3784. THE PANCREATIC ISLET TISSUE IN MICE WITH OBESITY INDUCED BY GOLDTHIOGLUCOSE. B.Pete* son and B.Heliman: Acta path. microbiol. scand., 1962, 55, 401-406 (Histol. Dept. Univ., Uppsala, Sweden) There was an increase of more than 10% in the total islet vol. in naturally lean adult mice of p^e American strain, but no significant change in the incidence of silver-pos. A cells. The results support the hypothesis that hyperphagia is not the cause of the marked changes in the pancreatic islet tissue associated with & obese-hyperglycaemic syndrome. LFriedmann

3785. CONNECTIVE TISSUE. I. GRANULOMA FORMATION INDUCED BY THE IMPLANTATION OF JAPANESE

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AGAR, K.Konn[©] and T.Tetsuka: J. Biochem. Tokyo, 1963, 53, 231-237 (Dept. Biochem., Fac. Med., Univ. Tokyo, Japan) Granulomas were produced on s.c. "Plantation in rats. The characteristics of several other granuloma producing substances were examined. The Uagen formed was examined. B.M.Stevens

3786. CONNECTIVE TISSUE. VIII. EFFECT OF RICKETS UPON CHEMISTRY OF INFLAMMATION. J.C.Houck and R.A.Jacob: Proc. Soc. exp. Biol., N.Y., 1963, 112, 446-448 (Biochem. Res. Lab., Children's Hosp., Georgetown Univ. Med. Sch., Washington, D.C., U.S.A.) Rachitic rats developed less of an inflammatory response in dermal lesions caused by croton oil than control animals. Apart from there being less of hydroxyproline and no gain in hexosamine, the chemistry of the changes was little different in the rachitic group from the healthy controls. The healing of such lesions appeared to be complete more quickly in rachitic rats. As estimated from the chemistry of recovery, dermal tissue of rachitic rats did not display the 'distal mucin collagen response' to the adjacent local inflammation. D.N.Wheatley

3787. SERUM POLYSACCHARIDES IN THE DIAGNOSIS OF SYSTEMIC LUPUS ERYTHEMATOSUS. F.W.Wiggs^U: Scot. Med. J., 1963, 8, 204-207 (Dept. Phys. Med. Royal Infirmary, Aberdeen, Scotland) Estimations of serum IgG bound polysaccharide were performed on 59 patients with rheumatoid arthritis and LE diagnosed by standard methods. The level was highest in untreated LE than in rheumatoid arthritis, although there was slight overlap this simple test formed a basis for differentiating the diseases. A.M.Mackay

3788. ROLE OF PARATHYROIDS IN PRODUCTION OF OSTEITIS FIBROSA AND SOFT TISSUE CALCIFICATION BY LEAD ACETATE. H.Selye, B.Tuchweber and G.Gabbiani: Endocrinology, 1963, 72, 782-786

(Inst. Med., Univ. Montreal, Montreal, Que., Canada) The presence or absence of the parathyroids in rats did not influence the development of cutaneous calcification and osteitis fibrosa induced by Pb acetate injn. followed by s.c. injn. of histamine liberator or NaCl soln.

H.C.Jones

3789. HISTOLOGY OF OESTEODYSTROPHY IN HAEMIN TREATED CHICKS. W.O.Pollard, M.S.Shorb and R.D. Creek: Proc. Soc. exp. Biol., N.Y., 1963, 112, 480-483 (Dept. Poultry Sci., Univ. Maryland, College Park, Md., U.S.A.) White Rock chicks were treated with haemin at a dosage of 5 mg. daily from the second day post-hatching. There was an arrested development of the epiphyseal regions and less matrix formation in the leg bones of treated as compared with control birds. This histopathology was similar to that found in certain nutritional deficiencies, especially cationic deficiencies.

D.N.Wheatley

3790. ADJUVANT INDUCED POLYARTHRITIS IN RATS. I. ADJUVANT COMPOSITION, ROUTE OF INJECTION AND REMOVAL OF DEPOSIT SITE. J.R.Ward and R.S. Jones: Arthritis and Rheumatism, 1962, 5, 557-564 (Dept. Med., Univ. Utah, U.S.A.) The i.d. route was the most effective and the i.v. the least. A simple suspension of M. butyricum in oil was more effective than an emulsion of M. butyricum. Wax fractions of the mycobacteria were ineffective. Removal of the adjuvant depot later than 2 hr. after injn. did not prevent the development of arthritis. It is suggested that the polyarthritis is dependent upon dissemination of mycobacteria and oil through regional lymph nodes.

D.G.Scott

3791. ROLE OF SEX HORMONE IN THE PATHOGENESIS OF OSTEOARTHROSIS OF MICE. M.Silberberg and R.Silberberg: Lab. Invest., 1963, 23, 285-289 (Pathol. Dept., Washington Univ. Med. Sch., St.Louis, Mo., U.S.A.) Testosterone given to ovariectomised C57Bl mice significantly increased the incidence of osteoarthritis of old age compared with controls. A.M.Mackay

MICROBIOLOGY

See also Biochemistry: Micro-organisms

GENERAL

(INCLUDING STRUCTURE AND VARIATION)

3792. RUPTURE OF BACTERIA BY EXPLOSIVE DE-COMPRESSION. J.W.Foster, R.M.Cowan and T.A.Maag: *J. Bact.*, 1962, 83, 330-334 (Dept. Microbiol., Sch. Vet. Med., Univ. Georgia, Athens, Ga., U.S.A.) C.Toothill
3793. SIMPLIFIED METHOD FOR THE ROUTINE DETERMINATIONS OF ANTKTREPTOKINASE TITRE. J.Boszormenyi: *Z. Immun.-Forsch.*, 1962, 124, 411-418 (Serum and Vacc Inst., 'Human', Budapest, Hungary) A technical contribution. D.P.Winstanley
3794. METHOD FOR THE ISOLATION OF MYXOBACTERIA IN PURE CULTURE. H.D.McCurdy jun.: *Canad. J. Microbiol.*, 1963, 9, 282-285 (Dept. Biol., Essex Coll., Assumption Univ. Windsor, Windsor, Ont., Canada) Note. S.L.Hoare
3795. MEDIA FOR THE ENUMERATION AND ISOLATION OF HETEROTROPHIC SALT-MARSH BACTERIA. T.R.G. Gray: *J. gen. Microbiol.*, 1963, 31, 483-490 (Dept. Bot., Univ. Nottingham, England) The relative merits of several media for counting salt-marsh bacteria were investigated. A nitrogenous medium was apparently the least selective. For the salt water muds studied, media with a salinity about the same as sea water gave the highest counts of bacteria, particularly for samples from the salicornietum. A possible correlation of this and the origin of the mud is discussed. K.Brew
3796. HAEMAGGLUTINATION PROCEDURE FOR THE ASSAY OF TETANUS ANTITOXIN OF CHILDREN'S SERA. M.Surjan and G.Nyerges: *Z. Immun.-Forsch.*, 1962, 124, 390-400 (State Hyg. Inst., Budapest, Hungary) The antitoxin titres of 752 children immunised with tetanus toxoid were determined by the haemagglutination technique. In most cases the results agreed with those found by toxin neutralisation tests in mice, but in a few there were discrepancies up to five-fold. The results of toxin neutralisation tests are, however, inconsistent among themselves, and depend on the dose of toxin (they used L+/10 and L+/400). D.P.Winstanley
3797. DIPHTHERIA ANTITOXIN TITRATION OF HUMAN SERA BY HAEMAGGLUTINATION. M.Surjan and G.Nyerges: *Z. Immun.-Forsch.*, 1962, 124, 401-410 (State Hyg. Inst., Budapest, Hungary) 187 human sera were titrated by the haemagglutination technique and by the rabbit i.d. test. In most cases the results agreed, but sometimes there were 5-6 fold discrepancies. These are attributed to differences in avidity and are thought not to detract from the value of the method. The lower limit of antitoxin detectable is 0.006-0.012 AU/ml. D.P.Winstanley
3798. DEMONSTRATION OF TETRATHIONATE-REDUCTASE IN FACULTATIVE ANAEROBIC GRAM-NEGATIVE BACTERIA (ENTEROBACTERIACEAE, AEROMONAS AND PASTEURELLA). METHOD AND DIAGNOSTIC VALUE. L.Le Minor and F.Pichinoty: *Ann. Inst. Pasteur*, 1963, 104, 384-393 (Inst. Pasteur, Paris, France) Tetrathionate reductase (TTTR) was measured by a simple method based on incubation of culture with potassium tetrathionate followed by titration with N/10 iodine of the

liberated thiosulphate. 1020 strains of Enterobacteriaceae studied in this way showed Arizona, Citrobacter and Proteus were all TTR + and Salmonella, Providence TTR with few rare exceptions. E. coli, Klebsiella and Shigella were all TTR -, and most Aerofacter were TTR -, Cholera and El tor vibrios, Pasteurella pseudotuberculosis and P. pestis were TTR - and P. septica was TTR +. M⁺ Aeromonas were TTO -. (francRT*** B.Payne

3799. SITE OF GRAM STAIN IN CELLS OF GRAM-POSITIVE MICRO-ORGANISMS. Y.T.Tchan: *Nature*, Lond., 1963, 198, 213-214 (Microbiol. Sect., Dept. Agric, Univ. Sydney, Australia) Using the modified Gram stain technique, differentiation and dehydration of material could be carried out in iodinated alcohol, which did not remove the stain. Examination of ultra thin sections by light or phase microscope showed that in cells of yeast and Bacillus the cytoplasm was uniformly stained. G.M.Lewis

3800. EFFECT OF WATER ACTIVITY, SOLUTES AND TEMPERATURE ON THE VIABILITY AND HEAT RESET ANCE OF FREEZE-DRIED BACTERIAL SPORES. B.J. Marshall, W.C.Murrell and W.J.Scott: *J. gen. Microbiol.*, 1963, 31, 451-460 (Commonwealth Sci. and Indust. Res. Organisation, Div. Food Preservation, Ryde, N.S.W., Australia) Freeze dried spores of Bacillus megaterium, B. stearothermophilus, Clostridium bifermentans and C. botulinum type E suffered little loss of viability after storage at 25° at water activity (a_w) values of 0.2 to 0.8. At a_w values outside this range different losses of viability occurred, depending on conditioⁿ. The effect on viability of addition of various compounds to spore suspension before drying is described. Greatest resistance to heating was found after storage for 2-6 yr. in spores kept at a_w values of 0.4, 0.6 and 0.8. KBrew

3801. NITROGEN METABOLISM OF RUMEN PROTEOLYTIC BACTERIA. A.R.A.Akkada and T.H.Blackbum: *h gen. Microbiol.*, 1963, 31, 461-469 (Rowett Res. Inst., Bucksburn, Aberdeen, Scotland) Isolates from rumen of sheep identified as Bacteroides amylophilus, B. ruiningcola, spp. of Bacteroides, Selenomonas, Butyrivibrio. Bacillus, Eubacterium, Clostridium and Gram-pas. cocc were found to de proteolyse some strains had exopeP*** dase and amidase activity, but deamidase was rare. Most strains preferentially utilised NH₃ in synthesising cell constituents in media containing preformed amino acids. Few of the strains had urease activity. KBrew

3802. CARBON DIOXIDE FIXATION BY ORGANOTROPHIC BACTERIA. R.M.Lafferty: *Arch. Mikrobiol.*, 1963, 373-405 (Inst. Mikrobiol., Univ. Gottingen, Germany) The effect of CO₂ decrease on endogenous respiration, substrate respiration and oxidative assimilation was examined for a no. of bacterial strains. CO₂ assimilation was related to O₂ uptake by the quotient -ACO₂/AO₂. The highest quotient was obtained during oxidative assimilation of branched fatty acids by 2 newly isolated strains of Mycobacterium, when CO₂ fixation increased with increasing CO₂ pressure up to 5% CO₂. After 1-3 min. the CO₂ was fixed as asparagine and glutamic acid. With butyric acid as substrate the main CO₂ is built up by carboxylation of propionyl CoA. (German) EM-W

3803. MEASUREMENTS OF THE REMOVAL OF ⁵¹C¹⁴ LABELED ENDOTOXIN FROM THE CIRCULATION IN EXPERIMENTAL ANIMALS. D.Koch-Weser, ^{w,j} J.^f ^{**} intyre and R.L.Schapiro: *In.: J. appl. Radiat.*, 1^{y,b}f' 75-80 (Dept. MecU Western Res. Univ., Cleveland.

Ohio, U.S.A.)* A lipopolysaccharide from *E. coli* endotoxin labelled with ^{57}Cr has been found to be taken up by RE system of normal rabbits. The clearance of this endotoxin and its uptake by various organs has been studied in normal and tolerant rabbits (made tolerant by related injn. of endotoxin). Clearance of ^{51}Cr endotoxin, ^3H compounds and colloidal ^{198}Au has been measured by cannulation of carotid artery through scintillation crystal. These measurements were correlated with external counting over liver and head, and with in vitro assays of fluid samples and organs. The carotid artery shunt technique is preferred for its greater sensitivity and accuracy.

B.Payne

3804. TRITIATED ENDOTOXIN. I. PREPARATION AND ANALYSIS OF TRITIATED ENDOTOXIN. W.H.Schrader and B.F.Woolfrey: Amer. J. Path., 1963, 42, 225-233 (Dept. Pathol., Univ. Minnesota Med. Sch., Minneapolis, Minn., U.S.A.) Physical, chem. and bioassay prep. of [^3R]endotoxin (0.3-4 mc/mg.) were closely similar to those of control material. Decrease in mouse lethality and Shwartzman toxicity decreased with higher quantities of ^3H .

D.C.Scott

3805. INFECTION-PROMOTING ACTIVITY OF HIGH MOLECULAR WEIGHT ACIDIC MICROBIAL POLYSACCHARIDES. M.Shilo: Bull. res. Counc. Israel A, WBS, 11, 310-318 (Lab. Microbiol. Chem., Dept. Biochem., Hebrew Univ., Hadassah Med. Sch., Jerusalem, Israel) A no. of acidic high mol. wt. polysaccharides, including polysaccharides of *Xanthomonas* and *Arthrobacter* and phosphomannan of *Hansenula holstii* promoted peritoneal infections in mice with *Salmonella typhi*, *S. paratyphi* B, *Pasteurella pestis* strain E.V. 76 and "Mycopoccus" aureus and promoted dermonecrosis in rabbits infected intracutaneously with different pathogens. It was suggested that the infection- and necrosis-promoting activity of a Polysaccharide depend on its colloid properties that these activities are not a function of the conformation, manner of linkage of the individual repeating units or the presence of polar groupings in the carbohydrate polymer.

L.G.Gillies

3806. SPORES OF MICRO-ORGANISMS. XII. NON-PARTICIPATION OF THE PRE-EXISTING SPORANGIAL CELL WALL IN THE FORMATION OF SPORE ENVELOPES AND THE GRADUAL SYNTHESIS OF DIAMINO- α -IMELIC ACID [DAP]-CONTAINING STRUCTURES PURING SPOROGENESIS OF BACILLI. V.Vinten Foua: Microbiol., 1963, 8, 147-155 (Dept. General Microbiol., Inst. Microbiol., Czechoslovak Acad. Sci., not Hg. Uef Czechoslovakia) Exogenous [^{14}C]DAP but not DAP^{U} Preexisting in vegetative cells is incorporated into the envelope proteins, one before formation of the envelope. When [^{14}C]lysine "forced" by decarboxylation of the DAP^{U} incorporated with the latter, the other during sporulation of DAP^{U} [^{14}C]lysine is not incorporated markedly elevated during the pre-sporulation and at the outset of sporogenesis.

J.R.Sargent

3807. COMPOSITION AND STRUCTURE OF BACTERIAL SPORES. A.D.Warth, D.F.Ohye and W.C.Murrell: J. anit Bfol., 1963, 16, 579-592 (Commonwealth Sci. Ind. Res. Org., Div. Food Preservation, Ryde, N.S.W., Australia) A comparative analysis of the from 2? f^{esol} contents and insol. integuments of disrupted spores of *Bacillus cereus*, *B. subtilis*.

B. coagulans and *B. stearothermophilus* was made and electron micrographs of thin sections compared. The spores of the 4 spp. are structurally similar, consisting of 2 coats, a cortex and cortical membrane around the spore. The structure of the outer coat differs in the 4 spp. The mucopeptide constituents α, β-diaminopimelic acid and hexosamine are cone, in the insol. integuments of the thermophiles but in the sol. fraction of *B. cereus* and *B. subtilis*.

F.I.Barrow

3808. LOCATION AND COMPOSITION OF SPORE MUCOPEPTIDE IN BACILLUS SPECIES. A.D.Warth, D.F.Ohye and W.C.Murrell: J. cell Biol., 1963, 16, 593-609 (C.S.I.R.O., Div. Food Preservation, Ryde, N.S.W., Australia) Integuments from disrupted *B. coagulans*

spores lost all the hexosamine and DU ε-diaminopimelic acid, which was released as non-diffusible mucopeptide, by autolysis. The residual cortical structure and cortical membrane were destroyed. Lysozyme digestion of integuments of several heated *Bacillus* spp. specifically removed the cortex and membrane releasing the mucopeptide. This appears to be mainly located in the residual cortex and cortical membrane.

P.Barrow

3809. CHARACTERISTICS OF SPORES OF BACILLUS CEREUS PRODUCED BY A REPLACEMENT TECHNIQUE. E.A.Pelcher, H.P.Fleming and Z.J.Orbak: Canad. J. Microbiol., 1963, 9, 251-258 (Dept. Food Technol., Univ. Illinois, Urbana, Ill., U.S.A.) A replacement technique whereby spores of *B. cereus* were produced by transferring vegetative cells into non-nutritive soln. was employed for investigation of the relationship between Ca, dipicolinic acid, and heat resistance in spores. Replacement soln. of distilled water, fresh medium, Ca and other metal salts were employed. Spores produced in distilled water were heat sensitive and contained low levels of Ca and dipicolinic acid. Heat resistant spores with a normal level of Ca and dipicolinic acid were formed only in fresh medium or in soln. containing suitable levels of Ca.

S.L.Hoare

3810. GENERATION TIMES OF INDIVIDUAL BACTERIA: SOME CORROBORATIVE MEASUREMENTS. E.O.Powell and F.R.Errington: J. gen. Microbiol., 1963, 31, 315-327 (Microbiol. Res. Estab., Porton Down, Salisbury, Wilts., England) Measurements of individual generation times in 3 spp. of bacteria in 2 different growth media confirmed previous conclusions about the broad features of the generation time pattern. The results supported the following inferences: (i) complex media give rise to a greater dispersion of generation time than simple media, (ii) there is pos. association between the generation times of second cousins.

K.Brew

3811. FIXATION OF TETANUS TOXIN, STRYCHNINE, SHT AND OTHER SUBSTANCES BY GANGLIOSIDE. W.E.van Heyningen: J. gen. Microbiol., 1963, 31, 375-387 (Dunn Sch. Pathol., Univ. Oxford, England)

Tetanus toxin is fixed by brain ganglioside but not by a no. of similar substances. Considerable variation in toxin-fixing capacity is found in isolated brain gangliosides. In chloroform and methanol brain extracts a no. of gangliosides differing in toxin-fixing ability can be separated chromatographically. The effects of complexing ganglioside with substances and of Ca^{2+} or fixation of toxin are described. The ability of ganglioside to fix many compounds was investigated and the results are presented.

K.Brew

3812. NATURAL CYTOTOXIC ANTIBODIES IN HUMAN BLOOD SERA WHICH REACT WITH MAMMALIAN CELLS AND BACTERIA. II. EFFECT OF HEATED

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HUMAN SERUM ON MICRO-ORGANISMS. SJ.Webb and SJFedorofft Canad. J. Microbiol., 1963, 9, 155-162 (Dept. Bact., Univ. Saskatchewan, Saskatoon, Sask., Canada) Certain bacterial and mammalian cells have similar receptor sites which react with natural Ab present in human blood sera. Heated human sera containing these Ab are bacteriostatic to E. coli and Mycobacterium phlei and bactericidal to Bacillus subtilis. -The antibacterial effect is eliminated when the serum is treated with mouse cells.

S.L.Jioare

3813. VIABLE ORGANISMS FROM FAECES AND FOOD-STUFFS FROM EARLY ANTARCTIC EXPEDITIONS.

G.H.Meyer, M.B.Morrow and O.Wyss: Canad. J. Microbiol., 19b3, 9, 163-167 (Dept. Microbiol., Univ. Texas, Austin, Tex., U.S.A.) Microbiol. studies of continuously frozen human faeces and foodstuffs from sites of early Antarctic expeditions revealed viable organisms after 50 yr. Aerobic and anaerobic spore forming and non-spore forming bacteria, actinomycetes, yeasts, and moulds were recovered. No coliform bacteria were found and other enteric bacteria were of low incidence.

S.L.Hoare

3814. EMERGENCE OF COMPETENCE (FOR TRANSFORMATION) OF THREE HAEMOPHILUS SPECIES IN A CHEMICALLY DEFINED ENVIRONMENT. G.Leidy, I. Jaffee and H.E.Alexander Proc. Soc. exp. Biol., N.Y., 1962, 111, 725-731 (Dept. Ped., Coll. Phys. and Surg., Columbia Univ., New York, N.Y., U.S.A.) Three spp. of Haemophilus (H. influenzae, H. aegyptius and H. pa rainfluenzae) grown under the method of Goodgal and Hernibit in buffered saline containing L-aspartic and L-glutamic acids, Ca and Mg, were shown to emerge to a state of competence for transformation to streptomycin resistance. The emergence of competence was temp, dependent and inhib. by chloramphenicol; multiplication was not necessary.

M.M.Shapland

3815. EFFECT OF CHEMICAL MODIFIERS ON INACTIVATION AND MUTATION-INDUCTION BY γ -RADIATION IN E. COLI. BJ.Bridges: J. gen. Microbiol., 1963, 31, 405-412 (Isotope Res. Div., Wantage Res. Lab.

(A.E.R.E.), Berks., England) A study is presented of the effect of chem. sensitising and protective agents on the rate of mutation induction by γ radiations in strain WP2 of E. coli B/r. The organism mutates spontaneously at a slow rate to a tryptophan non-dependent form from the normal tryptophan dependent form but mutates under the influence of radiation at a much higher rate. The effect of sensitising agents and protective agents on inactivation and mutation-induction by radiation is described.

K.Brew

3816. ACTION OF MUTAGENIC AGENTS ON AUXOTROPHIC STRAINS O⁺ STREPTOMYCES. MJárai: Acta microbiol. Acad. Sci. hung., 1962, 9, 273-283 (Microbiol. Lab., Dept. Antibiotics, Chinoim Pharm. Works, Budapest, Hungary)

The mutagenic action of u.v. and probably of X-rays has an optimal dose on back mutation freq. of Streptomyces auxotrophs. Under the same conditions mutagenic specificity of 6 markers was observed. Acridine Orange, streptomycin, hydroxylamine, phenyl isocyanate and 8-oxyquinoline exerted also a definite mutagenic effect.

S.Igali

3817. NATURE OF COMPETENCE OF TRANSFORMABLE STREPTOCOCCI. R.Rakula and W.Walezak: J. gen. Microbiol., 1963, 31, 125-133 (Dept. Bacteriol., State List. Hyg., Warsaw, Poland) Transformable streptococci produce an exocellular factor provoking com-

petence under certain conditions and non-competence cultures become competent on addition of this factor. The process of conversion is time and temp, dependent and the kinetics concomitant with an enzymic reaction. The factor is heat sensitive. Competence is provoked by the action of hypothetical enzyme on cells of a non-transformable Streptococcus.

K.Brew

BACTERIA

3818. PRODUCTION O⁺ OCTADECENOIC ACID IN PLASMA BY STAPHYLOCOCCUS AUREUS. J.T.Weld, B.H. Kean and W.M.O'Leary: Proc. Soc. exp. Biol., N.Y., 1963, 112, 448-461 (Dept. Publ. Hlth. and Microbiol., Cornell Univ. Med. Coll., New York City, N.Y., U.S.A.)

Lipid droplets or plaques can be found on human blood-agar plates or 10% plasma-agar plates when inoc. with certain strains of S. aureus or when exposed to active sterile agar segments. Staphylococcus antitoxin prevented this phenomenon. ItTs suggested that S. aureus strains release lipase which causes the formation of lipid plaques due to its action on human plasma lipids.

D.N.Wheatley

3819. ANTIGENIC STRUCTURE OF STAPHYLOCOCCUS EPIDERMIDIS. DJungezmais Bull. Acad. pol. Sci., 1963, 11, 125-128 (Dept. Med. Microbiol., Sch. Med., Warsaw, Poland) The results obtained from chem. analysis showed no significant differences between the structure of cell fractions of S. epidermidis and of S. aureus. Chromatographic analysis of polysaccharide fractions revealed certain differences. The presence of a hexose of Rf 0*30 was found in all the glycoprotein fractions of S. aureus but in S. epidermidis this hexose was found in only very small amounts in one fraction. E.Parkinson

3820. FREQUENCY OF ELEVATED ANTISTAPHYLOLYSIN VALUES OVER TEN YEARS. O.Widholm: Ann. Med. exp. Fenn., 1963, 41, 93 (Dept. Serol. and Bacteriol., Univ. Helsinki, Finland) The object of the investigation has been to study the use of the reaction and to compare the annual distribution of normal and elevated values. The results of titrations in the 1st, 4th, 7th and 10th yr. of the period (1949-1959) have been subjected to statistical treatment. No direct correlation of elevated values with a general incidence of infections of staphylococcal origin could be demonstrated.

G.Faulkner

3821. MECHANISM OF LONG-CHAIN PHENOMENON O⁺ GROUP A STREPTOCOCCI. J.J.Hahn and R.M.Cole: J. exp. Med., 1963, 117, 583-594 (Med. Dept., Univ. Illinois, Chicago, 111, U.S.A.) Formation and destruction of long chains of Group A streptococci in the presence of type-sp. Ab were studied with the fluorescent Ab technique. Long chains were only formed in the presence of free Ab during the growth of the bacteria. Destru^{*}tion of long chains was shown to be dependent on continued growth and division of the bacteria in the absence of free Ab. Univalent fragments of digested Ab do not give rise to long chains. End-to-end aggln. during growth of G&P A streptococci has been suggested to explain the mechanism of this phenomenon.

H.E.HJones

3822. IDENTITY OF STREPTOCOCCAL GROUP D ANTIGEN AND TEICHOIC ACID. AJ.Wicken, S.D.Elliott

and J.Baddiley: *J. gen. Microbiol., 1963, 31, 231-239 (Dept. Anim. Pathol., Univ., Cambridge, England) isolated intracellular teichoic acids from 2 strains of group D streptococci were purified and their serol. and chem. P^A^P. examined. Both compounds reacted serol. with group D streptococcal antiserum, and were shown to be &em. similar. Group Ag prep, from 3 other group D streptococcal strains were serol. identical and chem. ^{^A far to the} teichoic acid from strain 39. The difference in serol. activity between intracellular teichoic acid from strain 8191 and that from the other 4 strains is probably associated with small differences in chem. imposition. K.Brew

K.Brew

³⁸² 3. SEROLOGICAL GROUPING OF THREE STRAINS OF
STREPTOCOCCUS EQUINUS. R.Fuller and L.G.M.
Newland: J. gen. Microbiol., 1963, 31, 431-434
Wat. Inst. Res. in Dairying, Univ. Reading, Berks.,
England) Group D antisera were prepared from 3
shdure "collection strains of S. equinus. They were
Jwn by reciprocal absorption tests to be group D strepto-
cocci. K Brew

D step
K Brew

3824. MICROBIOLOGICAL TRANSFORMATION OF STEROIDS. XXN. HYDROXYLATION OF THE STEROID MOLECULE BY STRAINS OF STREPTOMYCES
 J. UADIAE, O. Vondrova, M. Tadra and A. Capek: FoHa Microbiol., 1963, 8, 176-179 (Inst. Microbiol., Czechoslovak Acad. Sci., Prague, Czechoslovakia)
 S. ^ Hid, transforal dd A4- β -Ketosteroids of the pregnane derivative maxinly to 60-hydroxy-, or 6 α ft 11a-dihydroxy of A $^{\prime\prime}$. These reactions can be used in the classification S. fraH ^ Otnycetes since a study of different strains of ^-SSjæd showed that the transformations were stable.
 389c J.R. Sargent

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J.R.Sargent

NEW GENUS OF THE ACTINOMYCETALES:
ICROELLOBOSPORIA GEN. NOV. T.Cross, M.P.Le-
 valier and H.Léchevalier: J. gen. Microbiol.,
 31, 421-429 (Dept. Biol. Sci., Bradford Inst.
 Ph.D. Bradford, England) Two aerobic meso-
 Plancton ^{60 min.} belonging to the family Actino-
 sporeae are described under the name Microellobos-
 poria. (M^* *cinerea* type sp.). The production of small
 club-shaped sporangia on the aerial mycelium character-
 izes the genus. Similar structures are formed on the sub-
 strata of the mycelium. Non-motile sporangiospores are few
 arranged in a single straight row inside the sporangium.

K.Brew

R. Brew

**E.-M. OBSERVATIONS OF THE SPORANGIAL
STRUCTURE OF AN ACTINOMYCETE, MICROELLO-
BOSPIRA FLAVEA. M.Rancourt and H.A.Lechevalier**

J. gen. Microbiol., 1963, 31, 495-498 (Inst. Micro-
biol., Rutgers State Univ., New Brunswick, N.J.,

Vete¹ Sial² xam³ an⁴ in⁵ ed⁶ wit⁷ an⁸ E#M*⁹ <11 le¹⁰ Ultrathin¹² sections¹³ of¹⁴ sporangia¹⁵ of¹⁶ M.¹⁷ flavea¹⁸

and¹⁹ Sial²⁰ xam²¹ ined²² wit²³ an²⁴ E#M*²⁵ <11 le²⁶ structures²⁷ of²⁸ the²⁹ spor³⁰

spores³¹ wall³² and³³ the³⁴ sporangiospores³⁵ are³⁶ described³⁷. The³⁸

finely³⁹ granular⁴⁰: nucleus⁴¹, large⁴² vacuoles⁴³ and⁴⁴ coarsely⁴⁵

granular⁴⁶ cytoplasm⁴⁷. The⁴⁸ cytology⁴⁹ of⁵⁰ the⁵¹ M. flavia⁵² spor⁵³

angiospores⁵⁴ is⁵⁵ similar⁵⁶ to⁵⁷ the⁵⁸ conidia⁵⁹ of⁶⁰ Waksmanialosea⁶¹.

K.Brew

3827. THREE FACTORS OF ANTHRAX TOXIN: THEIR IMMUNOGENICITY AND LACK OF DEMONSTRABLE ENZYMIC ACTIVITY. J.L.Stanley and H.Smith: J. r *Esk^wicrobiol* - 1963 - 31, 329-337 (Microbiol. Res. foU^{nff}Norton, Salisbury, Wilts., England) The ^factUpS^zyme activities were lacking in a lethal or ac id nh³ the factors of anthrax toxin: ATPase, alk. ^{pn}osphatase, catalase, collagenase, RNase,

DNase, gelatinase, hyaluronidase, lecithinase, lipase, proteinase. Factor II is the only factor which is immunogenic when inj. alone, but addition of factor I results in increased immunising activity whereas addition of factor III decreased the activity. The possible effect of these results on prep, used to immunise against anthrax is discussed.

K.Brew

3828. SWARMERS OF BACILLUS CEREUS. K.A.Bisset and
C.M.F.Hale: J. gen. Microbiol., 1963, 31, 281-284

(Dept. Bacteriol., Univ., Birmingham, England) The production of swarmers by *B. cereus* OCCUB naturally especially in the case of 'mycoides' variants, but can also be induced by growth on media of low N content, containing low concn. of basic dyes. The characteristics of these small coccobacilli are described. On continued subculture a proportion of strains gradually revert to a Bacillus-like form with heat-resistant endospore. Certain implications of the phenomenon are discussed. K.Brew

K.Brew

3829. PRODUCTION OF LYtic FACTOR BY U.V. IRRADIATED CULTURES OF BACILLUS CEREUS. I. CONDITIONS OF LYSIS INDUCTION. S.Csuzi and M.Kramer: *Acta microbiol. Acad. Sci. hung.*, 1962, 9, 297-304
(Inst. Chem. Univ. Med. Sch. Budapest, Hungary)

(Inst. Chem., Univ. Med. Sch., Budapest, Hungary)
 On lysis of B. cereus 569 induced by u.v. light a factor lytic to B. cereus 130 is released which is of protein character. Lysis of the strain 569 by u.v. irradiation and that of strain 130 by the lytic factor seem to be of different nature. S.Igali

S.Igali

3830. SECOND BACTERIOCIN-LIKE PRINCIPLE OF BACILLUS MEGATERIUM. I. CHARACTERISTICS OF BACTERICIDAL PRINCIPLE. E.H.Marjai and G.Ivánovics: Acta microbiol. Acad. Sci. hung., 1962, 9, 285-295 (Inst.* Microbiol., Univ. Med. Sch., Szeged, Hungary) The killer-principle¹ of 2 B. megaterium strains (an antagonist to the phage sensitive strains of the same species) is thermostable, sedimentable by centrifugation for 2 hr. at 50000 r.p.m., does not multiply in the cells though adsorbs on them. It can be readily differentiated from megacin, a bacteriocin-like substance of protein nature. S.Igali

S.Igali

3831. TESTS OF *BACILLUS THURINGIENSIS* VAR. *THURINGIENSK BERLINER* AND *B. CEREUS* *FRANKLAND* AND *FRANKLAND* ON LARVAE OF *CHORISTONEURA FUMIFERANA* (CLEMENS). W.A.Smirnoff: Canad. Ent.,

1963, 95, 127-133 (Forest Res. Lab., P.O. Box 35. Silviculture, Quebec, Canada) The host was the spruce budworm. Field tests indicate that some strains of B. cereus are as effective as B. thuringiensis and at a low temp. (13•#) the former is toe more effective. Since B. cereus does not form crystals these are perhaps not essential to mortality. It may be possible to select a bacillus strain to suit a particular condition. Field tests showed that previous laboratory tests gave an incomplete picture of bacterial effectiveness. Temp, and pptn, seem the most important factors. The presence also of a microsporidian pathogen complicates the assessment of results. H.W.Spencer

T. Spencer

**3832. EFFECTIVENESS OF A MICROBIAL INSECTICIDE
AGAINST LARVAE OF THE EUROPEAN PINE SHOOT
MOTH, RHYACIONIA BUOLIANA (SCHIFFERMULLER).
P.J. Pointing.
J. insect Path., 1962, 4, 484-486 (Forest**

P.J. Pointing: J. Insect Path., 1962, 4, 484-486 (Forest Insect Lab., Sault Ste. Marie, Ont., Canada) Fresh, uninfested buds of *Pinus resinosa* were treated with a commercial prep. of *Bacillus thuringiensis* and placed in 2-in. vials with single third-instar larvae of *R. buoliana*. After 7 days there was 80% mortality among Tarvae provided with buds contaminated on all surfaces but only 50% among those

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provided with uncontaminated bud base. The insecticide is toxic to *R. buoliana* but relatively ineffective because the insect rejects surface plant tissue, so avoiding the insecticide or only ingesting small amounts of it.

R.J.Walker

3833. COMPARATIVE DATA ON CLOSTRIDIUM PERFRINGENS (W. WELCHH) TOXINS AND ANATQXINS PURIFIED BY DIFFERENT METHODS. I.M.Khaustova and A.G.Ougleva: Vop. Med. Him., 1963, 9, 209-213 (State Res. Inst. Vaccines and Sera, Leningrad, U.S.S.R.) Toxin and anatoxin of *C. perfringens* were purified by 4 methods: (1) ammonium sulphate pptn. (2) isoelectric and ethanol pptn. (3) pptn. by TCA. (4) pptn. by sodium hexamethaphosphate in acid media. Highest yields and highest degreee of purification were obtained using the last method. J.R.Sargent

3834. E. COLI INFECTION. I. REPRODUCTION OF TOE DISEASE IN NATURALLY-REARED PIGLETS. C.N. Saunders, A.J.Stevens, J.B.Spence and W.Sojka. n. REPRODUCTION OF THE DISEASE IN PATHOGEN-FREE¹ PIGLETS. CN.Saunders, AJ.Stevens, J.B. Spence and A.O.Betts: Res. vet. Sci., 1963, 4, 333-346, 347-357 (Vet. Invest. Centre, Cambridge, England)

I. Fourteen new-born piglets were dosed orally with 1012 *E. coli* serotype G7, and 7 were dosed with 108 serotype-668 type 1. All the piglets scoured, and 11 died. Of 25 in-contact piglets, 15 scoured and excieted the infecting serotype, and 6 died. Strain P50, which was believed to be non-pathogenic was given to 7 piglets in a dose of 10^8 organisms. Only 1 piglet died, and this strain did not produce the typical clinical syndrome of neonatal diarrhoea, but this expt. was confused by a iatural infection with an E68 type 1 serotype.

II. Hysterectomy-derived, colostrum-deprived piglets reared in isolation were dosed when 12 hr. old with *E.coli* serotype E68 type 1, or with P50, a non-pathogenic strain. Of 6 piglets given 103 to 109 E68 type 1, 3 died and 3 scoured and recovered, but the severity of the disease was not related to the dose. 3 piglets given 106 to 10^9 P50 scoured, but all recovered. No scouring occurred in 4 isolated controls from the same litter which were dosed with peptone water. At 6 days of age, 3 of the controls and 2 of the P50-dosed piglets were given E68 type 1, and all died. J.B.Derbyshire

3835. COMMON HAPten ASSOCIATED WITH ENDO-TOXIN FRACTIONS OF E. COLI AND OTHER ENTEROBACTERIACEAE. CM.Kunin, M.V.Beard and N.E. Halmagyi: Proc. Soc. exp. Biol., N.Y., 1962, 111, 160-166 (Dept. Prev. Med., Univ. Virginia Sch. Med., Charlottesville, Va., U.S.A.) Sera from rabbits immunised with *E. coli* 014 Ag aggl. human and sheep r.b.c. coated withlipopolysaccharide or crude O type. Ag extracted from a wide variety of Enterobacteriaceae but did not produce heterologous bacterial aggl. Inhibn. and absorption studies indicated this was due to a hapten associated with the endotoxin moiety which was so structured in *E. coli* 014 as to be able to induce Ab formation. M.M. Shapland

3836. COLICINEA. G.T.Barry, D.L.Everhart and M. Graham: Nature, Lond., 1963, 198, 211-213 (Univ. Tennessee Mem. Res. Center, Knoxville, Tenn., U.S.A.) Purification and prop. of colicine A produced in cultures of *Citrobacter freundii* CA31A is described. The macromol. material consists of carbohydrate, protein and lipid, is thermostable, toxic and antigenic to rabbits and its biol. activity is neutralised by antisera

against the parent micro-organism or purified material. Immunol. studies showed that several strains of *C.freundii* and *E. coli* elaborate a similar colicine A. Colicine A appeals to be qual. similar chem. to colicines K and V.

G.M.Lewis

3837. MUTANTS OF AEROBACTER AEROGENES BLOCKED IN THE ACCUMULATION OF INORGANIC POLYPHOSPHATE. R.L.Harold and F.M.Harold: J. gen. Microbiol. 1963, 31, 241-246 (Dept. Expt. Chem., Div. Res. Lab., Nat. Jewish Hosp., Denver, Colo., U.S.A.) A method for isolating die mutants is described. Two classes of mutants are produced. The majority did not accumulate polyphosphate when phosphate was added to a phosphate-starved culture, but did so on prolonged S starvation. The remainder of the mutants did not accumulate polyphosphate under either condition. Both kinds of mutant grew well in a defined medium and showed no obvious physioLdisabilities. K.Brew

3838. NITRATE-REDUCTASE IN AEROBACTER AEROGENES. PROPERTIES. ACTION SPECIFICITY AND INHIBITION BY OXYGEN. F.Pichinoty: Ann. Inst. Pasteur, 1963, 104, 394-413 (Lab. Chim. Bact., Centre Nat. de la Recherche Sci., C.R.S.I.M., Mar seille, France) The affinity const. and activation energy of nitrate reductase of *A. aerogenes* were measure^d by a manometric method. Inhibn. of the reaction by cyanide and azide were also studied. Of the ions IO₃⁻, BrQ₃⁻ and ClO₃⁻ only ClO₃⁻ was found to be a substrate of the system. This is thought to be due to relative dis- pensions of ions. A physiol. system has been constructed in vitro containing ethanol dehydrogenase, NADH2-FMN reductase and nitrate reductase which catalyses reduction of nitrate at expense of ethanol. Aerobically O₂ acts as electron acceptor resulting in inhibn. of nitrate-reductase system. (French) B.Payne

3839. PREPARATION OF TYPHOID SOMATIC ANTIGEN VACCINE. IV. METHODS OF LYING TYPHOID ORGANISMS AND THE USE OF BENTONITE IN 1HE PREP; ARATION OF TYPHOID VACCINE. B.B.Diena, R.Wallace and L.Greenberg: Canad. J. Microbiol., 1963, 9, 279-282 (Lab. Hyg., Dept. Nat. Hlth. and Welfare, Ottawa, Canada) Note. S.L.Jioare

3840. HYPOGLYCAEMIA IN CHICK EMBRYOS INFECTED WITH SALMONELLA TYPHI VIA THE ALLANTOIC CAVITY. W.P.Weidanz and M.F.Shaffer: Proc. Soc. exp. Biol., N.Y., 1962, 655-659 (Immunol. Sect., Lab. Chem. Pharm., Nat. Cancer Inst., DHEW, Bethesda, Md., U.S.A.) Strains Ty2 and Vil of *S.typhi* produced marked hypoglycaemia in 10 day old embryos 16 hr. after infection. Blood glucose levels remained normal after infection of the 16 day old embryo. M.M.Shaplan^d

3841. FLOCCULATION TEST FOR SALMONELLA ANTIBODIES USING SENSITISED BENTONITE PARTICLES. B.B.Diena, R. Wallace and L.Greenberg: Canad. J. Microbiol., 1963, 9, 221-226 (Lab. Hyg., Dept. Nat. Hlth. and Welfare, Ottawa, Canada) A rapid slide flocc. test using bentonite particles sensitised with *Salmonella*. O somatic Ag extracts is described. A polyvalent Ag was also prepared using a no. of *Salmonella* extracts thereby making the test useful for the screening of either a monovalent Ab or covering a wide range pt^g, groups. S-L.Hoa*

3842. MODIFICATION OF SALMONELLA TYPHIMURB_J INFECTION OF EMBRYONATED EGGS BY ANTSER^g

ADULT SPLENIC TISSUE AND COMBINATIONS OF THESE AGENTS. E.G.Bлизнаков, J.P.Ransom and J.H. Heller- Proc. Soc. exp. Biol., N.Y., 1963, 112, 367-370 (New England Inst. Med. Res., Ridgefield, Conn., U.S.A.) White Leghorn eggs were treated at 8 days with antiserum to *S. typhimurium* or spleen implants from normal or immune donor hens. After the 13th day when the eggs were expt. infected, the average survival time of the treated eggs was increased. The most effective treatment was implantation of *immune* spleen plus antiserum on the day of injn. with the bacteria.

D.N.Wheatley

3843. IMMUNOCHEMICAL STUDIES ON SALMONELLA. K. FIRST RESULTS ON FACTOR 27 OF GROUP B, A AND D CONVERTED BY PHAGE 27. A.B.Staub and N. Forest: Ann. Inst. Pasteur, 1963, 104, 371-383 (Inst. Pasteur, Serv. des Vaccins, Paris, France) Conversion of strains of group A, B and D by phage 27 gave rise to different factors 27A, 27B and 27D and to one factor common to all three. Inhibitn. of pptn. by simple sugars shows that terminal sugar of 27A, 27B and 27D was the J-tetraose as the terminal sugar for the relative sp. factor - xylose for 27D, abequose for 27B and paratose for 27A. of *Salmonella* polysaccharides present in partial hydrolysates hvr. + anc. " Polysaccharides of group B suggested an hypothesis to explain formation of the 3 factors by modification of one enzyme system. (French) B.Payne

3844. HAEMAGGLUTINATION: A RAPID METHOD FOR DIFFERENTIATING VIBRIO CHOLERAE AND EL TOR VIBRIOS. R.A.Finkelstein and S.Mukerjee: Proc. Soc. exp. Biol., N.Y., 1963, 112, 355-359 (Walter Reed Inst. Res., Washington, D.C., U.S.A.) Suspect bacteria are added to chicken blood. Haemagglutination within 1 min. occurred with all *V. El Tor* strains but not with *V. cholerae* strains. D.N.Wheatley

3845. SEROLOGICAL STUDIES ON HAEMOPHILUS INFLUENZAE AND RELATED SPECIES. II. EXAMINATION OF THE TYPE SPECIFIC ANTIGENS OF H. INFLUENZAE BY MEANS OF THE CAPSULAR SWELLING METHOD. T.Omland: Acta path. microbiol. scand., 1963, 57, 286 (Bact. Inst., Oslo Univ., Norway) 36 H. influenzae strains proved typable by capsular swelling tests (22 fa). 14 of the strains gave a doubtful reaction. The commonest type was type b. Others belonged to c, f, a, d but none to e, y, P, e, C. The importance of s-forms is stressed. L.Friedmann

3846. RECENT ADVANCES OF WHOOPING COUGH VACCINATION IN HUNGARY. K.Solt and G.Barsy: Acta microbiol. Acad. Sci. hung., 1962, 9, 227-236 (State Inst. Hyg., Budapest, Hungary) As a result of combined continuous vaccination of the most susceptible child population of Hungary the whooping cough morbidity has largely decreased. The campaign-vaccination system has groups to provide sufficient protection to the youngest children. S.Igali

3847. OUTBREAK DUE TO LEPTOSPIRA POI IN WEST-HUNGARY. M.Filzi: Acta microbiol. Acad. Sci. hung., 1962, 9, 265-272 (Inst. Microbiol., Univ. Med. Sch., Budapest, Hungary) The characteristics of 7 cases of leptospirosis and the sources of the infection were studied. The leptospiral sources of the human infections are field rodents and small animals. S.Igali

3848. NUTRITIONAL STUDIES ON DESULPHOVIBRO DESULPHURICANS USING CHEMICALLY DEFINED MEDIA.

R.Macpherson and J.D.A.Miller: J. gen. Microbiol., 1963, 31, 365-373 (Nat. Chem. Lab., Teddington, Middx., England) A non-pptg. chem. defined medium containing lactate, sulphate and other inorg. salts supported repeated subculture of *D. desulphuricans* strain Hildenborough and gave yields comparable with those from media containing yeast extract or peptone. Addition of yeast extract, amino acid mixtures or ATP to the defined medium increased the crop. The effects of replacing various constituents of the defined media by other chemicals are described. K.Brew

3849. SPECIFICITY OF THE SALT REQUIREMENT OF HALOBACTERIUM ANTIRUBRUM. J.Boring, D.J.Kushner and N.E.Gibbons: Canad. J. Microbiol., 1963, 9, 143-154 (Div. Appl. Biol., Nat. Res. Council, Ottawa, Canada) Decrease in turbidity, release of cell constituents, and morphol. alterations were examined during the exposure of the extreme halophile, *H. antirubrum*, to graded concn. of various salts. NaCl, MgCl₂, CaCl₂ or Na acetate 3.5M or higher were required to maintain the cells as rods, although much lower concn. prevented gross release of cell constituents. Salt requirement was not solely to maintain a suitable osmotic pressure. There was no evidence to differential release of large (nucleic acids) or small (inorg. phosphate) mol. when bacteria were suspended in decreasing concn. of NaCl or MgCl₂. A no. of salts preserved cellular integrity, but high concn. of NaCl were essential for growth. S.L.Hoare

3850. STRUCTURAL TRANSFORMATIONS AND LYSIS OF HALOBACTERIUM SALINARIUM IN HYPOTONIC AND ISOTONIC SOLUTION. S. V. Mohr and H.Larsen: J. gen. Microbiol., 1963, 31, 267-280 (Dept. Biochem., Tech. Univ. Norway, Trondheim, Norway) The behaviour of *H. salinarium* in varying NaCl concn. and the effect of different chemicals and ionic spp. on die shape and size of the organism is described. Isolated cell wall fragments disintegrate into smaller units when exposed to conditions under which whole organisms lyse. The results indicate that enzyme action and osmotic phenomena are unimportant factors in the structural transformations and lysis of *H. salinarium*. The reaction of the cell wall globular lipoprotein particles to the various chemicals and ionic spp. results in the structural changes of the organism. K.Brew

3851. FINE STRUCTURE OF RHODOSPIRILLUM RUBRUM. G.Cohen-Bazire and R.Kunisawa: J. cell Biol., 1963, 16, 401-419 (Dept. Bacteriol., Univ. California, Berkeley, Calif., U.S.A.) Cultures were grown in a modified Hutner's medium under aerobic and semi-anaerobic conditions exposed to varying light intensities. Electron micrographs of cells post-stained with Pb(OH)₂ were studied and bacteriochlorophyll and protein determinations made. Membrane-bound vesicles of diam. 50 mil observed in the cytoplasm are inversely related to light intensity and directly to the chlorophyll content. The vesicular membrane is indistinguishable from the cytoplasmic membrane. The organisation of the bacterial photosynthetic apparatus is discussed. P.Barlow

3852. GROWTH FACTORS FOR SELENOMONAS RUMINANTIUM. P.N.Hobson, S.O.Mann and W.Smith?: Nature, Lond., 1963, 198, 213 (Rowett Res. Inst., Bucksburn, Aberdeen, Scotland) Strain 6 of *S. ruminantium* does not utilise ammonia and requires amino acids for growth. Acetate alone of the volatile fatty acids stimulates growth. G.M.Lewis

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3853. SYSTEMATIC POSITION OF GLUCONOBACTER UQUIFACIENS. M.R.Kimmitt and P.J.Le B.Williams: J. gen. Microbiol., 1963, 31,447-449 (H.P. Sauce Ltd., Aston Cross, Birmingham, England) A strain of *G.liquifaciens* was found to possess peritrichous flagella. It is proposed that the organism should be transferred to the genus *Acetobacter* as restricted by Liefson because of this and its biochem. similarity to *Acetobacter aceti*.

Orew

RICKETTSIAE AND VIRUSES

3854. DIAGNOSIS OF SMALLPOX BY IMMUNOFLUORESCENCE. H.G.S.Murray: Lancet, 1963, i, 847-848 (Virus Vaccine Dept., Lister Inst. Prev. Med., Elstree, Herts., England) A method is described for rapid diagnosis of smallpox by immunofluorescence. Several specimens from patients with smallpox were examined by this method: all gave pos. results. Specimens from patients which chickenpox, examined at the same time, were neg. G.H.Bell

3855. SEROLOGICAL RELATIONSHIPS BETWEEN HUMAN HERPES VIRUS TYPES 1 AND 2 AND SIMIAN HERPES VIRUS. K.E.Schneweis: Z. Immun.-Forsch., 1962, 124, 337-341 (Hyg. Inst., Univ., GOTtingen, Germany) Cross neutralisation tests using 2 strains of Type 1 and one strain of Type 2 human herpes virus showed distinct differences between them and a strain of simian herpes virus. (German) D .P. Winstanley

3856. SIMPLE METHOD FOR PURIFICATION OF INFLUENZA VIRUS. H.Mizutani: Nature, Lond., 1963, 198, 109-110 (N.IJH., Kamiosaki, Shinagawa-ku, Tokyo, Japan) A useful method for the prep. of influenza virus vaccines combines adsorption on barium sulphate and differential centrifugation techniques. G.M.Lewis

3857. HUMAN INFLUENZA VIRUSES IN DOMESTICATED ANIMALS. P.N.Meenan, M.R.Boyd and R.Mullaney: Brit. med. J., 1962, ii, 86-90 (Univ. Coll., Dublin, Eire) There is no reservoir of A2 viruses in domesticated animals in Ireland and there was no spread to them during the 1961 influenza epidemic. M.E.Nutt

3858. ADAPTATION OF HORSE INFLUENZA VIRUS TO CELL CULTURE. H.Mirchamsy and H.Taslimi: C.R. Acad. Sci., Paris, 1962, 255, 424-425 (Inst. d'Etat Razi, B.P. no. 656, Teheran, Iran) A strain of virus current during the epidemic of horse sickness in Iran became adapted to culture on hamster kidney cells. The virus was isolated from infected horse blood by passage through 4 young mice, then introduced into a medium containing 3 x 10⁵ hamster kidney cells/ml, in 20% inactivated calf blood and subcultured after 6 days at 37°. 1 ml. of the undiluted culture was used as inoculum. 0*9 ml. of lactalbumin hydrolysate containing 10% of Ab free normal horse serum was added to the culture after 30 min. at 37°. After 5 passages the virus killed white mice in 4 days instead of 8 days. (French) S. A. This tie wood

3859. INDUCTION, BY TRYPSINATION, OF PRODUCT-ION OF INFECTIOUS VIRUS BY KB CELLS CARRYING A CHRONIC LATENT INFECTION WITH MYXOVIRUS PARAINFLUENZAE I. (SENDAI VIRUS). G.Demont, A.Berkaloff and L.ColoberC C.R. Acad. Sci., Paris, 1962, 255, 421-423 (Centre Rech. du Serv. de Santé

des Armées, Div. de Microbiol., Lyon, France) KB cells inoc. with Sendai virus cultured on chicken embryo become capable of haemadsorption. At doses of 1-10 ID₅₀/cell cytopathogenic reactions and formation of viral Ag but not of much virus, occur. At 10-100 ID₅₀/cell large syncytia, but no Ag or vims, are formed. At O*⁰^ ID₅₀/cell cytopathogenic reactions do not occur but small quantities of infective virus are formed. The cells can be repeatedly subcultured and continue to produce virus. After 2 trypsin treatments within 1 to 5 days rapid cytopathogenic reactions occur, and both viral Ag and large quantities (400 ID₅₀/cell) of infective virus are produced. The max. effect is given by primary trypsination 5 days after inocn. Competition between processes producing AS, and virus is postulated. (French) S.A.ThistlewooOo

3860. ABO BLOOD GROUPS AND ACUTE RESPIRATORY DISEASE. J.C.McDonald and A.J.Zuckerman: Brit. med. J., 1962, ii, 89-90 (Epidemiol. Res. Lab., Colin^m dale, London, England) Investigation in approx. 2000 persons admitted to R.A.F. sick quarters during ¹⁹⁶¹ 61 with respiratory virus infection (diagnosed serol. or by virus isolation) showed a relative excess of group O and deficiency of group A amongst those infected by influent A2 virus ($p < 0.00001$). There was an opposite trend of lesser significance ($p < 0.005$) in adenovirus infections. Figures for influenza A1, influenza B and Coxsackie A21, infections did not differ significantly from those expected* Distribution of Rh genotypes, hair colour, eye colour and colour perception was similar in all groups studied.

MENU*

3861. g-PROPIOLACTONE [BPL] INACTIVATED NEWCASTLE DISEASE [ND] VACCINES. G.B.Simmins and B.A.Baldwin: Res. vet. Sci., 1963, 4, 286-293 (Cent. Vet. Lab., Weybridge, England) The efficiencies of BPL inactivated ND vaccines prepared from virulent Her¹⁹³³ and mild F strains were compared by measuring serum haemaggl.-inhibin. titres, and by challenge of fowls by the Herts strain. F strain virus was harvested from eggs at varying intervals after inocn., and the later harvests, up to 112 hr., produced as efficient a vaccine as that prepared from the Herts strain. J.B.Derbyshire

3862. GROWTH OF A VACCINE STRAIN (KOMAROV) ^{1/} NEWCASTLE DISEASE VIRUS [NDV] IN BOVINE KH^r TISSUE CULTURE AND PREPARATION OF A VACCINE. Chuygelen and J.Peetermans: Res. vet. Sci., 1963, 294-303 (R.I.T. Labs., Genval, Belgium) The growth of the attenuated KH strain of NDV was studied in bovine kidney tissue cultures. High titres of virus were obtained at an incubation temp. of 40° for 32-34 hr., ⁿ when the inoculum gave a TCD₅₀/cell ratio of 0.1 to ². There was no loss in the antigenicity of the virus ^{a*te}-Q^{*} 15-25 passages, but its intracerebral pathogenicity Ry^K day chicks was decreased. The virus was not transmxte to chickens in contact with vaccinated birds.

J.B.Derbyshire

3863. VIROLOGICAL EXAMINATION OF URBAN SEWAGE IN PERIODS OF MASS IMMUNISATION WITH LIVE TENUATED POLIOVIRUSES. M.Daniel and I.D.^{omg-239} Acta microbiol. Acad. Sci. hung., 1962, 9, 251-259 (State Inst. Hyg., Budapest, Hungary) In the urt sewage of Budapest poliovirus types 2 and 3 were ^{detf} ^{ter} able in most of the samples taken on the 2nd day of ^{*x} after the immunisation campaign of the children una^{ep} yr. of age with trivalent live poliovirus vaccine. Sva samples proved to be more valuable than catch ^{on} S.I.g.ii

3864. COXSACKIE A9 MYOCARDITIS IN ADULT MICE. A.M.Lemer and J.A.Shaka: Proc. Soc. exp. Biol., N.Y., 1962, 111, 804-808 (Dept. Biol., Massachusetts Inst. Technol., Cambridge, Mass., U.S.A.) Coxsackie A9 viNSI strain 13, replicated in the hearts of 1 yr. old mice and produced an isolated myocarditis in some without concomitant lesions of striated muscle. Differential susceptibility of striated muscle and heart was shown to vary with age; in suckling mice there was only myositis with 10000 times more virus per g. produced in skeletal Muscle than in myocardium, whereas in 1 yr. old mice, myocardium contained 10000 times as much virus as the b.
M.M.Shapland

3865. HAEMAGGLUTINATION BY CERTAIN TYPES OF ECHO VIRUSES. I. SOME PROPERTIES OF THE HAEMAGGLUTININS. G.Gaudin, A.M.Baraal and R.Sohier Ann. Inst. Pasteur, 1963, 104, 313-334 (Lab. Hyg., Fac. Med., Lyon, France) Certain types of ECHO virus (3, 6, 7, 11, 12, 19, 20, 21 and JN-10) are capable of Blutinatliig human r.b.c. R.b.c. from certain spp. of ¹¹⁰¹V₁₁₀₁ were used to demonstrate haemaggltn. using virus types 7 and 12. Treatment with trypsin or formol did not alter virus receptor on the r.b.c. surface, and this receptor was destroyed by virus type 7. Study of the behaviour of the virus towards pH and temp. gave similar classification of viruses into groups as study of growth of viruses on nonkey kidney culture. Haemagglutinins type 6 were found to be labile. This may explain differences in haemaggltn. found by different workers. (French) B.Payne

3866. FACTORS INHIBITING THE INTERFERENCE OF WESTERN EQUINE ENCEPHALITIS (WEE) VIRUS BY RABIES VIRUS IN CHICK EMBRYO TISSUE CULTURES. P-Cohen, S.Mazzur, M.M.Kaplan and H.Koprowski: Nature, Lond., 1963, 198, 270-271 (Wistar Inst., Philadelphia, Pa., U.S.A.) A heat-labile inhibitory factor in normal mouse brain prevents the interference of WEE virus by rabies virus. Variation in WEE plaqueing efficiency and rabies interference was observed between different embryonated eggs used. G.M.Lewis

3867. HAEMAGGLUTINATION BY MEASLES VIRUS. IV. A SIMPLE PROCEDURE FOR PRODUCTION OF HIGH TITRE ANTIGEN FOR HAEMAGGLUTINATION-INHIBITION (HI) TESTS. E.Norrby: Proc. Soc. exp. Biol., N.Y., 1962, 111, 814-818 (Dept. Virus Res., Karolinska Inst. Sch. Med., Stockholm, Sweden) By treatment with Tween 80 and ether a 4- to 8-fold increase in haemaggltn. titre was obtained with virus material grown in human embryonic cell line (Lu 106) and an 8- to 16-fold increase when grown in dog kidney tissue culture. We haemaggltn. titres obtained with 2 unconc. materials of 1:1024 and 1:4096. Serum titres greater by a factor of 16 were obtained when Tween/ether treated virus was substituted for untreated material as Ag in HI tests.
M.M.Shapland

3868. PATHOGENICITY OF LYMPHOCYTIC CHOROMENINGITIS VIRUS. III. AN INFLAMMATORY REACTION READILY VISIBLE. THE VIRAL OEDEMA ON THE HIND LEG OF A MOUSE. J.Roger: Ann. Inst. Pasteur, 1963, 104, 347-360 (Inst. Pasteur, Paris, France) s.c. injn. of the virus into foot of 11 g. albinomouse produced a local delayed response similar to those described in guinea-pigs and rabbits. A red oedema which was readily visible was produced within about 5 days. In 75% of animals this was accompanied by a temporary illness. In other animals there was a severe disease appearing at about 12th day which led to acute phase

and death within 3 to 5 days, or a chronic phase lasting 40-50 days. S.c. injn. into foot gave highest survival rate as compared with other routes of injn. and is the only method giving a local reaction readily visible to naked eye. (French)
B.Payne

3869. NEUTRALISATION OF VISNA VIRUS BY HUMAN SERA. H.Iltiormar and H. von Magnus: Acta path. microbiol. scand., 1963, 57, 261-267 (Enterovirus Dept., Statens Seruminst., Copenhagen, Denmark)

The majority of human sera studied in neutralisation tests against visna virus contained substances which neutralised the virus: one substance was inactivated by heating to 56° for 30 min. and another was not affected by this heating. The latter substance was most easily detected after incubation with virus at 37° for 18 hr. It was found as often in sera from normal blood donors as in sera from patients with multiple sclerosis. The heat-stable substance probably is a non-sp. inhibitor of visna virus.

L.Friedmann

3870. SECONDARY STRUCTURE OF REOVIRUS RNA. P.J. Gomatos and L.Tamm: Proc. nat. Acad. Sci., Wash., 1963, 49, 707-714 (Rockefeller Inst., New York, N.Y., U.S.A.) Reovirus contains a larger complement of genetic material than is present in any other RNA virus thus far studied, be it bacterial, plant, or animal. The RNA of reovirus has a no. of characteristics usually associated with DNA, its base ratios are complementary and it behaves as if it were double-stranded. If it is indeed double-stranded, then reovirus nucleic acid is the first RNA to be found in nature having this unusual structure. The RNA of wound tumour virus appears to have a similar structure.
J.R.Sargent

3871. HISTOLOGICAL OBSERVATIONS ON EXPERIMENTAL SCRAPIE IN MOUSE. I.H.Pattison and K.Smith: Res. vet. Sci., 1963, 4, 269-275 (A.R.C. Field Stn., Compton, Berks., England) Single sagittal sections of brain, stained with Haematoxylin and Eosin, were examined from 168 mice which were inoc. with scrapie mouse brain and killed at intervals. The lesions were extracellular vacuolation in the grey and white matter of the brain, and neuronal vacuolation in the cerebral cortex. Histol. lesions preceded clinical symptoms, and the incubation period correlated with the titre of inoculum used.
J.B.Derbyshire

3872. EXPERIMENTAL SCRAPIE IN MOUSE. R.J.L.Chandlen Res. vet. Sci., 1963, 4, 276-285 (A.R.C. Field Stn., Compton, Berks., England) Mice inoc. intracerebrally or i.p. with brain suspension from goats affected with scrapie developed nervous symptoms, and vacuolation and astrocytosis occurred in the c.n.s. This disease was passaged in mice with various tissues inoc. by various routes. The agent was filterable and resisted boiling for 30 min. Scrapie developed in goats which were inoc. with mouse brain material, and the disease was considered to be a form of expt. scrapie in the mouse. J.B.Derbyshire

3873. PREPARATIVE ULTRACENTRIFUGATION OF FOOT-AND-MOUTH DISEASE VIRUS THROUGH IMMISCIBLE FLUID INTERFACES INTO A CAESIUM CHLORIDE DENSITY GRADIENT. R.Trautman, S.S.Breese jun. and H.X.Bachrach: J. phys. Chem., 1962, 66, 1976-1983 (Plum Island Animal Dis. Lab., Agric. Res. Serv., U.S.D.A., Greenport, L.I., N.Y., U.S.A.) Foot-and-mouth disease virus has been purified by a simple technique of layering on to a tube containing CsCl isodense with the virus and also an immiscible org. layer of lower density

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than the virus particles and of higher density than the contaminating proteins. Removal of tissue particles of similar size and density was achieved and satisfactory electron micrographs were obtained of the virus particles.

G.CBair

3874. EFFECT OF VARIOUS INACTIVATING AGENTS ON VIRAL AND RNA INFECTIVITIES OF FOOT-AND-MOUTH DISEASE VIRUS AND ON ITS ATTACHMENT TO SUSCEPTIBLE CELLS. F.Brown, B.Cartwright and D.L.Stewart. J. gen. Microbiol., 1963, 31, 179-180 (Res. Inst., Anim. Virus Dis., Pirbright, Surrey, England)

The seiol. prop. of foot-and-mouth virus partially inactivated by various methods were studied, their RNA content determined by phenol extraction and ability to attach to susceptible cultivated pig kidney cells examined. Decrease in infectivity from formaldehyde or acetylethyleneamine, u.v. treatment or heat at 25° or 37° was proportional to loss of infective RNA, but loss of activity on mixing with antiserum trypsin or cell extracts was due to failure of virus to attach to susceptible cells.

K.Brew

3875. CINEMATOGRAPHIC STUDY OF CYTOPATHOGENIC EFFECTS PRODUCED BY RUBARTH VIRUS IN SPECIAL CELL MICROCUltURES. P. de Fonbrune and P.Reculard: Ann. Inst. Pasteur, 1963, 104, 335-346 (Inst. Pasteur, Annexe de Garches (S.-et.-O.), France)

A technique is described for culture and photography of epithelial dog kidney cells over a period of more than 200 hr. The cytopathogenic effects of Rubarth virus on these cultures was studied. After 20 hr. the cells showed lesions extending through the culture plaque, consisting of nuclear transformations, followed by cytoplasmic retraction. The culture was totally destroyed after 115-147 hr.

(French) B.Payne

3876. FLUORESCENT ANTIBODY STUDY ON THE FORMATION OF SIMIAN VIRUS 40 [SV40] IN MONKEY KIDNEY CELLS. H.Diderholm: Acta path. microbiol. scand., 1963, 57, 348-352 (Inst. Virol., Univ. Uppsala, Sweden)

The indirect fluorescent Ab technique was used to study the formation of SV40 in kidney cell cultures of the African green monkey. A few nuclei contained sp. fluorescent material 2 days after infection. During the next 3 days more nuclei were affected and the intensity of the fluorescence increased. Thereafter a sp. cytoplasmic fluorescence developed and increased with time, while the nuclear fluorescence decreased or completely disappeared.

L.Friedmann

3877. MORPHOLOGICAL AND VIROLOGICAL INVESTIGATION OF HUMAN TISSUE CULTURES TRANSFORMED WITH SIMIAN VIRUS 40 [SV40]. J.Pontí, F.Jensen and H.Koprowski; J. cell. comp. Physiol., 1963, 61, 145-164 (Wistar Inst., Philadelphia, Pa., U.S.A.)

Infection of human organ cultures and monolayers of human diploid fibroblasts by SV40 resulted in cytopathic changes within 2 to 4 weeks followed by disorganized multilayer growth, increased mitotic activity, loss of mitotic inhibn. and gradual replacement of fibroblasts by foci of epithelial-like cells. Clones derived from the epithelioid cells released virus while fibroblasts did not. The SV40 Ag was localised by immunofluorescence in the nuclei.

G.M.Lewis

3878. PERSISTENT INFECTION OF HUMAN CARCINOMA AND PRIMARY CHICK EMBRYO CELL CULTURES WITH SIMIAN VIRUS 40 [SV40]. B.Eddy, G.E.Grubbs and R.D.Young: Proc. Soc. exp. Biol., N.Y., 1962, 111, 718-722 (Div.Biol. Standards, N.I.H., Bethesda, Md.,

U.S.A.) Continued multiplication of SV40 was observed in HeLa cells for approx. 8 month*and in HEp-2 cells for a period of 6 months. Concn. of virus in culture fluids was high and neoplasms were induced in hamsters by 2 such fluids. SV40 was also shed into the fluid of chick embryo cultures kept for 6 months but concn. was low and neoplasms were not induced in hamsters inj. with fluid from 91 day old infected cultures. M.M.Shapland

3879. MORPHOLOGY AND DISTRIBUTION OF SV40-INFECTED CELLS IN HUMAN, SIMIAN AND HAMSTER RENAL CELL CULTURE AS DETECTED BY IMMUNOFLUORESCENCE. J.D.Levinthal and H.M.Schein: Proc. Soc. exp. Biol., N.Y., 1963, 112, 405-409 (Dept. Bacteriol. and Immunol., Children's Hosp. Med. Cente Harvard Med. Sch., Boston, Mass., U.S.A.) Simian virus 40 infected into a variety of cell lines maintained if culture showed by immunofluorescence a staining of the viral Ag in the nucleus and more precisely in the nucleolus of the cells. A correlation is believed to have been shown between the intensity of staining and the infectivity.

D.N.Wheatley

3880. VARIATION IN INTERFERON PRODUCTION BY POLYOMA VIRUS STRAINS OF DIFFERING ONCOGENIC CITY. R.M.Friedman, A.S.Rabson and W.R.Kirkhairst: Proc. Soc. exp. Biol., N.Y., 1963, 112, 347-349 (Pa.* Anat. Branch, Nat. Cancer Inst., N.I.H., Bethesda, Md. U.S.A.) Two variants of polyoma virus (S and M)

were compared with regard to their production of interferon in mouse embryo fibroblasts. Hie M strain was m^on^o effective. It is suggested that interferon may not be directly related to oncogenicity but a low interferon titre may explain a greater plaque size from oncogenic variants as compared with non-oncogenic variants.

D.N.Wheatley

3881. METABOLISM OF MOUSE EMBRYO CELLS GROWN IN VITRO AND INFECTED WITH THE ONCOGENIC VIRUS SE POLYOMA. M.Gumińska, B.Skarzinski and Z.Porwit-Babc: Acta biochim. pol., 1963, 10, 163-171 (Dept. Physiol. Chern., Med. Sch., Kraków, Poland)

The infected cells displayed diminished O₂ uptake, incieased aerobic glycolysis and incieased Crabtree effect. Release of virus into the medium was precede by reduction of O₂ uptake, observed after 24 hr. The lowest O₂ uptake on the 6th day was simult. with max. release of virus and with appearance of cytopathic change. In surviving cells (on the 9th day) O₂ consumption was greater than during the cytopathic process.

M.Korbeck*

3882. TRANSMISSION OF NUCLEAR-POLYHEDROSIS VIRUS IN LABORATORY POPULATIONS OF TRICHOPLUSIA NI (HUBNER). R.P.Jaques: J. insect Path.. 1962, 4, 433-445 (Res. Stn., Canada Dept. Agric* ^A Kentville, N.S., Canada)

T. ni larvae infected w[^] nuclear polyhedrosis transmitted the virus to healthy i[^]j[^]v[^]viduals with which they were -ssociated prior to death*. It would appear that much of the virus dispersed by in[^]fed larvae was transferred as external contamination ft[^]m¹the deposit of polyhedra upon which the larvae had fed and was not released from infected tissues of the live u[^]larvae. Group*infected larvae transmitted the w[^]to more members of the population and contaminated food more extensively than did individually infected... larvae. Excrement from infected larvae was not higiv infectious.

R.J.Walker

3883. CAUSATIVE AGENT AND HETOPATHOLOG^{tf}* A VIRUS DISEASE OF THE WESTERN OAK LOOPER*

OJSLMORRIS: J. insect Path., 1962, 4, 446-453 (Forest Entom. and Path. Lab., Dept. Forestry, Victoria, B.C., Canada) The causative agent of the nuclear polyhedrosis of Lambdina fiscellaria sqnniaria was studied D^{or}phol. and chem. The histopathology of the disease was followed in a series of larvae examined at 24 hr. intervals. The average diam. of the polyhedra was 1⁵ fi. The average size of die virus rods was 332 mji by 62 mp, < virus making up about 5³% of the total mass of the Polyhedron. The DNA content of the virus particles was approx. 7-9%. 6-7 days after the infection, the fat-body nucleus showed an increase in size, while some nuclei disrupted, liberating the polyhedra. Considerable packaging and retraction of the hypodermis from the uticle occurred, and numerous bodies resembling uric acid crystals in shape accumulated in all the infected tissues save blood cells. On the 8th to 9th day of infection, breakdown of fat-body and hypodermal cytoplasm occurred. Death took place on the 9th day.

R.J. Walker

3884. MULTIPLICATION OF NUCLEAR AND CYTO-LASMIC POLYHEDROSIS VIRUSES IN STARVED LARVAE OF THE SILKWORM, BOMBYX MORI (LINNAEUS). A.i.zawa and Y.Furuta: J. insect Path., 1962, 4, 465-468 (Sericul. Expt. Stn., Suginami-ku, Tokyo, Japan) After centrifugation, the supernatant of the haemolymph from infected larvae of B. mori was inj. into the haemo-coel of 5th-instar larvae which were kept at 25° unfed. The virus titre was determined at various intervals. When 24 hr. all amount was in increased phase began about Ph. Mowing the inj. and turned into a stationary coils after a W^{10K} 72 h*. The formation of polyhedra can be observed in the blood corpuscles after 96 hr. In the stationary Phase, the titre was nearly the same in few larvae as in fed larvae. There were generally fewer cytoplasmic polyhedra formed in starved larvae than those normally fed. T¹⁶ means size of the polyhedra from the starved larvae was generally smaller than the normally fed ones. R.J.Walker

3885. INDUCTION OF BACTERIOPHAGE FORMATION IN LYSOGENIC BACTERIA BY A POTENT CARCINOGEN, 4-NITROQUINOLINE 1-OXIDE, AND ITS DERIVATIVES. H.Endo, M.Ishizawa and T.Kamiya: Nature, Lond., 1963, 198, 195-196 (Div.Chem., Cancer Res. Inst., Kyus Univ., Fukuoka, Japan) Aplete coincidence was observed between the carcinogenicity and the ability to induce phage in E. coli K 12 among the deriv. and related compounds of 4-nitroquinoline 1-oxide. C.M.Lewis

3886. BACTERIOPHAGE AND BACTERIOCIN SYNTHESIS BY SPHEROPLASTS OBAINED BY MEANS OF LEDERBERG TECHNIQUE. THE ROLE OF PENICILLIN. J.Franon and Y.Peron: Ann. Inst. Pasteur, 1963, 104, 361-370 (Inst. Pasteur, Serv. Bacteriophages, Paris, France) Using Lederberg** technique bacteriophage developed and colicin synthesis by spheroplasts were max. only in absence of penicillin and if spheroplasts were treated to 1:100. Virulent bacteriophages showed different sensitivities to penicillin during spheroplast development. E. coli phages T1, T2 and T6 were blocked but T5 propagated well. Colicin titre of spheroplasts from 153, TR15 and TR21 after 10⁶ U/ml penicillin and increase in presence of 1000 U/ml penicillin. Impotent increase in presence of 10⁶ U/ml - irradiation of spheroplasts from strain P. rettgeri of 1⁰ U/ml. penicillin initiated synthesis of lysogenic power but apparently synthesis of

certain bacteriophage proteins cannot occur. Penicillin prevented transfer from prophage to RNA. (French)

B.Payne

3887. INFECTION OF E. COLI WITH LAMBDA (X,2> PHAGE AND THE ESTABLISHMENT OF LYSOGENY. B.A.Fry: J. gen. Microbiol., 1963, 31, 297-309 (Dept. Microbiol., Univ. Sheffield, England) Infection of E. coli by phage X 22 in 0.02M Sr, Ca or Mn occurred as readily as in 0.02M Mg and response in Sr, Ca and Mg was predominantly lysogenic. In optimal conditions with Mn, at least 25% of infected bacteria gave the lytic response. On transference of newly infected bacteria to a growth medium, a lapse of 40 min. occurred before the prophage could be detected. 100 min. period was required before all the bacteria giving the lysogenic response could be induced by u.v. radiation. K.Brew

3888. STRUCTURE OF COLIPHAGES. D.E.Bradley: J. gen. Microbiol., 1963, 31, 435-446 (Zool. Dept., Univ. Edinburgh, Scotland) The detailed morphology of several new coliphages is compared with the more familiar types. An examination at mol. level of the T even' phage tail structure makes it possible to propose the mol. packing changes accompanying sheath contraction. Phage T3 is shown to have an octahedral head and a new phage with octahedral head and contractile tail is described. The structure of pR (a epx 174 type phage) is revealed by E.M. K.Brew

3889. PHENOCOPY OF RESISTANCE OF PHAGE W IN BACILLUS ANTHRACIS. G.Ivánovics and J.Lantos: Acta microbiol. Acad. Sci. hung., 1962, 9, 237-246 (Inst. Microbiol., Univ. Med. Sch., Szeged, Hungary) Infection and lysis of capsulogenic and non-capsulogenic strains of B. anthracis by mutants of phage W were followed by a secondary growth and sporulation of the surviving bacteria. The vegetative population appeared to be resistant to the homologous phage but colonies grown from the spores were found to be highly sensitive. The temporary loss of the sp. receptor to phage W appears to be a phenocopy of phage resistance. S.Igali

3890. TRANSDUCING PHAGES FOR BACILLUS SUBTILIS. I.Takahashi: J. gen. Microbiol., 1963, 31, 211-217 (Microbiol. Res. Inst., Re. Branch, Canada Dept. Agric., Ottawa, Canada) Transducing phage PBS1 and a clear-plaque type mutant PBS2 derived from PBS1 show similar growth characteristics and are related serol. The phages are moiphob. indistinguishable, but PBS1 is more efficient in transduction and its plaque-forming activity more sensitive to u.v. irradiation than PBS2. The host range of phages is limited to B. subtilis strains and all Marburg strains tested were sensitive to the lytic action of the phages. Prophages of P3S1 and PBS2 were not u.v. inducible. Organisms lysogenic for PBS1 and PBS2 were not stable and reverted to the sensitive state. K.Brew

3891. LYSOGENY IN PROTEUS RETTGERI AND THE HOST-RANGE OF P. RETTGERI AND P.HAUSERI BACTERIOPHAGES. LN.Coetze: J. gen. Microbiol., 1963, 31, 219-229 (Dept. Microbiol., Univ. Pretoria, S. Africa) 22 different phage types of P. rettgeri were investigated by lysogeny by growing strains singly, in mixtures and by u.v. induction. Five strains were lysogenic for other members of the group. 18 different lytic phages were isolated from sewage with action on one or more of the strains, and the host range of all 23 phages tested against a no. of P. hauseri, P.morganii, Providence and other intestinal organisms. The results indicate close ties between

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the P.hauseri and P.rettgeri groups and between P.rettgeri and the Providence strains. "XBrew"

3892. PHYSICOCHEMICAL PROPERTIES OF PHAGES FOR AGROBACTERIUM RADIOBACTER. E.B.Roslycky, O.N. Allen and E.McCoy: Canad. J. Microbiol., 1963, 9, 199-209 (Univ. Wisconsin. Madison, Wis., U.S.A.)

Four selected phages for A.radiobacter were examined for plaque characteristics, morphology in die E.M., sensitivity to u.v. irradiation, thermal inactivation and its protection by cations. S.LJioare

3893. TRANSFER OF VIRUS BY A DIRECT LEAF-TO-LEAF METHOD. H.JH.Murakishi: Nature, Land., 1963, 198, 312-313 (Dept. Bot., Michigan State Univ., East Lansing, Mich., U.S.A.) A technique for transfer of plant virus by gently nibbing a young leaf face to face on a Carborundum-dusted leaf of the indicator plant gives results as sensitive as the leaf-disc method and generally superior to the juice inocn. technique. The method was tested using tobacco mosaic, cucumber mosaic, potato virus X and tobacco severe etch viruses. G.M.Lewis

3894. BEHAVIOUR OF SUSPENSIONS OF TURNIP YELLOW MOSAIC VIRUS [TYMV]. STUDY OF THE DIFFUSION OF LIGHT. C'Strazielle, P.Jiorn and L.Jiirth C.R. Acad. Sci., Pads, 1962, 255, 418-420 (Centre Rech. Macromol., Centre de Rech. Nucleaires, Strasbourg, France) RNA from TYMV suspended in a versene buffer instead of a phosphate buffer suffered fragmentations as shown by an immediate decrease in sedimentation const. and a further slow decrease to a limit. The ratio of the mol. wt. to the square root of the radius of rotation also decreased, indicating a change in configuration. Addition of Mg increased the final mol. wt. TMV does not react similarly. TYMV may consist of sub-units linked by heavy ions e.g. Mg or removal of the heavy ions could activate an enzyme present in the suspension. (French) S^A.Thistlewood

3895. CLOVER PHYLLODY AND STRAWBERRY GREEN PETAL DISEASES, CAUSED BY THE SAME VIRUS IN EASTERN CANADA. L.N.Chiykowski: Canad. J. Bot., 1962, 40, 1615-1617 (Plant Res. Inst., Res. Branch, Canada Dept. Agric, Ottawa, Qnt., Canada) Expt. were carried out to determine the relationship between clover phyllody and strawberry green petal diseases in Eastern Canada. The results, based on leafupper transmission and symptomatology indicated that clover phyllody and strawberry green petal diseases in Eastern Canada are caused by the same virus. The virus is transmissible from clover to strawberry and from strawberry to clover by Aphrodes bicinctus and Macrosteles fascifrons. A.Meany

YEASTS AND FUNGI

3896. RESISTANCE OF CRYPTOCOCCUS NEOFORMANS TO DESICCATION AND HIGH TEMPERATURES. F. Staik Arch. Mikrobiol., 1963, 44, 323-333 (Inst. Hyg. und Mikrobiol., Univ. Wuczburg, Germany)

Cultures of C.neoformans from canary excreta remained viable in dry river sand and garden soil for 480 days. Desiccated cells showed remarkable heat tolerance.

viable cells being present after exposure at. 80° for 24 hr., 100° for 3 hr. and 12(f for 1 hr. Undried Cells showed no heat tolerance. (German) E.M.Iing

3897. MYCOTIC INFECTIONS OF ANIMALS TRANSMISIBLE TO MAN. H.CRowsell: Amer. J. med. Sci., 1963, 245, 333-344 pept. Physiol. Sci., Ontario Vet. Coll., Guelph, Ont., Canada) Review. 153 ref. E.E.Hobbiger

3898. ULTRA-VIOLET MICROSCOPY OF BUDDING SACCHAROMYCES. D.O.McClary, W.J.XBowers jun. and G.R.Millen J. Bact., 1962, 83, 276-283 (Biol. Res. Lab., S. Illinois Univ., Carbondale, Ill., U.S.A.)

Synchronous cell division was obtained in Saccharomyces by transferring starved cells into nutrient medium. U.v. microscopy and Giemsa stained prep* of these cells showed nuclear division to occur in the mother cell early in the budding process. The divided nucleus passed into the neck between the mother cell and the bud and either fused together again or the 2 parts became so closely associated that one continuous dumb-bell shaped body was seen which seemed to divide by constriction. This effect was probably due to retention of the intact nuclear membrane until nuclear division was otherwise complete*. The nuclear apparatus lies outside the vacuole. These techniques cannot be used to determine the extent to which these 2 bodies function together. C.Toothill

3899. DETERMINATION BY AMMONIUM OF THE MANNER OF YEAST NUCLEAR DIVISION. J.J.MiUer: Nature, Lond., 1963, 198, 214-215 (Dept. Biol., Hamilton Coll., McMaster Univ., Hamilton, Ont., Canada) Active vegetative growth with little sporulation occurred in cultures of S.cerevisiae on a medium containing acetate, salts-vitamins and ammonium sulphate. Omission of the ammonium sulphate induced meiosis in more than half the cells. Further work has shown that both C and N sources are involved in inhibn. of sporulation. G.M.Lewis

3900. UPTAKE OF SOME SULPHUR-CONTAINING AMINO ACIDS BY A BREWERS' YEAST. G.A.Maw: J. gen. Microbiol., 1963, 31, 247-259 (A.Guinness Son and Co., Ltd., Dublin, Eire) A study of the accumulation by brewers' yeast of six [35]labelled S containing amino acids was carried out and the patterns of uptake described. Accumulation of S containing amino acids was inhib. by certain other amino acids with a close structural relationship to them and when present in high concn. Reduced glutathione enhanced cysteine uptake*. These effects were shown to be primarily changes in the transport of sulphur amino acids into die yeast although subsequent incorporation into protein may also be affect[©]. K.Brew

3901. METABOLISM OF YEAST SPORULATION. V. STIMULATION AND INHIBITION OF SPORULATION AND GROWTH BY NITROGEN COMPOUNDS. J.J.Mu^{let} Canad. J. Microbiol., 1963, 9, 259-277 (Dept. Biol., Hamilton Coll., McMaster Univ., Hamilton, Ont., Canada) The effects of a variety of N compound*, mainly amino acids, on ascus production by S.ceiexjs2z in sporulation media containing several C sources were[^] compared. A sporulation medium is recommended containing 0.02M dihydroxyacetone and 0.01M lysine. SL Hop

3902. I. ADAPTATION OF YEAST TO 3-AMINO-1,2,4-TRIAZOLE [3-AT]. T.Ktopotowski. H. IMroAZ^{if} GLYCEROL ACCUMULATION BY YEAST RESULT^{if} FROM THE INHIBITION OF HKTIDINE BIOSYNTHESIS

- BY3-AT. T.Ktopotowski: Acta biochim. pol. 1963, 10, 199-208, 2C9-218 (Dept. Biochem., Mother and Quid ResJhst., warszawa. Poland) I. The wild strain S. cerevisiae readily acquires resistance to 3-AT which is ^{on} on 3-AT concn. Histidine which completely releases ^{A⁺T inhibits} prevents development of resistance. Resistance is ⁱⁿ a single culture persists undiminished

5^oough at least 25 genei.
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3-AT [^] e restores growth of S. cerevisiae inhib. by ^{dimp} ^{8 * o ^ *} yields corresponding to limiting histidine: ^{Concn.} are equal ^{* >} found with histidine-less yeast. Yeast ⁱ V 3-AT accumulates imidazole-glycerophosphate to cells and imidazoleglycerol in the conelli. Accumulation is prevented by histidine. It is from ^{wed} ^{* at * eff} ect of 3-AT on yeast growth results PtohLS^{sub n} of an enzyme of histidine biosynthesis, most ^{aDiy} imidazoleglycerolphosphate dehydratase.
 M.Korbecki

3901. EFFECT OF ORGANIC SOLVENTS ON THE FUNCTION OF THE YEAST CELL MEMBRANE. H.Blennerhassett, S.Janocha, H.Keller and H.Netter: Hoppe-EijWeisZ.physiol. Chem., 1963, 331, 164-179 (Inst. Chem. Univ.. 23 Kiel, Germany)
 W in ve s [^] c ding alcohols, ketones, chlorinated hydrocarbons etc. caused reversible decreases in ethanol Dr [^] Cu oil [>] rate of respiration, glucose uptake etc. when added in a low concn. Higher concn. led to irreversible damage to the cell membrane, and the behaviour of these solvents discussed. Pentanol was the most polar solvent with low denaturation activity.
 (German) I.Comish

3904. RHODOTORULA NITENS SP. NOV. ISOLATED FROM THE ATMOSPHERE. D.W.R.Mackenzie and B.J. Aurora: J. gen. Microbiol., 1963, 31, 171-177 (Dept. of Microbiol., Queen's Univ., Belfast, Ireland) A new species Rhodotorula was isolated from the atm. in Edinburgh. Characteristics of this new yeast are described. A kmin * P^{sent} and the sp. has a predilection for low KBrew

3905. E.M. * RHODOTORULA GLUTINIS. T.R.Tliyargha, S.F.-Conti and H.B.Naylor: J. Bact., 1962, 83, 38-44 (Dept. Microbiol., Dartmouth Med. Sch., New Haven, Conn., U.S.A.) E.M. studies of R. glutinis by a [^] the nucleus is spherical to oval and is bounded as numerous membrane. Intranuclear structures identified. The inner membrane persists throughout the various stages of elongation and constriction. The fine structure of mitochondria and other components of the yeast cell and their behaviour during cell division are described. The vacuole is absent in actively dividing cells of R. glutinis. C.Toothill

3906. SLOOFFIA N. SP. E.K.Novák and Feucai: Acta microbiol. Acad. Sci. hung., 1963, 14, 261-263 (State Inst. Hyg., Budapest, Hungary) A new sp. "R. slooffii" was isolated from a laryngeal Swab sao. It multiplies only with budding, produces a carotenoid pigment, assimilates sucrose, lactose, galactose and glucose but not maltose, raffinose and starch. It does not utilise KNQ3, does not produce spUts arbutin. SJGau

- 3907. NUTRITIONAL STUDIES ON THE YEAST PHASE OF BLASTOMYCES DERMA TITIDIS AND B. BRASILIENSIS, CLGildardi and N.C.Laffer: J. Bact., 1962, 83, 219-227 (Dept. Microbiol., Univ. Maryland.**

College Park, Md., U.S.A.) The nutritional characteristics of the yeast phase of 22 cultures (9 of B.brasiliensis and 13 of B. dermatitidis) were studied to determine whether these might aid classification. Quiescent, agar slant and shake cultures were used. Both spp. synthesised their own vitamins, utilised the same 21 C and 25 N substrates when these were the sole source of the respective element, and produced their most luxuriant growth in shake cultures in the presence of either ammonium salts or org. N. S-containing compounds, reducing agents and Tween 80 retarded or inhibit, growth; the conversion to the mould phase at 35° occurred in the presence of tyrosine. No difference was detected between the 2 spp.

C.Tooihill

3908. DEVELOPMENT OF COREMIA. H. PENICILLIUM ISARIIFORME. MJ.Carlile, J.S.W.Dickens, E.M.Mor-due and M.A.A.Schipper: m. P. CLAVIGERUM, WITH SOME OBSERVATIONS ON P. EXPANSUM AND P. ITALICUM. MJ.Carlile, J.S.W.Dickens and M.A.A. Schipper: Trans. Brit. Mycol. Soc., 1962, 45, 457-461, 462-464 (Bot. Dept., Univ. Coll., Ibadan, Nigeria)

n. light is required for the initiation and development of coremia and spores by P. isariiforme. The coremia are positively phototropic and are not affected by gravity,
m. Lfeht has no effect on the coremia of P. clavigerum and P. italicum. The hyphae of P. expansum are positively phototropic. di ide

3909. ADAPTIVE METABOLISM OF D-GALACTOSE IN ASPERGILLUS NIDULANS. C.F.Roberts: J. gen. Microp. biol., 1963, 31, 285-295 (Microbiol. Unit, Dept. Bio-chem., Univ. Oxford, England) Methods are described for growth of A. nidulans in submerged culture. In intact organisms, D-galactose was oxidised by an inducible enzyme system and D-fucose was a poor inducer of this system. Mutants isolated by their failure to grow on galactose as sole C source were defective in die oxidation of galactose.

K.Brew

3910. MECHANISM OF ACTION OF AN INFECTIVE DOSE OF BOTRYTIS SPORES ON BEAN LEAVES. R.L.Wastie: Trans. Brit. Mycol. Soc, 1962, 45, 465-473 (Bot. Sch., Univ. Cambridge, England) The no. of spores required to bring about the development of one or more lesions on the leaves of broad bean plants in 50% of the total no. of unit leaf areas inoc. was 4 in the case of B. fabae and 500 in the case of B. cinerea. The lower infectivity of the individual spores of B. cinerea might be associated with their small size.

D.Hide

3911. DISPERSAL OF SPORES OF BOTRYTIS CINerea IN RASPBERRY PLANTATION. W.R.Jarvis: Trans. Brit. Mycol. Soc., 1962, 45, 549-559 (Scottish Hordcult. Res. Inst., Invergowrie, Dundee, Scotland) The dispersal of spores of B. cinerea in a raspberry plantation was studied using an automatic volumetric spore trap. Max. airborne spore concn. occurs when the R.H. is in die region of 65-85%. D.Hide

3912. GROWTH AND SPORULATION OF FUSARIUM UDUM IN RELATION TO C/N RATIO AND NITROGEN SOURCES. H.CShanna: Physiol. Plant., 1963, 16, 276-280 (Dept. Bot., Univ. Rajasthan, Jodhpur, India) The N source (nitrate, NH₄ or org. N) was more important than the C/N ratio in the control of growth and

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sporulation. KNO_3 and asparagine gave optimal growth and sporulation. Drifts in pH of the medium were governed by N-source. The extent of growth and sporulation varied with N level.

I.D.J.Phillips

3913. INFLUENCE OF OXYGEN UPON GROWTH AND RESPIRATORY BEHAVIOUR OF FUNGI FROM DECOMPOSING RYE-GRASS ROOTS. J.S.Waid: *Trans. Brit. Mycol. Soc.*, 1962, 45, 479-487 (Bot. Dept., Univ.

New England, Armidale, N.S.W., Australia) Fungi isolated from the inner cortex of decomposing rye-grass roots were more tolerant of low O_2 concn. than those isolated from the outer cortex and root surfaces. The R.Q. of fungi isolated from the inner cortex were lower in reduced O_2 concn. than those of fungi isolated from the outer cortex and root surfaces.

D.Hide

3914. INTRACELLULAR POLYPHENYLOXIDASES OF BROWN-ROT FUNGI, in. COMPARATIVE INVESTIGATIONS WITH MERULIUS LACRYMANS (WULF.) SCHUM EX FRIES, M. SILVESTER FALK AND CONIOPHORA CEREBELLA (PERS) DUBY. R.Rosch: *Arch. Mikrobiol.*, 1963, 44, 344-351 (Bot. Inst., Techn. Hochschule, Karlsruhe, Germany) The same polyphenyloxidase is active in all 3 fungi at optimum pH 3.0-4.0. Substrate specificity and pH optima exclude tyrosinase action. No definite physiol. differences between *M.lacrymans* and *M.Silvester* could be established by these and previous investigations. (German) E.M.Ling

3915. PRECIPITATION AND KINETICS OF FUNGAL CELLULASES. E.E.M.Taha and A.A.Abuzied: *Arch. Mikrobiol.*, 1963, 44, 366-372 (Microbiol. and Enzyme Res. Unit, Nat. Res. Centre, Cairo, U.A.R.) Acetone was the most suitable precipitant for cellulases of *Penicillium oxalicum* and *Helminthosporium cyclops*. Both cellulases were most active at 40° at pH 4.5. Cellulolytic activity increased to a max. after 30 min.

E.M.Ling

3916. SINGLE MITOCHONDRIA, FINE STRUCTURE AND GERMINATION OF THE SPORE OF BLASTOCLADIUM EMERSONII. E.C.Cantino, J.S.Lovett, L.V.Leak and J. Lythgoe: *J. gen. Microbiol.*, 1963, 31, 393-404 (Dept. Bot. and Plant Pathol., Michigan State Univ., East Lansing, Mich., U.S.A.) The fine structure of the motile spore of this water fungus is described. The spore contains a single mitochondrion and a single flagellum and a nuclear cap overlies the nucleus. The flagellum undergoes a series of characteristic movements before spore germination. The nuclear apparatus then rotates through 270° and the flagellum is retracted into the cell. Spore germination follows by formation of a germ tube, and the nuclear cap disintegrates.

K.Brew

3917. METHOD FOR INDUCING SPORULATION OF PURE CULTURES OF THE MYXOMYCETE PHYSARUM POLYCEPHALUM. J.W.Daniel and H.F.Russet: *J. Bact.*, 1962, 83, 234-240 (McArdle Mem. Lab., Univ. Wisconsin Med. Sch., Madison, Wis., U.S.A.) Small plasmodia grown in agitated culture were harvested, allowed to fuse into large plasmodia (1 $\frac{1}{2}$ g. wet wt. each) and, after incubation in the dark on a salts medium, exposed to light for 2 hr. The ensuing formation of sporangia containing spores was complete after 12-16 hr. The obligatory conditions for sporulation are: (1) an optimal growth age occurring just prior to the maximal growth of the organism and at a time when the nutrients in the medium are exhausted, (2) 4 days of incubation on a medium containing only inorg. salts and niacin or tryptophan, (3) subsequent

illumination with light of wavelengths between 350 and 500 m \AA .

• C.Toothill

3918. AGGREGATION TERRITORIES IN THE CELLULAR SLIME MOULDS. J.T.Bonner and M.R.Dodd: *Biol. Woods Hole*, 1962, 122, 13-24 (Dept. Biol., Princeton Univ., N.J., U.S.A.) The area of the aggregation territories was const. for a given sp. and given conditions regardless of the cell density within that area. As a result sporocarp size depends on the density of amoebae before aggregation.

G J.Peakin

OTHER MICRO-ORGANISMS

(Some abstracts on Protozoa, Diatoms, etc. may be found in the Experimental Zoology and Botany Sections)

3919. NEW THEORY OF AMOEBOID LOCOMOTION. J.¹ Kavanau: *J. theor. Biol.*, 1963, 4, 124-141 (Zool. Dept., Univ. California, Los Angeles, Calif., U.S.A.) Amoeboid locomotion is re-examined in the light of t&* theories of protoplasmic streaming. The mass flow of protoplasm is considered as a double counter-current P&." cess in which unfixed endoplasmic formed elements and enmeshed inclusions move forward while the matrix stre* backwards through the streaming endoplasm. Factors con* trolling streaming movements are discussed.

CF.Blane

3920. CHARACTERISATION OF ANTIGENS ISOLATED FROM TRYPANOSOMA RHODESIENSE. J.R.Seed and V. Weinman: *Nature*, Lond., 1963, 198, 197-198 (DeP* Microbiol., Yale Univ., New Haven, Conn., U.S.A.) Mice immunised with serum of rats infected with *T. rhodesiense* are protected against the organism. fl* Ag are composed of 2 groups. Ag antigens, which can be detected by agar diffusion techniques, are common to all trypanosomes although differing between strains in their antigenicity, heat lability etc.; these afford no protection to mice. The protective, PR antigens can be pptd. by ammonium sulphate but are not detectable in agar diff tests.

CM.Lewis

3921. STEARIC ACID AN ESSENTIAL GROWTH FACTOR FOR TRYPANOSOMA CRUZI. G.J.Boné and G.Paien*: *J. gen. Microbiol.*, 1963, 31, 261-266 (Lab. Parasit. Expt., Inst.Rech.Scient.Appl. Katanga, Elisabetville, Congo) The function of serum in the ^{?"} in sition of culture media for trypanosomes was investigated with *T. cruzi*. Serum supplies stearic acid, essential for the growth of this trypanosome. A liquid heat-sterile medium, composed of peptone and known chemicals described. The growth of *T. cruzi* in this medium reaches 70×10^6 trypanosomes/mir

K.Brew

3022. PATHOLOGY OF TOXOPLASMA INFECTION IN PREGNANT EWE. W.J.Hartley and J.C.KateP R.A. ve Sci., 1963, 4, 326-332 (Wallaceville A.R.S., Private Bag, Wellington, N.Zealand) Foetuses and foetal membranes from sheep expt. infected with *Toxoplasma* were examined. The lesions resembled those seen in similar material from field cases. In the foetus there was multiple focal necrosis of the central white matter of the cerebral hemispheres, with sometimes focal S ^{and} rarely clumps of *Toxoplasma*. Chronic focal in

sometimes occurred, in the liver* lung and heart. In the membranes there was focal necrosis in the foetal cotyledon, fifth hyperplasia and hypertrophy of the trophoblast Pithelium and occasional Toxoplasma clumps.

3923. B₁₂ VITAMINS AND GROWTH OF THE FLAGELLATE PRYMNESIUM PARVUM (CHRYSMONADINA). M.Rahat and K.Reich: J. gen. Microbiol., 1963, 31, 195-202 (Zool. Dept., Hebrew Univ., Jerusalem, Israel*) Vit[#] B₁₂ ** an essential nutrient for P.parvum. Growing in axenic culture and is replaceable only by a few complete analogues (devoid of one or both benzimidazole-methyl groups). Some substituted analogues can replace vit. B₁₂, but others (e.g. pseudovit. B₁₂, 2-methylmercaptoadenine, the ethylamide mono-acid, imidazole and anilide of vit. B₁₂) act as competitive inhibitors of the growth of P.parvum. K.Brew

3924. ROD-SHAPED PARTICLES IN SAPROSPIRA. R.J.Lewis: Nature, Lond., 1963, 198, 103-104 (Scripps Inst. Oceanography, Univ. California, La Jolla, Calif., U.S.A.) Large no. of rod-shaped particles, hollow rods or solid rods with tails, appear in natural lysates of Saprosira. The particles contain RNA and protein ratio 1:2 and have been termed ihapidosomes.

3925. METABOLISM CHANGES IN TETRAHYMENA PYRIFORMIS W ADAPTED TO POTASSIUM CYANIDE. B.W.Cashland and R.H.Steinacher: Proc. Soc. exp. Biol., 1962, 111, 789-793 (Dept. Zool., Univ. Neb., Neb., U.S.A.). KCN adapted T.pyriformis. After considerable alteration in glucose, acetate and elan metabolism. Total lipid metabolism is increased. Although adapted cells remove more amino acids from B₁₂ during growth, this is due more to increased oxidation. Methionine, proline, serine and valine oxidative activities are especially lowered, as is glucose oxidation. These changes show increase in auxin of Phalaenopsis isoleucine and threonine as well as methionine and

logarithmic growth phase. Cell litres in the max. stationary phase were approx. the same in all cultures.

S.L.Hoare

3927. METHICILLIN RESISTANCE IN STAPHYLOCOCCI. M.P.Jevons, A.W.Coe and M.T.Parker: Lancet, 1963, i, 904-907 (Cross-Infect. Res. Lab., Central Publ. Hlth. Lab., Colindale, London, England) 27479 cultures of Staphylococcus aureus sent to the Reference Laboratory in the 2 yr. from October, 1960, to September, 1962, were tested for sensitivity to methicillin. 102 were resistant.

CH.Bell

3928. INACTIVATION OF METHICILLIN, OXACILIN AND ANCILLIN BY STAPHYLOCOCCUS AUREUS. L.D. Sabath and M.Finland: Proc. Soc. exp. Biol., N.Y., 1962, 111, 547-550 (Thomdike Mem. Ub., Harvard Med. Sch., Boston, Mass., U.S.A.) The activity of the 3 penicillins decayed much more rapidly in a nutrient medium at 37° when exposed to a moderately heavy concn. of penicillinase-producing S.aureus than when incubated without these organisms.

M.M.Shapland

3929. EFFECT OF pH AND INORGANIC SALTS ON PENICILLINASE FORMATION BY STAPHYLOCOCCUS AUREUS. F.Leitner and S.Cohen: J. Bact., 1962, 83, 314-323 (Dept. Microbiol., M. Reese Hosp. and Med. Center, Chicago, Ill., U.S.A.) S.aureus strain S5-C-1 exhibited a progressive increase in penicillinase activity as the pH of its growth medium dropped from pH 6.0 to 4.7. At pH 4.7, the increase in enzymic activity was inhibited markedly by Ca and to a lesser extent by Mg and moderately by NaCl, KCl and NH₄Cl. Growth at the same pH in the presence of small concn. of Fe(NH₄)₂(SO₄)₂ (10⁻⁶ to 10⁻⁶M) elevated penicillinase activity greatly; this effect was also produced to a lesser extent by FeCl₃ and CoCl₂.

C.Toothill

3930. PENICILLIN-INDUCED LYSIS IN E. COLI. H.G.Boman and K.G.Eriksson: J. gen. Microbiol., 1963, 31, 339-352 (List. Biochem., Univ. Uppsala, Sweden)

The rate of induction of lysis in exponentially growing E.coli was studied for various concn. of ampicillin, using pure D and L forms and a mixture of these. Interpolation of penicillin concn. gives the 'LIOG value'-the concn. giving lysis in one generation. The LIOG value was used for characterising penicillins with 12 different side chains and for characterisation of some penicillin resistant mutants. The effects of culture concn., different media and penicillinase on the lysis rate are given. Different models for penicillin action in E.coli are discussed.

K.Brew

3931. IMMUNOCHEMICAL PROPERTIES OF A BRUCELLA ABORTUS STRAIN HIGHLY RESISTANT TO STREPTOMYCIN. J.Pamas, S.Poplawski, M.Cegielka, E.Kotlinska and K.Burdzyt: Z. Immun.-Forsch., 1962, 124, 383-389 (Inst. Med. Microbiol., Med. Ac ad., Lublin, Poland) Though resistant to 40000 µg./ml. of streptomycin, the strain showed no histochem. or immunochemical peculiarities.

(German) D.P.Winstanley

3932. SYNERGISM OF VMDOGRBEIN AND GRISEOVIRIDIN. K.Magyari, J.Stverteczky and L.Horváth: Acta microbiol. Acad. Sci. hung., 1962, 9, 247-250 (Res. Inst. Pharm. Ind., Budapest, Hungary) By the aid of a new chromatographic method the synergism between viddogrisein and griseoviridin (produced simult. by Streptomyces K 179 strain) was studied and demonstrated on the Staphylococcus aureus P 209 strain in fermentation broth and crude extracts.

S.Igali

AGENTS ACTING AGAINST MICRO-ORGANISMS

(See also Pharmacology)

ANTIBIOTICS AND CHEMOTHERAPY

3926. GROWTH OF PENICILLIN-RESISTANT AND PENICILLIN-SENSITIVE STRAINS OF STAPHYLOCOCCUS AUREUS. W.E.Allen and I.McVeigh: Canad. J. Microbiol., 1963, 9, 179-186 (Dept. Med., Vanderbilt Univ., Nashville, Tenn., U.S.A.) Ten strains of naturally penicillin-resistant S.aureus, two in vitro derived resistant strains and two sensitive strains, were grown at 37° in antibiotic intervals. Growth curves were plotted for each of the five strains. The growth curves for the naturally penicillin-resistant and penicillin-sensitive strains were very similar, i.e. in vitro resistance was very similar. The in vitro growth curves for the two in vitro derived penicillin-resistant strains were similar, but they grew at a slower rate during the

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OTHER AGENTS

3933. PURIFICATION AND CHARACTERISATION OF CHICK EMBRYO INTERFERON. G.P.Lampson, A.A. Tytell, M.M.Nemes and Hilleman: Proc. Soc. exp. Biol., N.Y., 1963, 112, 468-478 (Div. Virus and Tissue Culture Res., Merck Inst. Therap. Res., West Point, Pa., U.S.A.) A description of the complete prep. of chick embryo interferon is presented. It involves die use of WS influenza virus infecting eggs. The purification begins with acid pptn. The supernatant is treated with Zn at pH 6*0. A no. of chromatographic separations, dialyses and zone electrophoreses finally yield a prep., with 4500-fold the original interferon activity. The prop. of this pure interferon show that it is a basic protein of fairly low mol. wt. The u.v. absorption spectrum has a max. at 278 m μ and a min. at 253 m μ . The N content was about 16%. Arginine and lysine contents were calc. The prep. was free from nucleic acid. It prevents infection of cells with Eastern equine encephalitis virus and acts as a prophylactic suppressing development of Rous virus induced tumours. It is effective as an inhibitor of Newcastle disease virus infection but these biol. prop. did not effect the energy-releasing mechanisms in a no. of different systems.
D.N.Wheatley

3934. EFFECT OF INTERFERON ON SYNTHESIS OF VIRAL RNA AND PLAQUE FORMATION. M.Ha Proc. Soc. exp. Biol., N.Y., 1963, 112, 511-515 (Dept. Med., Brooklyn Hosp., State Univ. New York Coll. Med., New York City, N.Y., U.S.A.) WS influenza virus-induced interferon was extracted and shown to inhib. Eastern equine encephalitis virus in a predictable fashion up to a certain concn. after which it has little effect on plaque formation. The reduction in viral RNA synthesis when interferon was present had no relationship with the viral replication inhibn. It is concluded that interferon does not necessarily act merely by suppressing viral RNA synthesis.
D.N.Wheatley

3935. ACCELERATION OF BACTERIAL DEATH BY GROWTH SUBSTRATES. J.R.Postgate and J.R.Huntec Nature, Lond., 1963, 198, 273 (Microbiol. Res. Estab., Pojton Down, Wilts., England) Bacterial growth was limited in a variety of spp. by omitting certain C, N or P substrates. Culture of such limited cells in non-nutritive buffer in the presence of the limiting substrate resulted in acceleration of death. This phenomenon, termed 'substrate-accelerated death*', occurred with C-, N- and P-limited populations but only partially with S-limited populations and not at all with Mg-limited populations.
J.R.Sargent

3936. FACTORS AFFECTING VIABILITY OF AIRBORNE BACTERIA. VII. RELATIONSHIP BETWEEN STRUCTURE OF CHEMICAL ADDITIVES AND THEIR ACTION ON AIRBORNE CELLS. SJ.Webb Canad. J. Biochem., 1963, 41, 867-873 (Dept. Bacteriol., Univ. Saskatchewan, Saskatoon, Sask., Canada) Survival of airborne cells was studied with respect to *Serrada marcescens*, prepared as an aerosol and mixed with various test chemicals to give a final concn. of chem. of 0.25% w/v in the spray suspension. From a study of several amino-hydroxy benzenes and pyrimidines it was found that the -OH group was largely responsible for the protectiveness or toxicity of an added compound and that this activity could be greatly modified by an -NH₂ group as well as the ring nucleus on which it is held. The R.H. determined the toxicity or protectiveness of a given compound.
J.B.Parish

3937. SERIOUS LIMITATIONS OF A PORTABLE ETHYLENE OXIDE STERILISER. J.T.Taguchi, P.Edmonds and G.A. Harmon: Amer. J. med. Sci., 1963, 245, 299-303 (Cardiol. Sect., V.A. Center, Dayton, Ohio, U.S.A.) Two existing models of portable ethylene oxide sterilisers were found unsatisfactory since ethylene oxide diffused too rapidly from the chambers.
E.E.Hobbiger

3938. ANTIBACTERIAL ACTION OF GLYCINE. R.V.John and A.D.Russell: I. Pharm., Lond., 1963, 15, 346-347 (Welsh Coll. Adv. Technol., Cardiff, Wales) Spheroplasts of *E.coli* can be produced.
J.M.Whitmarsh

3939. ANTI-STREPTOCOCAL ACTIVITY OF LACTOPEROXIDASE. in. CRJago and M.Morrison: Proc. exp. Biol., N.Y., 1962, 111, 585-588 (Dept. Biochem-Sch. Med. and Dent., Univ. Rochester, N.Y., U.S.A.) Streptococcal growth is inhib. by purified lactoperoxidase under aerobic but not under anaerobic conditions. The inhibitory activity of this enzyme is reversed by catalase or horse-radish peroxidase.
M.M.Shapland

3940. T1ON-SPECIFIC RESISTANCE OF THE ORGANISM AND MYXOVIRUS INHIBITORS (COMPARISON OF SCANTT-BACTERIAL AND ANTI-VIRAL MECHANISMS). L.Borecky, V.Rathova and O.Krizanova: Folia Mice biol., 1963, 8, 137-146 (Inst. Viiol., Czechoslovak Acad. Sci., Bratislava, Czechoslovakia) Classified t.i.on of myxovirus inhibitors present in sera and tissues & discussed. Similarities in the prop. of 3-inhibn. of influenza virus and of bactericidal Gram-neg. organisms are emphasised. Ab formed by rats immunised with influenza virus and reacting with r.b.c. sensitised with O or Vi A₈ salmonellae were found to be Ab against the hosts' tissue present in allantoic fluid.
J.R.Sargent

3941. INFLUENCE OF SOME METAL IONS AND pH ON & INACTIVATION OF VACCINIA VIRUS BY HEAT. C.Kaplan: J. gen. Microbiol., 1963, 31, 311-314 (Lister Inst. Plev. Med., Elstree, Herts., England) The addition of metal ions to the suspending medium of vaccinia virus prep. made them more resistant to heat. Monovalent metals were more effective than divalent, a mixture of the 2 kinds was the most effective. Virus infectivity was rapidly destroyed by heavy metals. The protective effect is probably due to the formation of metal-protein complexes with increased resistance to heat denaturation.
K.Bre

3942. ULTRAVIOLET SENSITIVITY OF FROZEN PHAGE. M.Levine and E.Cox: Radiat. Res., 1963, 18, 213-222 (Brookhaven Nat. Lab., Upton, N.Y., U.S.A.) The phage of *Salmonella typhimurium* was more sensitive to 2537 m μ u.v. when irradiated in frozen state at -80° than at room temp. The absence of this effect at 2894 m μ suggested that it was connected with DNA rather than protein of phage, and absence of the effect in glycerol suggested that the cryst. state of water played an important part.
B.Payne

3943. REPORT OF THE EUROPEAN MEETING ON THE MICROBIOLOGY OF IRRADIATED FOODS. PAR? 1960. Int. J. appl. Radiat., 1963, 14, 1-58 (Organised by Food and Agricultural Organisation of the United Nations) *Clostridium botulinum* is particularly resistant to irradiation and in hermetically sealed food packages where may occur irradiation required for safety renders most parts unpalatable. Irradiation at non-sterilising dose is to heat pasteurisation in destruction of sp. micro-org.

Irradiation induces mutations at an increased rate, and resistance to irradiation in some bacteria has been demonstrated; planning and control are necessary to minimise these hazards. *Salmonellae*, *staphylococci*, *enterococci* and *Candida* spp. may survive selectively in H_2O -sterilising treatments due to their greater resistance. The present indicator organism *E. coli* is more sensitive than several pathogens, and a new indicator is desirable, viruses in food constitute a special problem due to their resistance and reactivation and recombination potentials.

B.Payne

^{Q94} 3944. TRANSIENT SENSITIVITY OF INTRACELLULAR PSITTACOSIS VIRUS TO X-RAYS. M.Pollard, N. Sharon and W.R.Klemm: Nature, Lond., 1963, 198, 313-314 (Lobund Lab., Dept. Biol., Univ. Notre Dame, Ind., U.S.A.) Irradiation of turkey psittacosis virus with X-rays destroyed its infectivity when exposure was during the stage of replication of DNA. Irradiation of infected human synovial cells caused inactivation of 80-90% I^* toe virus during the initial 3-9 hr. Capacity of the host cell to support virus was not affected. G.M.Lewis

^{Q945} 3945. RESPIRATION OF yIRRADIATED BRUCELLA ABORTUS AND M. TUBERCULOSIS. TJH.Ahn, H.Nishihara, C.M.Carpenter and G.V.Tapliir Proc. Soc. exp. Biol., N.Y., 1962, 111, 771-773 (H.N.Falk Res. Lab., Univ. California Sch. Med., Los Angeles, Calif., U.S.A.) ^{Ca, M, of} ^{uVz} ^{uphilised} *B.abortus* 19 and *M. tuberculosis* ^{WTRY} exposed from 750000 to 800000 r failed to grow ^T ^A ^Y ^O ^A ^r ⁱ ^a ^t culture media, yet continued to respire at 40% to 50% of the rate of the non-irradiated cells.

M.M.Shapland

^{Q946} A.M.Cook and T. A. Roberts: J. Pharm., Lond., 1963, J5, 345-346 (Sch. Pharm., 29-39 Brunswick Sq., London, England) Pre-irradiation sensitises the spores ¹⁰ normally sub-lethal heating. J.M.Whitmaish

SOIL MICROBIOLOGY

^{Q947} • SURVIVAL OF NITRIFYING BACTERIA IN SOIL. M.Garbosky and N.Giambiagi: Plant and Soil, 1962, 17, 271-278 (Direccion Invest. Forestales, Inst. Snelos, by Igrotechnia, Argentina) Nitrification as measured by survival of nitrifying bacteria was studied in 25 different soils, maintained in sterile flasks in darkness for 5 years. Temperature and joint action of Ca and K in adequate amounts were the most important factors governing survival. Mg^{++} , Cu^{++} , MB matter, org. N and pH of the soil did not influence the initial no. or survival of nitrifying bacteria. W.A.Stevens

^{Q948} 3948. AZOTOBACTER SPECIES IN SOIL. I. COMPARISON OF MEDIA AND TECHNIQUES FOR COUNTING AZOTOBACTER IN SOIL. E. POPULATIONS OF AZOTOBACTER IN THE RHIZOSPHERE AND EFFECTS OF ARTIFICIAL INOCULATIONS. M.E.Brown, SJOBurlingham and R.M.Jackson: Plant and Soil, 1962, 17, 309-319, 320-332. The highest counts of *Azotobacter* were obtained from soil suspensions shaken in sterile water containing 10 g/g glass beads and plated on to glucose agar. Mannitol enhanced lower counts than glucose, an effect enhanced by drying the agar blocks. A dear, pptd. phosphate and $CaCO_3$ free medium is recommended for the

agar plate method. The count is affected by phosphate concn. The diln. plate method is less accurate but more convenient than agar plates when soil samples have to be examined.

n. Rhizosphere effect is small and *Azotobacter* was often suppressed. Root washings indicated absence of cells from root surface. *Azotobacter* was absent from rhizosphere in acid soils. Soils of pH above 6.5 containing natural *Azotobacter* populations gave best inoc. results with seeds, roots and soils. Seed inocn. was the most practical and led to good establishment throughout the root system. Final population in the rhizosphere depended on size and age of initial inoculum and best results came from spraying seeds with 14-day old cultures and sowing seeds on the same day.

W.A.Stevens

^{Q949} 3949. ABSORPTION OF SODIUM BENTONITE PARTICLES ON BACILLUS SUBTILIS. N.Lahar. Plant and Soil, 1962, 17, 191-208 (Hebrew Univ., Fac. Agric., Rehovoth, Israel) Measurement was made of the electrophoretic mobility of *B. subtilis* under the influence of Na bentonite particles smaller than bacterial cells at different pH's and in various ionic strengths of NaCl and Na phosphate. The adsorption of the Na bentonite was measured quant. using a micro-electrophoretic method. Bacteria affected in electrophoretic mobility by Na bentonite were found in the same population as those not affected: they represent absorbing and non-absorbing groups of bacteria. Na bentonite absorption is reversible and influenced by pH and ionic strength. The mechanisms of adsorption are discussed.

W.A.Stevens

^{Q950} 3950. BIOCHEMICAL EXAMINATION OF RHIZOBIA STRAINS. E.Manningen Acta microbiol. Acad. Sci. hung., 1962, 9, 219-225 (Inst. Soil Res. Agrochem., Acad. Sci. Hung., Budapest, Hungary) 45 *Rhizobium* strains were divided into 3 groups on the basis of their biochem. reactions. Strains belonging to group A did not produce acid from sucrose, galactose, glucose, laevulose, raffinose, xylose and salicin. Strains B produced acid and gas from these substances and acid from aesculin. Group C strains formed only acid and did not split aesculin. Strains isolated from root nodules of one plant sp. could be included in different biochem. groups, therefore the classification of Rhizobia on an ecological basis is not justified.

S.Igali

^{Q951} 3951. MICROBIAL POPULATIONS OF WOODS. V. INFLUENCE OF SEVERAL SOURCES OF CARBON AND NITROGEN ON DECOMPOSITION OF SAWDUST. M.J.Mangenot and J.Reymond: Rev. gen. Bot., 1963, 70, 107-129. The competitive effects, of mainly *Trechispora* sp., but also *Stereum pugnireum* and *Sjogrenium*, *Peniophora incamata*, *Radula lcula* and *Tephritis mucida*, with the microbial population of various types of soil were studied using sterilised washed beech sawdust with soln. of glucose and asparagine, NH_4NO_3 gelatin and tannin-gelatin. (French) C.W.Mith

^{Q952} 3952. LYSIS OF SOIL FUNGI BY BACTERIA. R.Mitchell and M.Alexander Canad. J. Microbiol., 1963, 9, 169-177 (Lab. Soil Microbiol., Dept. Agron., Cornell Univ., Ithaca, N.Y., U.S.A.) A no. of bacteria able to lyse *Fusobacterium oxysporum* were isolated from soil. One of these, a strain of *Bacillus cereus*, was studied in detail. Living and dead *iusanum* mycelium as well as cell-wall prep. were digested. Chitin and the hyphae of a no. of other fungi also served as C sources for the active organisms. Lysis appeared to be associated with

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chitinase and laminarinase activity in *B. cereus*, but incubation of fungus mycelium with chitinase alone, or with chitinase with laminarinase, proteases and cellulase, did not result in lysis. N-Acetylhexosamine appeared during digestion*
 S.L.Hoare

3953. INFLUENCE OF SOIL AND ROOT EXTRACTS ON THE ASSOCIATIVE GROWTH OF SELECTED SOIL BACTERIA. E.C.S.Chan, H.Katzenelson and J.W.Roualt
 Canad. J. Microbiol., 1963, 9, 187-197 (Microbiol.
 Res. Inst., Canada Dept. Agric., Ottawa, Canada)
 Population changes of *Agrobacterium radiobacter*, *Arihrobacter citrous*, *Azotobacter chroococcum*, *Bacillus cereus* and a *Rseudomonas* sp. in pure and mixed culture were followed by plating on selective media (soil extract and root extracts of 2-, 4-, and 8-week old oats, soybeans and wheat).
 S.L.Hoare

3954. MICRO-ORGANISMS IN THE ROOT ZONE IN RELATION TO TEMPERATURE. J.W.Roualt, E.A.Peterson, H.Katzenelson and V.E.Henderson: Canad. J.

Microbiol., 1963, 9, 227-236 (Microbiol. Res. Inst., Dept. Agric, Ottawa, Canada) A study was made of the no. and kinds of micro-organisms in the root zone of wheat and soybeans grown in the greenhouse at 3 ranges of temp.: 55-60°, 70-75° and 85-9(f. The results suggest that temp. exerts a direct effect on the micro-organisms in the root zone and an indirect effect by influencing plant growth.
 S.L.Hoare

3955. POPULATIONS OF FUSARIUMOXYSPORUMF MELONIS AND THEIR RELATION TO THE WILT POTENTIAL OF TWO SOILS. R.N.Wensley and CD.McKeen:
 Canad. J. Microbiol., 1963, 9, 237-249 (Res. Stn., Canada Dept. Agric, Harrow, Ont., Canada) The relation of soil populations of the musk melon wilt fungus to the wilt potentials of a yellow Fox sandy loam soil and a dark Colwood loam was investigated. In either soil a direct relationship existed between the size of the population of the fungus and wilt incidence. With the same fungus population there was a greater incidence of wilt in the yellow Fox sandy loam.
 S.L.Hoare

ANTIBIOTICS AND CHEMOTHERAPY

³⁹⁵ 6. AMINOADIPYL PENICILLIN IN PENICILLIN FERMENTATIONS. M.Cole and F.R.Batchelor: Nature, Lond., 1963, 198, 383-384 (Beecham Res. Lab., Research Park, Betchworth, Surrey, England) Extracts of the mycelium of Penicillium chrysogenum were ground chromatographically and found to contain an acid-labile compound destroyed by penicillinase and signaled penicillin M. The production of penicillin M in ¹⁴C-tim¹⁴ by addition of DL-a-amino adipic acid to the thiomu¹⁴ Its prop# after Purification were very similar to cephalosporin N, and it is suggested that penicillin M is a¹⁴ amino adipylpenicillin with a side chain fission¹⁴ configuration, in contrast to cephalosporin with the D configuration. G.M.Lewis

³⁹ 57. ANTI-BIOTIC ACTION IN ADAPTATION. T.D.Luckey: Nature, Lond., 1963, 198, 263-265 wept, Biochem., Univ. Missouri Med. Center, Columbia, Mo., U.S.A.) The effect of penicillin, streptomycin, chloramphenicol and a¹⁴ C-mycin on heat stress in nematodes of Turbratrix was found to be inhibitory to heat survival at low concentrations stimulatory at higher concn. with 2 peaks of activity¹⁴ by a 2nd inhibitory zone. The result¹⁴ discussed in relation to theories of action of antibiotics. G.M.Lefkis

³⁹ 58. DETERMINATION OF EPITETRACYCLINE AND TETRACYCLINE BY ION-EXCHANGE PAPER CHROMATOGRAPHY AND ITS APPLICATION TO HUMAN URINE AND SERUM. E.Addison and R.G.Clark: J.Pharm., Lond., 1963, 15, 268-272 (Pfizer Ltd., Sandwich, Kent, Eng!) Whatman modified vitreous Phosphate cation-exchange paper is developed un 0.05% NH₄X soln. The spots are located under NH₄Cl¹⁴ solution, eluted in 10% NH₄Cl soln. Quantitative extinction measured at 356 mp. The method is direct for Urine and Qual. for serum, but is unsuitable for tetracycline or oxytetracycline. J.M.Whitmarsh

³⁹ 59. COMPARISON OF THE ACTION OF AUREOMYCIN AND MEXOCIN ON PROTEUS MIRABILIS. J.GuiUaume, R.Osteux, F.Wattel and F.Deschamps: C.R. Soc. Biol., Paris, 1962, 156, 1829-1832 (Inst. Pasteur, Lille, France) 100 fig./ml. mexocin or aureomycin decreased uptake by P. mirabilis in the absence¹⁴ of glucose, pyruvate, citrate and succinate. In presence¹⁴ of antibiotics, incubation of [14C]glucose with P. mirabilis resulted in the appearance of alanine, glutamate, malate and aspartate and later H₂O¹⁴ and fumarate. Addition of mexocin or aureomycin caused accumulation of pyruvic acid, acetic and citric acid. Traces of succinic, fumaric and malic acids were present but no citric acid was found.

³⁹ 60. EFFECT OF ORAL NEOMYCIN ON THE CONVERSION OF CHOLIC ACID TO DEOXYCHOLIC IN MAN. J.G.Hamilton: Arch. Biochem., 1963, 101, 7-13 (Dept. Biochem., Tulane Univ. Sch. Med., New Orleans, La., U.S.A.) Neomycin lowered serum cholesterol and increased faecal bile acid excretion. The formation of deoxycholic acid from cholic acid by intestinal bacteria was inhibited but the bacteria hydrolysed¹⁴ conjugated bile acids were unaffected. A simplified¹⁴ procedure for bile acid Purification and paper chromatograms for 2 dimensional thin layer and glass chromatography of bile acids are described. B.M.Stevens

^{3961.} SENSITIVITY TO DRUGS OF AUSTRALIAN LEPTOSPIRAL SEROTYPES. P.B.Spradbrook: Brit. J. Pharmacol., 1963, 20, 230-236 (Dept. Preventative Med., Sch. Vet. Sci., Univ. Queensland, Australia) Twelve leptospiral serotypes were tested and in general were susceptible to streptomycin, penicillin and tetracycline. L. icterohaemorrhagiae, L. canicola and L. zanoni were more resistant than the rest. High concn. of penicillin caused lysis of leptospirae but streptomycin and the tetracyclines did not. The results do not agree well with those on the chemotherapy of expt. infections. A.E.Brooks

^{3962.} CHEMOTHERAPY OF EXPERIMENTAL LEPTOSPIRAL INFECTION IN MICE. P.B.Spradbrook: Brit. J. Pharmacol., 1962, 20, 237-244 (Dept. Preventative Med., Sch. Vet. Sci., Univ. Queensland, Australia) Leptospira zanoni is used to produce chronic renal infections in young white mice, and a variant to produce acute disease with 50% mortality. If treated before jaundice developed a single dose of streptomycin and suitable doses of the tetracyclines prevented death and chronic infection. The penicillins had no permanent action. Concluded that streptomycin is the best treatment for leptospirosis in animals. A.E.Brooks

^{3963.} DIFFERENCES IN ACTION OF LARGE AND SMALL POLYENE ANTIFUNGAL ANTIBIOTICS. J.O.Lampen and P.M. Amow: Bull. Res. Coun. Israel, A, 1963, 11, 286-291 (Inst. Microbiol., Rutgers, State Univ., New Brunswick, N.J., U.S.A.) The polyene anti-fungal antibiotics combine with yeast cell membrane and decrease its permeability. In K-free medium the cells became deficient in K and glycolysis ceased. Adding K or NH₄ prevented or reversed the inhibn. of glycolysis by certain polyenes, e.g., nystatin or amphotericins A and B. Inhibn. by etruscomycin or filipin was not prevented even by a combination of K, NH₄, glycolytic cofactors and boiled yeast juice. Polyenes whose inhibn. was reversible contained 46-47 C atoms in their mol, whereas those which caused irreversible inhibn. contained 34-37 C atoms. The smaller mol. produced more drastic damage to the cell membrane. L.G.Gillies

^{3964.} STIMULATION OF TWO PATHOGENIC FUNGI BY HIGH DILUTIONS OF FUNGICIDES. F.J.Nutman and F.M.Roberts: Trans. Brit. mycol. Soc., 1962, 45, 449-456 (Coffee Berry Dis. Res. Unit, Dept. Agric, Kenya) Low concn. of a wide range of fungicides stimulates conidial germination, growth and infectivity of the pathogenic form of Colletotrichum coffeaeum as well as stimulating the germination of uredospores of Hemileia vastatrix. The author suggests that the physiol. mechanism leading to stimn. may be the same for all fungitoxic compounds. D.Hide

^{3965.} A TUMOUR INHIBITOR IN LAMPTEROMYCES JAPONICA. T.O.Yoshida, J.A.Rising and W.J. Nungesten: Proc. Soc. exp. Biol., N.Y., 1962, 111, 676-679 (Dept. Bact., Univ. Michigan, Ann Arbor, Mich., U.S.A.) An ethanol extract of this fungus was found to inhibit the growth of human cancer cells in tissue culture and was not inactivated by human serum. Ehrlich ascites tumour cells were inhibited in vivo providing the extract was put into contact with the cells. M.M.Shapland

^{3966.} ACTIVITY OF 1,3-D-ARABINOFURANOSYL-CYTOSINE HYDROCHLORIDE [CA] AGAINST HERPES SIMPLEX KERATITIS. G.E.Underwood: Proc. Soc. exp. Biol., N.Y., 1962, 111, 660-664 (Dept. Inf. Dis.,

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Upjohn Co., Kalamazoo, Mich., U.S.A.) The pyrimidine nucleoside, CA_t was found to be at least as effective as 5-iodo 2'-deoxyuridine in the treatment of herpes simplex keratitis in rabbits. M.M.Shapland

CENTRAL NERVOUS SYSTEM

3967. HYPOTENSION FROM ABSENT CIRCULATORY REFLEXES. EFFECTS OF ALCOHOL, BARBITURATES, PSYCHOTHERAPEUTIC DRUGS, AND OTHER MECHANISMS. M.A.Barraclough and E.P.Sharpey-Schafen Lancet, 1963, i, 1121-1126 (St. Thomas's Hosp. Med. Sch., London, England) Circulatory reflexes were investigated by standard procedures and were found to be absent in neuritis due to alcohol, porphyria, infective polyneuritis, and other conditions. Acute loss of circulatory reflexes was found in alcoholic intoxication and in poisoning due to barbiturates and drugs used in psychotherapy. Cerebrovascular accidents also caused acute interruption of the reflex pathways. Severe hypotension in the supine posture was usual in the acute group, and was precipitated in chronic neuritis by minor decreases in blood-vol., artificial respiration, and therapeutic doses of hypnotics or drugs for psychotherapy. In circulations without reflexes, the mechanism of hypotension is explained and its treatment determined by the simple relation existing between stroke output and arterial b.p. G.H.Bell

3968. EFFECTS OF INTRACAROTID AND INTRAVERTEBRAL THIOPENTAL, AMOBARBITAL, PHENOBARBITAL, CHLORPROMAZINE AND DIPHENYLHYDANTOIN IN CONSCIOUS, INTACT CATS. G.B.Jacobs, A.B.Rothbaler, F.C.Coppola and M.E. Jarvik: Int. J. Neuropharm., 1962, 1, 323-332 (Dept. Anat., A.Einstein Coll. Med., New York, U.S.A.) While the general nature of the lateralised syndrome which develops after administration of the different barbiturates was similar for each, differences in latency and duration of effect are interpreted in the light of differences in permeability const., cerebral extraction ratio, binding fraction and sp. receptor site action. Chlorpromazine provoked a characteristic behavioural response and there was little difference between intracarotid and the intravertebral route. Diphenylhydantoin also caused a barbiturate-like response from which the animals did not fully recover although recovery from the effects of the other drugs was complete. G.F.Blane

3969. A COMPARISON OF THE EFFECTS OF SIX BARBITURATES AND A PLACEBO ON INSOMNIA AND MOTILITY IN PSYCHIATRIC PATIENTS. J.M.Hinton: Brit. J. Pharmacol., 1963, 20, 319-325 (Acad. Dept. Psychy., Middlesex Hosp., London, England)

Cyclobarbitalone, hexobarbitalone, quinalbarbitalone sodium, pentobarbitalone-sodium, phenobarbitalone sodium, neal-barbitalone and a placebo are compared in psychiatric patients. The barbiturates prolong sleep and reduced motility, but there was little difference between them. Phenobarbitalone, quinalbarbitalone and pentobarbitalone were most effective. A.E. Brooks

3970. MECHANISM OF POTENTIATION OF BARBITURATES AND MEPROBAMATE ACTIONS BY IMIPRAMINE. R.Kato, E.Chiesara and P.Vassanelli

Biochem. Pharmacol., 1963, 12, 3&7-364 (Inst. PharmacoL, Univ., Milan, Italy) Imipramine potentiates the actions of hexobarbital, pentobarbital, meprobamate and carisoprodol but not of barbital and chloral hydrate. Unlike SKF 525-A, imipramine can reinduce sleep in rats awakening from pentobarbital hypnosis. In vitro studies indicated that imipramine inhibited the microsomal drug-metabolising enzymes, especially the enzyme which metabolised pentobarbital. In imipramine-treated rats, carisoprodol, meprobamate, hexobarbital *jj pentobarbital concn. in the brain, determined on recover) from the loss of the righting reflex, were a little lower than in controls. Imipramine could be classified both as a prolonging agent and a potentiating agent by its inhibitory action on drug metabolism and its ability to increase the sensitivity of the c.n.s. towards the drugs.

L.G.GUUES

3971. METABOLISM AND EXCRETION OF METHOHEXITAL IN THE RAT AND DOG. J.S.Welles, R.E. McMahon and W.J.Doran: J. Pharmacol. exp. Ther. 1963, 139, 166-171 (Eli Lilly and Co., Indianapolis, Ind., U.S.A.) Methohexitonal, a-(±)-1-methyl-5-allyl-5-(1-methyl-2-pentynyl)barbituric acid was metabolised to the 4-hydroxy deriv. Demethylation of the N-methyl group was unimportant. Excretion of meta*-bolites was rapid. J.M.Whitmarsh

3972. A COMPARATIVE CONTROLLED CLINICAL TRIAL⁰¹ SEVEN HYPNOTIC AGENTS IN MEDICAL AND PSYCHIATRIC IN-PATIENTS. K.Rickels and H.Bass: Amer. J. med. Sci., 1963, 245, 142-152 (Hosp. Univ. Pennsylvania, Philadelphia, Pa., U.S.A.) In medical patients 300 w methyjrylon, 800 mg.meprobamate and 500 mg.glutethimide produced a hypnotic effect similar to that of 100-200 mg. secobarbital sodium. In psychiatric patients with a? insomnia which did not respond to tranquillisers or &^{ab*} depressants, the same drugs, in the doses stated, were fl more effective than a placebo. The data show that the higher the psychopathology score of a patient the poorer the response to hypnotic medication. E-E-Hobbig^

3973. SPECIES DIFFERENCES IN THE EFFECT OF BODY WEIGHT ON PENTOBARBITAL INDUCED SLEEP. R.W.Morris: Arch. int. Pharmacodyn., 1963, 142, 550-555 (Dept. Pharmacognosy and PharmacoL, Univ. Illinois, Chicago, m., U.S.A.) Pentobarbit^{nt} sleeping times are measured in guinea-pigs, rabbits and mice, using doses of 30, 30 and 60 mg./kg. respectively. Changes of ambient temp. produce alterations of sleep times in rabbits and mice, but not in guinea-pigs. Differences are also formed with differing body wt. in guinea-pigs and rabbits but not in mice. S.E.Srmth

3974. USE OF DRUG-BINDING PROTEIN FROM ELECTRIC TISSUE TO EXPLAIN ACTION OF NEUROTROPIC AGENTS. S.Ehrenpreis: lit. J. Neuropharm., 1⁹⁶², 273-281 (Pharmacol. Dept., Sch. Med., Georgetown Univ., Washington, D.C., U.S.A.) The mechanism of action of a no. of drugs with marked action on ^{*e} is re-examined in the light of evidence on the strength^p interaction between the drugs and a protein extracted ^{fl***up} from the eel electric organ. The drugs considered ^{fl***up} tubocurarine, chlorpromazine, local anaesthetics, benzodryl, banthine, chlorisondamine, ACh and eserine. G.F.B.^{lane}

3975. DETERMINATION OF CHLORDIAZEPOXIDE [LIBRIUM] AND OF A METABOLITE OF LACTAM CHARACTER IN PLASMA OF HUMANS, DOGS, AND RATS BY A SPECIFIC SPECTROFLUOROMETRIC

METHOD. B.A.Koechlin and L.D'Arconte: Analyt. Biochem., 1963, 5, 195-207 (Dept. Pharmacol., Hoffman-La Roche Inc., Nutley, N.J., U.S.A.) CMordiazepoxide [I], after selective extraction, is hydrolysed to a lactam deriv. which converts in light to a fluorescent compound. This lactam is a major metabolite of I in man and dogs. I and the lactam can be quantitated separately by this method, with sensitivity of 25 µg./ml. of plasma, adequate for normal therapeutic doses. The half-life of I was 20-24 hr. in man, 14-20 hr. in dogs and 4-6 hr. in rats. A.D. Smith

^{3976.} EFFECTS OF BENZODIAZEPINES UPON AMYGDALA AND HIPPOCAMPUS OF CAT. A.Morillo: Int. J. Neuropharm., 1962, 1, 353-359 (Thudichum Psychiatric Res. Lab., Galesburg State Res. Hosp., Ill., U.S.A.) Two newly synthesised benzodiazepines, related chem. to chlordiazepoxide were studied in *cerveau isolé* and *encéphale isolé* prep. It is concluded that these drugs exert direct inhibitory actions at the level of the amygdala and hippocampus. G.F.Blane

^{3977.} ACTH-HYPERSECRETION INDUCED BY PHENOTHIAINE TRANQUILLISERS. R.L. Smith, R.P. Maickel and B.B.Brodie: J. Pharmacol. exp. Ther., 1963, 139, 185-190 (Nat. Heart Inst., Bethesda, Md., U.S.A.) Subacute doses of the tranquillisers evoke a persistent hypersecretion of ACTH, reducing its content in the pituitary by 70%, thus preventing response to stress. J.M.Whitmarsh

^{3978.} EFFECT OF DERIVATIVES OF PHENOTHIAZINE AND HALOPERIDOL ON AUDIOGENIC CRISIS IN THE MOUSE. G.Raynaud and G.Valette: Arch. int. Pharmacodyn., 1963, 142, 425-439 (Pharmacol. Lab., Pharmacy Fac., Univ. Paris, France) Various sound stimuli caused audiogenic crises in mice. These were inhibited by chlorpromazine, methopromazine and levosetazine; aminopromazine and afimemazine had similar but weaker effects. Thioproperazine, prochlorophenazine and haloperidol in some cases potentiated the crisis. T.J.Sullivan

^{3979.} NEUROPHYSIOLOGICAL BASIS AND PHARMACOLOGICAL MODIFICATION OF INHIBITORY EMOTIONAL BEHAVIOUR IN THE RABBIT. W.M.Davis: Arch. int. Pharmacodyn., 1963, 142, 349-360 (Univ. Oklahoma Coll. Pharm., Norman, Okla., U.S.A.) The nobilising effects of various drugs are studied in 5th m.s. M^or^oi^{ne} 1-5 mg./kg., chlorpromazine 1<25-^{ct} /kg. and pentobarbitone 10 mg. Ag. produce increased immobility. Levallorphan 0-1-1 mg. Ag. Phetamine 0<5-1 mg./kg. and meprobamate 2[#] 5-^{bra} Ag. decrease it. The action of these drugs on the limbic systems is discussed. S.E. Smith

^{3980.} RELATION BETWEEN STRUCTURE AND CENTRAL NERVOUS ACTION OF 5th ME HYDRAZINE DERIVATIVES. A.F.Crowther, A.Spinks and E.H.P.Young: J. Neuropharm., 1962, 1, 141-144 (I.C.I., Pharmaceuticals Div., Macclesfield, Cheshire, England) Some 300 arylhydrazines and araloxyalkylhydrazines were examined with particular ref. to possible antidepressant activity. G.F.Blane

^{3981.} RELATIONSHIP BETWEEN CHEMICAL STRUCTURE AND C.N.S.-DEPRESSANT ACTIVITY OF BASIC KETOSES RELATED TO HALOPERIDOL. P.A.J.Janssen: Int. J. Neuropharm., 1962, 1, 145-148 (Res. Lab., Beersse, Belgium) The finding of neuroleptic, anal-

gesic or hypotensive prop, among 2000 compounds screened is described. G.F.Blane

^{3982.} ACTION OF CHLORDIAZEPOXIDE ON TWO TYPES OF TEMPORAL CONDITIONING IN RATS. M.Richelle, B.Xhenseval, O.Fontaine and L.Thone: Int. J. Neuropharm., 1962, 1, 381-391 (Service Psychologie, Univ., Liege, Belgium) Chlordiazepoxide increased the conditioned activity and disrupted timing behaviour of rats suitably trained in a Skinner box to reinforcement schedules. The muscle relaxant action of the drug is tentatively suggested as an explanation of these effects on timing behaviour. G.F.Blane

^{3983.} EFFECTS OF RESERPINE AND MORPHINE ON BEHAVIOUR SUPPRESSED BY PUNISHMENT. L.Geller, E.Bachman and J.Seifter: Life Sci., 1963, No. 4, 226-231 (Wyeth Labs., Inc., Philadelphia, Pa., U.S.A.) Chronic administration of reserpine reinstated the suppressed lever-pressing behaviour of hungry rats, whose suppression of behaviour had been conditioned by simultaneous rewarding with food and punishment. Morphine sulphate had no such effect. K.Jones

^{3984.} ANALYSIS OF CENTRAL EFFECT OF (+)TUBOCURARINE CHLORIDE IN CAT. H.Kumagai, F.Sakai and Y.Otsuka: Int. J. Neuropharm., 1962, 1, 157-159 (Pharmacol. Dept., Univ., Tokyo, Japan) Electrophys. technique was used to study the effect of minute amounts of (+)-tubocurarine inj. directly into subcortical structures. The discharges which generally began in the hippocampus, then spread to other areas, were found to be similar to those produced by carbachol or muscarine administered sub-cortically. G.F.Blane

^{3985.} BEHAVIOURAL AND CENTRAL MUSCLE RELAXANT PROPERTIES OF 2-ETHYL-3-METHYL-VALERAMIDE. A.P.Roszkowski and W.M.Govien: Int. J. Neuropharm., 1962, 1, 423-430 (Pharmacol. Dept., McNeil Labs. Inc., Fort Washington, Pa., U.S.A.) 2-Ethyl-3-methylvaleramide was found to have central skeletal muscle relaxing prop, of long duration. Tranquillising prop. were also demonstrated in a variety of spp. Attention is drawn to apparent preferential suppression of polysynaptic rather than monosynaptic spinal reflexes. G.F.Blane

^{3986.} BEHAVIOURAL OUTPUT ENHANCING EFFECT OF IMIPRAMINE IN PIGEONS. P.B.Dews: Int. J. Neuropharm., 1962, 1, 265-272 (Dept. Pharmacol., Harvard Med. Sch., Boston, Mass., U.S.A.) Pigeons were trained on a multiple pos. reinforcement schedule and given drugs i.m. Imipramine, demethylimipramine and methylamphetamine but not chlorpromazine increased the behavioural output in this test. G.F.Blane

^{3987.} A NEW TECHNIQUE FOR STUDYING INHIBITORY EFFECTS OF DRUGS ON DISCRIMINATORY AVOIDANCE-ESCAPE BEHAVIOUR IN RATS. C.J.E.Niemegeers: Int. J. Neuropharm., 1962, 1, 79-83 (Res. Lab., Dr. C.Janssen, Beerse, Belgium) A complex test is described using a newly designed 'brightness discrimination' box for inducing discriminatory-avoidance habits. All of several groups of drugs with central actions acted as inhibitors of avoidance but only typical neuroleptic agents such as haloperidol and perphenazine were capable of blocking avoidance at dose levels below those which promote signs of gross neurological impairment. G.F.Blane

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- 3988. EFFECTS OF PSYCHOACTIVE DRUGS ON YOHIMBINE INDUCED RESPONSES IN CONSCIOUS DOGS.** W.J.Lang and S.Gershon: *Arch. int. Pharmacodyn.*, 1963, 142, 457-472 (Psychopharmacol. Unit, Pharmacol. Dept., Univ., Melbourne, Australia)
- A screening procedure for anti-anxiety agents is described. Yohimbine ($0.5\text{ mg. per kg. i.v.}$) caused an anxiety state in dogs similar to that caused in man. This was given 15 min. after the anti-anxiety drug being tested. Modification of the response to yohimbine provided an index of the activity of drugs including chlor diazepoxide, chlorpromazine, amylobarbitone, and meprobamate which correlated with the results of clinical trials on these compounds. T.J.Sullivan
- 3989. CEREBRAL AUTONOMIC CONTROL SYSTEMS AND THEIR PHARMACOLOGICAL EVALUATION.** E.C.Hoff, M.N.Carroll, jun. and J.F.Kell, jun.: *Int. J. Neuropharm.*, 1982, 1, 309-322 (Dept. Neurol. Sci., Med. Coll. Virginia, U.S.A.) Chiefly a review of attempts that have been made to correlate psychology with physiology. Attention is drawn to the effects of various psychotropic drugs including alcohol and the tranquillisers, with emphasis on their effect on brain autonomic control centres and the interpretation of the response in psychol. terms. G.F.Blane
- 3990. METABOLISM AND BEHAVIOURAL ACTION OF PSYCHOTROPIC TRYPTAMINE HOMOLOGUES.** S.Szara, E.Hearst and F.Putney: *Int. J. Neuropharm.*, 1962, 1, 111-117 (Clin. Neuropharmacol. Res. Center, St. Elizabeth's Hosp., Washington, D.C., U.S.A.) The final behavioural effect of 2 of the 3 homologues tested, N, N-dimethyltryptamine and N, N-diethyltryptamine, appeared to depend on the interaction between circulating unchanged compound which depresses motor activity and 6-hydroxylated metabolite which elicits hyperactivity. Hyperactivity produced by DL-C₁₈-methyl-tryptamine did not appear to depend on 6-hydroxylation. G.F.Blane
- 3991. EFFECT OF PSYCHOTROPIC DRUGS ON DE-CARBOXYLASE OF AROMATIC AMINO ACIDS IN RAT BRAIN.** W.P.Burkard, R.Pavlin, A.Pletscher and K.F.Gey: *Int. J. Neuropharm.*, 1962, 1, 233-237 (Med. Res. Dept., Hoffmann-La Roche and Co. Ltd., Basle, Switzerland) A variety of drugs including sedatives, psychostimulants and hallucinogens were administered to rats i.p. Extracts from die brains of these animals were tested for decarboxylase activity in vitro on the substrates, 3,4-dihydroxyphenylalanine and 5HTP. There was evidence of partial inhibn. of brain decarboxylase only after (X-rnethyl-5-hydroxytryptophan and a-methyl-3,4-dehydroxytoienylalanine. G.F.Blane
- 3992. EFFECT OF DRUGS ON 'METABOLIC PATTERN¹ OF BRAIN. EFFECT OF ISONIAZID, IPRONIAZIDE, AND PHENYL CYCLOCOPROPYLAMINE ON UTILISATION OF ENDOGENOUS SOURCES OF BRAIN IN PRODUCTION OF RESPIRATORY CO₂.** A.Geiger, G.Gombos, S.Otsuki, V.Aguilar, B.Gotheff, W.Scrucca and G.Whitney. *Int. J. Neuropharm.*, 1962, 1, 283-294 (Dept. Psychiatry, Univ. Illinois Coll. Med., Chicago, 111, U.S.A.) In studies made on cats, the brains of which were perfused *in situ* with blood containing [¹⁴C]glucose, isoniazid, iproniazide and phenylcyclopropylamine added to the perfusate increased the proportion of labelled CO₂ in the expired air. Transamination appeared to be inhibited by these drugs as judged by the low sp. activities of free brain glutamate and aspartate.

Since raising the brain level of 5HT or dopa did not produce the same changes in intermediate metabolism it is concluded that the effective drugs exert their action by a mechanism other than MAO inhibn. G.F.Blane

- 3993. AMINO ACID AND CARBOHYDRATE METABOLISM OF BRAIN AFTER RESERPINE.** D.Palm, H.Balzer and P.Holtz: *Int. J. Neuropharm.*, 1962, 1, 173-177 (Pharmacol. Dept., Univ., Frankfurt, Germany) Mice treated with reserpine showed enhanced gluconeogenesis as determined by tracer studies and glycogen determinations on brain and liver. The opposing action of reserpine and iproniazid on brain y-aminobutyric acid levels is discussed in the light of this finding. G.F.Blane
- 3994. METHOD FOR SIMULTANEOUS NUMERICAL COMPUTATION OF DIFFERENT TYPES OF SPONTANEOUS MOTILITY.** W.A.Behrendt, R.Deininger and H.O. Hillers: *Int. J. Neuropharm.*, 1962, 1, 125-128 (Res. Div., Nordmark-Werke, Hamburg, Germany) Method permits the simult. differential count of spontaneous motor activity and activity on a fixed site of small laboratory animals. The effects of amphetamine, caffeine and bemegride are discussed. G.F.Blane
- 3995. LOCALISATION OF ACTION OF CHLORPROMAZINE AND ANALGESICS IN RETICULAR FORMATION OF BRAIN STEM.** A.V.Valdman: *Int. J. Neuropharm.*, 1962, 1, 197-200 (Dept. Pharmacol., 1st Pavlov Med. Inst., Leningrad, U.S.S.R.) Different morphol. elements of the reticular formation and reticular neurones of cats and rabbits were found to differ greatly in their sensitivity to a no. of psychotropic drugs. Diagrams show the localisation of chlorpromazine action on the ponto-medullary reticular formation. G.F.Blane
- 3996. ANALYSIS OF TRANQUILLISERS IN CHRONICALLY ELECTRODE IMPLANTED CAT.** R.Kido and K.Yamamoto: *Int. J. Neuropharm.*, 1962, 1, 49-53 (Shionogo Res. Lab., Osaka, Japan) Gross behaviour and e.e.g. patterns from various regions of the brain described for cats receiving chlorpromazine and reserpine could be clearly differentiated from those seen in cats receiving phenobarbitone. Meprobamate had an effect intermediate between the tranquillisers and the hypnotic. G.F.Blane
- 3997. THE EFFECT OF CHLORPROMAZINE ON FREE AMINO ACIDS IN THE RAT BRAIN.** R.S.Piha, S.S.Oja and A.J.Uusitalo: *Ann. Med.*, 1962, 40, Supp. 5 (Inst. Physiol. and Dept. Biochem., Univ. Helsinki, Finland) The distribution of 14 amino acids or other amino compounds was examined by paper chromatography in whole brain homogenates and in four separate regions of the brain, the cerebral cortex, cerebellum, pons-medulla and interior of the cerebrum in normal rats and rats inj. with chlorpromazine. In whole brain homogenates a slight decrease in concn. of all amino acids was noted after chlorpromazine. Chlorpromazine appeared to affect the four regions investigated differently. The possible causes of the changes in the concn. of amino acids and the relationship of the amino acid status to protein formation in the brain are discussed. G.Faulkner
- 3998. DEMONSTRATION OF EARLY ENTRY OF IPRONIAZID INTO CENTRAL NERVOUS SYSTEM.** V.Nair, H.Lal and L.J.Roth: *Int. J. Neuropharm.*, 1962, 1, 361-369 (Pharmacol. Dept., Chicago Univ., Ill., U.S.A.) The prep. of ¹⁴C-iproniazid is described. Studies with rats and mice showed that the drug appears in

the c.n.s. within one minute after i.v. administration. It is suggested that breakdown to isopropylhydrazine may be a first stage in the catabolism of iproniazid within the cell and that this more potent MAO inhibitor may account for much of the activity of the inj. material.

G.F.Blane

- 399. RELATIONSHIP BETWEEN CENTRAL ANTI-CHOLINERGIC ACTIONS AND ANTI-PARKINSON EFFICACY OF PHENOTHIAZINE DERIVATIVES.** &P.White and E.J.Westerbeke: Int. J. Neuropharm., 1962, 1, 213-216 (Pharmacol. Div., Univ. Tennessee, Memphis, Tenn., U.S.A.) Diethazine, promethazine, and ethopropazine in high enough dose blocked the e.e.g. effects of physostigmine or DFP thus supporting the hypothesis that some phenothiazines such as these which are effective antiparkinson agents may act through antagonism of brain cholinergic systems. Other phenothiazines known not to be effective clinically in Parkinsonism were inactive in this test. G.F.Blane

- 400. CLINICAL APPLICATION OF DEMETHYL-IMIPRAMINE [DMI: A NEW TYPE OF ANTIDEPRESSANT DRUG.** N.S.Kline: Int. J. Neuropharm., 1962, 1, 55-60 (Rockland State Hosp., Orangeburg, N.Y., U.S.A.) DMI, a naturally occurring metabolite of Imipramine, was found to act more rapidly than the parent compound in patients with primary clinical Depression. 15 out of the 20 depressives studied showed improvement within 2 weeks and in 2 given the drug enterally the response was almost immediate. G.F.Blane

- 4001. EFFECT OF IMIPRAMINE ON MONOAMINE OXIDASE ACTIVITY OF CAT BRAIN.** R.A.Chaunina and L.P.Lapirc: Vop. Med. Him., 1963, 9, 184-188 (Lab. Psychopharmacol., V.M.Bechterev State Res. Inst., Leningrad, U.S.S.R.) Activity of cat brain MAO in vitro was inhibited 15-30% by imipramine with noreadrenaline as substrates. Enzyme activity was inhibited to about the same extent by iproniazid and chlorpromazine. Single and repeated administration of imipramine (5 mg./kg.) to cats had no effect on MAO activity subsequently measured in vitro. J.R.Sargent

- 4002. STUDIES ON THE METABOLISM OF MEPROBAMATE.** J.F.Douglas, B.J.Ludwig and N.Smith: Proc. Soc. exp. Biol., N.Y., 1963, 112, 436-438 Wallace Lab., Div. Carter Products Inc., Cranbury, N.J., U.S.A.) Meprobamate (2-methyl-2-propyl-1-hydroxypropandiol dicarbamate) excretion has been studied in different mammals including man following administration by several different routes. It was found that there was little difference in excretion of meprobamate or its major deriv. (hydroxymeprobamate) after the different routes but it was found with man that the initial dose was excreted mostly as meprobamate itself but chronic administration of the drug resulted in increasing appearance of metabolites in the urine. D.N.Wheatley

- 4003. EFFECT OF PROTRACTED MEPROBAMATE TREATMENT ON BIOELECTRIC AND PHOSPHORYLASE ACTIVITY OF DOG BRAIN.** F.Kajtor, O.Veres and L.Kocsar: Acta med. Acad. Sci. hung., 1962, 18, 384 (Dept. of Neurol. and Psychiatry, Univ. Med. Debrecen, Hungary) In dogs treated with ketipimide daily for periods ranging from 6 to 20 days there was a marked slowing of the EEG waves and appearance of 0-spindles associated with tranquillisation... Phosphorylase activity of

several regions from the brains of these animals was less than that seen in untreated controls although there was no correlation between this apparent enzyme inhibn. and the degree of e.e.g. change.

G.F.Blane

- 4004. CONVERSION OF TRANQUILLISERS TO ANTI-DEPRESSANTS BY REMOVAL OF ONE N-METHYL GROUP.** M.H.Bickel, F.Sulser and B.B.Brodie: Life Sci., 1963, No. 4, 247-253 (Nat. Heart Inst., Bethesda, Md., U.S.A.) Demethylation of certain phenothiazines such as promazine and trifluromazine converted potent tranquillisers to antidepressant agents. Since N-demethylation is a common reaction in drug metabolism, these findings are suggested to have a wide significance in pharmacology. K.Jones

- 4005. STRENGTH OF ANALEPTIC ACTION OF BEMEGRIDE, PENTYLENETETRAZOLE AND PICROTOXIN IN PHENOBARBITONE-HYDROXYDIONE-ETHINAMATE ANAESTHESIA AND THEIR RECIPROCAL ANTAGONISM.** F.Hahn and A.Oberdorf: Arch. int. Pharmacodyn., 1963, 142, 371-394 (Pharmacol. Inst., Freiburg im. Br., Germany) Mutually antagonistic median lethal doses of bemegride, pentylenetetraazole and picrotoxin and of phenobarbitone, hydroxydione and ethinamate were studied in mice. No life-saving action of the analeptics can be demonstrated against ethinamate. Against phenobarbitone and hydroxydione, the anti-lethal action of the analeptics increases in order picrotoxin, pentylenetetraazole, bemegride. (German) S.E. Smith

- 4006. COMPARISON OF EFFECTS OF ARECOLINE AND MUSCARINE ON C.N.S.** J.L.Riehl, J.Paul-David and K.R.Unna: Int. J. Neuropharm., 1962, 1, 393-401 (Pharmacol. Dept., Univ. Illinois, U.S.A.) The e.e.g.-activating effect of para-sympathomimetic drugs muscarine and arecoline was studied in cat encephale isolé prep. Responses to muscarine were abolished by adequate doses of atropine while those to arecoline remained relatively unaffected. These results are interpreted as evidence that the e.e.g.-activating system possesses cholinergic-'muscarinic' receptors and that when these are blocked a drug such as arecoline which has ganglion-stimulating 'nicotinic' action may still act by stimulating more centripetal synapses. G.F.Blane

- 4007. ROLE OF THAM IN PROTECTING MICE AGAINST CONVULSIVE EPISODES CAUSED BY EXPOSURE TO OXYGEN UNDER HIGH PRESSURE.** S.F.Gottlieb and R.V.Jagodzinski: Proc. Soc. exp. Biol., N.Y., 1963, 112, 427-430 (Res. Lab., Linde Co., Division of Union Carbide Corp., Tonawanda, N.Y., U.S.A.) Tris (hydroxy-methyl) aminomethane [THAM] was found to prolong the period of induction of convulsions when given in a dose of 1 ml. i.p. of a 0.3M soln. to male Swiss mice which were being exposed to 100% O₂ at 4 atm. THAM at this dosage was ineffective against mice at 6 atm. O₂. The administration of NaCl or KCl soln. of 0.01M concn. reversed the effect of THAM when given simult. D.N.Wheatley

- 4008. TREATMENT OF DRUG-INDUCED COMA: EFFECTIVENESS OF METHYLPHENIDATE.** R.J.Hoagland and R.J.McCarty: Amer. J. med. Sci., 1963, 245, 189-197 (Dept. Med., U.S. Tripler Gen. Hosp., Honolulu, Hawaii, U.S.A.) The analeptic drug methylphenidate, i.v., was found to accelerate die return to consciousness of patients who had taken excessive doses of depressant drugs, e.g. barbiturates. E.E.Hobbiger

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- 4009. CONCERNING ANALGESIC AND ANTICONVULSANT ACTIVITY OF SOME ANTICOAGULANT DRUGS AND VITAMIN K.** V.Kovalčík and R.Capek: Int. J. Neuropharm., 1962, 1, 153-156 (Pharmacol. Dept., Komensky Univ. Med. Sch., Bratislava, Czechoslovakia) Vit. K, warfarine and the bromo- and nitro-deriv. of a-naphthyl-indandione were found to be effective analgesics only in the rat-tail/radiant heat test. Some of die compounds tested also had some anticonvulsant activity but there was no relationship between this and their efficacy as anticoagulants. G.F.Blane
- 4010. EST [ELECTRO-SHOCK THRESHOLD] EFFECTS OF DIPHENYLHYDANTOIN IN HYPOPHYSECTOMISED RATS.** S.DeSalva: Arch. int. Pharmacodyn., 1963, 142, 366-370 (Dept. Pharmacol., Armour Pharmaceut. Co., Kankakee, 111, U.S.A.) Diphenylhydantoin 50-100 mg./kg. s.c. in rats increases the electro-shock seizure threshold. This effect is reduced or abolished by hypophysectomy 2 weeks previously. S.E. Smith
- 4011. EFFECT OF DRUGS ON EST [ELECTRO-SHOCK THRESHOLD] IN VARIOUS ENDOCRINE DEFICIENT STATES.** S.De Salva: Arch. int. Pharmacodyn., 1963, 142, 361-365 (Dept. Pharmacol., Armour Pharmac. Co., Kankakee, 111, U.S.A.) Increases in electro-shock seizure threshold induced in rats wi \pm diphenylhydantoin 50 mg./kg. phenobarbitone 25 mg./kg. meprobamate 100 mg./kg. and 5HT 20 mg./kg. are abolished or reversed by total or adenohypophysectomy, 2 weeks previously. Prior adrenalectomy exaggerates the anticonvulsant effects. Alone all the surgically-induced endocrine deficiencies lower the threshold. S.E. Smith
- 4012. TEMPERATURE AND BLOOD SUGAR ACTIONS OF BEIMEGRIDE, PENTYLENETETRAZOLE, AND PICROTOXIN IN NORMAL AND BARBITURATE-TREATED ANIMALS.** F.Hahn, O.Heidenreich and A.Oberdorf: Arch. int. Pharmacodyn., 1963, 142, 395-424 (Pharmacol. Inst., Freiburg im.Br., Germany) In mice and rabbits the analeptic drugs bemegride, pentylene tetraazole and picrotoxin induce hypothermia. In rabbits this is accompanied by hyperglycaemia. Barbitone- or 'Numal*' induced anaesthesia abolishes the hypothermic action. The analeptics may induce hyperthermia, resulting from direct stimn. of the temp.-regulating centre. (German) S.E. Smith
- 4013. PHARMACOLOGICAL ANALYSIS OF HYPERTHERMIA CAUSED BY PHENAMINE [AMPHETAMINE].** M.L.Belenky and M.Vitolina: Int. J. Neuropharm., 1962, 1, 1-7 (Pharmacol. Dept., Med. Inst., Riga, U.S.S.R.) A concomitant rise in skin and peritoneal temp, was observed in restrained conscious normal cats and rabbits given 15-20 mg./kg. amphetamine i.p. This effect was not modified by autonomic ganglion blockade but was prevented by muscle relaxants. Thalamic animals were more susceptible than normals to the hyperthermic effect but section of the brain between the superior and inferior quadrigeminal bodies abolished the response to amphetamine. G.F. Blane
- 4014. AMPHETAMINE AND COLD AND WARM STRESS.** L.Mariani, L.Moro and M.Giorgi: Atti. Acad. med. Lombarda, 1962, 17, 226-231 (1st. FarmacoL, Univ. Milano, Italy) (+)-Amphetamine, (\pm)-amphetamine and methyl amphetamine administered to rats in doses that result in a slightly increased body temp. (5-15 mg./kg. body wt.) induced a lethal hyperthermia when

the animals were exposed to heat stress (42°). Small doses (2.5-5 mg./kg.) gave a small protection against hypothermia in animals exposed to cold stress (Or), but large doses (15 mg./kg.) increased the hypothermic state and induced death. (Italian) G.N.Godson

- 4015. RELATIONSHIP BETWEEN BRAIN 5HT AND HYPERTHERMIA INDUCED BY TYPHOID VACCINE.** A.Ornesi: Atti. Acad. med. Lombarda, 1962, 17, 156-158 (1st. FarmacoL, Univ. Milano, Italy) When rabbits were treated with 1 mg./kg. reserpine i.v., 24 hr. before injn. of typhoid vaccine (T.A.B. 1 ml. AsO the normal hyperthermic response was considerably reduced. This effect was nullified by treatment of the reserpinised animals with 5HT (10 mg./kg.) or mono-amino oxidase inhibitor (2.5 mg./kg.) at the same time as with the typhoid vaccine. (Italian) G.N.Godson
- 4016. CORRELATION BETWEEN HYPERTHERMIA INDUCED BY LYSERGIC ACID DIETHYLAMIDE AND 5HT.** A.Ornesi: Atti. Acad. med. Lombarda, 1962, 17, 158-162 (1st. FarmacoL, Univ., Milano, Italy) LSD (25 fig./kg. body wt.) induces hyperthermia in rabbits which is not modified by pretreatment with reserpine (1 mg./kg. 24 hr. before LSD treatment) or MAO inhibitor (5 mg./kg. 24 hr. before LSD injn.). In animals resistant to LSD, hyperthermia inducing substances such as typhoid vaccine were still capable of provoking an increase in body temp. Sometimes, after induction of fever by typhoid vaccine in a LSD resistant rabbit, the animal became sensitive to LSD hyperthermia. (Italian) G.N.Godson
- 4017. RELATIONSHIP BETWEEN THE HYPOTHERMIAS INDUCED IN RABBITS BY CHLORPROMAZINE AND RESERPINE.** A.Ornesi: Atti. Acad. med. Lombarda* 1962, 17, 163-165 (1st. FarmacoL, Univ., Milano, Italy) Injn. of 2.5 mg./kg. body wt. of reserpine into rabbits induced a transitory hyperthermia, followed by a marked hypothermia lasting up to 10 hr. or more* Chlorpromazine (2.5 mg./kg.) also induced hypothermia* When administered together, they act synergistically, but in animals blocked with MAO inhibitor, chlorpromazine antagonised the reserpine induced hypothermia. This effect was probably caused by a decrease in 5HT in the brain. (Italian) G.N.Godson
- 4018. INTERFERENCE OF CHLORPROMAZINE WITH THE VARIOUS FORMS OF EXPERIMENTAL HYPERTHERMIA IN RABBITS.** A.Ornesi: Atti. Acad. med. Lombarda, 1962, 17, 166-169 (1st. FarmacoL, Univ., Milano, Italy) In order to demonstrate that chlorpromazine induction of hypothermia and inhibn. of hyperthermia is through its effect on 5HT, chlorpromazine effects on 5HT-mediated hyperthermia (induced by 5HTP, typhoid vaccine, dinitrophenol) were studied in relation to dose and time of administration. In the centrally-mediated expt. chlorpromazine protected in doses lower than would alone induce hypothermia, but it gave little protection with the peripherally-acting DNP. It appears to antagonise 5HT at encephalic level. (Italian) LA.B.*
- 4019. ACTION OF NICOTINE ON ASCENDING RETICULAR ACTIVATING SYSTEM.** D.E.Knapp and E.F. Domino: Int. J. Neuropharm., 1962, 1, 333-351 (Pharmacol. Dept., Michigan Univ., Ann Arbor, Mich., U.S.A.) Nicotine provoked activation of a* e.g. at doses between 10 and 20 fig./kg. i.v. In rabbit* cats, dogs and monkeys with pontine transections. From a study of the mechanism of action in die dog it is

Suggested that nicotine activates the e.e.g. by mimicking releasing ACh in ^A ponto-mesencephalic site. The possibility that vasopressin may be involved is not ruled out.

G.F.Blane

4020. DEPRESSION OF SPINAL INHIBITION BY ELECTROPHORETICALLY ADMINISTERED STRYCHNINE.

D.R.Curtis: *Int. J. Neuropharm.*, 1962, 1, 239-250
Stimulants^As¹⁰¹-! Nat. Univ., Canberra, Australia)
Strychnine and related compounds applied to lumbar motoneurons of cats from the outer barrel of co-axial electrodes depressed the hyperpolarising inhibitory potentials evoked by a variety of afferent stimuli, membrane potentials and excitatory postsynaptic potentials were not affected.

G.F.Blane

4021. AXI. PHARMACOLOGICAL EFFECTS OF A NEW ANAESTHETIC IN MAN. M.Swerdlow: *Int. J.*

Jfuiopharm., 1962, 1, 193-195 (Salford Royal Hosp., Chester, England) 2-Methoxy-4-allyl-phenoxyacetic acid diethylamide was found to be effective "clinically" as an ultrashort-acting i.v. anaesthetic. There was rapid onset and brief duration of anaesthesia with rapid recovery of full consciousness.

G.F.Blane

4022. A NEW LOCAL ANAESTHETIC WITH A LONG DURATION OF ACTION. P.Hey and G.L.Willey: *Nature*, Lond., 1963, 198, 390-391 (Smith Kline and French Res. Inst., Welwyn Garden City, Herts., England) The analgesic activity of some substituted amine oxyethylalkylamines is compared with the effect of different substituents discussed. Prop. of SKF 90054 are described in some detail.

4023. SPINAL ANAESTHETIC WITH LONG DURATION ACTION. F.Glyn Davies: *Nature*, Lond., 1963, 200, 390 (Nuffield Inst. Med. Res., Univ. Oxford, U.K.) SKF 90054 is a local anaesthetic suitable for spinal and epidural anaesthesia in sheep with a duration of action more than twice that of lignocaine.

4024. THE EFFECT OF CARBON DIOXIDE, ANAESTHETICS AND STRYCHNINE ON JAW REFLEXES. L.Juma and T.E.C. Archibald: *Arch. int. Pharmacodyn.*, 1963, 142, 338 (Nobel Inst. for Neurophysiol., Karolinska Hospital, Stockholm, Sweden) A study is made of chiro-oral and poly-synaptic jaw reflexes in pentobarbitone-Cat^{aldehyde} anaesthetised decerebrate cats. Hypercapnia and hypocapnoea increases these reflexes, at different rates. These effects are abolished by CO₂.

4025. THE EFFECT OF CARISOPRODOL UPON THE RETI-

CUL CONTROL OF MONOSYNAPTIC REFLEXES. J.DelCastillo and T.E.Nelson: *Arch. int. Pharmacodyn.*, 1963, 142, 572-590 (Dept. Pharmacol., Sch. Med., Univ. Juan Puerto Rico) The effect of carisoprodol on knee jerk monosynaptic reflex is studied in anaesthetised or decerebrate or spinal cats. Electrical stimulation of the medulla inhibits the reflex, the effect being exaggerated by carisoprodol 1-2 mg./kg. i.v. Supraspinal facilitation is blocked in some highly excitable prep. Physostigmine and carisoprodol are mutually antagonistic respects, probably at the reticular level.

4026. ROLE OF ACHE IN CONDUCTION IN MAMMALIAN N-MYELINATED NERVE FIBRES. J.M.Ritchie and C.J.Ammett: *J. Pharmacol. exp. Ther.*, 1963, 139,

201-207 (A.Einstein Coll. Med., New York, U.S.A.) Hexamethonium and prostigmine in concn. as high as 50mM do not block conduction. None of the compounds that inhibit the action of ACh, to which are now added dibucaine, morphine and nalorphine, has any effect on the action potential. The evidence is against the theory of a physiol. role of ACh in axonal conduction.

J.M.Whitmarsh

4027. ACTION OF MORPHINE ON IMPULSE PROPAGATION IN NERVE FIBRES. A.B.Cairnie and H.W.Kosterlitz: *Int. J. Neuropharm.*, 1962, 1, 133-136 (Physiol. Dept., Univ. Aberdeen, Scotland) Morphine was

found to have no effect on the threshold responses of nerve fibres to electrical stimn., on die conduction velocity of the nerve impulse or on the recovery of excitability after a single conditioning stimulus.

G.F.Blane

4028. AN ANALYSIS OF EFFECT OF DRUGS ON CONDUCTION OF EXCITATION IN DIFFERENT PARTS OF NEUROMUSCULAR JUNCTION WITH AID OF MULTIBARRELLED MICROELECTRODES. A.I.Shapovalov: *Int. J. Neuropharm.*, 1962, 1, 183-187 (Pharmacol. Dept., 1st Pavlov Med. Inst., Leningrad, U.S.S.R.)

Using the frog sciatic-sartorius prep, it was found that different pharmacol. agents produce neuromuscular block affecting different parts of die junction: presynaptic nerve terminals, subsynaptic receptive membrane, and so-called electrically excitable membrane of muscle fibre.

G.F.Blane

4029. NEUROMUSCULAR BLOCKING ACTION OF SUBSTANCES RELATED TO CHOLINE. W.C.Bowman and M.J.Rand: *Int. J. Neuropharm.*, 1962, 1, 129-132 (Pharmacol. Dept., Sch. Pharm., London, England)

Choline analogues were screened in an attempt to determine the structural requirements for a pre-synaptic blocking action at the neuromuscular junction. Compounds with ethyl groups attached to the quaternary N possessed optimal activity.

G.F.Blane

4030. OBSERVATIONS UPON ROLES OF ETHER OXYGEN, ALKYL GROUP SIZE, NUMBER OF ONIUM CENTRES AND INTER ONIUM DISTANCE UPON NEUROMUSCULAR BLOCK IN BIS- AND POLYONIUM COMPOUNDS. J.J.Lewis, M.Martin-Smith and T.C.Muin: *Brit. J. Pharmacol.*, 1963, 20, 307-318 (Div. Exp. Pharmacol., Inst. Physiol., The Univ., Glasgow, Scotland) Using die method of Van Rossum and Aviens (1959), some bis-tris, and tetra-onium neuromuscular blocking agents are classified into depolarising, non-depolarising and intermediate-acting compounds. The reasons underlying the quant. and qual differences between these groups are discussed.

A.E. Brooks

4031. POTENTIATION OF STRIATED MUSCLE CONTRACTION BY PIPERIDYL METHYLROSTANE (PMA). T.A.Loomis and B.Salafsky: *Proc. Soc. exp. Biol., N.Y.*, 1962, 111, 667-670 (Dept. Pharm., Sch. Med., Univ. Washington, Seattle, Wash., U.S.A.)

The potentiating effect of PMA on twitch response of intact, ant. tibial rabbit muscle was shown to occur following both direct stimn. and indirect stimn. This effect was accompanied by an increase in conduction time of indirectly induced cell depolarisation, and an increased duration of transmembrane and surface potentials of single muscle cells.

M.M.Shapland

4032. SOME OBSERVATIONS ON ACTIONS OF CERTAIN PHARMACOLOGICAL AGENTS ON FIBRILLATION POTENTIALS AND ON SENSITIVITY OF SKELETAL

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MUSCLE OF RABBIT IN ADVANCED LOCAL TETANUS. V.G.Prabhu, Y.T.Oester and A.G.Karczman: Int. J. Neuropharm., 1962, 1, 371-379 (Dept. Pharmacol. The rap. t Grad. Sch. Med., Loyola Univ., Chicago, 111, U.S.A.) Fibrillation potentials occurring spontaneously in the rabbit tibialis muscle 10-12 days after local injn. of minute amounts of tetanus toxin were analogous to those seen in chronically denervated muscle. Since the response to depolarising agents, anticholinesterases and (+)-tubocurarine were also similar to the denervated prep, it is proposed that tetanus toxin may have local as well as central effects, the former representing an abnormality of the neuromuscular junction.

G.F.Blane

4033. SOME ASPECTS OF THE PHARMACOLOGY OF ORPHENADRINE. G.Onuaguluchi and J.J.Lewis: J. Pharm., Lond., 1963, 15, 329-336 (Dept. Mat. Med., Univ., Glasgow, Scotland) Orphenadrine possesses muscle-relaxant activity resembling that of tubocurarine in prep. of the hen, rat, and frog. It antagonises suxamethonium-induced contracture in the hen but increases the duration of depression of the twitch height. The relation of this to anti-Parkinson's activity and other applications is discussed. J.M.Whitmarsh

4034. EFFECTS OF PHARMACOLOGICAL DRUGS ON MINIATURE END-PLATE POTENTIALS [m.e.p.p.]. LM.Glagoleva and E.A.Liberman: Int. J. Neuropharm., 1962, 1, 39-42 (Inst. Biophys., Acad. Sci., Moscow, U.S.S.R.) Evidence is presented to suggest that the quantum of ACh released from Rana nerve endings to provoke m.e.p.p. consists of more than a single mol. The effects of atropine, deplacine, procaine, caffeine, urethane and phosphacol on m.e.p.p. parameters are given in a table. G.F.Blane

4035. STUDIES ON THE REPETITIVE DISCHARGES EVOKED IN MOTOR NERVE AND SKELETAL MUSCLE AFTER INJECTION OF ANTI-CHOLINESTERASE DRUGS. L.C.Baber and W.C.Bowman: Brit. J. Pharmacol., 1963, 20, 326-344 (Dept. Pharmacol., Sch. Pharmacy, Brunswick Sq., London, England) The effect of edrophonium, neostigmine and ambenonium on repetitive discharges from the ventral root and gastrocnemius in response to single and closely spaced motor nerve shocks is described. A 1 to 5 msec. interval potentiated the repetitive firing, longer intervals did not. Tetanic stimn. depressed the repetitive firing. The action of anti-cholinesterases on these effects is discussed in relation to their sites of action. A.E.Brooks

4036. ACTION OF CHOLINOLYTICS AND ADRENO-MIMETICS ON TONIC MUSCLES. L.G.Magazanik, MJ.Michelson, E.K.Roshkova and LA.Shumova: Int. J. Neuropharm., 1962, 1, 165-168 (Sechenov Inst. Evolutionary Physiol., Acad. Sci., Leningrad, U.S.S.R.) A study was made of the sensitivity of tonic and non-tonic fibres of mixed muscles of cyclostomata, amphibia and birds to a wide variety of cholinomimetics and cholinolytics. Some attention was also given to the effects of adrenomimetics on the cholinergic contracture of some skeletal muscles. G.F.Blane

4037. EFFECT OF MORPHINE ON THE MOBILISATION AND TRANSPORT OF LIPIDS. R.Ventura and M.Usardi: Atti. Acad. med. Lombarda, 1962, 17, 144-148 (1st. Farmacol., Univ. Milano, Italy) I.p. injn. of rats with 10 and 20 mg. A.g. body wt. of morphine-HCl, induces a fall in adrenal ascorbic acid level and an

increase in plasma corticosterone and tryptophan pyrrole activity of the liver. Besides this stimn. of the hypothalamic-hypophysis-adrenal axis, there is an increased mobilisation of free fatty acids and an increase in triglycerides in the liver. (Italian) G.N.Godson

4038. THE EXCRETION OF PETHIDINE AND ITS DERIVATIVES. A.M.Asatoor, D.R.London, M.D.Milne and M.L.Simenhoff: Brit. J. Pharmacol., 1963, 20, 285-298 (Dept. Med., Westminster Med. Sch., London* England) Excretion of pethidine and its metabolite norpethidine is increased in acid urine and decreased in alkaline urine, where it is excreted as meperidinic and normeperidinic acids. NH₄Cl therapy is indicated for pethidine poisoning. A chromatographic method for diagnosis of pethidine poisoning is given. A.E.Broote

4039. EFFECT OF REPLACING THE PHENYL RADICAL BY A PROPARGYL RADICAL ON THE ACTIONS OF I-PHENETHYL^PHENYL^PROPIONOXY-PIPERIP^. G.Deltour, J.Mercier, R.Charlier, M.Prost, F.Binon*^{no} P.Etzensperger Arch. int. Pharmacodyn., 1963, 142' 493-509 (Services de Recherche Labaz., Brussels, Belgium) Substitution of a propargyl radical for a phenyl radical caused various changes in pharmacol. effects, especially in relation to tolerance to analgesic and anti-tussive actions. The addiction producing effects of the propargyl deriv. are less common.

(French) T.J.Sullivan*^{no}

4040. EXPERIMENTS IN RELIEF OF CLINICAL PAIN WITH N-(2,3-XYLYL)ANTHRANILIC ACID (CI-473, MEFERAMIC ACID). L.J.Cass and W.S.Frederik: J. Pharmacol. exp. Ther., 1963, 139, 172-176 (Univ. Health Serv Harvard Univ., Cambridge, Mass., U.S.A.) Oral medication with 250 mg. of CI-473 gave results superior to those with 600 mg. of aspirin, and equiv. to those with 50 mg. of codeine. Addition of codeine or prodilidine did not enhance the efficacy of CI-473 but doubling its dose gave a striking increase in efficacy.

j.M.Whitmarsh

4041. VISCERAL RECEPTORS CONCERNED IN VISCERAL PAIN AND THE PSEUDAFFECTIVE RESPONSE TO INTRA-ARTERIAL INJECTION OF BRADYKININ AMP OTHER ALGESIC AGENTS. R.K.S.Lim, C.N.Liu, F.Guzman and C.Braun: J. comp. Neurol., 1962, 129 269-293 (Med. Sci. Res. Lab., Miles Laboratories, Inc., Elkhart, Ind., U.S.A.) In rats, cats and dogs using the Methylene Blue method, paravascular free-branching receptors which constitute the visceral divis*^{no} of the spinal nerves were detected in connective tissue around main vessels and nerves, voluntary muscle, joint, stomach, intestine, spleen, heart and meninges* These appear to be responsible for evoking the sensations of visceral pain when bradykinin and other algesic agents are inj. Ia. GM.Lewis

AUTONOMIC NERVOUS SYSTEM

4042. LIMITATIONS IN THE METHOD OF MAGNUS f^R THE ESTIMATION OF ACTIVITY OF AN ANTI-CHOLINERGIC SUBSTANCE. P.Duchene-Marull^{f,p} J.VacheK C.R. Soc. Biol., Paris, 1962, 156, 1631* 1638 (Centre Européen de Recherches Mauvernay, Riom, France) The activity of 10 anticholinergic

^{S1*}stances was estimated by their ability to inhibit the effect of ACh on the isolated ileum and auricles of smne-a-pig and the effect of vagal stimn. on the heart 2^{te} of ^{an}esthetised guinea-pig. The relative amio-^unnergic activity of the compounds varied with the Method of assay. (French) M.A.Price

4043. ACTION OF CHOLINE SALICYLATE AND OTHER DERIVATIVES ON ARTERIAL PRESSURE OF RAT.

P.Bouvet, T.Gayet-Hallion and N.Dorme: C.R. Soc. civi. biol., Paris, 1962, ¹⁵⁶ « 1762 » 1763. Choline salicylate was more active in inducing arterial hypotension than choline bitartrate and citrate. Choline salicylate in concn. above 15 mg./kg. caused hypertension of 2040 mm. Hg. 1 mg./kg. atropine inhibited hypotensive effects of choline salicylate, bitartrate and a citrate. (French) M.A.Price

^{4044.} ACTION OF CHOLINE SALICYLATE AND OTHER CHOLINE DERIVATIVES ON THE SMOOTH MUSCULATURE OF GUINEA-PIG. P.Bouvet, T.Gayet-Hallion and N.Dorme: C.R. Soc. Biol., Paris, 1962, ¹⁵⁶ 3-1595. Choline salicylate in concn. of 100 ml./kg. caused contraction of the isolated ileum and gall bladder of guinea-pig. Salicylic acid was less effective. The effect of choline salicylate was antagonised by atropine. Choline chloride and choline citrate were less active than the salicylate. Choline eff. showed a weak effect. Na citrate inhibited the effect of choline salicylate and Na salicylate augmented effect of choline citrate. (French) M.A.Price

^{4045.} EFFECTS OF AUTONOMIC AGENTS, ALONE AND IN COMBINATION WITH ANTI-EPILEPTIC DRUGS, ON ECTROSHOCK SEIZURES IN RATS. B.Zablocka: ^{*JJ*} int. Pharmacodyn., 1963, 142, 533-538 (Farmaco⁰⁰¹, Dept. Acad., Warsaw, Poland) The effect of various drugs affecting the autonomic system was studied on rats submitted to electric shocks. The drugs were given alone and in combination with phenobarbitone and phenytoin. Pilocarpine and atropine showed anticonvulsant activity, neostigmine and physostigmine had little effect. Methacholine prolonged electric shock seizures but potentiated phenobarbitone and phenytoin. T.J.Sullivan

^{4046.} EFFECT OF ATROPINE ON CARDIOVASCULAR REACTIONS ELICITED BY CATECHOLAMINES, ANGIOTENSIN, HISTAMINE, 5HT AND ACETYLCHOLINE IN THE CONSCIOUS DOG. K.D.Bock and M.Meier: Arch. int. Pharmacodyn., 1963, 142, 444-460 (Res. ^{ab} « cab Ltd# » Switzerland) Arterial pressure and vena caval pressure were measured in trained conscious dogs, together with heart rate and respiratory movements. Atropine caused a fall in arterial pressure. It affected circulatory effects of noradrenaline, angiotensin, adrenalin, 5HT, histamine and acetylcholine, probably by inhibiting cardiovascular reflexes. T.J.Sullivan

^{4047.} COLLAGEN SENSITIZATION AND MOLECULAR PHARMACOLOGY OF GANGLIONIC BLOCKING AGENTS. I. 97¹-J.A.van Rossum: Int. J. Neuropharm., 1962, 1, 401-421 (Dept. Pharmacol., R.K. Univ. of Nijmegen, Nijmegen, Netherlands) The mechanism of ganglionic synaptic transmission and mode of action of stimulants. Guinea-pig intestine is taken as a model in which the mode of action of drugs on ganglionic transmission are studied and

classified. Part I deals with ganglionic stimulant-depolarising agents such as nicotine. Their action on other cholinergic receptors are also considered and it is suggested that there is a close similarity between ganglion and myoneural junctions while the parasympathetic receptors are different.

n. Mode of action of competitive and non-competitive ganglionic blocking agents. G.F.Blane

4048. REACTIVATION OF ALKYLPHOSPHORYLATED CHOLINESTERASE BY A CONSTITUENT OF LIVER.

V.Neuhoff and H.Kewitz: Int. J. Neuropharm., 1962, 1, 169-171 (Pharmacol. Inst. Free Univ., Berlin, Germany) A brain AChase prep. which had been inhibited by treatment with Paraoxon could be reactivated by a substance isolated from liver homogenates by dialysis against water. The substance was identified as laevulinic acid. G.F.Blane

^{4049.} EFFECTS OF GANGLIOLYTICS ON INTERNEURONAL TRANSMISSION IN SYMPATHETIC GANGLIA. D.A.Kharkevich: Int. J. Neuropharm., 1962, 1, 149-152 (Inst. Pharmacol. and Chemotherapy Acad. Med. ScL, Moscow, U.S.S.R.) Hexamethonium, pendiomide and mecamylamine were studied for their effects on ganglionic transmission in anaesthetised or decerebrate cats. From the results obtained it is proposed that the ganglion-blocking action of these 3 substances may depend partly on presynaptic effect as well as on the well known blockade of ganglionic cholinergic receptors. G.F.Blane

^{4050.} NEW METHOD FOR CONTINUOUS RECORDING OF THE PUPIL SIZE BY MEANS OF A PHOTOTRANSISTOR. S.Ueki and S.Cono: Arch. int. Pharmacodyn., 1963, 142, 339-348 (Dept. Pharmacol., Kyushu Univ. Fac. Med., Fukuoka, Japan) A continuous record of pupil size is obtained by recording the output of a small photo-transistor installed inside the eye-ball of pentobarbitone-anaesthetised cats. The actions of adrenergic and cholinergic drugs and of sympathetic stimn. are studied. S.E. Smith

^{4051.} MYDRIATIC RESPONSE OF MICE TO ATROPINE. R.M.Quirois: J. Pharm. Lond., 1963, 15, 239-250 (Pfizer Ltd., Sandwich, Kent, England) The time after s.c. injn. at which atropine produces max. mydriasis in mice increases with body wt. This relationship holds over the range 16-50 g. The time courses of the response are parallel to the time courses of the atropine concn. in the cardiac blood of mice of the same wt. range. The response to a standard dose of atropine is nearly constant between 8 a.m. and 2 a.m. if sufficient illumination is provided. J.M.Whitmarsh

^{4052.} POTENTIATION OF POST GANGLIONIC RESPONSES TO STIMULATING AGENTS FOLLOWING REPETITIVE PREGANGLIONIC STIMULATION. R.L.Voile: Int. J. Neuropharm., 1962, 1, 209-211 (Riarmacol. Dept., Pennsylvania Univ., Philadelphia, Pa., U.S.A.) Conditioning of sup. cervical ganglia of cats by repetitive preganglionic volleys resulted in an enhanced postganglionic discharge response to treatment with drugs known to stimulate ganglia. This is interpreted as evidence for the existence of a presynaptic component in the actions of these drugs. G.F.Blane

^{4053.} ANTAGONISM BY MEFENAMIC AND FLUFENAMIC ACIDS OF THE BRONCHOCONSTRKTOR

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ACTION OF KININS IN THE GUINEA-PIG.

H.O.J.Collier and P.G.Shorley: Brit. J. Pharmacol., 1963, 20, 345-351 (Dept. Pharmacol. Res., Parke, Davis and Co., Hounslow, Middx., England) These substances antagonise bronchoconstriction, not hypotensions, produced by kinins, nor do they reduce bronchoconstrictor responses to ACh, histamine or 5HT. They are equivalent in potency to i.v. acetylsalicylic acid and duodenal phenylbutazone. Higher doses of bradykinin restore the effect. The results agree with competitive antagonism.

A.E.Brooks

4054. OBSERVATIONS ON THE ISOLATED VAS DEFERENS.

P.Ohun and B.C.R.Stromblad: Brit. J. Pharmacol., 1963, 20, 299-306 (Inst. Physiol., Univ., Lund, Sweden) The effect of stimn. of the hypogastric nerve of the isolated vas deferens was increased by parasympathetic blocking agents or sympathetic blocking agents e.g. dihydro-ergotamine and phenoxybenzamine. This is not considered due to anticholinesterase activity, and both addition and removal of a drug from the bath had an effect. Chronic denervation expt., addition of hexamethonium and histol. examination indicate a distribution of ganglion cells along the nerve, just outside the organ. A.E.Brooks

4055. CENTRAL HYPERTENSIVE EFFECTS OF ANGIOTENSIN II.

R.P.Haftday and J.P.Buchley: Int. J. Neuropharmac., 1962, 1, 43-47 (Dept. Pharmacol., Univ., Pittsburgh, Pa., U.S.A.) Cross-circulation expt. with dogs in which the carotid body-sinus complex was denervated were used to provide further evidence that part of the hypertensive effect of angiotensin II is mediated by central sympathetic structures. This effect depends on peripheral sympathetic discharge which is independent of the carotid receptor system and is not due to hypo-oxia. G.F.Blane

4056. NORMAL HYPERTENSIVE REACTION OF CAT TO SPARTEINE.

R.Hazard, A.H.Nezamie, S.Larno, P.Mouillé and A.Renier-Cornec: C.R. Soc. Biol., Paris, 1962, 156, 1743-1745 (Lab. Pharmacol., Fac. Méd., Paris, France) Injn. of sparteine 0.02 g./kg. to chloralose anaesthetised cats resulted in prolonged carotid hypertension, unaccompanied by renal vasoconstriction. Injn. of a 2nd dose of sparteine 90 min. later had no effect on b.p. The hypertensive effect of sparteine was not modified by hexamethonium, yohimbine, ergotamine, tolazoline, or chlorpromazine. (French) M.A.Price

4057. THE ACTION OF SUBSTANCES WHICH BLOCK SYMPATHETIC POSTGANGLIONIC NERVOUS TRANSMISSION. J.H.Burn and H.Froede: Brit. J. Pharmacol., 1963, 20, 378-387 (Pharmacol. Dept., Washington Univ. Sch. Med., St. Louis, Mo., U.S.A.) Phenyltrimethylammonium blocks the inhibn. of the rabbit ileum produced by stimn. of the periarterial nerves in the mesentery after an initial augmentation. This effect is not modified by hyoscine. A.E.Brooks

4058. MECHANISM OF CATECHOLAMINE RELEASE

FROM THE ADRENAL MEDULLA AND THE ROLE OF CALCIUM IN STIMULUS-SECRETION COUPLING.

W.W.Douglas and R.P.Rubin: J. Physiol., Lond., 1963, 167, 288-310 (Dept. Pharmacol., A.Einstein Coll. Med., Yeshiva Univ., New York, U.S.A.) Expt. made on perfused cat's adrenal glands to examine further the role of Ca and other inorg. ions in the secretion of catecholamines evoked by ACh or K. ACh still evoked catecholamine release from adrenal glands

perfused with a soln. consisting simply of isosmotic sucrose with glucose and CaCl_2 but wa'i ineffective when CaCl_2 was omitted. Omission of Cl from Locke's soln. did not prevent the response to ACh; omission of either Na or K potentiated it. Excess Ca stim. secretion in the presence of ACh or excess K but not in their absence, there was a direct relation between Ca concn. and the rate of catecholamine release. Mg antagonised the stimulant effects of ACh and K; this effect was overcome by additional Ca. The introduction of Ca after perfus[^] with Ca-free Locke evoked secretion; this effect was partially antagonised by adding Mg along with Ca - it was completely suppressed by having Mg present throughout the period of Ca deprivation. ACh was still effective in depolarising concn. of K_2SO_4 - provided Ca was present* The results support the view that ACh (and K) evoke secretion by promoting Ca influx into the chromaffin cells. •

4059. EFFECT OF RESERPINE ON THE ADRENAL

M.Bianchi and M.C.Fargien: C.R. Soc. Biol., Paris, 1962, 156, 1797-1802 (Lab. Physiol., Fac. Méd., Alger, Algeria) Two hr. after injn. <* 1 mg. reserpine per kg. body wt. to dogs there was no variation in the adrenal medulla secretion of adrenaline and noradrenaline. 2-8 hr. after injn. the secretion of catecholamines increased by 0.100 to 0.25 pg./kg.¹¹¹¹. Extraction of the medulla showed the presence of larg[^] quantities of dopamine with a decrease in the levels of adrenaline and noradrenaline. 8-24 hr. after reserpine, the secretion of catecholamines decreased to 0.023 p¹/kg./min. and the catecholamines content of the adren¹ was 25% of the normal level. (French) M.h.&c;

4060. SYMPATHOLYTIC DRUGS AND SOME ENZYMES INVOLVED IN METABOLISM OF CATECHOLAMINE¹

T.L.Chrusciel: Int. J. Neuropharmac., 1962, 1, 1S²-140 (Pharmacol. Dept., Silesian Sch. Med., Zabrze, Poland) The influence of guanethidine, phenoxybenzamine and bretylium upon the activity of the amine oxidase of dog serum and of decarboxylases of mouse tissues was tested in vitro and in vivo. Phenoxybenzamine in vitro inhibited dopa decarboxylase and in vivo decreased the activity of the brain enzyme only, while guanethidine and bretylium had little effect. CF.Blaney

4061. EFFECT OF ADRENERGIC BLOCKING AGENTS¹

TYRAMINE-INDUCED RELEASE OF CATECHOL-^{proc} AMINES FROM THE CAT HEART.

C.R.Swaine: Soc. exp. Biol., N.Y., 1963, 112, 388-390 (pep^L, Pharmacol., Woman's Med. Coll. Pennsylvania, Philadelphia, Pa., U.S.A.) It has been shown &nd that perfusion of cat's hearts with 50 g./ml. tyramine at various agents preventing catecholamine release off¹⁰ phenoxylbenzamine was quite potent as was N-(2-nicotinyl)-ethyl-N-ethyl-cyclohexanemethylamine. Phentoian and dihydroergotamine were ineffective. Since the 3-haloalkylamine was effective, and seeing that it does not have a blocking effect on adrenergicⁿ endings, it is suggested that tyramine-induced release of catecholamines is blocked by compounds of similar structural arrangement. D.N. wne

4062. EFFECTS OF BLOCKADE OF MONOAMINE^{EXCIT¹} STORAGE PROCESSES UPON LIMBIC SYSTEM^{REZIN¹}

ABILITY AND BEHAVIOUR IN CAT.

AM-Rezin, S.Spector and E.Costa: Int. J. Neuropharmac., 1962, 1, 85-95 (Lab. Chem. Pharmacol., Nat. Heart Inst., Bethesda, Md., U.S.A.) Reserpine and a benzodiazepine

quinolizine-deriv. blocked the storage of noradrenaline and 5HT in cat brain. The associated neurological effects were not mimicked by administration of a-methyl-m-tyrosine which blocks the storage of noradrenaline only, the role of brain amines in the response to reserpine is discussed in the light of these findings.

G.F.Blane

⁴⁰⁶ 3. CHANGES IN NORADRENALINE AND 5HT CONTENT OF BRAIN AFTER SHIGELLA SHIGAE TOXIN ADMINISTRATION. K.Masek, R.Smetana and H.Raskova: Int. J. Neuropharmac., 1962, 1, 71-77 (Acad. Sci. and Dept. Pharmacol., Charles Univ., Praha, Czechoslovakia)

A dose-dependent depletion of brain 5HT and noradrenaline occurred in mice between 24 and 48 hr. after i.p. administration of the exotoxin. No such changes were found in heart tissue although the catecholamine content of the adrenals was reduced. These results are taken to support the thesis that the toxin may act indirectly by releasing 5HT from stores. G.F.Blane

⁴⁰⁶ 4. SUBCELLULAR DISTRIBUTION OF CATECHOLAMINES IN DOG HEART. EFFECTS OF RESERPINE AND NORADRENALINE ADMINISTRATION.

n-A.Campos and F.E.Shideman: Int. J. Neuropharmac., 1962, 1, 13-22 (Dept. Pharmacol. and Toxicol., Wisconsin Univ., Madison, Wis., U.S.A.) The homogenate Peculate and soluble fractions obtained by centrifuging samples of right atrial or cat heart muscle were assayed for total norepinephrine and adrenaline. Details are given of the course of depletion after reserpine and build-up on adrenaline infusion. G.F.Blane

⁴⁰⁶ 5. HYPERTENSIVE ACTION OF TOLAZOLINE AND HYDROXYMETHYLDERGINE. B.G.Benfey and D.R.Varma: Canad. J. Biochem., 1963, 41, 941-946 (Dept. Pharmacol., McGill Univ., Montreal, Que., Canada) The effects of tolazoline (0.5 mg./kg.) and i.v. Hydergine (10 mg./kg.) on b.p. of cardiac contractility and heart rate were studied in dogs under pentobarbital anaesthesia. Following s.c. reserpine (0.5 mg./kg.) the pressor effect of tolazoline had a marked pressor effect differentiated with pos. inotropic and neg. chronotropic (10^{-8}). These were abolished by i.v. phenoxybenzamine (10^{-8}). Hydergine had pressor and neg. chronotropic effects in the absence of reserpine and pos. inotropic actions after reserpine, the effects being abolished by phenoxybenzamine. J.B.Parish

⁴⁰⁶ 6. STRUCTURE OF SYMPATHOMIMETICS AS RELATED TO RESERPINE INDUCED SENSITIVITY. V.N.GEYER - B.I.THEUMLA SCHMIDT and 230; V.K.Fleming: J. Pharmacol. exp. Ther., 1963, 139, 1-10. (W.Virginia Med. Center, Morgantown, W.Va., U.S.A.) The α - and β -methyl groups are not both essential to direct action. Dichlorosubstitution of hydroxyl groups on the catechol nucleus only slightly reduces direct action. The p-hydroxyl group is not for direct action. Substitution of a β -methoxy but the β -hydroxyl group profoundly reduces direct action than to β -substitution. J.M.Whitmarsh

⁴⁰⁶ 7. ON THE SERPINE ANTAGONISTS AND THEIR EFFECTS ON THE SERPINE-INDUCED CATECHOLAMINE DEPLETION IN THE RAT ADRENAL MEDULLA. G.Zbinden: J. Neuropharmac., 1962, 1, 435-445 (Dept. Biol. Hoffmann-La Roche Inc., Nutley, N.J., U.S.A.)

Compounds which blocked the reserpine-induced catecholamine depletion from the adrenal medulla included iponiazid, tranylcypromine, anti-depressants and a benzoquinolizine deriv. Amphetamine, other monoamine oxidase inhibitors, chlorpromazine and scopolamine were inactive. Good correlation existed between anti-reserpine activity in this test and clinical anti-depressant efficacy.

G.F.Blane

⁴⁰⁶ 8. MECHANISM OF THE INITIAL ADRENERGIC EFFECTS OF BRETYLIUM AND GUANETHIDINE.

S.D.Gokhale, O.D.Gulati and V.V.Kelkar: Brit. J. Pharmacol., 1963, 20, 262-277 (Pharmacol. Res. Unit, Council of Sci. and Industr. Res., Med. Coll., Baroda, India) The effects of bretylium and guanethidine are prevented by phenoxybenzamine and dichloroisoprenaline and reduced by cocaine, imipramine and reserpine in anaesthetised and spinal cats. I.v. noradrenaline increases sensitivity to bretylium and guanethidine and restores the response in the reserpinised cat. It is concluded that their initial adrenergic effects are partly mediated through a release of catecholamine stores from the effector organ.

A.E. Brooks

⁴⁰⁶ 9. RELATIONSHIPS BETWEEN THE RELEASE AND TISSUE DEPLETION OF NORADRENALINE [NA] FROM THE HEART BY GUANETHIDINE AND RESERPINE.

D.C.Harrison, C.A.Chidsey, R.Goldman and E.Braunwald: Circulat. Res., 1963, 12, 256-263 (Cardiol. Branch, Nat. Heart Inst., Bethesda, Md., U.S.A.)

Coronary sinus and arterial blood levels of NA, indicated discharge of the NA by guanethidine in open chest dogs under pentobarbital. Myocardial NA was depleted more by reserpine but with no real evidence of discharge in the blood. The higher blood levels of NA corresponded with higher arterial pressure.

R.E.Moore

⁴⁰⁶ 0. ORIGIN OF HYPERSENSITIVITY TO CATECHOLAMINES INDUCED BY RESERPINE AND GUANETHIDINE.

A.Cession-Fossion: C.R. Soc. Biol., Paris, 1962, 156, 1935-1936 (Inst. Léon Fredericq, Univ. Liège, Belgium) Pretreatment of rats with reserpine (1 mg./kg.) or guanethidine (10 mg./kg.) caused hypersensitivity to exogenous adrenaline or noradrenaline (0.1 μ g.). This hypersensitivity was reduced by perfusion of noradrenaline ($200-400$ μ g./kg.) but reappeared after further treatment with guanethidine or reserpine.

(French) M.A.Price

⁴⁰⁶ 1. STUDY OF THE RELATIONSHIP BETWEEN THE NEUROTRANSMITTER STORE AND ADRENERGIC NERVE BLOCK INDUCED BY RESERPINE AND GUANETHIDINE.

T.E.Gaffney, C.A.Chidsey and E.Braunwald: Circulat. Res., 1963, 12, 264-268 (Cardiol. Branch, Nat. Heart Inst., Bethesda, Md., U.S.A.) The heart rate response to cardio-accelerator nerve stimn. was compared with noradrenaline [NA] concn. in the myocardium of dogs under pentobarbital. Guanethidine blockade was independent of NA concn., whereas reserpine blockade was only manifest when NA concn. had been reduced to about 0.3 μ g./g. Infusion of NA did not restore the response in either case.

R.E.Moore

⁴⁰⁶ 2. HAEMODYNAMIC EFFECTS OF GUANETHIDINE IN MAN.

J.N.Cohn, T.E.Liptak and E.D.Freis: Circulat. Res., 1963, 12, 298-307 (Dept. Med., Georgetown Univ. Med. Center, Washington, D.C., U.S.A.) Lv. infusion into supine men produced transient pressor effects followed in hypertensive subjects by hypotension. Digital vasoconstrictor reflexes were

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incompletely blocked and vascular responses to tyramine and ephedrine were not reduced. Splanchnic vascular resistance increased but cardiac output was hardly altered.

R.E.Moore

4073. STUDIES ON CARDIOVASCULAR ACTIONS OF ANTSYMPATHOMIMETIC DRUGS. B.G.Benfey and D.R.Varma: *Int. J. Neuropharm.*, 1962, 1, 9-12 (Pharmacol. Dept., McGill Univ., Montreal, Canada) Dibenamine, chlorpromazine and phentolamine stim. the heart and raised the blood pressure in barbiturate anaesthetised cats with autonomic ganglia blocked or the spinal cord transected between C1 and C2. Pretreatment with reserpine abolished the cardiac effect but potentiated the hypertensive action. The peripheral vasoconstrictor action of phentolamine (and hydergine) could be abolished by pretreatment with adrenergic vasoconstrictor blocking agents while piperoxan and phenoxybenzamine were still hypertensive and apparently acting directly rather than on adrenergic receptors.

G.F.Blane

4074. ACTION OF RESERPINE AND INHIBITORS OF MONOAMINE OXIDASE ON ANAPHYLACTIC SHOCK IN MICE. B.N.Halpern, T.Neveu, A.Branellec and C.Baracco-Drudi: *C.R. Soc. Biol.*, Paris, 1962, 156, 1739-1743 (Chaire Méd. expt., Coll. de France, Paris, France) 1-2 mg./kg* reserpine protected mice against passively induced anaphylactic shock. Previous administration of iproniazide or pheniprazine, at doses which inhibit the action of reserpine on the group toxicity of amphetamine, did not modify the protective action of reserpine against anaphylactic shock.

(French)

M.A.Price

4075. A NEW TEST FOR DETECTING MONOAMINE OXIDASE-INHIBITOR EFFECTS. A.Lehmann and R-G.Busnel: *Int. J. Neuropharm.*, 1962, 1, 61-70 (Lab. of Acoustic Physiology, I.N.R.A. Jouy-en-Josas, France) The increased sensitivity of audiogenic mice after treatment with 1 mg./kg. reserpine led to fatal seizures in 78% of the animals. MAO-inhibitors antagonised this effect of reserpine although given alone they have no influence on the seizure level. Non-MAO-inhibitors, acetazoleamide and imipramine also give a pos. reaction in this test.

G.F.Blane

4076. THE ACTION OF TYRAMINE ON THE ISOLATED DOG ATRIUM. W.J.Hall: *Brit. J. Pharmacol.*, 1963, 20, 245-253 (Dept. Physiol., Univ., Sheffield, England) Tyramine has pos. inotropic and chronotropic actions on dog isolated atrium, which are completely and reversibly inhibited by cocaine, but reversibly blocked by phenoxybenzamine. Concluded that tyramine liberates catecholamines from storage sites, but this release is different from that of adrenergic nerve stimm.

A. E. Brooks

4077. ACTION OF SYMPATHOMIMETIC DRUGS ON THE ISOLATED JUNCTION OF THE BILE DUCT AND DUODENUM. A.Crema and F.Berte: *Brit. J. Pharmacol.*, 1963, 20, 221-229 (Dept. Pharmacol., Univ., Pavia, Italy) The actions of adrenaline, noradrenaline and phenylephrine are studied on the terminal tract of the bile duct (as spiral strips or intact) and on the adjacent duodenum from the calf and the cat. They contract the bile duct and release the duodenum. On the basis of action of adrenaline antagonists it is suggested that there are α-receptors mediating contraction of muscle in the sphincter zone of the bile duct.

A.E.Brooks

4078. DOPAMINE-O-OXIDASE ACTIVITY IN MAN USING HYDROXYAMPHETAMINE AS SUBSTRATE. A.Sjoerdsema and W.von Studnitz: *Brit. J. Pharmacol.*, 1963, 20, 278-284. Hydroxyamphetamine is administered orally to 5 human subjects in daily doses of 26 to 118 mg. Approx. half the dose is recovered unchanged in the urine, and 43-7 to 94% excreted as hydroxy norephedrine. In vitro this conversion is effected by dopamine-o-oxidase. No impairment of the (3-hydroxylation was noted in an adrenalectomised subject.

A.E.Brooks

4079. INFLUENCE OF ANTI-BRADYKININ SUBSTANCES ON THE VARIATION OF THE CORTICO-PIAL CIRCULATION AFTER ANAPHYLACTIC SHOCK OF GUINEA-PIGS. M.Concioli, L.Mariani and R.Villiani: *Atti. Acad. med. Lombarda*, 1962, 17, 242-246 (1st. di FarmacoL, Univ. Milano, Italy) Sodium salicylate (250 mg./kg. body wt.) and phenylbutazone (50-100 mg*/kg.) administered i.v. to guinea-pigs completely inhibited the arteriolar vasodilation of the pial-circle that is normally induced by bradykinin or anaphylactic shock. These drugs also showed other anti-bradykinin activity & on the bronchial muscles. (Italian) G.N. Godson

4080. HYPOTHESIS FOR THE MODE OF ACTION OF α-METHYLDOPA IN RELIEVING HYPERTENSION. M.D.Day and M.J.Rand: *J. Pharm. Lond.*, 1963, 15, 221-224 (Señ. Pharm., 29-39 Brunswick Sq., London, England) Review. 19 ref. J.M.Whitmarsh

4081. MECHANISM OF CATECHOLAMINE RELEASE BY TYRAMINE. H.J.Schumann and A.Philippic *Int. J.* Neuropharm.*, 1962, 1, 179-182 (Biarmacol. Dept. #, ^ Frankfurt Univ., Germany) Isolated adrenal medullary chromaffin granules when incubated in vitro spontaneously release equivalent amounts of catecholamines and ATP. Indirectly acting sympathomimetic agents were found to accelerate this release of catecholamine but not that of ATP. It is argued that in the case at least of tyramine and phenylethylamine these more basic amines displace the less basic catecholamines from their storage sites in the granules and are themselves attached to the ATP*.

G.F.Blanc

4082. SIMPLE DEVICE FOR DETERMINATION OF CATECHOLAMINES. R.Smetana: *Int. J. Neuropharm.*** 1962, 1, 189-192 (Pharmacol. Lab., Acad. Sci., ^ Prague, Czechoslovakia) An apparatus and method** described for the differential estimation of adrenaline *^{no} noradrenaline by the trihydroxyindole technique with photographic recording of the fluorescence from corresponding lutines.

G.F.Blane

4083. EFFECT OF ESERINE ON ACTIVITY OF ADRENERGIC NERVES IN RAT. V.Varagić, R.Lesić, J.Vučo and B.Stamenović: *Int. J. Neuropharm.*, 1962, 1, 201-202. The hypertensive effect of eserine in the rat is due to central adrenergic stimm. rather than to release of pressor catecholamines from peripheral stores.

G.F.Blanc

4084. PHARMACOLOGICAL ANALYSIS OF NEUROGENIC MYOCARDIAL LESIONS. Z.I.Vedeneyeva: *Int. J. Neuropharm.*, 1962, 1, 207-208 (Int. Exp. Med., Leningrad, U.S.S.R.) Neurogenic lesions of rat myocardial tissue were produced by repeated stimm. of sympathetic ganglia lying on the efferent pathway to the heart. Similar muscle lesions could be made by the injn. of large doses of noradrenaline and adrenaline. The effects of other sympathomimetic agents are also reported and discussed.

G.F.Blane

4085. COMPARISON OF THE PHARMACOLOGICAL EFFECTS OF SOME COMPOUNDS RELATED TO 2-AMINOETHYLISOTHTORONIUM BROMIDE HYDROBROMIDE [AET]. V.Di Stefano, P.S.Korn and D.E.

Leary. Radiat. Res., 1963, 18, 177-185 (Dept. Pharmacol., Univ., Rochester, N.Y., U.S.A.) The pharmacol. effects of 9 compounds closely related to AET were studied in anaesthetised cats in an attempt to find a radiation protective drug of lower toxicity. In general the compounds gave attenuated gut response, amplified ganglionic blocking activity and resulted in neuromuscular depressant activity. No prediction could be made from pharmacol. evidence as to whether these compounds would give effective radiation protection. B. Payne

CR. Soc. Biol., Paris, 1962, 156, 1932-1934 (Inst. L.Fredericq, Univ., Liège, Belgium) The arterial hypotension induced in rat by 1-3 fig. bradykinin/100 g. was inhibited by 50-70 mg. Na salicylate/100 g. Purified ACTH did not reduce the concn. of Na salicylate required for inhibn. Bilateral adrenalectomy increased the duration of hypotension induced by bradykinin but did not modify the inhibn. by Na salicylate. (French) M. A. Price

4091. ADRENAL CORTICOID' TYPE HORMONAL PROPERTIES OF A TRITERPENIC ACID, POLYPORENIC ACID A. A.R.Ratsimamanga, B.Pasich, P.Boiteau and M.Nigeon-Dureuil: C.R. Soc. Biol., Paris, 1962, 156, 1552-1554 (Lab. Physiol. Nutrit., Fac. Méd., Paris, France)

Polyporenic acid A, (PPA), extracted from Polyporus betulinus, was administered to young adrenalectomised rats subjected to 2(f, to 2 hr. at & or to exhaustion. The survival rate of rats kept at 20° and receiving 0*05-3*5 mg. PPA was similar to those receiving 0*2 mg. DOCA. 0*005-0*25 mg. PPA increased the survival rate of animals subjected to 3°. The result was similar to that obtained after administration of 0*005-0*25 mg. hydrocortisone. (French) M.A.Price

4092. ADRENAL FUNCTION AFTER PROLONGED CORTICOSTEROID THERAPY. B.H.B. Robinson, D.Mattingly and C.L.Cope: Brit. med. J., 1962, i, 1597-1583 (Postgrad. Med. Sch., London, England)

Sixteen of 17 patients showed no evidence of damage to the pituitary-adrenal axis after prolonged corticosteroid therapy. The other patient showed severe adrenal inertia due to damage to his corticotrophin-releasing mechanism. Prompt response of collapsed patients to hydrocortisone i.v. is not evidence of adrenal cortical failure. M.E.Nutt

4093. RELATIONSHIP BETWEEN HYPOPHYSIS AND ALDOSTERONE SECRETION: MECHANISM OF DIURETIC INHIBITION BY RESERPINE. F.Clementi, F.Fraschini, E.Muller, A.Ornesi and A.Zanoboni: Atti. Acad. med. Lombarda, 1962, 17, 209-221 (1st. FarmacoL, Univ., Milano, Italy) After a long

lasting treatment of rats with a high dosage of aldosterone (0*1-0*5 mg./100 g. body wt.), diuresis was depressed. E.m. showed the pinealocytic cells to be depleted of dense granules. Reserpine (2*5 mg./kg.) exerted similar effects, but these were abolished by hypophysectomy. Aldolactone abolished the reserpine depression of diuresis. Thus, the hypophysis probably plays an important role in the electrolyte metabolic regulation. (Italian) G.N.Godson

4094. ACTION OF PITRESSIN ON OUTPUT AND CONCENTRATION OF URINE IN NORMAL AND HYPOTHYROID RATS DURING POLYURIA. P.Reville, H.Jahn and F.Stephan: C.R. Soc. Biol., Paris, 1962, 156, 1686-1690 (Chaire Pathol. expt., Fac. Méd., Strasbourg, France)

20 mU pitressin was administered to normal rats and those receiving propylthiouracil. Pitressin increased the urine Na content and increased antidiuresis in both groups. 50 mU pitressin inhibited diuresis and the osmotic concn. of urine increased above the plasma level. There were no significant differences between the results from normal and propylthiouracil treated rats.

4095. INFLUENCE OF 2a-METHYL-17p-HYDROXY-5(X-ANDROSTAN-3-ONE [MHA] ON INCORPORATION OF [2-14C3GLYCINE INTO PROTEINS OF A IMT MARY FIBROADENOMA. A POSSIBLE BIOASSAY METHOD. O.Abe, A.Herranen and R.I.Dorfman: Proc. Soc. exp. Biol., N.Y., 1962, 111, 706-708 (French) M. A. Price

ENDOCRINES

4086. CYTOPLASTIC BODIES IN THE ADRENAL CORTEX OF PATIENTS TREATED WITH SPIROLACTONE.

P.T.Janigan: Lancet, 1963, i, 850-852 (Dept. Path., Univ. Kansas Med. Center, Kansas City, Kansas, U.S.A.) cytoplasmic bodies with a predominant phospholipid content were found in the cells of the adrenal zona glomerulosa of 18 patients, all of whom had been treated with spiro lactone. G.H.Bell

4087. EFFECT OF HYDROCORTISONE ON a-AMINO ISOBUTYRIC ACID [AIB] UPTAKE BY ISOLATED ^-REFUSED RAT LIVER. A.D.Bass, J.W.Chambers and A.A.Richtarik: Life Sci., 1963, No. 4, 266-269 (Pt. Pharmacol., Sch. Med., Vanderbilt Univ., and Nashville, Tenn., U.S.A.) Livers from both normal Adx rats adrenalectomised rats exhibited an increase in uptake with hydrocortisone which acts directly on the liver to stimulate AIB uptake. K.Jones

4088. INHIBITION OF THE HYPOPHYSEAL-SUPRARENAL AXIS IN YOUNG CHILDREN BY THE PROLONGED ADMINISTRATION OF CORTICOSTEROIDS.

G.Chiumento: Atti. Acad. med. Lombarda, 1962, 17, 21-28 (Clin. Pediatrica, Univ., Pavia, Italy) doses of prednisolone to infants, had an inhibiting effect on the adrenal-pituitary axis which was considerable after oral intake of 10 mg. and max. after intake of 23S n? Total intake of 10 mg. & impound S excretion. (Italian) G.N.Godson

4089. DIFFERENTIAL ABSORPTION OF VARIOUS CORTICOSTEROIDS IN THE INTESTINE. G.Chiumento: Atti. Acad. med. Lombard, 1962, 17, 140-142 (CIP, Univ., Pavia, Italy) Babies and children were treated orally with 9-a-fluoro-16(X-17a,21-triol-3,20-dione(prednisolone) 0*8 mg./kg. body wt.), M-4-pregnane-17a,21-triol-3,20-dione(pregnane-17a,21-triol-3,20-dione) (dexameetasone, 0-15 mg./kg.) and 6a-fluoroprednisolone (0*4 mg.-Ag-)» amount per day. The intestine calc. from the changes in urinary excretion of a 17-OHCS, 6a-fluoroprednisolone was adsorbed and is recommended for clinical use.

4090. ANTAGONISM BETWEEN SYNTHETIC BRADYKININ AND SODIUM SALICYLATE IN RAT. J.Lecompte: (Italian) G.N.Godson

PHARMACOLOGY

(Worcester Found, for Expt. Biol., Shrewsbury, Mass., U.S.A.) The end-point of [2-14c] glycine uptake in proteins of transplanted rat mammary tumours has been used in assaying the effectiveness of anti-tumour steroids. Tumours were inhib. by testosterone propionate but more effectively by MHA. M.M. Shapland

4096. RESPONSE OF OBESE PATIENTS TO AN 11 β -HYDROXYLASE INHIBITOR, METHOPYRAPONE [SU-4885]. B.Simkin and R.Arce: Proc. Soc. exp. Biol., N.Y., 1962, 111, 780-783 (Div. Med., Cedars of Lebanon Hosp., Los Angeles, Calif., U.S.A.) Obese subjects exhibit 2 different responses to SU-4885 depending upon the level of the base line urinary 17-ketogenic steroid excretion Subjects with a normal base line have a normal response, whereas subjects with an elevated 17-ketogenic steroid give a markedly impaired response.

M.M. Shapland

4097. OBSERVATIONS ON A DITHIOCARBAMOYLHYDRAZINE [ICI 33828] AS AN INHIBITOR OF PITUITARY GONADOTROPHIC ACTIVITY. P.S.Brown: J. Endocr., 1963, 26, 425-436 (Obst. Med. Res. Unit, Univ., Aberdeen, Scotland) ICI 33828 had gross anti-

gonadotrophic effects on the sex organs of ? and <\$ rats. Sirnult. administration of ICI 33828 and gonadotrophin did in some cases result in a reduced response to the gonadotrophin but this could not be conclusively attributed to a sp. effect of the inhibitor at the gonadal level. Since pituitaries of rats treated with ICI 33828 contained less FSH than control glands it is concluded that the drug does act by reducing the formation of pituitary gonadotrophin. G.F.Blane

40981 EFFECT OF DERIVATIVE OF DITHIOCARBAMOYL HYDRAZINE [ICI 33828] ON TIBIAE OF HYPHYSECTOMISED RATS. H.E.C.Cargill Thompson: J. Endocr., 1963, 26, 447-448 (Clin. Endocr., Res. Unit, Univ., Edinburgh, Scotland) Compound ICI

33828, known to inhibit pituitary gonadotrophic activity, was found to diminish bone and body growth in immature hypophysectomised rats. When administered together with beef growth hormone the effect of the latter on tibial epiphysial width and on body wt. was reduced.

G.F.Blane

4099. EFFECT OF STEROIDAL ANTI-PROGESTINS ON IMPLANTATION OF FERTILISED EGGS OF RATS AND MICE. U.K.Banik and G.Pincus: Proc. Soc. exp. Biol., N.Y., 1962, 111, 595-602 (Worcester Found. Expt. Biol., Shrewsbury, Mass., U.S.A.) Of 9 steroidal anti-progesterones studied for their implantation-inhibiting activity, 3 were without effect, 4 were very active and 2 were effective in mice but not in rats. M.M.Shapland

4100. INSULIN-PRE-HYPOGLYCAEMIC THERAPY BY LUMBAR PUNCTURE IN CASES OF CEREBRAL APOPLEXY. A.Roversi, E.Pannaggi, L.C.Remonini and C.Borelli: Atti. Acad. med. Lombarda, 1962, 17, 231-234 (1st. Idrologia Med., Univ., Milano. Italy)

When insulin-pre-hypoglycaemic therapy (T.I.P.I.) was applied to diabetic cerebrally apoplectic patients using a lumbar puncture technique 18/24 showed improvement, whereas when the T.I.P.I. was applied to a group of 187 patients by hypodermic injn. only 54% showed an improvement. In a third group of 181 patients treated by other therapeutic methods, but no insulin only 38% showed any improvement. (Italian) G.N.Godson

4101. ACTION OF NEUROMIMETIC AMINES ON IN VITRO THYROID METABOLISM. J.E.Dumont and

P.Hupka: CR. Soc. Biol., Paris, 1962, 156, 1942-1946 (Lab. Méd. expt., Fac. Méd., Bruxelles. Belgium) Adrenaline, noradrenaline and 5HT increased the in vitro oxidation of C-1 of glucose by thyroid slices of sheep. Adrenaline was oxidised to adrenochrome during incubation and inhibn. of the oxidation by ascorbic acid decreased the action of adrenaline on glucose oxidation. Preincubation of adrenaline increased the effect on thyroid metabolism. (French) M.A.Price

4102. EFFECT OF AN EXTRACT OF LITHOSPERMUM (LITHOSPERMUM OFFICINALE L.) ON THE THYROID ACTIVITY OF THE MOUSE. F.Lachiver and B.Seshadrulu Arch. Sci. physiol., 1962, 16, 305-323 (Lab. Physiol. gen.. Museum d'Histoire Naturelle, 7 rue Cuvier, Paris, France) The effects of an aq. extract of stalks or leaves of *L. officinale* on the thyroid gland in mice were studied. The extract caused transitory inhibn. of fixation of ^{131}I and reduced the secretion of thyroid hormone and total body excretion of iodine. The intra-thyroid biosynthesis of hormones appeared unaltered.

(French) S. A. Thistlewood

4103. THYROID INFLUENCE ON THE TOXICITY OF RESPIRATORY IRRITANT GASES, OZONE AND NITROGEN DIOXIDE. E.J.Fairchild, II and S.L. Graham: J. Pharmacol. exp. Ther., 1963, 139, 177-184 (Div. Occupation Hlth., U.S.Dept. HI*, Cincinnati, Ohio., U.S.A.) Chem. or surgical thyroideectomy enhanced survival of mice or -rats exposed to O_3 and NO_2 . Increased thyroid activity rendered mfc highly susceptible to the gases. Thyroid blocking agents gave protection and thyroid hormone augmented toxic action. Doses of DNP which elevated metabolism did no alter the toxic response to O_3 .

J.M.Whitmarsh

GENERAL PHARMACOLOGY

4104. CLINICAL EFFECTS OF BITES BY MALAYAN VIPER (ANCISTRODON RHODOSTOMA BOIE).

H.A.Reid, P.C.Thean, K.E.Chan and A.R.Baharom: Lancet, 1963, i, 617-621 (Penang Gen. Hosp., Malaya) The clinical features following bites by ^{hc} *Ancistrodon rhodostoma* in 250 patients personal observed in 1960-61. Clotting defect is the principal characteristic of systemic poisoning, which was present in 39% of victims. In 15% there is an overt haemorrhage syndrome, of which haemoptysis is the earliest sign ana sparsely scattered discoid ecchymoses are a distinctive feature. The coagulation defect in the absence of sp-^ treatment may continue for over 3 weeks. G.H**

4105. PROLONGED COAGULATION DEFECT (DEFIBRINA TION SYNDROME) IN MALAYAN VIPER BITE.

H.A.Reid, K.E.Chan and P.C.Thean: Lancet, 1963, i, 621-626 (General Hosp., Penang, Malaya) Defibrination is the main feature of systemic poisoning following bites of the Malayan Pit-viper *Ancistrodon rhodostoma*. Observation of a clot quality closely parallels ^{tab. or ?} ¹ ¹ tests such as the thrombin titre. An outstanding find in this viper-bite defibrillation syndrome is its long ^{per} ¹ ¹ ^d ence. Treatment by blood-transfusion or by cone ^P ¹ ¹ ^d human fibrinogen is disappointing. In contrast, sp-¹ ¹ ^d venene is dramatically successful.

4106. RELATION BETWEEN TUMOURICIDAL AND PROPHAGE-INDUCING ACTION. H.Endo, M.Ishizawa, T.Kamiya and S.Sonoda: Nature, Lond., 1963, 198, 258-260 (Divn. Chem., Inst. Cancer Res., Kyushu re J~inv. Fukuoka, Japan) A direct relationship is in^{re}te^{ce}* between the capacity to induce phage formation in^{re}2li²K12(X) and carcinostatic activity of mito-anthrⁿ and^{re}gated compounds and nitrogen mustard Dm^{it} J^S deriv. The induction of lysogenic bacteria may E, V^{lde} a rapid and simple screening method for anti-tumour agents. G.M.Lewis

4107. IN VIVO ANTI-TUMOUR ACTIVITY OF ETHYL HEPTYLOXYACETATE AGAINST EHRLICH ASCITES CELLS. G.F.Townsend, W.H.Brown and E.E.Felauer: Nature, Lond., 1963, 198, 384-385 (Dept. Agric, [16SS] 8¹¹⁰ A⁸fic Coll., Guelph, Ont., Canada) B^W-De canoate inj. into mice is rapidly destroyed by blood destr^{ion}* Substitution of an O atom for the 3rd C in^{re}s its degr^aation in vivo without affecting its cytotoxic effect on transfers of AKR leukaemia cells in into mice for 5 days after transplant of Ehrlich ascites nth reduced the total packed cell count in ascites fluid n^o ~6th day to Mr^o of the control, due to reduction in Urine large cells. The treatment did not increase Val. G.M.Lewis

4108. ANTIMITOTIC ACTION OF 5-(2'-BROMO-^N-CETAMIDO)-URACIL [BAU] ON THE EHRLICH ASCITES TUMOUR. T.A.Okada and E.Roberts: Proc. Soc. p. Biol., N.Y., 1962, 111, 695-698 (Dept. Biochem., City of Hoep Med. Center, Duarte, Calif., U.S.A.) Single i.p. inj. of BAU produced a variety of anomalies in mitotic rat^e tumour cells causing a mid^oase in mitotic rate from 3-24 hr. after injn. but *** inhib. was not observed. This antimitotic effect was prevented by injn. of glutathione or cysteine simult^{an} with BAU. M.M.Shapland

4109. EFFECTS OF VIPERA AMMODYTES AMMODYTES VENOM ON ISOLATED HEART. I.Ivancevic, N.Marian Knezevic: Toxicon, 1963, 1, 65-66 (Inst. Hygiene Col^t Dep^t Pam^bl. Hosp. Stojanovic, Zagreb, Yugoslavia) The venom of V. ammodytes ammodytes produces sp. changes in the isolated hearts of frogs and mice hⁱ which are quite different in most instances from his tam^V produced by histamine, strophanthine and the me-liberator. K.Brew

4110. PREPARATION OF EGYPTIAN BLACK SNAKE ANTIVENIN. A.H.Mohamed and A.M.Kamek: Toxicon, 1963, 1, 71-79 (DePt- Physiol., Fac. Med., Ein Gez, Cairo, Egypt) Antivenin was prep. in the unis^{ed} and goats[#] During the early part of the i^{se} Ved t^h Programme, the deleterious signs, usually inj. of cor^t sone and a^{nt}ropine. These drugs did not appear affect^{an} antigenicity; they reduced mortality. K.Brew

4111. ANTIVENIN ACTIVITY OF SOME SNAKE SERA. K. 89⁹, T⁰ ras and V.B.Mhasalkar: Toxicon, 1963, 1, 79-84 (Inst., Bombay, India) Studies are the effects of certain snake sera on snake venoms. The inhibitor activity of those sera was observed and the effects on r.^hc. in the presence of K.Brew

4112. EFFECT OF EDUCED DERIVATIVES OF FOLIC ACID ON TOXICITY ANU ANTI-LEUKAEMIC EFFECT

OF METHOTREXATE IN MICE. J.A.R-Mead, J.M. Venditti, A.W.Schrecker, A.Goldin and J.C.Keresztesy: Biochem. Pharmacol., 1963, 12, 371-383 (Lab. Chem. Pharmacol., Nat. Cancer Inst., Bethesda, Md., U.S.A.) Mice were inoc. with leukaemia L1210 and 3 days later were treated daily with combinations of methotrexate and a no, of folic acid deriv. Treatment with methotrexate alone or with folic acid resulted in a considerable prolongation of life. With all other treatments leukaemic death resulted at the same time as in the controls. Delayed administration of citrovorum factor and prefolic acid A, after large doses of methotrexate, reduced the toxicity with little effect on the antileukemic effect when given 12-24 hr. after, but not 48 hr. after. L.G. Gillies

4113. ANOXIC CHANGES OF LIVER CELLS. E.M. AFTER INJECTION OF COLLOIDAL MERCURY. P.R.Oudea: Lab. Invest., 1963, 12, 386-394 (Pathol. Dept., Mt. Sinai Hosp., New York, U.S.A.) Male rats were ether anaesthetised and colloidal Hg inj. i.v. They were allowed to breathe a low O₂ mixture for about 1 hr., the liver was then prep. for E.M. Numerous pinocytic vacuoles were observed containing colloidal particles. Lysosomes appeared to come from these. Mitochondria were usually swollen and ergastoplasm usually unaltered. A.M.Mackay

4114. CYTO-ACTIVE AMINO ACIDS AND PEPTIDES. K. FURTHER STUDIES OF N-ACYL-DIPEPTIDES FROM MELPHALAN. F.Bergel, J.M.Johnson and R.Wade: J. chem. Soc., 1962, 3802-3805 (Chester Beatty Res. Inst., Fulham Rd., London, England) The synthesis of a series of N-acetyl-L- and -D-aminoacyl deriv. of melphalan ethyl ester [$\text{N}(\text{H})\text{-di-(2-chloroethyl)-aminophenylalanine ethyl ester}$] was described. The tendency of acetamido-acids to racemise during the mixed-anhydride procedure and the advantage of the azide method for peptide synthesis were confirmed. Throughout the series there was considerable variation in carcinostatic activity and toxicity although the chemical reactivity of the 'mustard' group remained constant. Within each stereoisomeric pair for which data were available, the L,L- was more active than the D,L-isomer by a factor of at least 100. L.G.Gillies

4115. CYTO-ACTIVE AMINO ACIDS AND PEPTIDES. X. PENTAPEPTIDE AND BASIC DIPEPTIDE FROM MELPHALAN. J.M.Johnson and J. A. Stock: J. chem. Soc., 1962, 3806-3808 (Chester Beatty Res. Inst., Fulham Rd., London, England) The prep. of the ethyl esters of L-arginyl-melphalan and L-prolylglycyl-L-valyl-L-phenyl-alanyl-melphalan was described and some of their biol. effects were briefly reported. L.G.Gillies

4116. EFFECT OF PURINE ANTIMETABOLITES ON SERUM GLOBULINS IN THE RABBIT. S.M.Wolff and H.C.Goodman: Proc. Soc. exp. Biol., N.Y., 1963, 112, 416-419 (Lab. Clin. Invest. and Immunol., Nat. Inst. A.I.L, N.I.H., Bethesda, Md., U.S.A.) The purine antimetabolites 6-mercaptopurine and 6-thio-guanine have been shown to affect the serum globulins of albino rabbits as demonstrated by agar and paper electrophoresis of sera. Immuno-electrophoretic methods demonstrated, apart from the increase in the 32-globulin fraction and decreases in the y-globulin fraction, a fast moving y_x fraction precipitin which was masked in the other techniques used. D.N.Wheatley

PHARMACOLOGY

4117. INFLUENCE OF pH ON REACTIVITY OF CHLORAMBUCIL. J.H.Linford: Biochem. Pharmacol., 1963, 12, 317-324 (Dept. Biochem., Univ. Manitoba, Winnipeg, Canada) The reactivity of chlorambucil in aq. soln., as measured by the rate of the alkylation reaction with K_b , decreased with the decrease of pH below 7. Both the solubility of chlorambucil and the degree of dissociation of the carboxyl group also decreased in soln. of low pH. A study of the related changes in these three factors indicated that activation of the molecule to the carbonium ion form was brought about by an approach of the -COOH group to the Cl-group. This led to an explanation of the relation of reactivity of compounds in this series with length of aliphatic chain and point of attachment to the benzene ring. L.G. Gillies

4118. STUDIES OF MECHANISM OF ACTION OF 1-AMINOCYCLOPENTANE-1-CARBOXYLIC ACID [ACC]. W.R.Sterling and J.F.Henderson: Biochem. Pharmacol., 1963, 12, 303-316 (Dept. Pharmacol., G.Washington Sch. Med., Washington, D.C., U.S.A.) The mechanism of action of the non-metabolisable (X-amino acid, ACC, was investigated in ascites tumour cells *in vitro*. It replaced no natural amino acid in protein synthesis nor did it interfere with the endogenous synthesis of natural amino acids from glucose. ACC appeared to be taken, in the cells by an active transport system utilised by some natural amino acids. Participation in a heteroexchange diffusion process with DL-leucine and DL-valine was demonstrated. The inhibn. of incorporation of amino acids at high concn. was probably due to inhibn. of transport and the relation of this to carcinostatic action is discussed. L.G.Gillies

4118&. NEW POTENT INHIBITOR OF MICROSOMAL DRUG-METABOLISING ENZYMES 2,4-DICHLORO-6-PHENYLPHENOXYETHYLAMINE HC1 [DPEA] (LILLY 32391). R.Kato, P.Vassanelli and E.Chiesara: Biochem. Pharmacol., 1963, 12, 353-356 (Inst. Pharmacol., Univ., Milan, Italy) The inhibitory action of DPEA on the microsomal drug-metabolising enzymes was studied and compared with the action of SKF 525-A and Lilly 18947. DPEA is a primary amine analogue of Lilly 18947 and has an inhibitory action 5 times greater. Although it has no N-N-diethylamino group, it was about as potent an inhibitor as SKF 525-A both *in vitro* and *in vivo*. The mechanism of the inhibn. was not known. L.G.Gillies

4120.. ENHANCED PHENOBARBITAL INDUCTION OF LIVER MICROSOMAL ENZYMES IN MICE INFECTED WITH MURINE HEPATITIS VIRUS. R.Kato, Y.Nakamura and E.Chiesara: Biochem. Pharmacol., 1963, 12, 365-370 (Inst. Pharmacol., Univ., Milan, Italy) The effect of an infection in mice with a murine hepatitis virus, Buescher type, on the liver microsomal drug metabolising enzyme was investigated, alone and in combination with phenobarbital pretreatment. A diphasic effect on the infection was observed. The enzyme activity increased slightly 12 hr. after the infection and was markedly depressed after 48-60 hr. The effect of phenobarbital pretreatment on the microsomal drug metabolising enzymes was enhanced in mice infected 12-24 hr. previously. The results suggested that the condition of stim. biosynthesis of protein and RNA in the liver of infected mice enhanced the effect of phenobarbital. L.G.Gillies

4121. INHIBITION OF SOME MICROSOMAL DRUG-METABOLISING ENZYMES BY INHIBITORS OF CHOLESTEROL BIOSYNTHESIS. R.Kato, P.Vassanelli and

E.Chiesara: Biochem. Pharmacol., 1963, 12, 349-351 (Inst. Pharmacol., Univ., Milan* Italy)

Microsomal enzymes were observed to help some stages of cholesterol biosynthesis. They acted in the same manner as those responsible for the metabolism and consequent inactivation of several drugs, e.g., pentobarbital and carisoprodol. Some well-known inhibitors of the cholesterol synthesis like triparanol and carisoprodol were proved to have an inhibitory action also on the *in vitro* and *in vivo* metabolism of both pentobarbital and carisoprodol.

L.G.Gillies

4122. OXIDATIVE METABOLISM OF TISSUE CULTURE CELLS IN THE PRESENCE OF PORPHYRIA INDUCING DRUGS. M.L.Cowger, R.F.Labbe and M. Sewell; Arch. Biochem., 1963, 101, 96-102 (Dept. Pediatrics* Univ. Washington Sch. Med., Seattle, Wash., U.S.A.)

The drugs produced stoichiometric increases in lactic acid production and glucose consumption in mammalian cells. Concomitant decreases in ATP levels, catalase activity and O_2 uptake occurred. Cell multiplication decreased; mean cell diam. and RNA and protein content/cell increased. 'Porphyric*' cells took up more ^{59}Fe , incorporated more ^{59}Fe into cellular haemin and cone, more total Fe/cell.

r.M.Stevens

4123. RADIOACTIVE DRUG: 2-METHYL-6-TRITIO-1,4-NAPHTHAQUINOL BIS(DISODIUM PHOSPHATE) AND 2-METHYL-5,6, 7-TRITRITIO-1,4-NAPHTHAQUINOL BIS(DISODIUM PHOSPHATE). K.J.M.Andrews, F.Bultitude, E.A.Evans, M.Gronow, R.W.Lambert and D.H.Marrian: J. chem. Soc., 1962, 3440-3446 (D^{1*}) Radiotherapeutics, Univ., Cambridge, England

The first-named compound was prep. by reductive dehalogenation of the corresponding 6-iodo-compound by carrier-free tritium. The product, of sp. activity 27 c/mM, remained essentially radiochemically pure in aq. soln. for several months. Preliminary laboratory and clinical investigations of the compound as a new form of treatment of human malignancies suggested the need for even higher activity. 5,6,7-Tribromo-2-methyl-1,4-naphthaquinol bis(disodium phosphate) was therefore synthesised and similarly reduced to the tritio-compound of sp. activity 83 c/riM.

L.G.Gillies

4124. MECHANISM OF STIMULATION OF MAMMALIAN NITRO REDUCTASE BY FLAVINS. J.J.Kamm and h* Gillette: Life ScL, 1963, No. 4, 254-260 (Nat. Heart Inst., Bethesda, Md., U.S.A.) Evidence is presented to show that treatment of rabbit liver microsomes with pancreatic lipase destroys endogenous nitro reductase, but solubilises an enzyme which catalyses the reduction of nitro compounds in the presence of large amounts of FAD. The solubilised enzyme, probably NAD(H)-cytochrome β reductase, catalysed the reduction of flavins by NAD(P)_H, the reduced flavin then converting nitro compounds to primary amines.

K.Jones

4125. OPHIOFAGUS HABITS OF PSEUDOBOA CLOE^{LLA}. J.W.Abalos: Toxicon, 1963, 1, 90 (Inst. Nacion^{*1} Microbiol., Santiago del Estero, Argentina) T&e sensitivity of P. cloelia to the venom of various other snakes is discussed. Illustrations are presented of a ? P. cloelia capturing and swallowing Rothrops neuquensis.

4126. TREATMENT OF MEDULLARY APLASIA BY PHARMACOLOGICAL PROVOCATION WITH AUTOGRAPHIC GRAFTS OF MEDULLARY BONE-MARROW. S.Pie^{10#}

G.Pellegris and G.Caprio: Atti Acad. med. Lombarda, 1962, 17, 252-255 (Ist. Nazionale Studio e la Curadei tumori, Italy) Bone marrow autografts, stored at $\frac{1}{4}$ °C were successfully implanted into 3 patients with Malignant neoplasia (metastatic thyroid and generalised carcinoma) already receiving anti-tumour chemotherapy. (Italian) G.N.Godson

4127. CASE OF PURE RED-CELL APLASIA SUCCESSFULLY TREATED WITH COBALT. M.A.Voyce: Brit. J. Haemat., 1963, 9, 412-418 (S.Devon and E.Cornwall Hosp., Freedom Fields, Plymouth, Devon, England) Oral CoCl₂ therapy prevented the need for numerous blood transfusions in a patient with erythroblast hypoplasia. Immunoelectrophoresis showed an "normal protein of localised y-mobility, cross-reacting" & normal globulin which is typical of multiple myelomatosis. The Co has not produced any undesirable side effects. The literature is reviewed. J.Sneath

4128. CLINICAL EXPERIENCE WITH IRON-SORBITOL, A NEW INTRAMUSCULAR IRON MEDICATION. M.Van Slyck: Amer. J. med. Sci., 1963, 245, 176-183 (Div. Haematol., H.Ford Hosp., Detroit, Mich., U.S.A.) The drug is a colloidal iron-sorbitol-citric acid Prep, it is rapidly absorbed after i.m. injn., non-toxic, well tolerated and effective in iron-deficiency states. E.E.Hobbiger

4129. SIDEROCALCIPHYLACTIC SENSITISATION TO MASTOCYTE DISCHARGERS. H.Seyle, J.M.Dieudonné and R.Veilleux: Canad. J. Biochem., 1963, 41, 291-297 (Inst. Méd. et de Chirurgie expt., Univ. Montréal, Que., Canada) Female rats of approx. 100 g. were given dihydrotachysterol [DHT] in a dose of 1 mg. in 0.5 mL corn oil by stomach tube for calcification sensitisation. Some rats received no additional ferric dextran while others received ferric dextran containing sulphur. As mastocyte dischargers polymixin B 100 units 0.1% W/I 48/80, or stilbamidine 0.1 pg.-af 1 in 0.2 ml. of saline were given s.c. immediately after ferric dextran. Rats were killed 7 days after treatment and the resulting calcified wheals were measured. Pretreatment with both DHT and ferric dextran was essential for development of wheals, their size 8 Proportional to the dose of mastocyte discharger. J.B.Parish

4130. EFFECTS OF SKF 525-A ON HEPATIC GLYCOGEN AND RATE OF HEPATIC DRUG METABOLISM. J.A.Rogers, R.L.Dixon and J.R.Fouts: Biochem. Pharmacol., 1963, 12, 341-348 (Dept. Pharmacol., Coll. Med. State Univ. Iowa City, Iowa, U.S.A.) The level of hepatic glycogen and rates of certain drug metabolisms were studied after administration of SKF 525-A (β -diethylaminoethyl diphenylpropyl acetate HCl) to adult I $\frac{1}{2}$ yr. SKF 525-A inhib. hepatic drug metabolism after $\frac{1}{2}$ hr. and a significant effect was seen up to 24 hr. to a $\frac{1}{2}$ hr. inistration. SKF 525-A lowered hepatic glycogen level in 8-12 hr. The recovery of hepatic glycogen and rate of hepatic drug metabolism to control values occ. at the same time. The effects on certain enzymes of hepatic glycogenesis and glycogenolysis were also studied. L.G.Gillies

4131. PHARMACOLOGICALLY ACTIVE ACIDIC PHOSPHOLIPIDS AND GLYCOLIPIDS. W.Vogt: Biochem. Pharm. *COL 1963 - 12 415-420 (Pharmak. Abteilung Forschungsanstalt Max-Planck Gesellschaft, Gothenburg, Sweden, Germany). The occurrence and smooth

muscle stimulating action of darmstoff, a substance found in the fluid bathing isolated frog intestine prep., was described and a phosphatidic acid and other acidic phospholipids were identified as the active principles. The smooth muscle stimulating activity of these substances depended on their acidity which enabled them to form lipid-sol. salts with inorg. cations. A possible relationship exists between pharmacological activity and Ca-binding of these compounds. L.G.Gillies

4132. EFFECT OF HYPOCHOLESTEROLAEMIC AGENTS ON INTESTINAL CHOLESTEROL ABSORPTION. S.A.Hyun, G.V.Vahouny and C.R.Treadwell: Proc. Soc. exp. Biol., N.Y., 1963, 112, 496-501 (Dept. Biochem., G.Washington Univ. Med. Sch., Washington, D-C, U.S.A.) The action of certain agents such as cholestyramine (MK-135), pectin, nicotinuric acid, was studied with regard to die cholesterol level in lymph of adult o rats. MK-135 and pectin caused a considerable reduction in the cholesterol level and inhibited the uptake of labelled [¹⁴C]cholesterol. Cholesterol trimethyl-acetate, nicotinuric acid and pyridine-3-acetic acid did not have this effect. The % of cholesterol esterification of absorbed cholesterol-4-14c was independent of the degree of absorption. Diarrhoea and death was experienced to a high degree in the expt. groups. D.N.Wheatley

4133. INHIBITION OF THE INCREASED BIOSYNTHESIS OF CHOLESTEROL INDUCED BY CCI4, BY SECTION OF THE SPINAL CORD. E.Grossi, A.Faccioli and R.Vertua: Atti. Acad. med. Lombarda, 1962, 17, 153-155 (Ist. di Farmacologia, Univ., Milano, Italy) Administration of CCI4 (1 g/kg body wt.) to rats induced a marked increase in [¹⁻¹⁴C]acetate incorporation into liver cholesterol, but had no effect on the acetate incorporation into fatty acids. This effect is antagonised completely if the 5th cervical segment is sectioned before CCI4 treatment. (Italian) G.N.Godson

4134. MECHANISM OF ACTION OF CATECHOLAMINE IN ANIMALS WITH CCI4 INDUCED FATTY LIVER. R.Vertua and M.Usardi: Atti. Acad. med. Lombarda, 1962, 17, 149-152 (Ist. di Farmacol., Univ. Milano, Italy) In normal adrenal-medullectomised rats and in similarly operated animals treated with noradrenaline (1 mg./rat) administration of CCI4 (0.5 ml./100 g. body wt.) did not induce an increase in plasma free fatty acid as is the case in unoperated animals. Thus, CCI4-induced fatty liver is not related to increased mobilisation of lipids. The increase in liver triglyceride, induced by the CCI4 in normal animals is antagonised by removal of the adrenal medulla, but this increase appears again on administration of noradrenaline. (Italian) G.N.Godson

4135. INTESTINAL ACTION OF BENZMALECENE: THE RELATIONSHIP OF ITS HYPOCHOLESTEROLAEMIC EFFECT TO ACTIVE TRANSPORT OF BILE SALTS AND OTHER SUBSTANCES. L.Lack and LM.Weinen: J. Pharmacol. exp. Ther., 1963, 139, 248-258 (Sch. Med., Johns Hopkins Univ., Baltimore, Md., U.S.A.) Benzmalecene inhibits the active absorption of taurocholate, and also of sugar and tyrosine, by the small intestine in vivo and in vitro. This is thought to contribute to its hypocholesterolaemic action. The maleyl moiety is not essential for activity. The a-diastereoisomers are more active than the β . Dehalogenation has significant effect on potency. Benzmalecene inhibits enzymes of die Krebs cycle. J.M.Whitmarsh

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4136. EFFECT OF HYPERCHOLESTEROLAEMIA ON DIGOXIN TOLERANCE. P.L.Rodensky, W.C.Grant and F.Wasserman: Proc. Soc. Exp. Biol., N.Y., 1962, 111, 629-631 (Dept. Med., Vet. Admin. Hosp., Coral Gables, Miami, Fla., U.S.A.) A significant increase in digitalis tolerance was observed in hypercholesterolaemic d* rabbits when compared to normal animals. M.M.Shapland

4137. GLYCEROL INTAKE, BLOOD CHOLESTEROL LEVEL AND ANAEMIA IN THE GUINEA-PIG AND RABBIT. R.Ostwald: Proc. Soc. exp. Biol., N.Y., 1962, 111, 632-634 (Dept. Nutrit. Sci., Univ. California, Berkeley, Calif., U.S.A.) Guinea-pigs given more than 5 ml. of a 50% soln. of glycerol daily died with acute toxic symptoms but rabbits tolerated at least 10 ml. daily. In neither animal did the level of plasma or cell cholesterol show consistent changes attributable to the intake of glycerol. It appears probable that in the guinea-pig intake of glycerol is accompanied by an anaemia. M.M.Shapland

4138. DIRECT EFFECT OF RESERPINE ON VENTRICULAR CONTRACTILITY. W.G.Naylen: J. Pharmacol. exp. Ther., 1963, 139, 222-229 (Baker Med. Res. Inst., Melbourne, Australia) Reserpine at 1 μ g./ml. evoked a pos. inotropic response from isolated toad ventricle but at 1.5-5 fig./ml. a neg. response. The neg. response was reversed by caffeine, strophanthin-G or additional Ca^{2+} . The treated ventricles displayed a 'reversed staircase', and post-stimn. potentiation was absent, there was an altered efflux of ^{45}Ca . The relation between Ca^{2+} efflux and release of catecholamine stores is discussed. J.M.Whitmarsh

4139. EFFECT OF RESERPINE IN COARCTATION OF AORTA. A.Actis-Dato and E.de Giorgi: Brit. Heart J., 1963, 25, 343-346 (Dept. Cardiovasc Surg., Univ., Torino, Italy) Reserpine, 0.5-0.75 mg. daily by mouth was given to 15 patients with coarctation of the aorta. In all, the systolic b.p. decreased in the arms and there was a progressive rise of the systolic b.p. in the legs. It is probable that the drug induces dilatation of the vessels bypassing the point of obstruction. P.F.Meyer

4140. ACTION OF RESERPINE AND TETRABENAZINE ON THE MELANOPHORES OF LEBISTES RETICULATUS PETERS. K.Opitz and M.Stanisic: Arch. int. Pharmacodyn., 1963, 142, 556-561 (Pharmacol. Inst., Munster Univ., Germany) The action of various drugs in surrounding water on skin melanophores are studied in *Lebistes* fish. Reserpine 5 fig./l. and tetrabenazine 100 $\mu\text{g}/\text{l}$ cause pigment spread, the latter of shorter duration. Amphetamine 2 mg./l. inhibits these changes. (German) S.E. Smith

4141. OBSERVATIONS CONCERNING THE EFFECTS OF A THIOXANTHINE UPON THE HEART OF THE INTACT ANIMAL. G.M.Maxwell, R.B.Elliott and G.M. Kneebone: Aust. J. exp. Biol. med. Sci., 1962, 40, 335-340 (Dept. of Child Health, Univ., Adelaide, South Australia) 3-Isobutyl-1-methyl-6-thioxanthine (M and B 5924), when given i.v. in a dose of 1*0 mg./kg. to anaesthetised, but otherwise intact dogs, gave statistically significant increases in respiratory rate, respiratory vol., O₂ consumption, CO₂ production and pulse rate. Femoral and pulmonary arterial pressures decreased, as did the total peripheral resistance. Coronary blood flow and cardiac metabolic rates for O₂

and CO₂ increased. Cardiac efficiency and coronary vascular resistance decreased. B.A.Stone

'4142. CARDIOVASCULAR RESPONSES FOLLOWING INJECTION OF PICROTOXIN INTO LATERAL CEREBRAL VENTRICLE OF RABBITS. D.R.Varma, N.N. Share and K.I.Melville: Int. J. Neuropharm., 1962, 1, 203-206 (Pharmacol. Dept., McGill Univ., Montreal, Canada) Picrotoxin could stimulate central sympathetic mechanisms leading to increased sympathetic outflow affecting the cardiovascular system as evidenced by cardiac arrhythmias and a rise in b.p. This effect appeared to be independent of the analeptic action of picrotoxin. G.F.Blane

4143. QUINIDINE POLYGALACTURONATE IN THE TREATMENT OF CARDIAC ARHYTHMIAS: A CLINICAL REPORT. R.L.Uber, A.M.Clark, A.Foe and D.G.Hudson: Amer. J. med. Sci., 1963, 245, 171-175 (Yakima, Washington, U.S.A.) The polygalacturonate of quinidine is more potent than its sulphate as an antiarrhythmia agent and produces less gastrointestinal irritation than the latter. E.E.Hobbiger

4144. PLASMA QUINIDINE CONTENT LEVELS FOLLOWING SINGLE ORAL DOSES OF QUINIDINE POLYGALACTURONATE. R.Khorsandian, R.F.Caplan, L.J. Feinberg and S.Bellet: Amer. J. med. Sci., 1963, 245, 311-316 (Div. Cardiol., Philadelphia Gen. Hosp., Pa., U.S.A.) Studies of the plasma concn. of quinidine showed that there is no difference between the levels obtained at various times after the administration of equimolar amounts of quinidine sulphate and quinidine polygalacturonate. E.E.Hobbiger

4145. CLINICAL EXPERIENCES WITH POLYTHIAZIDE IN THE TREATMENT OF HYPERTENSION. J.J.Kelly, jun., E.L.Housel and J.W.Daly: Amer. J. med. Sci., 1963, 245, 160-165 (Dept. Med., Jefferson Med. Coll., Philadelphia, Pa., U.S.A.) Polythiazide, 2-methyl-3,4-dihydro-3-(2,2,2-trifluoroethylthiomethyl)-6-chloro-7-sulphamyl-1, 2,4-benzothiadiazine-1-l-dioxide, is an antihypertensive agent, which acts in doses of 1 to 2 mg. and does not produce any serious side effects. It is thought that the drug produces its effect by reducing arteriolar tone through changing the Na⁺ gradient between interstitial fluid and arteriolar cells. E.E.Hobbiger

4146. CLINICAL OBSERVATIONS ON THE ANTIHYPERTENSIVE EFFECT OF PARGYLINE HYDROCHLORIDE. A.L.Sutnick, J.W.Fewell and L.A.Soloff: Amer. J. med. Sci., 1963, 245, 166-170 (Dept. Cardiol., Temple Univ. Sch. Med., Philadelphia, Pa., U.S.A.) Pargyline, N-benzyl-N-methyl-2-propynylamine HCl is an antihypertensive agent which causes primarily an orthostatic hypotension. The frequency and nature of side-effects are reported. E.E.Hobbiger

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4147. INJECTION OF DYE INTO ISOLATED ARTERIES SUPPLYING BRAIN OF DOG. W.A.Himwich and OR-Inman: Int. J. Neuropharm., 1962, 1, 303-307 (Thudichum Psychiatric Res. Inst., Galesburg State Res. Hosp., IL, U.S.A.) When the basilar artery is occluded with a clip all functional connection between the vertebral and carotid arterial circulations appeared to be absent. Exteriorisation of segments of the carotid or vertebral arteries did not affect dye distribution. The significance of these findings in the interpretation of behavioural responses of dogs to intra-carotid artery drug administration is discussed. * G.F.Blane

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4148. INFLUENCE OF DRUGS AND POTASSIUM ON RESPIRATION AND POTASSIUM ACCUMULATION BY BRAINISSUE. F.Bilodeau and K.A.C.Elliott: Canad. J- Biochem., 1963, 41, 779-792 (Donner Lab. Expt. Neurochem., Montreal Neurolog. Inst., Montreal, Que., Canada) When rat brain cortex slices, ⁵Pleated of K⁺, were incubated at 38° in a K⁺-free, sucrose containing medium, the addition of 3'6mM K⁺ increased the rate of O₂ uptake and caused a re-accumulation of K⁺ in the tissue with an approx. equal extrusion of Na⁺; the absence of substrate or Na⁺ these effects do not occur. Malonate pentobarbital and protamine, which increase K⁺ uptake, and phenobarbital, chlorpromazine, diphenine and procaine, which have no effect on K⁺ uptake, suppressed the stimulatory effect of 3'6mM K⁺ on respiration. Protoveratrine and DNP enhanced the stimulatory effect of 3'6mM K⁺ on respiration. J.B.Parish

4149. STRUCTURE-ACTION STUDIES ON SPASMODIC HYDROXY-ACIDS AND COMPARISON WITH CEREBRAL HEMISPHERE ACID. N.Ambache and M.Reynolds: Int. J. Neuropharmac., 1962, 1, 119-123 (Dept. Physiol., M.R.C., Royal Coll. Surgeons, London, England) A method for the purification of a (1,3,5-trihydroxy-acid resembling irin and obtained from rat brain is described. The activity of the extract was compared with a series of hydroxy-acids and lactones in an attempt to determine the essential groups of biological material. G.F.Blane

4150. RESPONSE OF VASCULAR SMOOTH MUSCLE TO K⁺ AND ITS ANTAGONISM BY PHENOXYBENZAMINE. J.A.Bevan, J.V.Osher and C.Su: J. Pharmacol. exp. Ther., 1963, 139, 216-221 (Univ. California Med. Center, Los Angeles, Calif., U.S.A.) The contraction of rabbit aorta strip after increase of K⁺ is slower than that due to (-)-noradrenaline. It is reversible but is maintained indefinitely. The ED₅₀ is approximately 1 mg./ml. The response is antagonised by phenoxybenzamine, by N-(2-chloroethyl)-N-ethyl-L-naphthalene-1-hydrazine HCl (SY-14) but not by yohimbine. J.M.Whitmarsh

4151. EFFECT OF LYSOLECITHIN ON THE SMOOTH MUSCLE STIMULATING ACTIVITY OF HISTAMINE, pETYLCHOLINE, 5-HYDROXY-TRYPTAMINE, APHYLACTIC SLOW-REACTING SUBSTANCE AND BRADYKININ. E.Middleton, jun. and G.B.Phillips: Jature, Lond., 1963, 198, 758-760 (Dept. Med., Oil, phys. and surgn., Columbia Univ., New York, W.I.S.A.) Evidence presented indicates that lysophosphatidylserine may produce a non-competitive type of inhibition. The specific action of the substances examined on pig ileum. J.R.Sargent

4152. ACTION OF TRINITROGLYCERIN ON CHRONIC-OBSTRUCTED PERIPHERAL ARTERIES. C.Ghirighelli and A.Grassò: Atti. Acad. med. Lombarda, 1962, 17, 43-102 (Clin. Chirurgica Generale, Univ., Milano, Italy) Rheographic, histological and clinical evidence is presented to indicate that trinitroglycerine has a vasodilatory effect on the peripheral blood vascular system and can obtain therapeutic success on patients with chronic active atherosclerosis of the limbs.

4153. COMPARISON OF CONTINUOUS LONG-TERM HEPARIN AND ORAL ANTICOAGULANT THERAPY IN PATIENTS WITH SEVERE ANGINA PECTORIS. G.N.Godson, F.Hughes, F.Mortensen and L.Shourie: Amer. Heart

J., 1963, 65, 615-627 (Dept. Med., Med. Coll. Alabama, Birmingham, Ala., U.S.A.) In a long-term trial of anticoagulant treatment of angina pectoris, 53 patients were given twice daily injn. i.m. of 100-200 mg. heparin sodium in cone. aq. soln. and 51 were treated with coumarin drugs. There were fewer deaths and fewer reinfarctions in the heparin treated group which also showed greater subjective improvement and improvement in e.cg., b.cg. and in cholesterol levels.

P.F.Meyer

4154. CLINICAL AND PHYSIOLOGICAL EFFECTS OF ANTAZOLINE, A NEW ANTI-ARRHYTHMIC AGENT. L.S.Dreifus, T.F.McGarry, Y.Watanabe, S.R.Kline, M.Waldman and W.Likoff: Amer. Heart J., 1963, 65, 607-614 (Dept. Med., Cardiovasc. Section, Hahnemann Med. Coll., Philadelphia, Pa., U.S.A.) The effect of an antihistaminic, 2-(N-benzylanilinomethyl)-2-imidazoline, was investigated in anaesthetised dogs; 10-20 mg. i.v. caused a temporary fall in cardiac output and stroke vol.; the b.p. remained unchanged, peripheral vascular resistance increased. In patients, 400-800 mg. daily by mouth, or 10 mg. i.v., abolished premature beats and often terminated ectopic rhythms other than atrial fibrillation and flutter. P.F.Meyer

4155. CARDIAC STIMULATING ACTIVITY OF VASODILATORS. F.Lourdan, G.Faucon and G.Schaff: C.R. Soc. Biol., Paris, 1962, 156, 1855-1859 (Inst. de Recherches Cardiol. de Royat, France)

IsoprenaUne (8-16 fig./kg.), aminophylline (0.8-1.2 eg./kg.), papaverine (1.4-2.2 mg./kg.) and khelline (2.2-4.4 mg. Ag.) increased the amplitude and freq. of the heart beat of the chloralose anaesthetised dogs. The duration of effect was greatest with aminophylline.

(French) M.A.Price

4156. LIPID SPASMOGENS APPEARING IN CONNECTION WITH HISTAMINE LIBERATION. B.Uvnas: Biochem. Pharmacol., 1963, 12, 439-443 (Dept. Pharmacol., Karolinska Inst., Stockholm, Sweden) Histamine release was induced from perfused cat paws and isolated rat mast cells with compound 48/80, and from sensitised guinea-pig lungs with Ag. Several spasmogenic substances were obtained which were separated chromatographically. Chem. and biol. prop. indicated the presence of unsat. fatty acids, phosphatidyl and phosphatidyl choline and an SRS principle. The SRS principles from the 3 spp. seemed to be identical or closely related. L.G.Gillies

4157. IRIN AND HYDROXY-ACID FROM BRAIN. N.Ambache: Biochem. Pharmacol., 1963, 12, 421-428 (M.R.C., Royal Coll. Surg., London, England) Intracocular injn. of irin mimicked the prolonged atropine-resistant meiosis elicited by antidromic mechanical stimn. of the trigeminal nerve in rabbits. Procedures for extraction, assay and purification of irin were described and evidence presented that it is a lipid-sol. unsat. hydroxy-acid. A similar substance was present in aq. extracts of blood-free rabbit brain tissue. Both acids were purified by chromatography on silica. Studies of hydroxy-acids suggested that their spasmogenic action on certain muscles depended on free -COOH and -OH groups and was enhanced by unsatn. L.G.Gillies

4158. STUDIES ON ISOLATION OF BRADYKININOGEN. L.M.Greenbaum and T.Hosoda: Biochem. Pharmacol., 1963, 12, 325-330 (Dept. Pharmacol., Coll. Med., State Univ. New York, Downstate Med. Cent., Brooklyn, N.Y., U.S.A.) A purified protein from bovine blood can be obtained in solid form and in high

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yield which, when incubated with trypsin, released Pharmacol, active material, either bradykinin or a similar substance. This substance contracted guinea-pig ileum, caused vasodepression in the cat via vasodilatation and was destroyed by chymotrypsin. The precursor protein was obtained by relatively simple procedures and could be stored without deterioration. The prep, was reproducible. Certain physical prop, of the protein and the kinetics of the reaction with trypsin were studied.

L.G.Gillies

4159. ACTION OF STROPHANTHIN ON RENAL FUNCTION. F.Solti, L.Marton, J.Rev and R-Hermann: Acta med. Acad. Sci. hung., 1962, 19, 31-41 (Med.

Klinik, Med. Univ., Budapest, Hungary) The action of Strophanthin-K on a variety of indices of renal activity was studied in patients with chronic cardiovascular diseases and in dogs. The results suggest that the drug effects are mediated chiefly by sympathetic centres in the c.n.s. (German) G.F.Blane

4160. EVIDENCE FOR THE RENAL TUBULAR ACTION OF HYGROTOM IN THE COCKEREL. Y.Cuypers: Arch. int. Pharmacodyn., 1963, 142, 274-275 (Clin. Dept.. Med. Inst., Brussels, Belgium) Hygrotom, 1-oxo-3-(3'-sulphamyl-4'-chlorophenyl)-3-hydroxy-iso-indoline, was inj. into the renal blood vessels of the cockerel, and increased excretion of water and electrolytes was demonstrated. (French) T.J.Sullivan

4161. PHENACETIN IN RENAL PYRAMIDAL TISSUE IN CASES OF RENAL PAPILLARY NECROSIS. L.Meurman, A.Karkela and M.Oka: Ann. Med. exp. Fenn., 1963, 41, 6-9 (Dept. Path. Med., Central Hosp., Kuopio, Finland) Five autopsied cases of renal papillary necrosis and 5 cases without renal diseases were examined for the presence of phenacetin in the renal pyramids. Ftienacetin could be detected in 3 cases of renal papillary necrosis and in one control. All pos. cases had been phenacetin abusers. G.Faulkner

4162. ULTRASTRUCTURAL CHANGES PRODUCED IN THE RAT KIDNEY BY A MERCURIAL DIURETIC [MERALLURIDE]. A.Sanabria: Brit. J. Pharmacol., 1963, 20, 352-361 (Lab. Ultrastructure, Inst. Investig. Cientif., Caracas, Venezuela) Meralluride causes const, structural changes in the proximal tubules, but not the distal tubules. Vacuolation, intracytoplasmic oedema, and mitochondrial swelling occurs. Glomerular changes are variable, but the mitochondrial matrix and the vesicles of the endoplasmic reticulum are affected. A.E.Brooks

4163. RELATION BETWEEN ENZYME INHIBITION AND PHYSIOLOGICAL RESPONSE IN THE CARBONIC ANHYDRASE SYSTEM. T.H.Maren: J. Pharmacol. exp. Ther., 1963, 139, 140-153 (Coll. Med., Univ., Gainesville, Fla., U.S.A.) Five inhibitors of varying types were studied with respect to their concn. in the kidney. The dose-response curve of very potent inhibitors was influenced by the concn. of enzyme in the tissue. It is concluded that carbonic anhydrase is the dominant receptor in tissues for monosulphonamides of the type aryl-SO₂NH₂. J.M.Whitmarsh

4164. EVALUATION OF FIVE HOURS AND TWENTY-FOUR HOURS DURATION OF URINE COLLECTION FOR ASSESSING DIURETIC ACTIVITY IN RATS. K.N.Modi, M.N.Vartak and U.K.Sheth: Arch. int. Pharmacodyn., 1963, 142, 539-549 (Pharmacol. Dept., Seth G.S.Med. Coll., Bombay, India) Freq.

distribution of urination was studied over 5 and 24 hr. in control rats and rats treated with hydrochlorothiazide. Over 5 hr. the urine flow of control rats did not follow a normal distribution, but it did so with treated rats. 24 hr. periods give more reliable results. T.J.Sullivan

4165. SODIUM DEPLETING EFFECT OF SULPHIN-PYRAZONE. J.P.De Koster, F.Vanderveken, P.Vereerstraeten and P.P.Lambert: Arch. int. Pharmacodyn., 1963, 142, 473-492 (Lab. Expt. Med., Free Univ., Brussels, Belgium)

In the dog, sulphinpyrazone caused an increased urinary excretion of Na and Cl and also, to a lesser extent, of K. This was independent of variations in glomerular filtration, nor was the drug an aldosterone antagonist. It appeared to affect an active process of indeterminate nature in the proximal tubule. (French) T.J. Sullivan

4166. CARRAGEENIN-INDUCED OEDEMA IN HIND PAW OF THE RAT AS AN ASSAY FOR ANTI-INFLAMMATORY DRUGS. C.A.Winter, E.A.Risley and G.W.Nuss: Proc. Soc. exp. Biol., N.Y., 1962, 111, 544-547 (Merck Inst. Therap. Res., West Point, Pa., U.S.A.) Measurement of the effect of a single oral dose of anti-inflammatory drugs was made by observing the inhib. of carrageenin-induced oedema in the hind paw of rats. M.M.Shapland

4167. INHIBITION OF INFLAMMATORY AND OEDEMATOUS PHENOMENA BY e-AMINOCAPROIC ACID. A.Bertelli, M.Proto and M.Rossano: Atti. Acad. med* Lombarda, 1962, 17, 204-208 (Ist. Farmacol., Univ. Milano, Italy) 6-Aminocaproic acid (300 mg./kg' body wt.) and 6-acetoamidocaproic acid (300 mg./kg' gave great protection to rats against expt. induced albumin oedema, some protection against kaolin oedem* and still less protection against agar granuloma. Amino* phenazone also showed some anti-phlogistic activity. C-Aminocaproic and 6-acetoamidocaproic acids also showed a marked inhib. of local oedema caused by histamine itself. (Italian) G.N.Godson

4168. MECHANISM AND PHARMACOLOGY OF ENDO-TOXIN SHOCK IN SHEEP. D.F.J.Halmagyi, B.Starzecki and G.J.Homer: J. appl. Physiol., 1963, 18, 544-552 (Med. Dept., Univ., Sydney, Australia) Administration of colic-lipopolsaccharide and staphylococcus toxin to sheep resulted in increased pulmonary arterial and pulmonary arterial wedge pressure, and a fall in cardiac output and systemic pressure. Lung compliance fell due to terminal airway closure. Isoproterenol reduced these effects. Endotoxin resistant sheep were also not responsive to pulmonary embolism and incompatible blood transfusion. H.C.Jones

4169. ACCELERATED DEVELOPMENT OF SALIVARY GLANDS OF EARLY POSTNATAL RATS FOLLOWING ISOPROTERENOL. C.A.Schneyer and J.M.Shackleford* Proc. Soc. exp. Biol., N.Y., 1963, 112, 320-324 (Dept. Physiol., Univ. Alabama Sch. Dent., Birmingham, U.S.A.) dosage of 1*5 mg. to neonatal rats over long periods or time resulted in vast increases in the sizes of the submaxillary and parotid salivary glands but not of the sublinguals whilst the total body wt. and size showed a far slower grow* rate than controls. The heart size was slightly increased as compared with controls. In the salivary glands differentiation was enhanced as well as increase in cell size. * D.N.Wheatley

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4170. TERATOGENIC ACTION OF N-PHTHALYLGUT-AMINIC ACID 1MIDE. A LABORATORY TEST
METHOD. R.Riemschneider, K.Brockmeyer and H.Sommer. Z. Naturforsch. B, 1963, 18, 166-167 (Inst. Biochem., Freien Univ. Berlin-Dahlem, Germany) Note. (German) J.C.Crawhall

4171. INCIDENCE OF MALFORMATIONS SINCE INTRODUCTION OF THALIDOMIDE. LM.Leck and E.L.M. Millan. Brit. med. J., 1962, ii, 16-20 (Dept. Soc. Med., Univ., Birmingham, England) Incidence of malformations in Birmingham children born in 1957-61 was examined for secular changes. Bilat. reduction deformities of limbs have become more common since introd. of thalidomide in 1958, but unilat. deforms have not increased. Ten children born in 1960 had bilat. defects which have been described in SW. Association with thalidomide and 5 of these survived. Ear defects may have occurred in approx. 800 children in the U.K. to children without reduction deformities of limbs the incidence of other deformities did not seem to have risen, except in the case of thiamine. There are similarities between the effects of thiamine and those of vit. B deficiency. M.E.Nutt

4172. INCIDENCE OF LIMB AND EAR DEFECTS SINCE THE WITHDRAWAL OF THALIDOMIDE. R.W.Smithells and L.Leck: Lancet, 1963, i, 1095-1097 (Dept. Child Health, Univ., Liverpool, England) 71 children with limb and ear defects of the type often caused by thalidomide were born to residents of Birmingham, birth year and B.M.C. 1960-62. The freq. of affected limbs rose to a peak in late 1961, nine months after the greatest thalidomide output was highest. Incidence in 1962, and was lower nine or more months after the withdrawal of thalidomide than in any previous year since 1960. The thalidomide sales and incidence of affected births were much higher in Liverpool and Bootle than in Birmingham. The findings suggest that thalidomide was largely, if not entirely, responsible for the recent epidemic of reduction deformities of the limbs and ears. G.H.Bell

4173. THALIDOMIDE INDUCED MALFORMATIONS IN PREGNANCY AND EXPERIMENTAL RESEARCH. A.Pisati and R.Nodari: Atti. Acad. med. Lombarda, febbraio 1962, 172, 178 (1st. FarmacoL, Univ., Milano, Italy) Statistical and clinical data are given for 172 babies born in a Milan hospital with abnormalities due to treatment of the mother with thalidomide. When rats and rabbits were treated with 50 mg./kg. body wt. of thalidomide per day orally, abnormalities developed in the foetuses of the rabbits, but not of the rats.

4174. EFFECTS ON EARLY EMBRYO OF AGENTS APPLIED TO THE MOTHER. C.Lutwak-Mann (Italian) G-R Godson and X. Sato: Brit. med. J.: 1962, 1, 944-946 (Agric. Eng. Coun. Unit of Reprod. Physiol., Univ., Cambridge, England) The action of maternally transmitted agents on the early embryo of the rabbit was studied by histol. examination of flat-mounts of rabbit blastocysts obtained from treated and normal untreated pregnant rabbits. Changes produced by 6-mercaptopurine, E39 sol. alidomide and phthaloyl-DL-isostearate in doses which did not affect maternal health, were studied. Use of the method as a screening test for cussed. M.E.Nutt

4175. COMPARATIVE EFFECTS OF A PURIFIED AND STOCK DIET ON DBH [2,5-DI-TERT-BUTYLHYDRO-

QUINONE] TOXICITY IN THE RAT. B.H.Ershoff: Proc. Soc. exp. Biol., N.Y., 1963, 112, 362-365 (Inst. Biol. Res., Culver City, Calif., U.S.A.)

Immature rats were fed DBH as well as either a basal stock diet (commercial chow) or a well defined basal purified diet. The DBH caused retardation of growth and alopecia in the groups fed purified diet but some unknown constituents of the stock diet abrogated the detrimental effect of DBH. No difference was found in the effect of DBH between the sexes. D.N. Wheatley

4176. ANTIFERTILITY ACTIVITIES OF TWO DIPHENYL-DIHYDRONAPHTHALENE DERIVATIVES. G.W.Duncan, S.C.Lyster, J.J.Clark and D.Lednicer: Proc. Soc. exp. Biol., N.Y., 1963, 112, 439-442 (Res. Labs., Upjohn Co., Kalamazoo, Mich., U.S.A.) Antifertility activity by oral administration of U-10520 A (2-[E-(3,4-dihydro-6-methoxy-2-phenyl-1-naphthyl)phenoxy]-triethylamine hydrochloride) and also the phenoxy-ethyl pyrrolidone deriv. (U-11100A) has been demonstrated in rats, guinea-pigs and rabbits but not hamsters. They also inhibited the uterine stimulating effect of oestradiol. To date these are the most potent antifertility agents. D.N.Wheatley

4177. ACTION OF SODIUM SALICYLATE AND ASPIRIN ON SOME KALLKREIN SYSTEMS. P.Hebborn and B.Shaw: Brit. J. Pharmacol., 1963, 20, 254-263 (Res. Dept., Boots Pure Drug Co., Notts., England)

Na salicylate and aspirin are tested on pancreatic, salivary and serum kallikreins and kinin production assessed on a guinea-pig isolated ileum prep. Esterolytic action is measured by acid release from toluene-p-sulphonyl-L-arginine methyl ester. 50mM Na salicylate gives 50% salivary kallikrein inhib. and 5mM of either substance has no effect on esterolytic activity. Prior incubation with the drug has no effect. Concluded that Na salicylate and aspirin are poor inhibitors of kallikrein activity in vitro. A.E.Brooks

4178. TOPICAL ACTION OF SALICYLATES IN GASTRO-INTESTINAL EROSION AND HAEMORRHAGE.

J.L.A.Roth, A.Valdes-Dapena, P.Pieses and E.Buchman: Gastroenterology, 1963, 44, 146-158 (Div. of Gastroenterology, Grad. Hosp., Univ. of Pennsylvania, Philadelphia, Pa., U.S.A.) It has been shown that topical application of acetyl salicylates between the gum and lip for 30 min. in man causes desquamation of the buccal mucosa. Phenacetin and acetaminophen did not. In cats given topical application of acetyl salicylate in the stomach for 2 to 3 hr. under anaesthesia, these subjects suffered from bleeding and mucosal damage at die site of application. Again the two other drugs had no effect. It is suggested that these effects of salicylates should be kept in mind especially when prescribing such drugs for patients already suffering from lesions of the gastrointestinal tract. D.N.Wheatley

4179. BANANA AND EXPERIMENTAL PEPTIC ULCER.

A.K.Sanyal, K.K.Gupta and H.K.Chowdhury: J. Pharm. Lond., 1963, 15, 283-284 (S.N. Med. Coll., Agra, India) A letter. Banana helps distinctly in die prevention and care of the phenylbutazone-induced ulcers. J.M.Whitmarsh

4180. ROLE OF BIOGENIC AMINES IN THE DEVELOPMENT OF SOME EXPERIMENTAL GASTRIC ULCERS. J.Necina and I.Krejci: Arch. int. Pharmacodyn., 1963, 142, 316-322 (Res. Inst. Natural Drugs, Prague, Czechoslovakia) Reserpine-induced gastric ulcers are studied in rats.. Treatment with iproniazid and

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tranylcypromine does not influence the incidence of ulceration. The occurrence is inhib. by pyrogallol 40 mg./kg. which inhibits catechol Omethyltransferase and by D₁, L-dopa 500 mg./kg. The results suggest that decreased catecholamine concn. are concerned in the production of these ulcers.

S. E. Smith

4181. COMPARATIVE ANTHELMINTIC EFFICACY OF THIABENDAZOLE AND MIXTURES OF PHENOTHIAZINE AND PHENZIDOLE. J.R.Egerton, W.H.Ott and A.C.Cucklen *Nature, Lond.*, 1963, 198, 309-310 (Merck Inst. Therap. Res., Rahway, N.J., U.S.A.)

The relative anthelmintic potencies of phenothiazine, phenzidole and thiabendazole against 6 spp. of gastrointestinal worms in sheep were assessed after 1 week of treatment. Combination of phenothiazine and phenzidole did not have any synergistic action.

G.M.Lewis

4182. EFFECT OF ETHYL *trans*-AMINOBENZOATE [MS 222] ON THE ELASMOBRANCH. E.C.G. G.D.Campbell and D.H.Davies: *Nature, Lond.*, 1963, 198, 302 (Oceanographic Res. Inst., Durban, South Africa) MS 222 caused a bradycardia in 3 spp. of elasmobranch fishes.

G.M.Lewis

4183. RELEASE OF HISTAMINE ON STIMULATION OF NERVES TO FROG'S STOMACH MUSCLE AND ITS SIGNIFICANCE. I.Singh: *Arch. int. Pharmacodyn.*, 1963, 142, 522-532 (Physiol. Dept., Med. Coll., Agra, India)

The frog's stomach muscle was found to release histamine spontaneously. This was increased on nervous or electrical stimn. of the stomach. Mepyrain decreased the mechanical response of the muscle to stimn. whereas histamine enhanced it.

T.J.Sullivan
4184. OBSERVATION OF EFFECT OF ISONIAZID ON DEVELOPMENT OF ANEURINE DEFICIENCY. B.Bhagat: *Arch. int. Pharmacodyn.*, 1963, 142, 440-443 (Dept. Physiol. Pharmacol., Chelsea Coll. Sci. and Technol., London, England)

In doses up to 100 mg./kg. isoniazid failed to influence the rate of growth of aneurine deficient rats.

T.J.Sullivan

4185. EFFECT OF BIS-(2,2,2-TRIFLUOROETHYL)ETHER ON BRAIN ELECTROLYTES AND WATER DISTRIBUTION IN RAT. A.S.Clangand J.C.Krantz, jun.: *Biochem. Pharmacol.*, 1963, 12, 394-395 (Dept. Pharmacol., Sch. Med., Univ. Maryland, Baltimore, Md., U.S.A.) Short comm.

L.G.Gillies

4186. PRODUCTION OF A CONDITION RESEMBLING MYASTHENIA GRAVIS OR FAMILIAL PERIODIC PARALYSIS IN RAT. P.Stern, B.Nikodijević and M.Kundurović: *Int. J. Neuropharmac.*, 1962, 1, 431-434 (Inst. Pharmacol., Fac. Med., Sarajevo, Yugoslavia)

Small doses of strophanthin followed by insulin caused muscular weakness in the rat which resembled myasthenia gravis or familial periodic paralysis in its characteristics and response to drugs. It is suggested that such an animal might serve as a model for the evaluation of drugs.

G.F.Blane

4187. RELATION BETWEEN CHEMICAL STRUCTURE AND BIOLOGICAL ACTIVITY: DISCUSSION OF POSSIBILITIES, PITFALLS AND LIMITATIONS. J.M.van Rossum: *J. Pharm.*, Lond., 1963, 15, 285-316 (Catholic Univ., Nijmegen, Netherlands) A review. 70 ref.

J.M.Whitmarsh

4188. POTENTIOMETRIC MEASUREMENTS IN SOLUTIONS OF NON-IONIC SURFACTANTS. M.Donbrow and C.T.Rhodes: *J. Pharm.*, Lond., 1963, 15, 233-238

(Chelsea Coll. of Sci. and Technol., London, England) In deionised cetomacrogol soln. the surfactant did not affect the pH values of NaOH or HC1 soln. In buffer soln. containing cetomacrogol the pH was changed to an extent depending on the buffer acid. Possible mechanisms are discussed.

J.M. Whitmarsh

4189. USE OF THIN-LAYER CHROMATOGRAPHY FOR THE ANALYSIS OF DRUGS. ISOLATION AND IDENTIFICATION OF BARBITURATES AND NON-BARBITURATE HYPNOTICS FROM URINE, BLOOD AND TISSUE. J.Cochin and J.W.Daly: *J. Pharmacol. exp. Ther.*, 1963, 139, 154-159 (Nat. Inst. Arthritis, Bethesda, Md., U.S.A.)

The drugs are extracted and applied to the TLC without purification. Rf values in 3 systems are given. Two metabolites of secobarbital were identified in human urine, 5-allyl-5-(1-hydroxy-1-methyl"butyl)barbituric acid and 5-(methylbutyl)barbituric acid

J.M.Whitmarsh

4190. USE OF THIN-LAYER CHROMATOGRAPHY FOR THE ANALYSIS OF DRUGS. IDENTIFICATION AND ISOLATION OF PHENOTHIAZINE TRANQUILLISERS AND OF ANTIHISTAMINICS IN BODY FLUIDS AND TISSUES. J.Cochin and J.W.Daly: *J. Pharmacol. exp. Ther.*, 1963, 139, 160-165 (Nat. Inst. Arthritis, Bethesda, Md., U.S.A.) The extracted drugs are applied without further purification, Rf values are given for 18 phenothiazines and related compounds, 8 sulph" oxides and 18 antihistaminics and chlordiazepoxide.

J.M.Whitmarsh

4191. QUANTITATIVE CONVERSION OF BARBALOIN T⁴ ALOE-EMODIN AND ITS APPLICATION TO THE EVALUATION OF ALOES. J.W.Fairbairn and S.Simi*: *J. Pharm.*, Lond., 1963, 15, 325-328 (Sch. Pharm., Brunswick Sq., London, England) Barbaloin is quant. converted to aloe-emodin by heating to 100° under reflux in 4N HC1 with 4% FeCl₃ for 4 hr. The aloe-emodin is extracted with CCl₄ and the extinction at 500 mp is&^a in aq. soln.

J.M.Whitmarsh

4192. NOTE ON THE SYNTHESIS OF ESTERS OF N-METHYLPYRROLIDINYLAALKANOLS. F.Perks and P.J. Russell: *J. Pharm.*, Lond., 1963, 15, 341-353 (Co.^o, Technol., Portsmouth, Hants., England) The V&R of a series of esters of 1-methyl-2,5-di(2^{fc}hydroxy-2', phenylethyl)pyrrolidine is described. They are assign[^] trans configurations on the basis of their pK_a values.

J.M.Whitmarsh

4193. NOTE ON THE STABILITY OF THE TRIFLUORO-\$, METHYL GROUP OF BENDROFLUMETHIAZIDE IN Δ^{\pm} G.Hasselmann and K.Roholt: *J. Pharm.*, Lond., 1963, 15, 339-340 (Leo Riarm. Products, Copenhagen, Denmark) No release of F was detected when the title substance was administered for 85 days to carious in comparison with NaF.

J.M. Whitman

4194. MOUSE STRAIN DIFFERENCE IN RESPONSE T° ANTI-HISTAMINE DRUGS. A.M.Brown: *J. VbBt^A*, Lond., 1963, 15, 344-345 (M.R.C. Lab., Vloodtrw⁺, sterne Rd., Carshalton, Surrey, England) A ^{lett}_{i,u} Differences are of genetic origin.

J.M. Whitman

4195. CONVERSION OF DL-LACTATE-2-14C OR -3-14C OR PYRUVATE-2-14C TO BLOOD GLUCOSE IN HUMANS; EFFECTS OF DIABETES, INSULIN, TOLBUTAMIDE AND GLUCOSE LOAD. R.CDe Merte^{er} and V.W.Shreeve: *J. clin. Invest.*, 1963, 42, 52&¹, 53², 54³, 55⁴ (Med. Res. Center, Brookhaven Nat. Lab., U.P.**¹, Belg^{2,3,4}) U.S.A.; Serv. Med., Hôp. Civil de Renaix, Belg

A/ter i.v. inj. of DL-lactate-2-14C or -3-14C, non-diabetic subjects showed 10-15% of the inj. 14c in calc. extracellular glucose and severe diabetics, up to 30%. Jj^ulin, tolbutamide and glucose inj. to diabetics before toe administration of labelled compound, reduced the ^PPearance of 14c in extracellular glucose. The possible Mechanisms for their action are discussed. K.Jones

4198. CATATONIC ACTION OF METHYL ETHERS OF MONO- AND POLYPHENOLAMINES. R.Michaux and W.G.Verly: Life Sci., 1963, No. 3, 175-183 (Lab. Isotope, Dept. Biochem., Univ. de Liege, Belgium) Among the compounds tested, 4-methoxy-phenylethyl-mime (tyramine methyl ether) was most active in catatonic action. Any further substitution on the ring or the side chain was associated with a cumulative loss of activity. (French) K.Jones

4197. FILM PENETRATION AND ADSORPTION. EFFECT OF VERATRINE AND PROCAINE ON DESORPTION KINETICS OF MONOLAYERS OF MONO-OCTADECYL PHOSPHATE. N.L.Gershfeld: J. phys. Chem., 1962, 66, 1923-1927 (Nat. Inst. Arthritis and Metabolic Dis., N.I.H., Bethesda, Md., U.S.A.) Monolayers of nonooctadecyl phosphate slowly desorb and this desorption rate decreases as the surface pressure is raised, w/ increased van der Waals interactions between the hydrocarbon chains of the monolayer. Veratrine speeds the loss of film material by penetrating the hydrocarbon region; But procaine, while at low concn. it increases desorption rate by penetrating the ionic layer, at higher concn. it decreases the desorption. This is parallel to the pharmacol. activity and possible mechanisms of action are presented. G.C.Barr

4198. AN IMPROVED MICROMETER DEVICE FOR STEROTAXIC MANIPULATIONS. B.Blum and D.Feldman: Int. J. Neuropharm., 1962, 1, 445-446 (Dept. E&T, Weizmann Inst. Sci., Rehovoth, Israel) A short note with diagram. G.F.Blane

4199. NOTE ON THE PREPARATION OF RICINOLEIC ACID BY UREA COMPLEXING. D.Chakravarty and A.Bose: J. Pharm., Lond., 1963, 15, 337-338 (Smith, Kline & French Co. Ltd., Calcutta, India) Some SL acids were separated from hydrolysed castor oil in a 1:10 soln. by successive additions of urea. Ricinoleic acid of B.P. 1948 standard was thus prep. j.M.Whitmarsh

4200. DIOSCOREA BELIZENSIS LUNDELL AS A SOURCE OF DIOSGENIN. G.Blunden and R.Hardman: J. Phann., 1963, 15, 273-280 (Dept. Kiarm., The Univ., Wild Pts., England) Saponins were sought in 29 spp. of *Dioscorea* from British Honduras. The tubers of *D. hispida* yielded steroids amounting to w/oot of various methods of handling. Much of the product is produced by an endogenous enzyme system integration of the tissue. J.M.Whitmarsh

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4201. PREPARATION, PURIFICATION AND IDENTIFICATION OF SOME COMMON BARBITURATES IN

TOXICOLOGICAL ANALYSIS. R.C.Gupta and J.Kofoed: Nature, Lond., 1963, 198, 384 (Attorney-General's Lab., Toxicol. Sect., Toronto, Canada)

A combination of paper chromatography and sublimation was successfully applied to obtain barbiturates from blood and other tissue materials in a pure state for characterisation by crystal tests. G.M.Lewis

4202. GROUP EFFECT IN THE FISH, GAMBUSIA HOLBROOKI. H. ACTION OF DEXAMPHETAMINE, DL-AMPHETAMINE AND METHAMPHETAMINE. J.Delphaim C.R. Soc. Biol., Paris, 1962, 156, 1892-1894 (Fac. Méd. et de Pharm., Marseille, France)

The toxicity of dexamphetamine and DL-amphetamine on *G. holbrooki* was less pronounced in fish kept in groups than those kept singly. The group effect was greatest in groups of 10 fish. The group effect of methamphetamine was less pronounced than that of the other compounds. (French) M.A.Price

4203. GROUP EFFECT IN THE FISH, GAMBUSIA HOLBROOKI. I. ACTION OF CHLORPROMAZINE, POTASSIUM ARSENATE AND POTASSIUM CYANIDE. J.Delphau C.R. Soc. Biol., Paris, 1962, 156, 1881-1884 (Fac. Med., Marseille, France) The % mortality of *G. holbrooki* maintained for 24 hr. in 1-6.5 mg. chlorpromazine/l., was greater in fish kept singly than in those in groups. There was no difference in the results obtained with potassium arsenite or KCN between single fish and those in groups. (French) M.A.Price

4204. FIXATION OF TETANUS TOXIN BY GANGLIOSIDE. W.E.van Heyninger: Biochem. Pharmacol., 1963, 12, 437 (Dunn Sch. Path., Univ. Oxford, England) Review. 10 ref. L.G.Gillies

4205. EFFECT OF 4,4'-DIAMINODIPHENYLMETHANE AGAINST FASCIOLA HEPATICA IN THE RABBIT AND IN CATTLE. V.N.Williams: Nature, Lond., 1963, 198, 203-204 (Vet. Res. Divn., May and Baker Ltd., Fyfield Rd., Ongar, Essex, England) 4,4'-Diaminodiphenylmethane inj. i.p. into rabbits at dose 0.2 g./kg. was active against immature as well as mature *F. hepatica*; it was inactive when administered orally. Although the compound was also effective in cattle, toxic symptoms were manifest, a dose of 0.2 g./kg* proving fatal. G.M.Lewis

4206. ALLEVIATION OF 1-AMINOCYCLOPENTANE-L-CARBOXYLIC ACID TOXICITY BY VALINE. L.J.Machlin, R.S.Gordon and F.Puchal: Nature, Lond., 1963, 198, 87-88 (Lab. Biochem. and Nutr., Monsanto Chem. Co., St. Louis, Mo., U.S.A.)

The toxicity of 1-aminocyclopentane-l-carboxylic acid to chicks was reduced by increasing the protein content of the diet. Of the amino acids, only valine was effective in preventing growth inhibn. by this compound, which is presumed to be a valine antagonist. Loucine, also a valine antagonist, induced more severe growth retardation than the drug alone. G.M.Lewis

4207. ACTION OF FUMIGANTS ON INSECTS. IV. EFFECTS OF OXYGEN ON TOXICITY OF FUMIGANTS TO INSECTS. E.J.Bond: Canad. J. Biochem., 1963, 41, 993-1004 (Res. Inst., Canada Dept. Agric, Univ. Post Office, London, Ont., Canada) Two spp. of insects, *Sitophilus granarius* (L.) adults and *Tenebrio molitor* (L.) larvae were exposed to a series of fumigant concn. then divided into groups and placed in N₂ or air for 48 hr. They were then placed in air for

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5 days after which mortality counts were made. The fumigants used were HCN, acrylonitrile, methyl bromide, ethylene dibromide, ethylene oxide, hydrogen phosphide and chloropicrin. O₂ at and below 1 atm. enhanced the toxicity of all fumigants to both spp., although it had no obvious effects on untreated insects. J.B. Parish

4208. MODIFICATION OF THE TOXICITY OF HISTAMINE DURING POST-NATAL DEVELOPMENT IN MICE. D.N.Halpern, T.Neveu and A.Banellec: CR. Soc. Biol., Paris, 1962, 156, 1536-1538 (Lab. Méd. expt.. Coll. France, Paris, France)

The toxicity of histamine was studied in mice during three weeks of post-natal life and compared with that of adults. The toxicity decreased progressively with development of the animal. The dose of histamine dihydrochloride producing 50% mortality was 5*75 mg. at 3 days, 1*625 mg. after 18 days and 1*5 mg. in adults.

(French) M.A.Price

4209. CENTRAL NERVOUS INJURY BY A CHEMICAL HERBICIDE. I.Desi and J.Sos: Acta med. Acad. Sci. hung., 1962, 18, 429-433 (Inst. Pathophysiol., Univ. Med.

Sch., Budapest, Hungary) The weed-killer 2,4-di-chlorophenoxyacetic acid given parenterally as a single dose of 200 mg./kg. caused reversible inhibn. of the e.e.g. pattern in anaesthetised laboratory animals. In chronic expt. neurol. impairment was shown in the shortened desynchronisation time and deterioration in cond. refl. response.

G.F.Blane

4210. IMMUNOLOGICAL (OUCHTERLONY METHOD) IDENTIFICATION OF INTRASUBSPECIES QUALITATIVE DIFFERENCES IN SNAKE VENOM COMPOSITION. S.Schenberg: Toxicon, 1963, 1, 67-75 (Lab.

Physiol. Inst. Butantan, São Paulo, C.P.65, Brazil) The venoms of 298 snakes of 6 *Bothrops neuweidi* subsp. were studied using the Ouchterlony method by comparison with three venom pools and two sera. Five basic immunol. variants with 20 different well-defined venoms were found and results show that no close relationship between morphology and venom composition exists in this sp. The geographical distribution of some of the snakes with these variations supports the existence of the variations and seems to indicate that the variants are genetically determined. Staining and photographic improvements for immuno-pptn. are described.

K.Brew

4211. STUDIES OF THE VENOMS OF SOME CONIDAE.

R-Endean and C.Rudkin: Toxicon, 1963, 1, 49-64 (Dept. Zool., Univ. Queensland, Brisbane, Australia) The effects of the venoms of 14 spp. of Conidae on a variety of animals are described. The authors suggest that only piscivorous sp. of Conidae present a real threat to man.

K.Brew

4212. HYDROXOCOBALAMINE IN THE TREATMENT OF CYANIDE POISONING. G.Paulet, J.P.Bernard and M.Olivien C.R. Soc. Biol., Paris, 1962, 156, 1867-1869.

The anti-cyanide action of 50 mg. hydroxocobalamin/kg. was studied in chloralose anaesthetised dogs, receiving an i.v. infusion of 0*1 mg./kg./min. NaCN. Hydroxocobalamine prevented death of 3/5 dogs at the stage of secondary apnoea. Hydroxocobalamine was more efficient than nitrates but less efficient than EDTA-CO₂.

(French) M.A.Price

4213. HYPERVENTILATION IN CO POISONING.

G.L.Leatharc Brit. med. J., 1962, ii, 511-512 (Med. Sch., King's Coll., Newcastle-on-Tyne, England)

Arterial blood pH measurements indicated a non-respiratory acidosis in 4 patients hyperventilating during recovery from coal gas poisoning. Acidosis may have contributed to their prolonged coma. Such patients are better treated with pure O₂ than with 5% or Tfo carbogen. MENU*

4214. STUDIES ON THE MECHANISM OF THE POISONOUS EFFECT OF PHALLOIDIN [CYCLIC PEP-¹TIDE ANTIBIOTIC] WITH RADIOACTIVELY LABELLED TOXIC AGENTS. D.Rehbinder, G.LBfler, O.Wieland and T.Wieland: Hoppe-Seylers-Z. physiol. Chem., 1963, 331, 132-142 (Inst. Org. Chem. Univ. Frankfurt/M., Germany) Phalloidin labelled with ³H and ³⁵S was inj. into rats and the highest concn. was found in the liver and the kidneys. From the organs two ^ radioactive substances were separated by paper chromatography. The radioactive toxin was also found in perfused prep. of isolated liver and was not decreased by perfusion with fresh medium.

(German)

LCorni*

4215. E.M. STUDY OF THE LIVER AFTER X-IRRADIATION CARBON TETRACHLORIDE TREATMENT.

G.P.Longostrevi and L.Lombardi: Atti. Acad. Med.Lombarda, 1962 J17, 195-204 (1st. di Farmacol. Univ., Milano, Italy) Three days after injn. of rats, with 0-1 ml. of 30% CCl₄ s.c. (0-15 ml./100 g. body WW the liver mitochondria were observed with the E.M. to D_i* swollen and to contain osmophilic accumulation of lip_m* the endoplasmic reticulum had developed localised dilations and distortions. When the animals were irradiated with 200 r X-rays no pathol. lesion in the liver cells could be detected by E.M. (Italian) G.N.Godson

4216. PROTECTIVE EFFECT OF 0-MERCAPTOETHYL AMINE [MEA] AND MESENTERIC VESSEL CLAMPBJ_j IN INTESTINE IRRADIATED RATS. K.N.Prasad, G.M. Kolimorgen, T.H.Kent and J.W.Osborne: Int. J. rad. Biol., 1963, 6, 257-269 (Rad. Res. Lab., Coll. Me*, Univ. Iowa, Iowa City, Iowa, U.S.A.) I.p. MEA

15 min. before, or clamping of the mesenteric vessel during, X-irradiation of the exposed ileum and jejunum reduced mortality, body wt. loss in survivors and micto damage. Mortality and histol. responses after 1800 r w_x MEA were similar to those after 1400 r with no other ^ treatment. MEA was ineffective at and above 2200 r, clamping was ineffective at and above 3000 r. A combination of the 2 treatments gave 67% survival at 350U* but became ineffective at and above 4500 r.

B.M.Stevei*

4217. CARBON TETRACHLORIDE POISONING. H. SERUM ENZYMES, FREE FATTY ACIDS [FFA] ^ LIVER PATHOLOGY: EFFECTS OF PHENOXYBENZAMINE AND PHENERGAN (R).

C.F.Fox, B.D.Dinner* and W.J.Frajola: Proc. Soc. exp. Biol., N.Y., 111, 731-734 (Dept. Biochem., Univ. Chicago, U.S.A.) Serum FFA were decreased by CCU *** increased by phenoxybenzamine, simulu admintoijf * produced effects which appeared to be additive. benzamine was ineffective in protecting the liver from damage caused by CCl₄ vapour. Phenergan (N-2 -> 1 methylamino-2'-methyl)ethyl phenothiazine) ^ JS rohepatic necrosis and serum activity of glutamic dehydrogenase. Lipophilic staining was increased while se.**.Jntly activity of liver supernatant enzymes was not conw. Shapland MM.

4218. SOME EFFECTS OF ALDRIN, CHLORDANE, DIELDRIN AND HEPTACHLOR ON EUROPEAN FORFICULA AURICULARIA. E.F.Legner and D. ...

J. econ. Entomol., 1963, 56i 29-31 (Utah Agric.Expt. Stn., U.S.A.) <Adults and final instar nymphs were fleeted with baits. Six insects were confined in Petri jshes with a wooden pot marker which had been dipped ^a wettable powder and a piece of moistened cellulotton. The insecticides were used at 3 dosages/100 gal. jests were performed at nil, 204-7, 522-4 hr. after treat- *en. t. Also plastic tubes treated with 1 lb./100 gal. insecticide concn. confined 6 insects for 1,5,10,15,30 or IT!&c¹ One pound dieidrin Save 50% mortality after /* hr. and 2 lb. gave 100% after 207 hr. but heptachlor flower^q the quickest kill. All substances gave 96-99% kill in the field on the 6th day. H.W.Spencer

⁴219. TESTS WITH SYSTEMIC INSECTICIDES FOR CONTROL OF GASTEROPHILUS LARVAE IN HORSES. R.O. Drummond: J. econ. Entomol., 1963, 56, 50-52 (Entom. Res. Div., Agric. Res. Serv., U.S.D.A., Kerrville, Tex., At^st 4') At slaughter *G. nasalis* larvae were found attached to the pylorus and anterior duodenum and *G. intestinalis* larvae mostly attached to the pharyngeal stomach of horses. Using a stomach pump 50 mg./kg. Bayer 37341, a phosphorothioate, and 100 mg./kg. butenamate, a butyl analogue of dipterex, were highly effective in ridding horses of bot-flies. In a single feed 50 mg./kg. butonate or 10-75 mg./kg. DDVP were effective. Most

fly larvae consequently expelled in manure of treated horses died. H.W.Spencer

4220. EXPERIMENTAL GROUNDNUT POISONING IN PIGS. J.D.J.Harding, J.T.Done, G.Lewis and R.Allcroft Res. vet. Sci., 1963, 4, 217-229 (Cent. Vet.Lab., Weybridge, England) Pigs were fed rations containing 17*5-20% toxic groundnut meal, and killed at intervals for histol. examination of the organs. The main lesions were in the liver, in which changes progressed through steatosis, ductule proliferation and pericellular fibrosis to nodular hyperplasia. There was an increased fat concn. in the liver, and a decrease in hepatic vit. A. There were sometimes elevated serum levels of GOT and alkaline phosphatase. The thyroid/body wt. ratios were low in the expt. pigs. J.B.Derbyshire

4221. TOLERANCE AND TOLERANCE STUDIES ON AET. C.Hanna and N.V.Collough: Arch. int. Pharmacodyn., 1963, 142, 510-515 (Childrens' Cancer Res. Fdn., Boston, Mass., U.S.A.) The LD₅₀ dose of 6, 2-aminoethyl-isothiouronium bromide hydrobromide [AET] by i.p. injn. was raised by 25% by repeated injn. over 14 days in rats, and over 12-20 days in dogs. Tolerance did not develop in rabbits over 7 days. By increasing tolerance, a radio-protective dose could be given to the rat, but not to the dog or rabbit. T.J. Sullivan

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GENERAL AND METHODS

- 4222. POLAR PHYSIOLOGY. ITS DEVELOPMENT IN BRITAIN.** H.E.Lewis and J.P.Masterton: Lancet, 1963, i, 1009-1014 (Div. Human Physiol., Nat. List. Med. Res., London, England) Review. GJH.Bell
- 4223. PHYSIOLOGICAL AND MEDICAL ASPECTS OF THE HIMALAYAN SCIENTIFIC AND MOUNTAINEERING EXPEDITION, 1960-61.** L.G.C.E.Pugh: Brit. med. J., 1962, ii, 621-627 (M.R.C. Lab., Holly Hill, Hampstead, London, England) Physiol. investigations were made, in a prefabricated laboratory, (during 5 months), at 19000 ft. (380 mm.Hg) during the attempted ascent of Mt. Makalu (27790 ft.). Eight months were spent at heights above 15000 ft. Data are reported on B.M.R., muscular exercise, respiratory regulation, blood vol., Hb and r.b.c., e.c.g. changes, nutrition and endocrine and renal function. Lung diffusion, cardiac output and arterial O₂ satn. were measured during exercise at 19000 ft. and O₂ intake, ventilation and heart rate at heights up to 24400 ft. (300 mmHg). At 24400 ft. max. O₂ intake was 1-4 l./min., ventilation B.T.P.S. 119 l./min. and heart rate 135 min. Haldane end-expiratory alveolar samples at rest had mean pO₂ 33 mm.Hg and mean pCO₂ 14 mm. Hg. Arterial O₂ satn. < 50% was observed during 2-3 min. max. exercise at 19000 ft., the mean resting value being 67%. Acclimatisation to 19000 ft. was good and there was no objective evidence of mental impairment but wt. loss was progressive and indefinite tolerance of stay doubtful. Newcomers with 4-6 weeks acclimatisation were marginally fitter and more active than those who had wintered at 19000 ft. There were cases of cerebral thrombosis, pulmonary infarction, acute pulmonary oedema and frostbite. The ascent was made without O₂, but this was available for medical purposes. M.E.Nutt
- 4224. INCREASE OF YIELD OF SERUM FROM SAMPLES OF BLOOD.** A.A.Hirata: Nature, Lond., 1963, 198, 96-97 (Nat. Inst. Hlth., Nat. Cancer Inst., Bethesda, Md., U.S.A.) A method for obtaining high yields of serum within 1 hr. of bleeding and with min. haemolysis involves centrifugation at 2400 g after treatment with thromboplastin. The procedure is applicable to rabbit, guinea-pig, hamster and chicken blood. G.U.Lewis
- 4225. QUANTITATION OF HAEMAGGLUTINATION BY ENUMERATION OF FREE CELLS BY AN ELECTRONIC COUNTER.** M.B.Gibbs and E.L.Becker: Nature, Lond., 1963, 198, 90 (Dept. Immunochem., W. Reed Army Med. Center, Washington, D.C., U.S.A.) Prelim. comm., G.M.Lewis
- 4226. ELECTRONIC MICROMETER.** E.A.Lentini and W.V. Guyette: J. appl. Physiol., 1963, 18, 636-638 (Physiol. Dept., Univ. Oregon Med. Sch., Portland, Ore., U.S.A.) An electronic micrometer has been described to measure myocardial shortening without affecting movement of the tissue, during simult. O₂ consumption measurements. The apparatus consists of an oscillator, amplifier and a demodulator. H.C.Jones
- 4227. SIMPLE PHOTOELECTRIC METHOD FOR MEASURING SYSTOLIC BLOOD-PRESSURE IN THE NEWBORN.** T.E.Oppé and F.Gellen: Lancet, 1962, ii, 1255-1256 (St. Mary's Hosp. Med. Sch., London, England). GJH.Bell

- 4228. APPARATUS FOR THE AUTOMATIC RECORDING OF SYSTOLIC AND DIASTOLIC BLOOD-PRESSURE.** D.H.Follett, H.F.Freundlich, D.B.Shaw and D.H.Davies: Lancet, 1963, i, 808-809 (Gen. Hosp. Branch, Bristol Roy. Hosp., Bristol, England) Korotkov sounds are recorded simult. with cuff pressure. G.H.Bell
- 4229. SIMPLE METHOD OF INTRA-ARTERIAL PRESSURE MEASUREMENT.** E.F. de Bona: Lancet, 1963, i, 1142-1143 (Dept. Med., St. Thomas's Hosp. Med. Sch. London, England) An arterial needle may be connected to 20 cm. of polythene tubing or 10 cm. capillary glass tubing. The air in the tubing is compressed and the length of the column of blood gives the b.p. GHBeU
- 4230. HYDRAULIC IMPEDANCE OF RIGID CANNULAS.** J.E.Randall: J. appl. Physiol., 1963, 18, 648-649 (Physiol. and Pharmacol. Dept., Missouri Univ. Med. Center, Columbia, Mo., U.S.A.) Inertia for pulsating flow in polyethylene tubing has been demonstrated to be an important factor at higher freq. and the hydraulic impedance of the tubing has been calc. from the Navier Stokes Equation. H.C.Jones
- 4231. METHOD FOR IN VIVO CANNULATION OF BOTH ADRENAL GLANDS OF HAMSTER.** K.M.Knigge: An** Rec., 1961, 141, 145-149 (Dept. Anat., Sch. Med., Univ. Cincinnati, Ohio, U.S.A.) An in vivo cannulation method is described which permits perfusion and collection of effluent blood from both adrenal glands of hamster. The method consists of cannulating and ^Ugartering abdominal vessels in such a manner that perfusate is delivered to the adrenals via the abdominal aorta and adren? effluent blood collected from the inferior vena cava. F.Beck
- 4232. TECHNIQUE FOR TEMPORARY OR CHRONIC VASCULAR OCCLUSION OR NARROWING IN INTACT ANIMALS.** R.W.Eckstein and T.E.Driscoll: Proc. Soc. e*P-Biol., N.Y., 1963, 112, 318-319 (Dept. Med., Western Res. Univ. Med. Sch., Cleveland, Ohio, U.S.A.) A new technique is described using polythene tubing for temporary or permanent occlusion or constriction of art^ies. It involves the passing of surgical thread out & ^ A snare through the chest wall so that it can be operated w* to occlude or block an artery such as the aorta without recourse to surgery every time the vessel is to be occluded. D.N.Wheatley
- 4233. ECHOENCEPHALOGRAPHY. MEASUREMENT OF POSITION OF MID-LINE STRUCTURES IN THE SKULL WITH HIGH FREQUENCY PULSED ULTRASOUND.** R.Ford and J.Ambrose: Brain, 1963, 86, 189-196 (Atkinson Morley Hosp., Wimbledon, London, J^{angle}land) 1000 unselected patients were examined to assess ^{wid} appilability and clinical reliability of the method. 1** overall * to accuracy in determining the position of the mid-line was 93* 85. The method is r^Did, atraumatic and easily reproducible. R.H.Kimberlin
- 4234. MEASUREMENT OF PRESSURE BETWEEN FOOT AND SHOE.** J.H.Bauman and P.W.Brand: Lancet, 1963, 629-632 (Christian Med. Coll., Vellore, South India) Thin capacity transducers are connected to a transistored pre-amplifier.
- 4235. CONTINUOUS MEASUREMENT IN AN ANIMAL OF SPECIFIC RADIOACTIVITY OF EXPIRED CO₂ AFTER THE ADMINISTRATION OF COMPOUNDS TAGGED WITH 14C. STUDY OF KOTOPIC EQUILIBRIA.**

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P.Chevallier, M.Briere, F.Serrell and M.Cumin J. Physiol*. Paris, 196°, 54, 701-710 (Dept. Biol., Centre d'Etudes Nucléaires, Saclay, S.-et-O., France) A technique is described for the continuous measurement of quantity and radioactivity (and hence the sp. radioactivity) of expired CO₂ in an animal receiving a compound tagged with ¹⁴C. The method gives information on equilibrium of a compound from a study of its ¹⁴C-radioactivity, which is const. with time.

(French) A.Angel
4236. METHOD FOR AUTOMATICALLY MAINTAINING BODY TEMPERATURE OF RATS AT CONSTANT LEVEL. A-Ashworth and R.E.Haist Canad. J. Biochem., 1963, 41, 1081-1083 (Dept. Physiol., Univ. Toronto, Canada) A device is described whereby the body temp. of ¹⁴C rats can be maintained at sub-normal levels. The rats were suspended in tunnels with a lamp above each rat and a fan at open end by means of a special circuit design the temp. of each rat could be controlled with less than ± 1° variation for 24 hr. Prelim. J.B.Parish

4237. CLOSED SYSTEM FOR PROLONGED EXPOSURE OF SMALL ANIMALS TO ARTIFICIAL ATMOSPHERES. J.H.Dines and F.A.Hitchcock: J. appl. Physiol., 1963, 17, 663-636 (Physiol. Dept., Ohio State Univ., Columbus, U.S.A.) Apparatus is described whereby can be investigated in situ. O₂ consumption could be determined and excreta collected throughout the expt. H.C.Jones

4238. SIMPLE DEVICE FOR MEASUREMENT OF SPONTANEOUS MOVEMENTS OF ANIMALS. F.Alvarez-Urquiza and H.Redetzke Arch. int. Pharmacodyn., 1963, 142, 516-521 (Dept. Pharmacol., Louisiana State Univ. Sch. Med., New Orleans, La., U.S.A.) Spontaneous movements of a mouse in a small box are picked up by a crystal gramophone cartridge, amplified and recorded by a pen writer. Potentiometric records are quantitated by eluting the ink off the paper and measuring absorbance spectrophotometrically. S.E.Smith

a. MODIFIED MUSCLE ERGOGRAPH. R.B.J. De Jong (ALV-Terpoorten: J. appl. Physiol., 1963, 18, 672 ASST Vsiol. Dept., Coronel-Lab. Hyg., Univ. Netherland) In order to load a muscle resistance without mass a force of a piston connecting a vacuum containing a variable vacuum has been used, H.C.Jones

BODY TEMPERATURE

240. PARTITION OF INSENSIBLE LOSSES OF BODY WEIGHT AND HEAT FROM CATTLE UNDER VARIOUS CLIMATIC CONDITIONS. J.A.McLean: J. Physiol., Lond., 1963*, 167, 427-447 (Physiol. Dept., Hannah Dairy Res. Inst., Ayr, Scotland) Insensible wt. loss of calves aged 6 to 10 months increased from 66 g./hr. at 15° air temp. to 412 g./hr. at 4C*. Of this, all except approximately 20% presented vaporised moisture at all temperatures. Presented vaporised moisture at all temperatures. Cutaneous and respiratory evaporation were of magnitude at 15° but at 4(f) the skin contributed 45% of the total vapourised moisture. Non-evaporative heat appeared to be primarily determined by the insulation

of the coat and the physical prop. of the environment at air temp., above 2(f). Evaporation from the skin was quant. controlled by physiol. means near to a level that made up the difference between heat production and other forms of heat loss. Except under extremely humid conditions the physical prop. of the environment could directly influence cutaneous evaporation only from limited skin areas or for transient periods. There was evidence that the air expired by cattle is 90 to 100% sat. with moisture at body temp., but the mask worn by the animals limited respiratory evaporation in the expt. *

4241. MEASUREMENT OF CUTANEOUS MOISTURE VAPORISATION FROM CATTLE BY VENTILATED CAPSULES. J.A.McLeaK J. Physiol., Lond., 1963, 167, 417-426 (Physiol. Dept., Hannah Dairy Res. Inst., Ayr, Scotland) The rate of moisture vaporisation from the skin under ventilated capsules is dependent on the geometry of the capsule and die ventilation rate. The critical air flow rate* which gives ventilation under a capsule equiv. to that over undisturbed skin may be assessed by comparing skin temp. inside and outside the capsule. *

4242. LOSS OF WEIGHT AND METABOLIC RATE OF RATS WITH LESIONS IN THE MEDIAL AND LATERAL HYPOTHALAMUS. J.A.F.Stevenson and D.C.Montemurra Nature, Lond., 1963, 198, 92, (Dept. Physiol., Univ. Western Ontario, London, Qnt., Canada) The resting O₂ consumption and metabolic rate of hypothalamic, hyperphagic rats was normal while that of aphagia, adipsic rats was greater than normal. Rats with lesions in die ventromedial or lateral hypothalamus showed metabolic rates as much as 50% greater than controls for 3 days post-operatively; this would account for the more rapid loss of wt. of such animals compared with rats deprived of food and water. G.M.Lewis

4243. CHANGES IN BODY TEMPERATURE AND BASAL METABOLIC RATE OF AMA. B.S.Kang, S.H.Song, C.S.Suh and S.K.Hong: J. appl. Physiol., 1963, 18, 483-488 (Riysiol. Dept., Yonsei Univ. Med. Coll., Seoul, Korea) The duration of work periods in Korean diving women was determined by the water temp., and hence the oral temp., of the women. The average body temp. declined to 34°6° in summer and 30° in winter. The B.M.R. of these women was higher in winter than in summer. H.C.Jones

4244. METABOLIC RESPONSE TO COLD AIR IN MEN AND WOMEN IN RELATION TO TOTAL BODY FAT CONTENT. E.R.Buskirk, R.H.Thompson and G.D. Whedon: J. appl. Physiol., 1963, 18, 603-612 (Metabolic Dis. Br., Nat. Inst. Arthritis and Metabol. Pis., N.I.H., Bethesda, Md., U.S.A.) The metabolic response to cold of men and women was inversely related to % body fat, and the total body insulation after 2 hr. exposure at 15° was proportional to % body fat. Nevertheless, large individual differences were observed in the metabolic response to cold. H.C.Jones

4245. METABOLIC AND THERMAL RESPONSE OF ESKimos DURING MUSCULAR EXERTION IN COLD. K.N. Anderson, J.S.Hart, H.T.Hammel and H.B.Sabean: J. appl. Physiol., 1963, 18, 613-618 (Inst. Work Physiol., Blindem, Oslo, Norway) No higher heat production rates during exercise in a cold environment, could be demonstrated in Eskimos than in Caucasians, but previously cooled skin on the hands rewarmed more quickly in Eskimos as a result of exercise in the cold.

H.C.Jones

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4246. THERMOGENESIS DUE TO EXERCISE AND COLD IN WARM- AND COLD-ACCLIMATED RATS. J.S. Hart and L.Jansky: *Canad. J. Biochem.*, 1963, 41, 629-634 (Div. Appl. Biol., Nat. Res. Council, Ottawa, Canada) White rats were acclimated to 30° and 6° for 4-6 weeks after which tests were carried out at various temp, during rest and running. In warm- and cold-acclimated rats the max. heat production during exercise did not exceed the max. at rest in extreme cold. Exercise substituted for shivering in warm-acclimated rats and, below 10°, resulted in hypothermia. Exercise also substituted for shivering in cold-acclimated rats below -2GP resulting in hypothermia, but above -20° the heat derived from exercise added to non-shivering thermogenesis. **J.B.Parish**

4247. PARTICIPATION OF SKELETAL MUSCLE AND KIDNEY DURING NON-SHIVERING THERMOGENESIS IN COLD-ACCLIMATED RATS. L.Jansky and J.S.Harc Canad. J. Biochem., 1963, 41, 953-964 (Div. Appl. Biol., Nat. Res. Council, Ottawa, Canada) Ob consumption of the partly isolated leg muscles and of the kidney was measured in situ in cold-acclimated rats, anaesthetised with Na barbital, before and during exposure to cold or during noradrenaline infusion. During cold exposure and noradrenaline infusion O₂ consumption of the rats was doubled and so too was that of the leg muscles without any increase in blood flow. No increase in O₂ consumption of the kidney was observed in similar circumstances. Thus direct evidence for the participation of striated muscles in non-shivering thermogenesis was obtained. **J.B.Parish**

4248. ADJUSTMENTS TO CONSTANT LOW TEMPERATURES IN WHITE RATS LIVING IN GROUPS. O.Héroux: Canad. J. Biochem., 1963, 41, 587-595 (Div. Appl. Biol., Nat. Res. Council, Ottawa, Canada) Rats in groups of 10 were exposed for 3 months in the laboratory to 19° or -10°. Grouping of the rats did not alter the pattern of metabolic adaptation usually observed in individually cold-acclimated rats and in group-caged white rats exposed out-doors during the winter. Group caging at low temp, prevented the development of cold injuries and the enlargement of pituitary, thyroid and adrenals and resulted in increased resting metabolism, normal adrenal cortex activity and no increase in pelt insulation in contrast to rats grouped out-doors. **J.B.Parish**

4249. INFLUENCE OF RESPIRATORY AND RENAL FACTORS ON CARDIAC ACTIVITY DURING DEEP HYPOTHERMIA. J.Hunter and D.A.Hurley: *Canad. J. Biochem.*, 1963, 41, 551-560 (Def. Res. Med. Lab., Toronto, Ont., Canada) Rats were anaesthetised with pentothal and the kidneys placed in small cups around which water at a desired temp, could be circulated. Blood, colonic and renal temp, were measured by thermocouples and heart rate and b.p. were recorded continuously. After initial measurements the animals were cooled in crushed ice. With and without artificial ventilation, the effects of warming the kidneys during general body cooling, cooling kidneys at the same rate as the body and isolating the kidneys before hypothermia were studied. Maintenance of renal circulation by warming resulted in improved b.p. and cardiac function at colonic temp, below 22°. **J.B.Parish**

4250. NORADRENALINE AND SURVIVAL OF RATS IN COLD ENVIRONMENT. E.SchOnbaum, EA .Sellers and G.EJohnson: *Canad. J. Biochem.*, 1963, 41, 975-983

(Dept. Pharmacol., Univ., Toronto, Ont., Canada) Large doses of noradrenaline (500 μ g./rat, i.e. 2 mg./kg.) given s.c. to rats produced hypothermia, frequently lethal in rats acclimated to 23° and acutely exposed to 2°, but not in rats acclimated to 23° and kept at that temp. T^Δ dose of noradrenaline inhibited shivering and reduced O₂ consumption in acutely cold-exposed rats but stim. O₂ consumption in cold-acclimated rats. Rats living at 2° and treated with guanethidine or reserpine to reduce tiss^{ue} levels of noradrenaline still became acclimated, indicating that increased amounts of noradrenaline were not required for acclimation to cold. **J.B.Parish**

4251. HKTAMINE AND COLD ADAPTATION. J.LeBland Proc. Soc. exp. Biol., N.Y., 1963, 112, 25-26 (Dept. Physiol., Med. Sch., Laval Univ., Quebec City, Canada) Histamine was excreted at substantially higher rates from rats maintained during the course of t&c expt. at a temp, of 6° than from rats kept at normal ^{toot} temp. Guinea-pigs similarly maintained, showed less in* cidence of bronchospasms in the group kept at 6° than m the other group when subjected to aerosol sprays of hist* amine. **D.N.Wheatley**

4252. EFFECT OF EXTENDED EXPOSURE TO HOT ENVIRONMENT ON RESPONSE OF CHICKEN TO HYPER* THERMIA. H.S.Weiss, H.Frankel and K.C.Hollands: Canad. J. Biochem., 1963, 41, 805-815 (Physiol. ^{mic} Sect., Rutgers State Univ. New Jersey, New Brunswick, N.J., U.S.A.) Adult ? chickens lived for ~~20~~ te either 32-36° and 50-60% R.H. or 22-24° with R.H. uncontrolled. Hyperthermia was induced by exposing the restricted animal to 40*5° and 60% R.H. and measurements w^o made of body temp., respiratory rate, min. vol., tidal vol., heart rate, and systolic, diastolic and pulse pressure for i-i° changes in body temp. The adapted birds resisted hyperthermia better than the controls and the results suggested that the mechanisms of adaptation were other tn^g increased respiratory elimination of heat. **J.B.P¹¹**

4253. RESPIRATORY AND CIRCULATORY RESPONSES & HYPERTHERMIC CHICKENS. H.Frankel, K.G.Hoip and H.S.Weiss: Arch. int. Physiol., 1962, 70, 555-563 (Physiol. Sect., State Univ. New Jersey, New Brunswick, N.J., U.S.A.) Body temp., respirat^{xw} rate and min. vol., heart rate and b.p. were measured * White Leghorn chickens exposed to an environmental temp, of 40-5 ^0-5°, R.H. 56%. Body temp, rose ^{progres} to a max. of 46-47°. Respiratory rate rose to a ^{max} of 140-170/min. at 43-5-44-8° and thereafter ~~decreas~~ ^{at} Min. vol. reached a max. at 44-5-45-5° being ^{maintained} at the higher body temp, by increase in tidal vol. Decline in heart rate occurred at temp.> 46°. B.p. ^{remained} unchanged in cT or declined slowly in ? until 45° for * systolic and 46° for systolic p., thereafter there was a ^{temp} at capitous decline in p. in both sexes. Thus body ^{temp} at which changes occurred was different for the various responses measured and there was some sex difference * **M.E.Lutt**

WORK AND METABOLISM

4254. BASAL CALORIC PRODUCTION ON 541 SUBJECTS OF BOTH SEXES BETWEEN THE AGES OF 40-91 YEAI

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STUDY OF TWO FACTORS MODIFYING BASAL METABOLISM. L.Binet, M.Bochet and J.Vallery-Masson: *J.Physiol.*, Paris, 1962, 54, 687-700. Basal metabolism was measured on 541 subjects judged to be in good health clinically. Arterial hypotension (with no signs of thyroid hypertrophy) was associated with an elevation of B.M.R. higher in women than men. Heat production was measured in 15 men with gonadal insufficiency when B.M.R. was 11% less than in normal men.

(French) A.Angel

4255. INTERRELATIONSHIP OF ACTIONS OF GLUCAGON AND SOMATOTROPHIN [GH] ON PROTEIN METABOLISM IN FASTED HYPOPHYSECTOMISED RAT. J.L.Izzo and S.R.Glasser: *Endocrinology*, 1963, 72, 701-708 (Med. Dept., Univ. Med. Center, Rochester, N.Y., U.S.A.) Administration of glucagon to fasted hypophysectomised rats did not result in the increased protein catabolism seen when it is administered to intact rats. Administration of GH to hypophysectomised rats resulted in reduced protein catabolism and estrogon treatment in these animals reversed these H.Clones

4256. EFFECT OF PAINFUL STIMULI ON NITROGEN BALANCE. I.Gontzea, P.Sutzescu and L.Gontzea: *J. Physiol.*, Paris, 1962, 54, 637-646 (Inst. de Med. et Pharm., Bucarest, Roumania) Painful stimuli (injn. teve, 10-3 ml. of turpentine into the paw) produced a fte of N balance by an increase in renal excretion, This J? als (rats > losin 8 considerable quantities of N. Peptic ed even when ** Protein intake was maintained at ievel which had previously maintained N balance.

4257. T. (French) A. Angel
w¹. INFLUENCE OF ENDOCRINES ON CARBOHYDRATE TABOLISM. IV. EFFECT OF THYROID HORMONES PYRUVIC ACID METABOLISM. L.Macha Arch. Int. Physiol., 1962, 70, 507-522 (Endocrinol. List., Slowak Acad. Sci., Bratislava, Czechoslovakia) Untreated normal, thyroidectomised and thyrocoine chinchilla rabbits, wt. 2-3 kg, were given 20 mg./kg. bod^w of a-ketoglutaric acid neutralised topH 7.4 by Na₂CO₃ into a marginal ear vein. The excess a-ketoglutarate disappeared from the blood at a mean rate of 4.20 ± 0.17% min. in normal rabbits, indicating an efficient mechanism for maintenance of a const. blood level. F¹? of disappearance of a-ketoglutarate was faster in thyroidectomised than in normal animals and was slowest in those seated with thyroxine. Urinary ex of <10% small during the period, thus changes in rate of disappearance from blood do not result from changes in M.E.Nutt

4258. EFFECTS OF PROLONGED HYPERGLYCAEMIA ON GLUCOSE METABOLISM IN NORMAL DOG. W.M. Staquet, J.R.M. Jrackson and V.Conard: *Arch. Med. Bel.* 1962, 16, 364-378 (Lab. Expt. ft 164'r Tee Univ., Brussels, Belgium) Seven dogs, 4-a t? 8- received infusions of glucose, 3 g./kg./hr., iNrv iv. Blood glucose concn. and a-v. difference and ^w n^w Hx^w on of glucose, blood lactic acid concn., at^w spaces and cardiac output were estimated, as estima^w alic. during the infusion. Glucose assimilation metabolised and expressed as the ratio between glucose glucose concn. rises and ratio of assimilation increases due to stimm. o^w pancreatic islet cells by the hyperglycaemia, in^w peak rate being reached in 2-3 hr. In some animals hyperglycaemia then increases progressively with re-

duction in cardiac output and GFR. In others the blood glucose concn. oscillates around a plateau and cardiac output and GFR remain const. In all animals the ratio of assimilation falls due to intervention of factors such as limitation of rate of penetration of glucose into cells, satn. of insulin producing potential of pancreas and alterations in cellular metabolism. (French) M.E.Nutt

4259. MECHANISM OF ETHANOL-INDUCED HYPOGLYCAEMIA. J.B.Field, H.E.Williams and G.E.Mortimore: *J. clin. Invest.*, 1963, 42, 497-506 (Clin. Endocr. Branch., Nat. Inst. Arthr. and Metab. Dis., Bethesda, Md., U.S.A.) Ingestion of 35-50 ml. of ethanol after a 2-day fast consistently produced hypoglycaemia in humans. Ethanol inhibited glycogen synthesis and interfered with glucose and urea formation in isolated, perfused rat liver, but not with amino acid mobilisation, suggesting a block in oxidative deamination of amino acids. Inhib. of gluconeogenesis is suggested to be responsible for hypoglycaemia, in conjunction with depletion of liver glycogen. K.Jones

4260. CHICK GLYCOGEN BODY: EFFECTS OF HORMONES AND NORMAL GLYCOGEN TURNOVER. J.G. Snedecor, D.B.King and R.C.Henrikson: *Gen. comp. Endocr.*, 1963, 3, 176-183 (Zool. Dept., Univ. Massachusetts, Amherst, Mass., U.S.A.) Administration to chicks of regular insulin, glucagon-free insulin, adrenaline, cortisone, hydrocortisone, corticosterone, and mammalian growth hormone, was without effect on the glycogen content of the glycogen body. Studies using [¹⁴C]glucose showed that glycogen turnover was occurring without change in the total concn. S.A.Carney

4261. INFLUENCE OF CORTICOSTERONE ON THE METABOLISM OF PALMITATE AND GLUCOSE IN COCKERELS. C.L.Nagra and R.K.Meyer: *Gen. comp. Endocr.*, 1963, 3, 131-138 (Dept. Zool., Univ. Wisconsin, Madison, Wis., U.S.A.) Cockerels treated with i.m. injn. of corticosterone had decreased carcass protein and glycogen but increased carcass lipid, and also increased plasma levels of total lipids and cholesterol. Wt. and lipid content of liver, adrenal wt., and corticosterone secretion were unaffected. There was no sustained effect on rate of CO₂ exhalation or [¹⁴C]calmitate metabolism, but the in vivo disposition of glucose carbon was altered. S.A.Carney

SKIN AND BONE

4262. ACTION OF DETERGENTS AND Ca ON ELECTRICAL POTENTIAL ACROSS ISOLATED FROG SKIN. E.Schoffeniels, R.Gilles and G.Dandrifosse: *Arch. int. Physiol.*, 1962, 70, 335-344 (Inst. Léon Fredericq, Univ. Liege, Belgium) Ionic detergents (Lauryl Na sulphate, Lauryl triethanolamine SO₃, benzalkonium Cl) applied to one surface of the isolated skin of Rana temporaria result in an increase, followed by a decrease, in the spontaneous p.d. between the 2 skin surfaces. The non-ionic detergent polyethylene glycol has no effect. Increase in Ca concn. of the fluid bathing the external surface of the skin results in augmentation of the spontaneous p.d. followed by decrease to a steady level slightly

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below the control value. Increase in Ca concn. on the internal surface has the opposite initial effect. These changes probably result from changes in the passive permeability of die skin to K. Effects of the ionic detergents are not altered in the presence of varying Ca concn. It is thus unlikely that they act by modifying die Ca concn. in cell membranes. (French) M.E.Nutt

4263. CONSUMPTION OF OXYGEN BY SWEAT GLANDS OF INDIAN ZEBU CATTLE. D.P.Sadhu and D.R. Chowdhuiy: *Nature, Lond.*, 1963, 198, 311 (Dept. Physiol. and Nutr., Bengal Vet. Coll., Calcutta, India) The O₂ consumption of slices of skin from regions of the hump, dewlap and dorsal trunk of Zebu cattle was measured with or without addition of succinate or ascorbate. There was a definite correlation between the O₂ consumption, sweating rate, and density and vol. of sweat glands. It was concluded that the hump is a well-developed evaporatory surface. CM.Lewis

4264. ACTION OF LOCAL APPLICATION OF HYDROCORTISONE ON DIFFERENT TISSUES OF THE SHAVED SKIN OF MOUSE. MJ.Tharanne: *C.R. Soc. Biol., Paris.* 1962, 156, 1584-1587 (Lab. d'HistoL., Fac. Méd., Paris, France) Application of 1% hydrocortisone cream to the shaved skin of adult mice for 24 days, resulted in a local growth of hair with a decrease in sebaceous gland activity. There was a decrease in adipose tissue of the hypodermis with an increase in growth and differentiation of the epidermis. The same effect was seen on areas adjacent to the treated zone. Application of 0.1% hydrocortisone cream gave similar but less consistent results. (French) M. A. Price

4265. LOW VALUES FOR SEBUM IN EUNUCHS AND OOPHORECTOMISED WOMEN. J.B.Hamilton and G.E. Mestler: *Proc. Soc. exp. Biol., N.Y.*, 1963, 112, 374-378 (Dept. Anat., State Univ. New York Coll. Med., Brooklyn, N.Y., U.S.A.) In man the testicular secretions or their metabolites and also the ovarian secretions have been shown to induce sebum production since the production of sebum is significantly lower in castrated cT and oophorectomised ?. In eunuchs the urinary metabolites of the adrenal secretions were little altered and Aerefore the TQw ~sebum level cannot be associated with lack of adrenocorticoid secretions. After orchietomy the decline in sebum production is very slow. D.N.Wheatley

4266. ENDOGENOUS HISTAMINE AND OEDEMA FOLLOWING CYSTAMINE INJECTION. J.Lecompte and P. Franchimont: *C.R. Soc. Biol., Paris.* 1962, 156, 1951-1953 (Inst. Léon Fredericq, Liège, Belgium) 5 min. after injn. of 500 fig. cystamine to the foot of rat, there was an increase in wt. of the skin and a decrease in the histamine content of the skin from 29 jg./g. to 5.9 fig./g. The histamine content returned to the normal level 45 min. after injn. with an increase to 32.7 jg./g. after 90 min. (French) M.A.Price

4267. ENDOCRINE CONTROL OF SKELETAL DEVELOPMENT IN MAN. B.W^A.LeemJig: *Brit. med. J.*, 1962, ii. 358-361 (Wellington Hosp., New Zealand) Radiographic study of hands and pelvis in 25 cases of ovarian agenesis leads to the view that 3 components of bone growth, assumption of final dimensions, assumption of final shape and epiphyseal closure are under separate endocrine control. In the Y epiphyseal closure is controlled by oestrogens. M.E.Nutt

MUSCLE

4268. AN X-RAY AND LIGHT DIFFRACTION STUDY # THE FILAMENT LATTICE OF STRIATED MUSCLE IN THE LIVING STATE AND IN RIGOR. G.J.F.Elliott, J. Lowy and C.R.Worthington: *J. mol. Biol.*, 1963, 6, 295-305 (M.R.C. Biophys. Res. Unit, King's Coll., London, England) The spacings and relative intensities of the small-angle equatorial X-ray reflections obtained from vertebrate striated muscles have been studied over a wide range of lengths in living muscles, and in muscles in a state of rigor. It has been shown that the relative intensity of the reflections changes with sarcomere length, and does not depend primarily on whether the muscle is alive or in rigor. It is also shown for HyW muscle that over a wide range of muscle lengths the filament lattice maintains a const. vol. *

4269. ACTIVE RELAXATION OF UNSTRIATED MUSCLE PRODUCED BY NORADRENALINE. I.Singh: *Arch. int. Physiol.*, 1962, 70, 547-554 (Dept. Physiol., Med. Coll. Agra, India) Muscle of frog stomach and pig uterus relaxes without application of external force when treated with noradrenaline. Relaxation is accompanied by increase in O₂ consumption and is inhibited by CN'. DNP and iodoacetic acid. Relaxation produced by noradrenaline, like that produced by adrenaline, is probably an active process. M.E.Nutt

4270. DKTRIBUnQN OF WATER, SODIUM AND POTASSIUM IN RESTING AND STIMULATED MAMMALIAN MUSCLE. F.A.Sréter: *Canad. J. Biochem.*, 1963, 41, 1035-1045 (Dept. Anat., Univ. British Columbia, Vancouer, B.C., Canada) K and Na concn. and inulin space were measured in samples of rat gastrocnemius after direct or indirect stimn. in situ for 1, 3 or 6 hr. in the proximal, middle and distal regions of the muscle. After prolonged stimn. the intra-fibre Na and K concn. were not uniform along the fibre but K depletion ana Na accumulation was greater in the middle. After prolog but slower stimn. the proximal and middle portions of muscle showed similar cationic distributions whereas the distal portion showed the most marked cationic debt. J.B.Parish

4271. SODIUM EXCHANGE IN SMOOTH MUSCLE. C.Bumstock, DJ.Dewhiirst and S.E.Simon: *J. Physiol., Lond.*, 1963, 167, 210-228 (Dept. Zool., Univ. Melbourne, Australia) The exchange of ²²Na⁺ isolated sheets of smooth muscle from the toad's stomach was studied, in conjunction with estimations of the extracellular space using 1311-labelled albumin. Na⁺ exchange change was rapid; the efflux curve indicated no single major rate limiting step to diffusion at 2(f). The ²²Vf curves of ²²ta and [1311]albumin were compared with theoretical curves for diffusion from a plane sheet. The divergence of the ²²NSL curve from the plane suggested that factors other than the geometry of the tissue impede Na exchange. Evidence is presented suggesting that intracellular Na is heterogeneous; part exchange with a high, and part with a low temp. coeff.

4272. ACTION OF DEOXYCORTICOSTERONE ACETATE ON GLYCOGEN. II. RELATIONSHIP OF MUSCLE GLYCOGEN FORMATION TO POTASSIUM METABOLISM. W.Niedermeier and E.B.Cannichael: *Proc. Soc. exp. Biol., N.Y.*, 1962, 111, 777-780 (Arth. and Rheum. Res. Labs., Dept. Med., Univ. Alabama Med. Center, Birmingham, Ala. U.S.A.) Daily administrate

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DOCA to intact rats resulted in inhibn. of muscle glycogen formation, accompanied by an approx. proportional increase in K concn. of both serum and skeletal muscle, maintenance of normal K levels by forced intake to r^{1/2}A treated rats resulted in non-inhibited glycogen production. These results indicate that DOCA induced inhibition of muscle glycogen formation was secondary to depletion. M.M.Shapland

1273. MUSCLE GLYCOGEN IN JUVENILE DIABETES BEFORE AND DURING TREATMENT WITH INSULIN. (Bergström, E.Hultman and A.E.Roch-Norlund: Nature, Lond., 1963, 198, 97-98 (Central Lab., St. Erik's Hosp., Stockholm, Sweden) In 6 uncomplicated juvenile diabetics, the muscle glycogen values were significantly lower than the normal range; after treatment with insulin, the muscle glycogen levels rose to normal values. G.M.Lewis

1274. RELATIVE IMPORTANCE OF GASTROCNEMIUS AND SOLEUS MUSCLES IN THE ANKLE JERK OF MAN. (yv. J. neurol. neurosurg. psychiat., 1963, 26, J. 150 (Neurol. Unit, Northern Gen. Hosp., Edinburgh, Scotland) In 12 normal subjects the composition of the reflex contraction was greater over the soleus than over the gastrocnemius. It is suggested that the soleus plays a greater part in the production of the ankle jerk. A.Angel

1275. EFFECT OF CHANGES IN Na⁺ CONCENTRATION ON ACTION POTENTIAL OF RAT UTERINE SMOOTH MUSCLE. (H. Niijima, A.Nakajima and M.Kumamoto: B.I.U., Yamaguchi Med. Sch., 1962, 9, 55-61 (Dept. in T. Yamaguchi Med. Sch., Ube, Japan) During spontaneous activity the membrane potential was around -15 mV and varied from 40 to 50 mV, the spikes of trivalent spontaneous contraction ranging from -60 to -70 mV. Little changes were detectable in spike configuration when the external Na concn. was reduced to 20 mM but further reduction to 10 mM or less affected spike height and configuration gradually, so that no activity was maintained in Na free soln. small if? < more & the spikes degenerated into peaked negativities. K. Jones

BLOOD

1276. INDUCED UPHILL AND DOWNHILL TRANSPORT: RELATIONSHIP TO THE USSING CRITERION. H.G. Britton: Nature, Lond., 1963, 198, 190-191 (Physiol. Dept., St. Mary's Hosp. Med. Sch., London, Bigland) The phenomenon of induced outward flux of radioglucose, fructose or galactose against a concn. gradient in human, rat, dog and monkey cells during the entry of glucose is shown to be directly related to the ratio of the inward and outward fluxes across the membrane. A reversible thermodynamic derivation of the Ussing criterion is presented. C.M.Lewis

1277. SEASONAL VARIATIONS IN THERMAL FRAGILITY OF R.B.C. IN MAN: INFLUENCE OF AGE. (L.G. Oldschmidt: Nature, Lond., 1963, 198, 297; L.G. Oldschmidt: Queens W. (Creedmoor Inst. ftychobiol. Studies, Queens Jamaica, N.Y., USJL) Observed seasonal

changes in the thermal fragility of r.b.c. with ageing could not be correlated with the thyroid function but appeared to be due to sex differences. G.M.Lewis

4278. CHANGES IN BLOOD VOLUME AND BLOOD PICTURE DURING THE LIFE OF THE RAT AND GUINEA-PIG FROM BIRTH TO MATURITY. B.J.Constable: J. Physiol., Lond., 1963, 167, 229-238 (Nutr. Lab., Cambridge, England) Plasma and blood vol. throughout the actively growing life of the d¹ rat and d guinea-pig were determined, together with haematol. values. A gradual decrease in blood vol. in the guinea-pig from 11.5 to 5.9% (body wt.) was found between birth and maturity; no such fall was observed in the rat. An increase of over 100% in the red cell count between birth and 250 g. body wt. was noted only in the rat. An anaemic period occurred during weaning in rats and guinea-pigs which is probably common to most animals. *

4279. ERYTHROCYTE SURVIVAL IN GUINEA-PIGS. L.H. Smith and T.W.McKinley jun.: Proc. Soc. exp. Biol., N.Y., 1962, 768-771 (Biol. Div., Oak Ridge Nat. Lab., Oak Ridge, Tenn., U.S.A.) Calcn. from survival curves of 51Cr-labelled guinea-pig r.b.c. showed that disappearance rates of autologous and isologous cells were almost the same but homologous cell clearance rate was significantly faster. A value of 80-90 days was suggested as an estimate life span for guinea-pig r.b.c.

M.M.Shapland

4280. EFFECT OF TEMPERATURE ON RED CELL SURVIVAL IN THE ALLIGATOR. M.J.Cline and T.A.Waldmire: Proc. Soc. exp. Biol., N.Y., 1962, 111, 716-718 (Metab. Serv., Nat. Cancer Inst., N.I.H., Bethesda, Md., U.S.A.) R.b.c. survival in immature American alligators kept at 16°-17° for 6 to 7 months was at least 3 times that in reptiles kept at 31°-32° for the same period. M.M.Shapland

4281. EFFECT OF A DECREASE IN PARTIAL PRESSURE OF OXYGEN IN INSPIRED AIR ON CARBONIC ANHYDRASE ACTIVITY OF RED BLOOD CELLS IN THE RAT. P.L. Biget and M.Roberc: C.R. Acad. Sci., Paris, 1962, 255, 380-381 (Centre d'Enseignement et de Recherches du Méd. Aéronautique, 5 bis, Avenue de la Porte-de-Sèvres, Paris, France) 12 Wistar rats were exposed to a simulated altitude of 5000 m. for 1 hr. CO₂ accumulation was prevented. R.b.c. counts, haematocrit and carbonic anhydrase activities were then compared to those of controls kept at normal barometric pressure. The haematocrits and r.b.c. counts were unchanged. Carbonic anhydrase activity was significantly increased.

(French) S.A.Thistlewood

4282. USE OF CARBON MONOXIDE TO PREVENT SICKLE-CELL FORMATION. J.A.Sire: Lancet, 1963, i, 971-972 (Physics Dept., St. Mary's Hosp. Med. Sch., London, England) CO both in vivo and in vitro reduces the risk of sickle cell formation. G.H.Bell

4283. IS HAEMOGLOBIN ESSENTIAL STRUCTURAL COMPONENT OF HUMAN ERYTHROCYTE MEMBRANES? R.J.Weed, C.F.Reed and G.Berg: J. clin. Invest., 1963, 42, 581-588 (Dept. Med., Univ. Rochester Sch. Med. Dent., Rochester, N.Y., U.S.A.) Ghosts prepared from normal human r.b.c. by gradual osmotic lysis (99.5% of Hb was removed), had glucose 6-phosphate dehydrogenase and Na⁺ + id⁻-dependent ATPase activities independent of their Hb content, and retained all the cholesterol and phospholipid content of the cells from which they were prepared. They also retained the bi-concave disc shape of intact r.b.c. and osmotic responsive-

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- ness. The results showed that Hb was not an essential structural component of the human r.b.c. membrane. K.Jones
- 4284. ALKALI-RESISTANT HAEMOGLOBIN CONTENT OF BLOOD IN CONGENITAL HEART DISEASE.** J.F. Farrar and J.Bломfield: Brit. J. Haemat., 1963, 9, 278-287 (Children's Med. Res. Fdn., Royal Alexandra Hosp. for Children, Sydney, Australia) Differences in foetal Hb content of 344 children forming 3 groups (those with normal hearts, with acyanotic congenital heart disease and those with cyanotic congenital heart disease) showed no significance. Abnormal quant. were found in 2/79 subjects in the cyanotic congenital heart disease group. Family studies in both these cases revealed no relatives with foetal Hb. 11 Mongol children were also tested but none possessed foetal Hb. The acid-denaturation method was found to be more reliable than paper electrophoresis. J.Sneath
- 4285. ERYTHROPOIETIC ACTIVITY OF HUMAN PLASMA IN HAEMATOLOGICAL AND OTHER DISORDERS.** P.Boivin, G.Lagru and R.Fauvert Nouv. Rev. Franc. Hémat., 1963, 3, 35-80 (Centre Rech. Applications méd. Radioisotopes, Hop. Beaufon, Clichy, Seine, France) Erythropoiesis was estimated by the rate at which S^3Fe was incorporated into r.b.c. The rate was appox. normal after injn. of plasma from cases of polycythaemia, spherocytosis, renal failure or liver cirrhosis, and increased in some cases of bone marrow failure, renal cancer, haemolytic anaemia or myxoedema. (French) V.Eisen
- 4286. SUGGESTED MECHANISM OF ERYTHROPOIETIC CONTROL BY JUXTAGLOMERULAR CELLS.** G.Reeves, L.Lowenstein and S.C.Sommers: Amer. J. med. Sci., 1963, 245, 184-388 (Scripps Mem. Hosp., La Jolla, Calif., U.S.A.) In non-cirrhotic patients the blood Hb levels are directly proportional to the no. of juxtaglomerular cells. E.E.Hobbiger
- 4287. METABOLISM OF ^{59}Fe -SORBITOL COMPLEX IN MAN.** G.Wetherley-Mein, J.G.Buchanan, U.H.Glass and L.C.Pearce: Brit. med. J., 1962, i, 1796-1800 (St. Thomas's Hosp., London, England) A [^{59}Fe]-sorbitol complex was rapidly cleared from an i.m. injn. site in man. Mean half-time (T_{1/2}) deltoid clearance was 46 min. in Fe-deficient and 174 min. in control groups. Clearance was almost complete in 10 days. Clearance times for L-[^{59}Fe]sorbitol were shorter than for [59-Fe]-dextran, probably due to lower mol. wt. which also resulted in rapid urinary excretion. Urinary excretion was max. in the first 12 hr. after injn., 18-53% of the inj. dose was excreted in 48 hr. Incorporation into r.b.c. at 10 days was 27-66% and was greater in the Fe-deficient than in the control group. The curve of utilisation of ^{59}Fe in the deficient group showed that max. utilisation had not occurred by T+ 10 days. Surface counting indicated that retained Fe, not utilised for Hb synthesis by T+ 10 days, was stored predominantly in the liver. M.E.Nutt
- 4288. INFLUENCE OF AGE UPON IRON CONTENT OF BONE-MARROW.** R.McD. Benzie: Lancet, 1963, i, 1074-1075 (Law Hosp., Carlisle, Lanarkshire, Scotland) Manow-Fe deposits increase with age irrespective of disease, including even blood-disease. Caution must therefore be exercised in interpreting marrow-Fe estimations. G.H.Bell
- 4289. SIDEROTIC GRANULES AND GRANULES OF PUNCTATE BASOPHILIA.** T.Beritic: Brit. J. Haemat., 1963, 9, 185-188 (Inst. Med. Res., Zagreb, Yugoslavia)

Fe-containing granules of siderocytes have rarely been clearly differentiated from the RNA-containing granules of stippled cells. Patients with Pb poisoning and refractory sideroblastic anaemia had blood and bone-marrow smears with 3 kinds of r.b.c. those with either Fe-pos. or Fe-neg. granules and some with both. J.Sneath

- 4290. BLOOD GROUPS AND ENZYMES OF HUMAN RED CELLS AFTER A YEAR IN LIQUID N₂.** RG.Huntsman. B.A.L.Hum, E.W.Ikin, H.Lehmann and J.Liddell Brit. med. J., 1962, ii, 1508-1514 (St. Bartholomew's Hosp. London, England) Blood was preserved in liquid N₂ with EDTA as anticoagulant. After more than 1 yr. 90% of cells could be recovered intact and all blood groups were demonstrable, though acidity and titre of some agglutinogens decreased. Activity of aldolase decreased significantly on storage. Activity of transaminase decreased to a lesser extent, but concn. of TPN dependent dehydrogenases was maintained. Advantages of the method compared with glycerol storage are discussed. MENU*

- 4291. ISOLATION OF A MUCOID WITH N BLOOGR ACTIVITY FROM HORSE ERYTHROCYTE STROMA.** G.Uhlenbruck and M.Krtlpe: Z. Immun.-Forsch., 1962, 124, 342-345 (Physiol.-chem. Inst., Univ., Koln, Germany) Extraction of horse r.b.c. stroma with phenol-saline yielded a mucoid which reacted strongly with anti-N phytagglutinin from Vicia graminifera, though not with ordinary anti-N serum from rabbits. (German) D-P.WinstanM

- 4292. VARIATIONS IN INHIBITORY POWER OF THE FACTOR Gm(A) ACCORDING TO THE SEROLOGICAL PHENOTYPE Gm OF THE SUBJECT.** J.Ruffie, J.Duc[<] and M.Vatsi: CR. Acad. Sci., Paris, 1962, 255, 45-405. Sera from subjects of phenotypes Gm (a + b + x-), Gm (a f b + x-) and Gm (a+b- x-) were titrated by Morten Harboe's method against 3 serums containing anti-Gm(a) (anti-Gm(a) SNAGG) Nos. 8972, 7429 and 10424. In each case satn. of the Ab was greatest for phenotype Gm (a + b- x-) and least for Gm (a f b + x-), i.e. the presence of Gm (b) and Gm (x) decreases the quantity of factor Gm (a) present. Perhaps a single base substance is converted according to the genes present in factor Gm (a) and/or Gm (b) and/or Gm (x), the total quantity of factor Gm produced being const. (French) S.A.Thistlewood

- 4293. HAEMOLYTIC SYSTEM ASSOCIATED WITH ENTERITIS IN RABBITS. I. NATURE OF CELL CHANGE AND SERUM FACTORS CONCERNED.** RS.Evans, Bingham and R.S.Weise: J. exp. Med., 1963, H^G, 647-661 (Med. Serv., V.A. Hosp., Washington, D.C., U.S.A.) A disease in which enteritis is associated with agglutinable r.b.c. often develops in weanling rabbits. The r.b.c. abnormality was found to be resistant to the action of trypsin or papain and persisted in heated stroma prep. derived from a⁺luminable r.b.c. Factors necessary for aggln. and haemolysis of these r.b.c. are present in normal rabbit sera but are lacking in the sera of affected rabbits. The sera of rabbits with agglutinable r.b.c. contained normal levels of C^f and properdin. Aggln. factor of normal serum is heat stable (56° f^r, 30 min.) while the haemolytic factor is heat labile. C^f is fixed when the stroma from agglutinable cells was rea with normal serum. H.E.H Jones

- 4294. LEUCOCYTE PREPARATION FROM HUMAN BLOOD; EVALUATION OF THEIR MORPHOLOGIC AND METABOLIC STATE.** H.J.Fallon, E.Frei, J.-L'Davidson, J.S.Trier and D.Burte: J. Lab. clin. Med.,

1962, 59, 779-791 (Biochem. Lab., Cancer Inst., Bethesda, Md./U.S.A.) W.b.c. were prepared free ^r.b.c. by sedimentation with dextran and subsequent j?posure ^{to} hypotonic saline to remove remaining r.b.c. j?ross changes in cellular respiration or glycolysis were no^ted in either normal or leukaemic prep. E.M. studies, Trypa_n Blue staining and their ability to decarboxylate orotic acid showed w.b.c. to be unchanged.

C.Toothill

4295. LEUCOCYTES OF PERIPHERAL BLOOD IN HUMAN FOETUS. L.H.L.Playfair, M.R.Wolfendale and H.E.M. Kay: Brit.J.Haemat., 1963, 9, 336-344 (Dept.Clin.Path., of F.O. Maisden Hosp., London, England) Blood counts in foetuses between 8 and 27 weeks old showed a decrease in erythroblast count and an increase in granulocyte count with increased age. Granulocytes were found in the earliest foetuses. In 41 foetuses from abortions, the erythroblast and granulocyte counts were about 4 times higher than in foetuses obtained by hysterectomy. At 6 months, the foetuses suggest a higher lymphocyte count than at full-term which suggests a sizeable immunological potential at this stage. J.Sneath

4296. MITOGENIC PROPERTY TO PHYTOHAEMAGGLUTININ (PHA*) STUDIES ON HUMAN LEUCOCYTES. M.W.Elves and M.C.G.Israels: Brit. J. Haemat., 1963, 10, 406-411 (Dept. Clin. Haemat., Royal Infirmary, Manchester, England) PHA can be obtained in the same form as HA(M) containing protein and mucopolysaccharide and in a relatively pure form PHA(P) which is purified. The lymphocyte response is greater to PHA and PHA(P) and the mitogenic power of PHA is proportional to the haemagglutinating strength. PHA is not by itself during culture and prednisolone inhibits lymphocyte transformation. J.Sneath

4297. EOSINOPHIL TURNOVER IN THE RAT. E.C.Foon Nature, Lond., 1963, 198, 297-298 (Dept. Pathol., Jt. Mary's Hosp. Med.Sch., London, England) A method involving continuous infusion of thymidine that the turnover time of eosinophils in rat peripheral blood was 6 days. G.M.Lewis

4298. HUMORAL REGULATION OF PLATELET PRODUCT-ION. K.Rak: Acta med. Acad. Sci. hung., 1962, 67-75 (1st Dept. Med., Univ. Med. Sch., Szeged, of Hungary) Available information on the existence of a factor governing the production of thromboplastin is briefly reviewed and tests for this factor in serum presented, based on 139 cases, conclusions are drawn regarding the nature of this humoral factor, "thrombopoietin", which is distinguished from erythropoietin. C.F.Blane

4299. P'T ASJOTOM ET RIC STUDY OF EFFECT OF ADP ON PLATELETS. H.Vainer and J.Caen: Nouv. Rev. franc., nat., 1963, 3, 149-156 (Centre Rech. Leucémies, Claude-Bernard, Hop. Saint-Louis, Paris, France) Platelets from normal subjects, from patients with untreated or treated (transfusions or corticosteroids) disease, and from patients with Von Willebrand's disease (Glanzmann) were studied. ADP 0.05-50 μg/ml was added to buffered platelet rich plasma. At 15 sec. agitation, the O.D. at 610 Å was measured. The decrease in O.D. was in thrombopenic patients more than in normal subjects. In Willebrand's disease, decreased normality with ADP concn. of 15-50 μg/ml decreased normality with ADP concn. of 18 μg/ml, but 0.05 μg./0.8 ml. produced a slight increase in O.D. (French) V.Eisen

4300. PLATELET DISINTEGRATION DURING CLOTTING.

N.F.Rodman, J.C.Painter and N.B.McDevitt: J. cell Biol., 1963, 16, 225-241 (Dept. Path., Sch. Med., Univ. N. Carolina, Chapel Hill, N.C., U.S.A.) Platelet-rich plasma prepared from human citrated blood at 37° was followed macroscopically for platelet agglgn. and aliquots of citrated and recalcified citrated plasma fixed in OsO₄ and embedded in methacrylate or Epon. 10 min. after recalcification the platelet degenerates with disruption of the limiting membrane. Granular material agglomerates and finally disappears on clot retraction and vesicular platelets progressively disintegrate during 2 hr. P.Barlow

4301. EFFECT OF ETHYL ALCOHOL ON SOME COAGULA-

TION FACTORS IN MAN DURING ANTICOAGULANT THERAPY. E.Waris: Ann. Med. exp. Fenn., 1963, 41, 45-54 (Med. Dept., South Saimaa Central Hosp., Lappeenranta, Finland) Healthy men were given moderate amounts of ethyl alcohol orally first in normal conditions then during anticoagulant therapy. Quick's thromboplastin time was determined before and after alcohol. Alcohol had no effect on thromboplastin time. Alcohol was also administered by drip infusion during anticoagulant therapy to patients with coronary disease, the blood coagulation activity was followed by Owren's thrombotest before and after alcohol. A slight fall in the thrombotest values was seen in some cases. G.Faulkner

4302. EFFECT OF ETHYL ALCOHOL ON SOME COAGULATION FACTORS IN RAT.

E.Waris and O.Mustala: Ann. Med. exp. Fenn., 1963, 41, 54-60 (Dept. Pharmacol., Univ. Helsinki, Finland) The effect of ethyl alcohol on the blood coagulation activity of rat was studied by Owren's thrombotest method. This method can be used to establish the changes in the prothrombin and factor VII, IX and X contents. No differences were found between controls and the groups given alcohol. C.Faulkner

4303. PURIFICATION OF FACTOR VIII (ANTIHAEMOPHILIC GLOBULIN).

S.E.Michael and G.W.Tunnah: Brit. J. Haemat., 1963, 9, 236-244 (Crookes Lab. Ltd., Park Royal, London, England) Purification of crude porcine Factor VIII was effected by chromatography on ion-exchangers using the carboxylic resin XE 64 and the basic exchanger Whatman DEAE-cellulose. Adsorption from dil. neutral phosphate buffer soln. and subsequent elution produced a prep. containing 75-150 Oxford u./mg. protein. This contained appreciable amounts of fibrinogen and was only moderately stable in aq. soln. Sterile filtration and freeze-drying were possible after addition of stabilisers such as human serum proteins. The prep. was successfully used on a boy of 12 yr. suffering from a severe form of haemophilia, while undergoing appendicectomy. J.Sneath

4304. ANTIHAEMOPHILIC GLOBULIN (FACTOR VIII) (AHG) INHIBITOR PURIFICATIONS, CHARACTERISATION AND REACTION KINETICS.

A.Leitner, E.Bidwell and G.W.R.Dike: Brit. J. Haemat., 1963, 9, 245-258 (Blood Coagulation Res. Unit, Churchill Hosp., Oxford, England) Circulating anti-coagulants sometimes develop in haemophiliacs receiving AHG. Plasma from such a patient was used to obtain an inhibitor of AHG by salt pptn. and anion exchange chromatography. Immunoelectrophoresis showed that it belonged to the Y "globulin group (medium fast) and ultracentrifugation gave a sedimentation const. corresponding to 7.6 proteins. It was stable over a wide pH and temp. range and unaffected by crude pepsin. Enzymic digestion and heat denaturation altered

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some prop, but did not effect its inhibitory activity. The AHG-anti AHG complex appeared to be bimol. in the first reaction phase but final combining properties were altered by relative concn., temp, and pH. Dissociation of the complex could not be shown. J.Sneath

4305. FURTHER EXPERIENCE WITH A CONCENTRATE CONTAINING HUMAN ANTI-HAEMOPHILIC FACTOR [AHG]. W.d'A.Maycock, S.Evans, L.Vallet, B.Cambridge, P.Wolf, N.McGibbon, E.E.French, L.H.Wal-latt, J.V.Dacie, R.Biggs, D.Handley and R.G.Mac-farlane: Brit. J. Haemat., 1963, 9, 215-235 (Lister Inst. Prevent. Med., Elstree, Herts., England) 69

haemophiliacs, of whom 36 suffered from a clinically severe form of the disease received a prep. of human AHG concentrate. A plasma antihaemophilic factor [AHF] raised to 25% above the normal, achieved haemostasis and operations ranging from dental extractions to hysterectomy and gastrectomy were carried out successfully. The AHF level due to infused AHG fell rapidly and seldom lasted longer than 24 hr. Two patients who became refractory to treatment with human or animal AHG had developed a circulating anti-coagulant. Reactions to the AHG prep, occurred in some patients but could be eliminated by slowing the rate of infusion, there was no lasting ill-effect. The prep, is a reliable means of controlling bleeding in haemophiliacs. J.Sneath

4306. TRANSFUSION STUDIES IN VON WILLEBRAND'S DISEASE: EFFECT ON BLEEDING TIME AND FACTOR VIII. P.Cornu, M.J.Larrieu, J.Caen and J.Bernard: Brit. J. Haemat., JL 963, 9, 189-202 (Inst. Rech. Maladies du Sang, Hop. St.-Louis, 2, Place du Docteur Fournier, Paris, France) Transfusions of normal blood into patients with von Willebrand's disease produced an increase in Factor VIII concn. a few hr. after the end of the transfusion which declined slowly during the following 48 hr. This rise was often greater than could be expected from the vol. transfused. Bleeding time (Duke's method) was completely corrected in a majority of transfusion. Haemophilic blood was also responsible for a correction in the Factor VIII level in the recipient, in contrast to results of in vitro expt. Haemophilic blood seemed to be more effective than normal blood in correcting the bleeding time. Nilsson's 'vascular factor' hypothesis is confirmed by these results. J.Sneath

4307. TREATMENT OF HAEMORRHAGE IN VON WILLEBRAND^A DISEASE AND THE BLOOD LEVEL OF FACTOR VIII [AHG]. R.Biggs and J.M.Matthews: Brit. J. Haemat., 1963, 9, 203-214 (Blood Coagulation Res. Unit, Churchill Hosp., Oxford, England) Control of traumatic bleeding seemed to be correlated with the blood level of Factor VIII. Various infusions stimulated the production of this factor. The substance appears to be cone, in the fibrinogen fraction of plasma and is present in substantial amounts in fibrinogen made from "out-dated" plasma. It is present in serum, is not adsorbed by Ca₃(PO₄)₂ and is not present in the albumin or γ-globulin fractions. J.Sneath

4308. FIBRINOLYSIS. I. A CIRCULATING SUBSTANCE CAPABLE OF CONVERTING PLASMIN-SENSITIVE TO PLASMIN-RESISTANT CLOTS. S.F.Rabiner and K.C. Robbins: Ptoc. Soc. exp. Biol., N.Y., 1962, 111, 701-706 (Dept. Haem. Res., M. Reese Hosp., Chicago, 111, U.S.A.) In vitro resistance to fibrinolysis was produced by incubation of thrombin-fibrinogen clots in either serum, plasma, BaSO₄ adsorbed plasma or serum globulin

fraction. The agent responsible for this clot resistance was non-dialysable, destroyed by acid or heat and distinguishable from serum antiplasmin. M.M.Shapland

4309. ALTERATIONS IN FIBRINOLYTIC PARAMETERS OF SUBJECTS WITH DIABETES MELLITUS. H.Sandberg, O.Muller, S.Bellet, L.J.Feinberg, F.Gagnon and L.Gelber: Amer. J. med. Sci., 1963, 246, 153-159 (Div. Cardiol., Philadelphia Gen. Hosp., Pa., U.S.A.) The anti-fibrinolysis lysis time of diabetic subjects is much shorter than that of healthy people. It is thought that this is due to an action of insulin and not a manifest* don of the diabetic state. E.E.Hobbiger

4310. INHIBITION OF HUMAN FIBRINOLYTIC SYSTEM BY NORMAL AND PATHOLOGIC SERA. J.T.Corrall and A.Sjoerdsma: Proc. Soc. exp. Biol., N.Y., 1962, 111, 274-277 (Expt. Therap. Branch., Natl. Heart fast.. Bethesda, Md., U.S.A.) Pathol. sera from 8 of 32 patients with various diseases inhib. standardised fibrinolytic systems to a significantly greater extent than norm* human sera. None of abnormal sera used were from patients with increased accumulation of fibrin. M.M.Shapland

4311. FIBRINOLYTIC ACTIVITY OF HUMAN ERYTHROCYTES. W.Klinzer and A.Haberhausen: Nature, Londi 1963, 198, 396-397 (Univ. Kinderklin. Freiberg im Breisgau, Germany) Adult human r.b.c. display a high spontaneous fibrinolytic activity which becomes apparent only after haemolysis and is associated with the stromata; the activity is enhanced by streptokinase. CM.Lewis

4312. FIBRINOLYSIS RELATED TO AGE IN MEN. H.T. Swan: Brit. J. Haemat., 1963, 9, 311-318 (Dept.Haemat., Royal Inf., Sheffield, England) Fibrinolysis was measured by timing the complete dissolution of fibrin clots prepared by serial diln. of plasma in ice-cold veronal buffer incubated at 37°. 135 men, aged 20-83 yr., were tested and the mean lysis time of the 50% plasma clots were grouped in order of donor-age. The regression line of to* means showed shortening of lysis time with increased af# The correlation did not apply to diln. of < 30% plasma* J.Sneath

4313. EFFECT OF THYROID HORMONE ON HUMAN SERUM RNase. R.D.Leepen J. clin. Endocr., 1963, 23, 426-432 (Div. Clin. Invest., Mem.-Sloan-Kettering Cancer Center, New York, N.Y., U.S.A.) 1*Q... sera of hyperthyroid patients showed higher RNase active than those from normal and myxoedematous individuals. The administration of thyroid hormone to a patient with myxoedema increased serum RNase activity. The serum RNase was inhib. by heating and heparin in the same manner as was bovine cryst. RNase. K.Jones

4314. EFFECT OF ETHANOL tN PLASMA FREE FATTY ACIDS [FFA] IN MAN. C.S.Lieber, C.M.Leevy, S.W. Stein, W.G.George, G.R.Cherrick, W.H.Abelmann and C.S.Davidson: J. Lab. clin. Med., 1962, 59, 826-83* (Dept. Med., Harvard Med. Sch., Boston, Mass., U.S.A.) Ethanol was given i.v. to 13 fasting patie^ who had no evidence of liver disease or disturbance.on. lipid metabolism. All 13 had a significant drop (P < .01) of arterial FFA averaging 30% of the initial concn. At this FFA tended to rise again despite continued ethanox fusion. No change was observed in the blood sugar DU* the blood lactate rose in all the patients, these blood lactate concn. were comparable with the levels in 3

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subjects given i.v. lactate infusions but who did not show any changes in EFA. In 6 patients in whom the initial Peripheral FFA a-v. difference across the forearm or leg was pos. ethanol produced a reduction of this difference ≈ 2 and a reversal in 4 subjects suggesting that the observed fall in FFA levels during ethanol infusion is partly due to a decreased release or to an increased uptake of FFA in peripheral tissue.

C.ToothiU

- 4315.** ADIPOKINETIC EFFECT OF INTRAVENOUS CORTISOL IN HUMAN SUBJECTS. R.V.Nayak, E.B.Feldman and A.C.Carten Proc. Soc. exp. Biol., N.Y., 1962, 111, 682-686 (Dept. Med., State Univ. New York, Brooklyn, N.Y., U.S.A.) Lv. injn. of cortisol caused significant rise in serum free fatty acids and a fall in jejunum triglycerides in healthy fasting human subjects. injn. of either saline or cortisol vehicle induced a significantly lesser rise in serum free fatty acid levels and no change in serum triglyceride levels. M.M.Shapland

- 4316.** BLOOD LACTATES AFTER PROLONGED SEVERE EXERCISE. PJVstrand, LHaUback, R.Hedman and B. Saltin: J. appl. Physiol., 1963, 18, 619-622 (Physiol. ^{^e}Pt. Kungliga Gymnastiska Central-inst., Stockholm, dt. ^{^e}Jedén) Blood lactate measured at the end of exercise decreased with the duration of the exercise, when assessed in cross-country skiers distancing 10-85 km. H.Clones

- 4317.** EFFECT OF MUSCULAR ACTIVITY ON LACTATES, pH AND PLASMA FATTY ACIDS. A. De Coster, M. Levarlet, v.Conard and J.R.M.Jrancckson: C.R. Soc. Biol., Paris, 1962, 156, 1937-1939 (Lab. de Med. expt., Univ. Libre de Bruxelles, Belgium) Muscular activity resulted in a reduction in total plasma fatty acids[#]. During const. activity this reduction was accompanied by an increase in lactic acid. During increasing activity the increase in lactic acid was less significant, while the increase in fatty acid content did not vary with the degree of muscular activity. (French) M.A.Price

- 4318.** ACTION OF ADRENALINE AND GLUCAGON ON GLYCAEMIA, PLASMA LACTATES AND FATTY ACIDS. M.Levarlec C.R. Soc. Biol., Paris, 1962, g*. 1940-1942 (Lab. de Méd. expt., Univ. Libre de Bruxelles, Belgium) Injns. of 10 µg. glucagon/kg. or 0.5 µg/kg. adrenalin to pentobarbital anaesthetised dogs increased blood glucose level to 150 mg./100 ml. Glucagon did not effect plasma lactic acid cemcn. while adrenalin increased the level from 19 to 45 mg./100 ml. Adrenalin increased the fatty acid content of the femoral fatty. a?d vein « Glucagon induced a slight increase in the content of the femoral artery but not of the vein. (French) M.A.Price

- 4319.** CHANGES IN RAT PLASMA AND SERUM CALCIUM DURING STORAGE. A.L.Wilk and C.T.G.King Nature, Dent-B, 1963, 198, 187-188 (Lab. Biochem., Nat. Inst. W.W.?) ^{^e}esda, Md., U.S.A.) Rat plasma after ^{^F}ated to months showed a drop in the Ca level when d. in ^y ^{^e} Munsan technique unless the sample was maintained at the ⁰ S?P⁴terstorag e. G.M.Uwis

- 4320.** INFLUENCE OF PARTIAL PRESSURE OF O₂ ON TOTAL SERUM-CALCIUM CONCENTRATION. F.-Radcliff, P.E.Baume and W.O.Jones: Lancet, 1962, 2, 1249-1251 (fost. Med. Res., Royal North Shore Hospt. Sydney, Australia) Blood for the estimation of serum-calcium concen> should be taken without the vein or exercising the arm. ~C JLBell

4321. ERRORS RELATED TO VARIATIONS IN BLOOD PROTEIN LEVEL IN THE CALCULATED VALUE FOR IONISED CALCIUM IN SERUM. J.Paupe: C.R.Soc. Biol., Paris, 1962, 156, 1591-1593 (Lab. Pathol., Fac. de Méd., Paris, France) From an estimation of the serum Ca level in human subjects by bioassay on the isolated heart of toad, errors were demonstrated in the graphical method of free Ca estimation based on total serum Ca and serum protein level. This error was apparent in subjects with abnormal serum protein levels as in hyperglobulinaemia. In this case, the value for free Ca as determined by graphical methods was lower than that obtained by bioassay. (French) M.A.Price

- 4322.** DETERMINATION OF CALCIUM AND MAGNESIUM IN BLOOD PLASMA BY MEANS OF SODIUM TRIPOLYPHOSPHATE. YeJ.Galkina and S.F.Zavgorodnyi: Vop. Med. Him., 1963, 9, 207-209 (Chair Ihorg. Analyt. Chem., State Med. Sch., Rostov, U.S.S.R.) Ca and Mg can be determined directly in dil. plasma adjusted to pH 10.0 with NH₃ by titration with Na tripolyphosphate (Na₅P₃Qio). Mg alone is determined after pptn. of Ca as CaCO₃. J.R.Sargent

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- 4323.** RECORDING OF INVISIBLE MOVEMENTS OF ROOT OF TONGUE AND OF LARYNX WHICH ACCOMPANY THOUGHT AND COMPARISON WITH THOSE OBSERVED DURING SPEECH AND WHISPERING. M.Marchat C.R. Acad. Sci., Paris, 1962, 255, 382-384. Movements of the tongue and larynx were recorded by 'Kinedensography' in subjects speaking, whispering or thinking of a number. Traces from different subjects for the same number were similar. The movements observed during thought, though slight, were similar to those observed during speech. Kinedensography involves observation of the changing X-ray shadows with a radio-electric receptor and display as a moving trace. (French) S.A.Thistlewood

- 4324.** RESPIRATORY RESPONSES MEDIATED THROUGH SUPERFICIAL CHEMOSENSITIVE AREAS ON MEDULLA. R.A.Mitchell, H.H.Loescheke, W.H.Mission and J.W. Severinghaus: J. appl. Physiol., 1963, 18, 523-533 (Cardiovasc. Res. Inst., Univ. California Med. Center, San Francisco, Calif., U.S.A.) A chemosensitive area on the surface of the medulla in the subarachnoid space has been demonstrated by perfusing with modified CSF. Respiration was stim. by increased PCO₂, increased [H+] and depressed by procaine, NaCN, lobeline, cold, decreased PCO₂ and [H+] H.C.Jones

- 4325.** SPECIFICITY OF H ION CONCENTRATION AS CAROTID CHEMORECEPTOR STIMULUS. T.F.Hornbein and A.Roos: J. appl. Physiol., 1963, 18, 580-584 (Div. Anesthesiol., Washington Univ. Med. Sch., St. Louis, Mo., U.S.A.) The electrical activity of the cat Hering nerve was recorded during variations in [H+] pCO₂ and PO₂ of arterial blood. The results suggest that [H+] was the primary chemoreceptor stimulus, CO₂ acting through its affect on [H+]. H.C.Jones

- 4326.** INFLUENCE OF PARTIAL PRESSURE OF O₂ ON COMPLIANCE OF ISOLATED BRONCHIAL TREE OF

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GUINEA-PIG. F.Hagemeijer, A.Vanwijck and J.M. Petit Arch. int. Physiol., 1962, 70, 469-475 (Inst. L. Fredericq, Univ. Liège, Belgium) Pressure/vol. diagrams of isolated trachea and lungs of guinea-pig were made in vitro at 37°, pH 7*3, PCO₂ 41 mm.Hg and pO₂ varying from 0-658 mm.Hg. Of 19 prep, which responded normally to ACh 9 showed anoxic broncho-dilatation while the others gave no response. There was no evidence for a direct broncho-constrictor action of anoxia.
 (French) M.E.Nutt

4327. CHANGES IN COMPLIANCE IN RABBITS SUBJECTED TO ACUTE BRONCHOCONSTRICCTION. N.R. Anthonisen: J. appl. Physiol., 1963, 18, 539-543 (Physiol. Dept., Dartmouth Med. Sch., Hanover, N.H., U.S.A.) During bronchospasm induced in anaesthetised rabbits by injn. of acetyl 3-niethylcholine, the functional residual capacity increased and the dynamic compliance decreased. The results suggest that the airway occlusion accounted for part of the decrease in compliance. Bronchoconstriction in artificially ventilated animals reduced the semistatic compliance. H.CJones

4328. RELATION BETWEEN WORK OUTPUT OF RESPIRATORY MUSCLES AND END-TIDAL CO₂ TENSION. J.Milic-Emili and J.M.Tyler: J. appl. Physiol., 1963, 18, 497-504 (Physiol. Dept., Harvard Sch. Publ. Hlth., Boston, Mass., U.S.A.) A linear relationship was found between work output of the inspiratory muscles in man and end-tidal CO₂ tension. It was not affected by the addition of resistances to inspiration. No consistent relationship was found between ventilation or the work output of the expiratory muscles and end-tidal CO₂ tension. H.CJones

4329. DIRECT MEASUREMENT OF RESPIRATORY PLEURAL PRESSURE CHANGES IN NORMAL MAN. W.J.Daly and S.Bondurant J. appl. Physiol., 1963, 18, 513-518 (Med. Dept., Indiana Univ. Med. Sch., Indianapolis, Ind., U.S.A.) Pressures recorded from the pleural space in man showed that respiratory pressure changes vary in different pleural sites. A large pneumothorax equalised the respiratory pressure changes but the oesophageal respiratory pressure change was not affected by a pneumothorax. Acute central vascular engorgement resulted in similar changes in intrapleural and oesophageal respiratory pressure changes. H.CJones

4330. NUMERICAL INDEX OF STABILITY OF LUNG EXPANSION. P.Gruenwald: J. appl. Physiol., 1963, 18, 665-367 (Pathol. Dept., Sinai Hosp., Baltimore, Md., U.S.A.) A numerical index of stability of lung expansion has been devised using pressure-vol. curves of infants lungs obtained at autopsy. The values obtained fell into two groups of good and poor stability. Results have also been obtained from other mammals. H.CJones

4331. VOLUME-PRESSURE RELATIONSHIPS DURING PRESSURE BREATHING AND VOLUNTARY RELAXATION. L.F.Johnson jun. and J.Mead: J. appl. Physiol., 1963, 18, 505-508 (Physiol. Dept., Harvard Sch. Publ. Hlth., Boston, Mass., U.S.A.) Lung vol. during pressure breathing were measured using a body plethysmograph with pressure applied through a breathing tube, and secondly by applying external pressure to the body and recording lung vol. through a bag-box system. The first method gave results which were closest to those obtained by relaxation pressure measurements. H.CJones

4332. LUNG VOLUMES AND VENTILATORY RESPONSES TO HIGH CO₂ AND LOW O₂ IN THE AMA. S.H.Song, D.H.Kang, B.S.Kang and S.K.Hong: J. appl. Physiol., 1963, 18, 466-470 (Physiol. Dept., Yonsei Univ. Med. Coll., Seoul, Korea) Korean diving women had a higher lung vital capacity and a higher inspiratoiy capacity than control subjects. Max. inspiratory pressure for a given lung vol. was higher for diving women but max. expiratory pressure and resting alveolar gas composition was the same for both groups. H.CJones

4333. RELATION BETWEEN ANATOMICAL RESPIRATORY DEAD SPACE, BODY SIZE AND LUNG VOLUME. M.G. Hart, M.M.Orzalesi and C.D.Cook: J. appl. Physiol., 1963, 18, 519-522 (Med. Dept., Children's Hosp. Met Center, Boston, Mass., U.S.A.) The respiratory anatomical dead space measured by die N₂ washout method, was found to correlate with height, body wt. surface area, and functional residual capacity. There was no difference in dead space values for τ and Ψ . Dead space appeared to have a const. relation with height from infancy to adult* hood. H.CJones

4334. VENTILATORY POSITION AND DYNAMIC PULMONARY RESISTANCE. R.Marcelle, J.M.Petit and J. Troquec Arch. int. Physiol., 1962, 70, 476-482 (Inst. L. Fredericq, Univ. Liege, Belgium) Dynamic pulmonary resistance was measured in 6 normal 0° adults by interruption of air-flow during slow forced inspiration and expiration of 1 l. of air, utilising successively, the whole range of the vital capacity. Dynamic resistance is obtained by relating the change in buccal p. on interrupting air-flow (this represents the alveolar-buccal p. gradient) to the rate of flow immediately prior to the interruption. Resistance to both inspiration and expiration increases progressively as the ventilatory position is displaced towards max. forced expiration in the expiratory reserve zone. It remains relatively const, in the inspiratory reserve zone. (French) M.E.Nutt

4335. MEASUREMENT OF THORACIC GAS VOLUME IN NEWBORN INFANT. P.A.M.Auld, N.M.Nelson, R.B. Cherry, A.J.Rudolph and C.A.Smith: J. clin. Invest., 1963, 42, 476-483 (Dept. Pediat., Harvard Med. Sch., Boston, Mass., U.S.A.) Thoracic gas vol. [TGV] and total lung capacity [TLC] were established within a few W after birth in normal infants and increased little during subsequent neonatal life. A decrease in TGV and TLC was observed in newborn infants with the hyaline memj* brane syndrome, the decrease in vol. occurring early in the disease. Trapped gas seemed to exist in the lungs of some normal newborn infants. K Jones

4336. PEAK FLOW RATES IN NORMAL AND ASTHMA CHILDREN. P.J.D.Heaf and M.S.Gillam: Brit. med. J., 1962, 1, 1595-1596 (University Coll. Hosp., London, England). M.E.Nutt

4337. INDEX OF ALVEOLAR VENTILATION. S.T.A.Lichtneckert and C.E.G.Lundgren: J. appl. Physiol., 1963*, 18, 639-645 (Lab. Aviation Med., Physiol. Inst., Västerås, Lund, Sweden) An expression for alveolar ventilation efficiency is given which is based on an analysis of N₂ elimination from air-containing lungs during O₂ breathing. N₂* J_0 in the end tidal air is measured. The alveolar ventilation index was calc. in several expt. and good reproducibility was obtained. H.CJones

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4338. ALVEOLAR GAS EXCHANGE DURING BREATH HOLDING WITH AIR. E.H.Lanphier and H.Rahn: J. appl. Physiol., '1963, 18, 478-482 (Physiol. Dept., State Univ. New York, Buffalo, N.Y., U.S.A.) During breath holding with air and during exercise, O₂ uptake slowly declined and CO₂ transfer fell to zero as the alveolar pCO₂ rose. Arterial PCO₂ became equal to mixed venous pCO₂ and then exceeded it. H.C.Jones

4339. ALVEOLAR GAS EXCHANGE DURING BREATH-HOLD DIVING. E.H.Xanphier and H.Rahn: J. appl. Physiol., 1963, 18, 471-477 (Physiol. Dept., State Univ. New York, Buffalo, N.Y., U.S.A.) Breath-hold dives up to 33 ft. were simulated in a recompression tank. O₂ uptake was normal until the ascent owing to maintenance of alveolar pO₂ by the increased ambient pressure. CO₂ was taken up during the descent, longer dives were made possible by hyperventilation before rehand. H.C.Jones

4340. ALVEOLAR GAS EXCHANGE DURING SUBMARINE ESCAPE. A.B.DuBois, G.J.Bond and K.E.Schaefen: J. appl. Physiol., 1963, 18, 509-512 (Physiol. Dept., Grad. Med. Sch., Univ. Pennsylvania, Philadelphia, Pa., U.S.A.) The alveolar PCO₂ was found to be the same at the beginning as at the end of a buoyant ascent, from a depth of 90 ft. pO₂ indicated normal arterial O₂ saturation. H.C.Jones

4341. DIVING PATTERN, LUNG VOLUMES, AND ALVEOLAR GAS OF THE KOREAN DIVING WOMAN (AMA). ^K.Hong, H.Rahn, D-H.Kang, S.H.Song and B.S.Kang: J. appl. Physiol., 1963, 18, 457-465 (Physiol. Dept., Division of Medicine, Seoul University, Korea) Unassisted divers of Korean women were typically to a depth of 45 ft. holding 30 sec. averaging 60 dives/hr. Before a dive, men hyperventilated and the lungs were filled to 100% of vital capacity. Both O₂ and CO₂ were removed from the lungs during a dive, the CO₂ uptake having accounted for by gas compression. O₂ pressure was at the bottom of a dive but fell rapidly during ascent. H.C.Jones

4342. EFFECT OF EXERCISE ON PULMONARY DIFFUSING CAPACITY. C.M.Tuiino, E.H.Bergofsky, R.M.Goldberg and A.P.Jishman: J. appl. Physiol., 1963, 18, 478-482 (Med. Dept., Columbia Univ., Coll. Physn. and Physiol., New York City, N.Y., U.S.A.) Pulmonary diffusing capacity for O₂ (DLO₂) was found to increase with severity of exercise, and to increase to a greater extent than CO₂ at the same level of exercise. At rest, the level of exercise DLO₂ exceeded DLCO by a lesser extent than can be accounted for by the difference in diffusion rates of the two gases. Body position did not influence DLO₂ and DLCO during exercise. H.C.Jones

A.C. MONITORING FUNCTION IN NEWBORN INFANT! ALVEOLAR-ARTERIAL OXYGEN GRADIENT. N.M.Nelson, T.L.S.Prod'horn, R.B.Cherry, P.J.Upsitz and C.A. Deppert: J. appl. Physiol., 1963, 18, 534-538 (Pediat. Dept. Harvard Med. Sch., Boston, Mass., U.S.A.) The venous admixture component of alveolar-arterial O₂ gradient has been measured in infants. The high gradients found in both normal babies and babies with respiratory distress syndrome accounted for by a shunt flow revealed good air breathing, as distribution of ventilation was good. H.C.Jones

4344. EFFECT OF A SYSTEMIC ARTERIO-VENOUS FISTULA AND OF PULMONARY EMBOLISATION ON

DIFFUSING CAPACITY. M.H.Williams and B.J.Sobel: J. appl. Physiol., 1963, 18, 553-556 (Cardioresp. Lab., Grasslands Hosp., Valhalla, N.Y., U.S.A.) Pulmonary diffusing capacity in dogs was increased by the opening of an a-v. fistula and was slightly decreased by pulmonary embolisation. H.C.Jones

4345. RADIOACTIVE XENON FOR STUDIES OF REGIONAL LUNG FUNCTION. COMPARISON WITH 1502. C.T. Dollery, P.Hugh-Jones and C.M.E.Matthews: Brit. med. J., 1962, ii, 1006-1016 (Postgrad. Med. Sch., London, England) ¹³³Xe was taken as a single breath and distributed to different lung areas measured. Blood flow was deduced from clearance slope during breath-holding. Relatively insol. ¹³³Xe entered both well and badly ventilated areas of lung during rebreathing from a close-circuit spirometer and ventilation of different regions was compared by time of washout on resuming air breathing. ¹³³Xe gave more information about badly ventilated areas than did single breaths of O₂. Comparisons of blood flow were made by injecting ¹³³Xe dissolved in saline i.v. and observing the amount evolved in different regions of lung. Xe and O₂ gave similar results for most purposes, but ¹³³Xe was useless for detecting left to right shunts for which CO₂ labelled with ¹⁵⁰O is valuable. ¹⁵⁰O₂ can be used to measure flow rate and changes in it, but Xe only determines relative flow through areas. Normal subjects had low blood flow through upper zones of lungs in contrast to subjects with mitral stenosis who had high upper zone and limited lower zone flow. Both methods revealed regional ventilation abnormalities not apparent from chest radiographs. M.E.Nutt

4346. REBREATHING METHOD FOR DETERMINATION OF MIXED VENOUS pCO₂. E.J.M.Campbell and J.B.L. Howell: Brit. med. J., 1962, ii, 630-631 (Dept. Med., Middlesex Hosp., London, England) Factors affecting the two-stage rebreathing method for measurement of mixed venous pCO₂ are discussed. Vol. of gas in the bag should be not more than twice the tidal vol., but exact ratio is not critical. Suitable equipment, practical problems and variations in technique are described.

M.E.Nutt

4347. REBREATHING METHOD FOR DETERMINING MIXED VENOUS pCO₂ DURING EXERCISE. C.H.Ashton and G.J.R.McHardy: J. appl. Physiol., 1963, 18, 668-671 (Pharmacol. Dept., Middlesex Hosp. Med. Sch., London, England) The rebreathing method for determining mixed venous PCO₂ in subjects at rest has been modified for use in subject in exercise. The accuracy of the method and possible sources of error are discussed. H.C.Jones

4348. RESPONSE TO HIGH PRESSURE OXYGEN OF CONSCIOUS VOLUNTEERS AND PATIENTS. C.A.Foster and L.Churchill-Davidson: J. appl. Physiol., 1963, 18, 492-496 (Anaesthetics Dept., St. Thomas's Hosp., London, England) The results of exposure to high pressure O₂ of normal subjects and patients with malignant tumours are described. Subjects at rest did not show signs of toxicity after 1 hr. at 3 atm. O₂ pressure. H.C.Jones

4349. EFFECT OF VARIOUS MODES OF O₂ ADMINISTRATION ON ARTERIAL GAS VALUES IN PATIENTS WITH RESPIRATORY ACIDOSIS. D.J.Massaro, S.Katz and P.C.Luchsingen: Brit. med. J., 1962, ii, 627-629 (Georgetown Univ. Med. Sch., Washington, D.C., U.S.A.) Patients with respiratory acidosis (15) were

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divided into groups receiving O₂ by mask for 10 min., O₂ by nasal catheter for 10 min. and O₂ by nasal catheter for 150-240 min. Hypo-oxia was not relieved for an appreciable time by intermittent O₂ and often became worse on its cessation. PCO₂ increased in all groups given O₂*. Continuous O₂ by catheter gave sustained increase in arterial pO₂, but acidosis seriously worsened in 2 subjects. Administration of O₂ to patients with respiratory acidosis should be by mechanical respirator or with pharmacological stimulant to ensure continued alveolar ventilation.

M.E.Nutt

4350. RELATION OF ARTERIAL HYPO-OXAEMIA TO THE HYPERVENTILATION OF CHRONIC LIVER DISEASE.

R.E.Snell and P.C.Luchsinger Amer. J. med. Sci., 1963, 245, 289-292 (Cardiopulmonary Physiol. Res. Lab., Mt. Alto V.A. Hosp., Washington, D.C., U.S.A.) In patients with chronic liver disease no correlation exists between hyperventilation and arterial hypo-oxaemia.
E.E.Hobbiger

HEART

4351. RECORDING OF MECHANICAL ACTIVITY OF THE SEMI-ISOLATED HEART OF PORCELLIO DILATATUS, (SPONTANEOUS ACTIVITY AND INDUCED RHYTHM). A.Holley and Y.M.Gargouil: C.R. Soc. Biol., Paris, 1962, 156, 1910-1915 (Lab. de Physiol. animale, Fac. des Sci., Poitiers, France) In the recording of activity of the heart of *P. dilatatus* via a transducer, the heart remained attached to a section of integument. The ventral nerve cord was removed during dissection. A const. recording of heart beat was obtained for 1 hr. at 280 beats/min. Electrical stimm. of an inactive heart resulted in a return to rhythmic activity. (French) M.A.Price

4352. MOVEMENTS OF Ca IN FROG HEART VENTRICLES AT REST AND DURING CONTRACTURES. R.Niedergerke: J. Physiol., Lond., 1963, 167, 515-550 (Biophys. Dept., University Coll., London, England) To test the hypothesis that Ca inward movement initiates the contraction of heart cells 45Ca was used to examine the Ca fluxes in frog heart ventricles. Ca influx was facilitated by application of 'contracture fluids' which contained reduced Na concn. and either normal or increased K concn. The magnitude of this effect increased, similarly to the strength of the observed contractures, with increasing depletion of Na and also on addition of K. Approx. influxes in fibres of average size (at room temp.): are (a) resting influx, 0.009 p-mole/cm², sec⁻¹ (b) influx associated with 'threshold' contracture, 0.11 p-mole/cm², sec. Ca efflux was also facilitated by these 'contracture-fluids'; large effluxes were found associated with relaxation after max. contractures induced by Na-free fluids.

4353. MOVEMENTS OF Ca IN BEATING VENTRICLES OF THE FROG HEART. R.Niedergerke: J. Physiol., Lond., 1963, 167, 551-580 (Biophys. Dept., University Coll., London, England) Periods of electric stimm. increased the influx and also the efflux of Ca in ventricles of the frog heart, both fluxes being determined by means of 45C. The magnitude of the extra-influx depended, like the strength of the heart beat, on the ratio [Ca]/[Na]² in the external fluid. Approx. values of the influx/beat in fibres of average size: 0.15, 0.23 and 0.25 p-mole/cm². in the presence of 1 mM Ca-Ringer, 2 mM Ca

Ringer and 0.5 mM Ca, 50% Na-50% choline Ringer, respectively. The extra-efflux/beat was of similar magnr. aide as the extra-influx. *

4354. EFFECTS OF ALDOSTERONE ON CONTRACTILE AND ELECTRICAL PROPERTIES OF DRIVEN ISOLATED RABBIT ATRIA. J.V.Levy and V.Richards: Proc. Soc. exp. Biol., N.Y., 1962, 111, 602-606 (Surg. Res. Lab., Presbyterian Med. Center, San Francisco, Calif. U.S.A.) Both the natural and racemic isomers of aldosterone had no significant effect on the contractile prop. of driven isolated rabbit atria.

M.M.Shapland

4355. CARDIOTONIC ACTION OF (+)-ALDOSTERONE. A.Loubatieres and A.Sassine: C.R. Acad. Sci., Paris, 1962, 255, 374-376 (Lab. de Physiol. appliquee., Fac. de Med., Montpellier, France) 5-10-5 or 5*10⁻⁶ fig./ml. of (+)-aldosterone were added to the soln. bathing a prep. of isolated papillary muscle from the right cardiac ventricle of the cat. The drug delayed the onset of fatig^{ue} on repeated stimm. of fresh muscle but did not relieve fatigue already established. 3*10⁻⁴ jjg./ml. (+)-aldosterone are found in normal human plasma and may be concerned in maintaining cardiac tone.

(French) S.A.Thistlewood

4356. EFFECT OF THYROXINE ADMINISTERED IN VITR^O AND IN VIVO ON SUCCINOXIDASE AND MALIC DE; HYDROGENASE REACTIONS OF FROG MYOCARDIUM. P.V.Tishler: Endocrinology, 1963, 72, 673-676 (Dept. Med., Harvard Med. Sch., Boston, Mass., U.S.A.)

In vitro administration of thyroxine to frog myocardial homogenates resulted in enhanced succinate oxidation and inhib. malate oxidation. These effects were not seen following in vivo administration, malate oxidation being slightly stimulated.

H.C.Jones

4357. TURNOVER RATES OF NORADRENALINE [NA] IN HEARTS OF INTACT MICE, RATS AND GUINEA-PIGS USING TRITIATED NORADRENALINE. R.Montanari, E.Costa, M-A.Beaven and B.B.Brodie: life Sci., 1963, 4, 232-240 (Lab. Chem. Pharmacol., Nat. Heart Inst., Bethesda, Md., U.S.A.) NA was formed continually at a const. rate, as studied using PH³NA. The labelled amine was taken up into a readily miscible pool and then slowly diffused into a second pool. At equilibration, the slope of the exponential decline in radioactivity was related to, but not equal to, the rate of NA synthesis.

K.Jones

4358. TURNOVER OF NORADRENALINE [NA] IN THYROID TOXIC AND NONTHYROTOXIC MICE. M.A.Beaven, E.Costa and B.B.Brodie: life Sci., 1963, 4, 241-247 (Lab. Chem. Pharmacol., Nat. Heart Inst., Bethesda, Md., U.S.A.) The total NA content of the heart remained unaltered, although the concn. of endogenous NA was decreased after triiodothyronine treatment, as shown using ³HNA. The rate of synthesis of endogenous NA was not affected by triiodothyronine administration. The symptoms of hyperthyroidism cannot be explained on basis of more rapid formation of NA.

A.Jones

4359. CARDIOVASCULAR EFFECTS OF THYROXINE, TREATMENT IN HYPOPHYSECTOMISED RATS. J.J.^oUnak: Circulat. Res., 1963, 12, 333-340 (Dept. of Physiology, Univ., Ottawa, Canada) Thyroxine treatment restores the cardiac output, work etc measured under JV_d barbital anaesthesia. It does not enable the heart to respond just to acute expansion of blood vol. or to chronic a^or constriction as effectively as in a normal rat.

R.E.Moore

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- 4360.** CARDIOVASCULAR EFFECTS OF INFUSION OF ADRENALINE AND ANGIOTENSIN SINGLY AND IN COMBINATION^t: P.F.Binnion and J.DJHatcher. Circulat. Res., 1963, 12, 393-398 (Dept. Physiol., Queen's Univ., Kingston, Ont., Canada) A transient augmentation of cardiac output and stroke work was observed ^{**} aogs under Na pentobarbital when the two substances were administered at the same time, suggesting a degree of interaction between them. R.E.Moore
- 4361.** INHIBITION OF ACh-INDUCED ATRIOVENTRICULAR BLOCK BY K. CFisch, H.Feigenbaum and J.A. Weiss: J. clin. Invest., 1963, 42, 563-569 (Kramnert Heart Res. Inst., Marion County Gen. Hosp., Indianapolis, Ind., U.S.A.) Elevation of the plasma K from control mean of 3⁴ mequiv./l. to a mean of 6¹ l⁻¹ v/l. inhibited the ACh-induced block and prevention of the p wave and segment in dogs. This ACh effect of moderate hyperkalaemia is discussed. A Possible explanation of the paradoxical behaviour of A_V conduction in patients with atrial fibrillation treated with digitalis and with K. K.Jones
- 4362.** MECHANISMS OF CARDIAC ARREST PRODUCED BY POTASSIUM. B.Surawicz and L.S.Gettes: Circulat. Res., 1963, 12, 415-421 (Univ. Vermont Coll. Med - Burlington, Vt., U.S.A.) Transmembrane potentials and e.c.g. were recorded from fibres in the isolated Perfused rabbit heart. The arrest observed on changing from normal K⁺ concn. is attributed to pacemaker taMbn. The normal velocity of repolarisation was much increased in the myocardium whilst resting potential² and upstroke velocity of action potential were little changed. R.E.Moore
- 4363.** DYCARDIA IN HUMAN DIVERS. LJrving: J. Physiol., 1963, 18, 489-491 (Arctic Hlth. Res. Ctr. Box 960, Anchorage, Alaska, U.S.A.) In & records showed that bradycardia develops rapidly in subjects during apnoea in air and when submerged in water. H.C. Jones
- 4364.** RELATION BETWEEN RATE AND AMPLITUDE IN ATRIAL MYOCARDIUM OF HAMSTER COMPARED WITH THAT IN GUINEA-PIG AND RAT. V.Kruta and JskalovS: Arch. int. physiol., 1962, 70, 443-458 (Inst. of Med., J.E.Purkyne Univ., Brno, Czechoslovakia) The relation between amplitude and rate of contraction of the electrically driven atrium of the guinea-pig, rabbit, cat and dog is represented by a triphasic curve with a min. amplitude at 40-60/min. (postural contractility). In the rat the curve amplitude/rate is hyperbolic. In the hamster atrium at 2T and below, the relationship of amplitude to rate follows the more common pattern but at 34¹ and above, it is a hyperbolic curve with a min. amplitude at 300-400/min. (optimal contractility). Between 2ST and 34T the amplitude is intermediate in type, amplitude is low freq. then decreases and increases again with increased rate to a low optimum reached at fairly low rate. Anoxia or metabolic inhibitors (fluoracetate, iodoacetate, DNP) progressively convert the typical triphasic pattern of guinea-pig auricle into an intermediate type. M.E.Nutt (French) M.E.Nutt
- 4365.** EFFECT OF CONTINUOUS ADMINISTRATION OF ANGIOTENSIN ON VENTRICULAR FUNCTION. S.E.Dorning and E.H.Sonnentag: J. appl. Physiol., 1963, 18, 585-592 (Lab. Cardiovasc. Physiol., Natl. Heart Inst., N.I.H., Bethesda, Md., U.S.A.) Administration of angiotensin II to cats resulted in a greater increase in b.p. than with noradrenaline, but only a transient increase in ventricular contractility was seen. In some cases myocardial depression occurred and small reductions in coronary blood flow were sometimes seen at the same time. H.C. Jones
- 4366.** SYNCHRONICITY OF VENTRICULAR CONTRACTION: OBSERVATIONS COMPARING HAEMODYNAMIC EFFECTS OF ATRIAL AND VENTRICULAR PACING. J.P.Gilmore, SJ.Samoff, J.H.Mitchell and RJXinden: Brit. Heart J., 1963, 25, 299-307 (Lab. Cardiovasc. Physiol., Natl. Heart Inst., Bethesda, Md., U.S.A.) Central pressure and aortic flow were recorded in dogs with open chests to investigate the effect on cardiac function of electrical pacing applied to atria or ventricles at a rate slightly above the spontaneous heart rate. Ventricular function curves relating stroke work to atrial or ventricular end-diastolic pressure were obtained with repeated blood transfusions during periods of electrical stimm. When atrium and ventricle contract at or about the same time instead of sequentially, the ventricle is deprived of atrial contribution to ventricular filling, mean atrial pressure rises in relation to left ventricular end-diastolic pressure, the end-diastolic pressure is lower, and the ventricle produces less external work; when the ventricle is caused to contract as the result of direct electrical stimm. instead of a normally propagated impulse, it will produce less external work from any given end-diastolic pressure. Haemodynamic evidence suggests that this is due at least in part to a less synchronous ventricular contraction. P.F. Meyer
- 4367.** LEFT VENTRICULAR FILLING PRESSURE GRADIENT IN MITRAL INCOMPETENCE. P.CF.Nixon and G.H. Woolen: Brit. Heart J., 1963, 25, 382-388 (Dept. Thoracic Surg., Gen. Infirmary, Leeds, England) Simult. left atrial and left ventricular pressure tracings, recorded in 5 patients with mitral incompetence, showed an abnormally large left ventricular filling pressure gradient in predominant mitral incompetence when there was a degree of fusion of the mitral valve cusps, and also in pure mitral incompetence. This gradient disappears when the heart rate is slow. P.F.Meyer
- 4368.** EFFECT OF COCARBOXYLASE ON CARDIAC OUTPUT IN ACUTE HYPO-OXIA. Z.Nagy and L.Skolnik: Acta med. Acad. Sci. hung., 1962, 19, 59-66 (2nd Dept. Med., Univ. Med. Sch., Budapest, Hungary) Lv. administration of 50 mg. cocarboxylase to dogs rendered hypo-oxic by breathing an O₂-low mixture reduced the rise in cardiac output seen under control conditions, although there was no concomitant change in the degree of arterial desatn. Cocarboxylase had no effect on the cardiac output of animals with normal arterial O₂ satn. CF.Blane
- 4369.** ON-LINE COMPUTATION OF CARDIAC OUTPUT FROM DYE DILUTION CURVES. H.H.Hara and J.W. Bellville: Circulat. Res., 1963, 12, 379-385 (Beckman/Berkeley Div., Richmond, Calif., U.S.A.) An analogue computer circuit for calculating cardiac output and mean transit time is described which receives as its input the output of a cuvette densitometer. R.E.Moore
- 4370.** DETECTION AND MEASUREMENT OF EXPERIMENTALLY PRODUCED AORTIC REGURGITATION BY

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MEANS OF INDICATOR-DILUTION CURVES RECORDED FROM THE LEFT VENTRICLE. E.Arrielin, L.Michaels, H.W.Marshall, D.E.Donald, R.J.Cheeseman and E.H. Wood: *Circulat. Res.*, 1963, 12, 269-290 (Mayo Clin.. Rochester, Minn., U.S.A.) Acute or chronic aortic incompetence was produced surgically in dogs. The regurgitant fraction, which was calc. from left ventricular dye-diln. studies, following aortic root injn., correlated well with the incompetence as determined by post-mortem pressure-flow observations. Neither catheter tip position nor time of injn. in relation to cardiac cycle were major determinants of the calc. back flow.
R.E.Moore

4371. COMPARISON OF CENTRAL AND PERIPHERAL INJECTION SITES IN THE ESTIMATION OF CARDIAC OUTPUT BY DYE DILUTION CURVES. G.A.Bousvaros, W.H.Palmer, P.Sekelj, M.McGregor: *Circulat. Res.*, 1963, 12, 317-321 (Royal Victoria Hosp., Montreal, Canada) Injn., with flushing, into an antecubital vein was as efficient as central injn. in human subjects.
R.E.Moore

4372. EFFECT OF ACUTE PULMONARY ARTERY CONSTRICKTION ON FORM OF THE INDICATOR-DILUTION CURVE. R.C.Little, B.H.Brundage, R.A. Orlando and Pwr Moedjona: *Proc. Soc. exp. Biol.*, N.Y., 1962, 111, 786-788 (Dept. Physiol., Seton Hall Coll. Med. and Dent., Jersey City, N.J., U.S.A.) Time requirements for the various parts of the indicator-diln. curve decreased with mild pulmonary artery constriction and increased with more severe reduction in artery lumen. Peak concn. of dye decreased with increasing constriction. It is suggested that the form of the curve is dependent upon degree of cardiac compensation as well as severity of the constriction.
M.M.Shapland

4373. DETECTION AND QUANTITATION OF INTRACARDIAC LEFT-TO-RIGHT SHUNTS BY AN OKIMETRIC INERT GAS TECHNIQUE. R.C.Wood, H.W. Marshall and E.J.H.Wood: *Circulation*, 1963, 27, 351-359 (Mayo Clin., Rochester, Minn., U.S.A.) Changes in blood O₂ satn. at sites within the right heart and a systemic artery produced by breathing a small amount of an inert gas were recorded by oximetry. This technique permitted even quite small left-to-right shunts to be calc.
R.S.Duff

4374. DISTRIBUTION OF HEART POTENTIALS ON THE THORACIC SURFACE OF NORMAL HUMAN SUBJECTS. B.Taccardi: *Circulat. Res.*, 1963, 12, 341-352 (Inst. Cardiol. Sperimentale, Via Bellerio 43, Milano, Italy) A series of isopotential lines were plotted for the QRS complex. These showed two 'sources' and 'sinks' for parts of the cycle and one during other parts.
R.E.Moore

4375. ELECTRICAL AND ANATOMICAL STUDY OF PURKINJE SYSTEM OF CANINE HEARTS. M.S.Spach, S. Huang and C.R.Ayeis: *Amer. Heart J.*, 1963, 65, 554-673 (Dept. of Pediat., Duke Univ. Sch. Med., Durham, N.C., U.S.A.) The activation of the conducting system and adjacent muscle of the subendocardium of the entire left ventricle and right ventricular free wall were studied in the intact canine heart by means of plunge electrodes. Penetration of Purkinje potentials to a depth of 3-4 mm. beneath the endocardial surface was recorded first in mid left septal surface areas 1-1*5 cm. below the bifurcation of the left bundle. No such penetration occurred in the upper left septal surface. Measurement of the period between Purkinje potentials and adjacent muscle activation suggested that muscle activation begins in the

lower left septal surface 2-3 mm. below the endocardial surface. Purkinje potentials recorded in the right ventricular free wall indicated that the activation wave to this area is transmitted by the peripheral conducting system. There was 81% correlation of the localisation of sp. strands of conducting tissue demonstrated by iodine staining with the recording sites which demonstrated Purkinje potentials.
P.F.Meyer

4376. TECHNIQUE FOR RECORDING MULTIPLE AVIAN EMBRYONIC ELECTROCARDIOGRAMS. S.D.Burton, H.N.Uhley and T.Ishida: *J. appl. Physiol.*, 1963, 18, 650-651 (H.Brunn Inst., Mt. Zion Hosp., San Francisco, Calif., U.S.A.) A unit has been constructed for recording simult. the electrical activity of 8 isolated embryonic chick or duckhearts. The method can be used for biol. assays.
H.C.Jones

4377. E.C.G. CHANGES AT HIGH ALTITUDE. J.S. Milledge: *Brit. Heart J.*, 1963, 25, 291-298 (M.R.C. Lab., Dept. Human Physiol., Holly Hill, Hampstead, London, England) E.c.g. recorded on climbers during an Himalayan expedition at altitudes of 19000-24400 ft. showed a shift of the QRS and T vectors to the right in the frontal plane, and inversion of T waves in the chest leads. O₂ breathing did not usually reverse these changes which suggested right ventricular overload.
P.F.Meyer

4378. ELECTROCARDIOGRAPHS AND CIRCULATORY CHANGES IN PROGRESSIVE MUSCULAR DYSTROPHY. F.Solti, E.Zadory and G.Bekeny: *Acta med. Acad. Sci. hung.*, 1962, 19, 1-10 (1st Dept. of Med., Univ. Med. Sch., Budapest, Hungary) Pathcl. changes in the heart and circulatory dynamics were found in 80% of patients suffering from progressive muscular dystrophy. Stroke vol. was freq. subnormal and peripheral resistance elevated, associated with atypical e.c.g. patterns. It is concluded that those processes which affect the skeletal muscles also influence the cardiac muscle.
G.F.Blane

4379. METHOD FOR INVESTIGATING TRANSTHORACIC AND DIACARDIAC PROPAGATION OF SOUND WAVES. K.W.Victor and P.Heintzen: *Z.Kreisl.-Fisch.*, 1963, 52, 298-305 (Kinderklin., Univ. Kiel, Germany) A sound transmitter placed on the chest wall, and a Ba-titanate receiver placed in the heart or in the oesophagus were used to study the propagation of sound waves through the chest wall or in the heart. The technical details are described, including the amplifier for the transmitter and the preamplifier constructed for the phonocatheter.
(German)
P.F.Meyer

4380. HAEMODYNAMIC CORRELATES OF VARIOUS COMPONENTS OF FIRST HEART SOUND. P.M.Shah, M. Mori, D.M.MacCanon and A.A.Luisada: *Circulat. Res.*, 12, 386-392 (Div. Cardiovasc. Res., Chicago Med. Sch., Chicago, Ill., U.S.A.) Three high freq. components were recognised in the dog, the first 2 originating in the left ventricle and the third in the aorta.
R.E.Moore

4381. CONSTITUENTS OF FIRST HEART SOUNDS IN CLINICAL AND EXPERIMENTAL AORTIC STENOSIS. A. van Bogaert, A. van Genabeek, M.Amoldy, J.Wauerts, H. van der Henst, M.Keireebelik and J.Vandael-Arch. Mai. Coeur, 1963, 56,40-54 (Serv. des Recheiches Cardio-Vasculaires 'Groupe Comte de Launoit' Inst., Bunge) The first heart sound was inaudible in 14/25 cases of aortic stenosis, and clearly heard in the remainder. In dogs with a stenosing ligature round the ascending aorta, the 1st pre-ejection component of the 1st heart sound increased in intensity and the interval between Q waves in the

e.c.g. and onset of the first heart sound was shortened, with the result that the phonocardiogram suggested a pre-systolic murmur. The 2nd pre-ejection component of the 1st heart sound extended its duration and reached into the ejection period. Onset of ventricular strains or excessive ventricular dilation with mitral incompetence reduced the intensity of the 1st and 2nd component of the 1st heart sound with the result that a silent gap appeared between the 1st heart sound and onset of ejection murmur.

(French) P.F. Meyer

4382. CORRELATION OF INTRACARDIA PRESSURE AND PRECORDIAL MOVEMENT IN ISCHAEMIC HEART DISEASE. D.G.Dimond and A.Benchimol: Brit. Heart J., 1963, 25, 389-392 (Inst. f. Cardiopulm. Dis., Scripps Clin. and Res. Fdn., La Jolla, Calif., U.S.A.) The apex cardiogram, a left ventricular pressure tracing and the phonocardiogram were recorded in patients with angina of effort. Angina provoked by mild exercise caused marked accentuation of the 4th heart sound in the Phonocardiogram and an increased amplitude of the atrial component in the apex cardiogram; there was also a rise in left ventricular end-diastolic pressure. These changes were reversed after sublingual nitroglycerol administration. It is suggested that the apex cardiogram can be used to measure changes in left ventricular end-diastolic Pressure.

P. F. Meyer

4383. PHASES OF DIASTOLE IN VARIOUS SYNDROMES OF MITRAL VALVULAR DISEASE. P.C.F.Nixon and G.H.Woolen: Brit. Heart J., 1963, 25, 393-404 (Dept. Thoracic Surg., Gen. Infirmary, Leeds, England)

Left heart pressure pulses, phonocardiograms and displacements curves of the left ventricular apex were recorded in Patients with mitral valve disease. A prolonged phase of filling beginning with the 3rd heart sound was present in every case of severe mitral incompetence; this observation was not consistent with the belief that the 3rd sound is caused by the left ventricle suddenly reaching the limit of extensibility. An analysis of the events occurring at the time of the 3rd heart sound suggests that it is caused by sudden tensing of the mitral cusps and chordae.

P.F.Meyer

4384. SIMPLIFIED THEORY OF SHOCK. FUNDAMENTAL ROLE OF MYOCARDIUM. F.E.Weale: Lancet, 1963, i, 973-976 (St. Bartholomew's Hosp., London, England)

The hypotension of shock is due to acute myocardial failure. Changes in other organs are secondary to a diminished flow of blood. Improvements in the treatment of irreversible shock will depend on the facilitation of the transport of O₂ to the myocardium.

Gil.Bell

4385. SODIUM AND POTASSIUM IN PATHOGENESIS OF 'ELECTROLYTE-STEROID CARDIOPATHY WITH NECROSIS'. P.Prioreschi: Canad. J. Biochem., 1963, 41, 965-968 (List. Expt. Med., Univ. Montreal, Que., Canada)

Groups of rats were treated twice daily with doses of Na₂HPO₄, KCl, Na-cifrate in water by stomach and a suspension of 1-5 mg. of 9a-fluorocortisol in water was inj. s.c. once daily. Rats were killed on the 5th JIV and Na and K were measured in the serum and in the "atria". In the second expt. the treatment was continued for 10 days omitting the K-salt. Following the decrease in myocardial K produced by 9a-fluorocortisol the administration of Na-salts increased the Na content of the heart. The concomitant administration of KCl corrected K depletion and inhibited the entry of Na into the cells.

J.B.Parish

4386. ACYANOTIC FORMS OF TETRALOGY OF FALLOT. G.Gottsegen and B.Zaborszky: Acta med. Acad. Sci.

hung., 1962, 18, 405-416 (Inst. Cardiol., Univ. Med. Sch., Budapest, Hungary) An analysis of the congenital heart diseases generally classified as Fallot's tetralogy. Special consideration is given to the cases where cyanosis is absent.

G.F.Blane

CIRCULATORY SYSTEM

4387. STOCHASTIC MODELS FOR TRACER EXPERIMENTS IN THE CIRCULATION: PARALLEL RANDOM WALKS.

C.W.Sheppard: I. theor. Biol., 1962, 2, 33-47

(Physiol. Div., Tennessee Univ. Med. Units, Memphis, Tenn., U.S.A.) The theory of parallel combinations of simple walks with different horizontal magnifications h and randomising const, k is considered, for use in studying transit times of labelled material through the circulatory labyrinth. Occasions when a parallel system can be approximated by one simple random walk are discussed.

J.A.Dawson

4388. EFFECTS OF FLOW PROFILE ON ELECTROMAGNETIC FLOW METER ACCURACY. S.C.Goldman, N.B.Marple and W.L.^colnik: J. appl. Physiol., 1963, 18, 652-657 (Biomed. Eng. Lab., Sch. Eng. and Appl. Sci., Columbia Univ., New York City, N.Y., U.S.A.) Expt.

have been made to determine the effect of radial asymmetry of the flow profile on the voltage developed by an electromagnetic flow-meter. The results indicate that asymmetry of the flow profile has an important effect on flow measurements and it is possible that these effects occur in closed blood vessels.

H.C.Jones

4389. METHOD FOR STUDY OF PERIPHERAL VASCULAR RESPONSES IN RAT. M.J.Brody, R.A.Shaffer and R.L. Dixon: J. appl. Physiol., 1963, 18, 645-647 (Pharmacol. Dept., State Univ. Iowa Med. Coll., Iowa City, Iowa, U.S.A.) A surgical technique is described for auto-perfusion of the hind quarters of rats anaesthetised with Na pentobarbital. The method can be used for studying peripheral vascular phenomena uncomplicated by cardiac or reflex activities.

H.C.Jones

4390. CONDUCTION OF CARDIOVASCULAR SOUND ALONG ARTERIES. J.J.Farber and J.H.Purvis: Circulat. Res., 1963, 12, 308-316 (Dept. Biophysics, Univ. W. Ontario, London, Ont., Canada) Evidence was

obtained in dogs and man using phonocatheters with external microphones, that most of the energy of heart sounds is conducted in a manner analogous to the pulse wave.

R.E.Moore

4391. DIMENSIONS OF BLOOD VESSELS FROM DISTRIBUTING ARTERY TO COLLECTING VEIN. M.P.Wiedeman: Circulat. Res., 1963, 12, 375-378 (Dept. Physiol., Temple Univ. Sch. Med., Philadelphia, Pa., U.S.A.)

Vessels in the unanaesthetised bat (*Myotis*) wing were measured by direct microscopic examination. The greatest cross sectional area was found in venules, and it is estimated that up to 80% of the blood vol. is held in the venous system.

R.E.Moore

4392. CORTICOPYRAMIDAL FIBRES PRODUCING VASODILATATION OF THE LIMBS. P.Zwirn and J.Coriol: Arch. Sci. physiol., 1962, 16, 325-345 (Lab. de

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physiol., Fac. de Méd., Marseille, B.-du-R., France) Stimn. of the cortex causes hypertension in conscious animals and hypotension in deeply anaesthetised animals. Dogs were anaesthetised with 0.04 g. Nembutal/kg. body wt. and paralysed with 2-4 mg./kg. (+)-tubocurarine or Flaxedil (galiamine triethiodide). Their carotid arterial pressure and resistance to perfusion of the hind limbs and kidney were recorded during electrical stimn. of the sigmoid gyrus and pyramid. Stimn. produced a transient drop in blood pressure and a vasodilatation confined to the muscles. Section of the pyramid, ergotamine or sympathectomy but not atropine blunted these responses. Unilateral stimn. produced a bilateral response. The vasodilatation is attributed to inhibn. of vascular tone. Cortical control of circulation is discussed in general.

(French) S. A. This tie wood

4393. VASODILATATION AND BODY WARMING IN THE RAT. R.T.GranC J. Physiol., Lond., 1963, 167, 311-317 (Dept. Expt. Med., Guy's Hosp., London, England) Vessels of the rat's ear do not dilate in response to body warming or to sympathetic nerve section. A-v. anastomoses are absent from the rat's ear. These and other observations suggest that vasodilatation through inhibn. of vasoconstrictor tone in response to body warming may be limited to areas containing numerous a-v. anastomoses. *

4394. VENI-VENOMOTOR RESPONSE TO LOCAL CONGESTION. W.Wallis, R.Brennan and CR.Hong: J. appl. Physiol., 1963, 18, 593-596 (Physiol. Dept., Univ. Rochester Med. Sch., Rochester, N.Y., U.S.A.) A nervous mechanism has been shown to be responsible for a vasoconstrictor response which occurred with local congestion in man. H.C.Jones

4395. DOES 'RESTRICTED DIFFUSION¹ OCCUR IN MUSCLE CAPILLARIES? C.Crone: Proc. Soc. exp. Biol., N.Y., 1963, 112, 453-455 (Inst. Med. Physiol., Univ. Copenhagen, Denmark) Comparison of the diffusion coeff. of sucrose and inulin in the capillaries of the hind leg of a dog, showed that the ratio of the two values approached more closely the ratio expected from free diffusion coeff. (observed 2.53 ± 1.65 : theoretical 2.98). This suggests that restricted diffusion through pores of 35A as deduced by Renkin and Pappenheimer probably was not the operative mechanism. D.N.Wheatley

4396. A CONCEPT OF NEGATIVE INTERSTITIAL PRESSURES IN IMPLANTED PERFORATED CAPSULES. A.C. Guyton: Circulat. Res., 1963, 12, 399-414 (Dept. Physiol., Univ. Med. Center, Jackson, Miss., U.S.A.) Hollow perforated plastic capsules were chronically implanted into dogs. Pressures within the capsules were measured by needle puncture and were normally neg. (mean -6.4 mm. Hg) but became pos. if oedema developed. The pressure changed in the expected directions when arterial or venous pressures were altered or when hydrating or dehydrating procedures were employed. It is argued that the pressures measured represented better estimates of interstitial pressure than obtained by direct needle puncture of tissues which normally gave pos. values and were insensitive to physiol. alteration. . R.E.Moorc

4397. CIRCULATORY RESPONSES TO HIGH ALTITUDE IN CAT AND RABBIT. J.T.Reeves, E.B.Grover and R.F. Grover J. appl. Physiol., 1963, 18, 575-579 (Cardio-vasc. Lab., Med. Dept., Univ. Colorado Med. Center, Denver, Colo., U.S.A.) Cats taken to 14000 ft. all died without developing heart failure or pulmonary hypertension. Of 8 rabbits, 5 survived the altitude with poor

blood oxygenation and right ventricular hypertension and dilatation. H.C.Jones

4398. EFFECTS OF CO₂-INDUCED RESPIRATORY ACIDOSIS ON DEPRESSOR AND PRESSOR COMPONENTS OF THE DOG'S BLOOD PRESSURE RESPONSE TO ADRENALINE. W.B.Wood, E.S.Manley and R.A.Woodbury: J. Pharmacol, exp. Ther., 1963, 139, 238-247 (Univ. Tennessee Med. Units, Memphis, Tenn., U.S.A.) The 2 components of the response were dissociated by the use of dichloroisoproterenol and phentolamine. Hypoxia and acidosis strikingly reduced the amplitudes of the pressor and depressor responses, the latter more so in the case of acidosis. The roles of acidosis and hypo-oxia in the development of adrenaline refractoriness are discussed. J.M.Whitmarsh

4399. FACTORS INFLUENCING ARTERIAL PRESSURE IN THE GENERAL POPULATION IN JAMAICA. W.E.Miall, E.H.Kass, J.Ling and K.L.Stuart Brit. med. J., 1962, ii, 497-506 (Dept. Med., Univ. Coll. W. Indies, Kingston, Jamaica, W. Indies) A statistical survey. M.E.Nutt

4400. VARIATIONS OF BLOOD-PRESSURE IN HYPERTENSIVES DURING SLEEP. D.B.Shaw, M.S.Knapp and D.H.Davies: Lancet, 1963, i, 797-799 (Bristol Royal Infirmary, Bristol, England) The sleeping and waking b.p. has been studied in hypertensive patients with an automatic b.p. recorder. The patients with benign hypertension showed a significant fall in systolic and diastolic b.p. during sleep of 15.4 and 9.1 mm. Hg respectively. There was no fall in b.p. in hypertensive patients. CH.Bell

4401. HYPERTENSION EXPLAINED BY STARLING'S THEORY OF CIRCULATORY HOMEOSTASIS. J.G.G. Borst and A.Borst-De-Geus: Lancet, 1963, i, 677-682 (Binrengasthuis, Univ. Amsterdam, Netherlands) In this review paper the authors postulate that on the basis of Starling's theory of fluid balance and circulatory homeostasis, hypertension is part of a homeostatic reaction to deficient renal Na output. When the Na output is insufficient at a normal arterial pressure, accumulation of extra-cellular fluid will raise the pressure to the abnormally high level required for the re-establishment of Na balance? thus, a seemingly normal Na output is maintained at the expense of hypertension. 70 ref. G.H.Bell

4402. RENIN IN EXPERIMENTAL RENAL HYPERTENSION IN MONKEYS. M.H.Frank: Circulat. Res., 1963, 12, 241-255 (Dept. Physiol., Univ. Illinois Coll. Med., Chicago, Ill., U.S.A.) Renin from man or monkey was pressor but that from dog or hog was not. Anti-human renin from dogs but not anti-dog or hog renin, reduced b.p. in hypertensive (renal artery clamp) monkeys. Some post-mortem findings in hypertensive monkeys are described. R.E.Moore

4403. NON-SPECIFIC RESISTANCE IN SPONTANEOUS HAEMORRHAGE. W.M.Chubaty and L.B.Jaques: Canad. J. Biochem., 1963, 41, 1079-1080 (Dept. Physiol., Univ. Saskatchewan, Saskatoon, Sask., Canada)

Rats were exposed to stress in the form of i.p. 10% NaCl, electric shock, restraint, insulin or frostbite and after recovery were again subjected to stress and then given dicoumarol daily for 10 days; previous exposure to stress in many cases lowered mortality due to spontaneous haemorrhage. Prelim. comm. J.B.Parish

4404. COMPARATIVE VASOMOTOR ACTION OF TWO INSULIN FREE PANCREATIC EXTRACTS. J.Xecompte:

C.R. Soc. Biol., Paris, 1962, 156, 1727-1729 (Inst. L. Fredericq, Ujiiv. L'fege, Belgium) Angioxyl caused arterial hypotension in rat, rabbit and cat. The duration of hypotension induced by Padutine was more prolonged. Chromatographic analysis showed Angioxyl to contain a high level of ATP and Padutine to contain kallikrein. Trasylol, an inhibitor of kallikrein, did not modify the hypotension induced by Angioxyl. Phenylbutazone inhibits the effects of Padutine but not of Angioxyl.

(French) M.A. Price

4405. ANTAGONISM OF ISOPROPYLNORADRENALINE [UFA] TO SYMPATHETIC MEDIATORS. STUDY ON RAT'S BLOOD PRESSURE. D.Delia Bella, F.Rognoni and U.M.Teotina Arch. int. Physiol., 1962, 70, 327-334 (Res. Lab., Selvi and Co., Milan, Italy)

The hypotensive action of IPA is only partially dependent on dose and does not occur when basal b.p. is 50 mm.Hg or less. The hypotensive effect is not reversed by pre-treatment with adrenergic blocking agents. IPA reduces the hypertensive effect of adrenaline and noradrenaline on rat b.p. and modifies responses of the isolated aortic strip of rat to these substances by its action on receptors. By antagonising at 3 receptors it inhibits the reversed response to adrenaline in animals treated with adrenergic blocking agents.

M.E.Nutt

4406. INTRAVENTRICULAR PRESSURE AND THE DISTRIBUTION OF CORONARY BLOOD FLOW. R.Cutarelli and M.N.Levy: Circulat. Res., 1963, 12, 322-327 (Res. Div. St. Vincent Charity Hosp., Cleveland, Ohio, U.S.A.) ⁸⁶Rb was used to assess relative capillary flows in the dog myocardium. In the normal heart the transmural distribution was not affected by intraventricular pressure, but in the fibrillating heart or ischaemic region of a heart the capillary flow was reduced subendocardially.

R.E.Moore

4407. SYSTEMIC AND CORONARY HAEMODYNAMIC EFFECTS OF SYNTHETIC BRADYKININ. G.G.Rowe, S.Alfonso, C.A.Castillo, F.Lioy, J.E.Lugo and C.W. Crumpton: Amer. Heart J., 1963, 65, 656-663 (Cardiovasc. Res. Lab., Dept. Med., Univ. Wisconsin Med. Sch., Madison, Wis., U.S.A.) In anaesthetised dogs, right atrial infusion of bradykinin, usually 2-5 fig./kg./ttfn. for 20 min., resulted in a fall of peripheral, pulmonary and coronary vascular resistance, and in systemic arterial hypotension; cardiac output increased; coronary blood flow increased in those animals with a normal or low resting coronary flow, and decreased in those with high resting coronary flow. The depletion of catecholamine, through the administration of reserpine, did not change the response basically.

P.F. Meyer

4408. ANGIOGRAPHIC EVIDENCE OF PULMONARY VASOMOTION IN DOGS. J.C.Hirschman and R.J.Boucek Brit. Heart J., 1963, 25, C75-381 (Sect. Cardiol., Univ. Miami Sch. Med., Miami, Fla., U.S.A.) In dogs, contrast material was inj. into a pulmonary artery segment of the right lower lobe. Inj. and subsequent X-ray exposures were electronically programmed from the R-wave of the e.c.g. Optimum dye inj. and X-ray viewing times were established. This precise X-ray viewing permitted comparisons of arteries of 0.2-0.3 mm. diam. Adrenaline (0.01 mg.), 5HT (0.1 mg./kg.), ¹³¹I-gamma-inulin (1 mg.) inj. into the pulmonary artery, and hypo-oxygenation (10% O₂ in N₂) caused segmental narrowing and occlusion of smaller arteries while the larger, proximal vessels passively dilated.

- P.F.Meyer

4409. PRESSURE WAVE FORM IN PULMONARY ARTERY.

D.B.Shaw: Brit. Heart J., 1963, 25, 347-356 (Cardiac Dept., United Bristol Hosp., Bristol, England) A catheter-tip micromanometer was used to study the pulmonary artery wave form during diastole in 43 patients. A small presystolic wave, presumably reflecting right atrial contraction, was seen in 30. A dicrotic wave was present in 35; it was large when pulmonary blood flow was increased as the result of a septal defect, and it was small or absent in pulmonary hypertension or pulmonary stenosis. A small, secondary pressure wave followed the dicrotic wave especially when the dicrotic wave was large. It is believed that the dicrotic and secondary waves have a common origin in the main pulmonary trunk; possible mechanisms for their production are discussed.

P.F.Meyer

4410. RELATION BETWEEN PRESSURE AND DIAMETER IN MAIN PULMONARY ARTERY OF MAN. J.C.Greenfield jun. and D.M.Griggs, jun.: J. appl. Physiol., 1963, 18, 557-559 (Sect. Clin. Biophys., Cardiol. Branch., Nat. Heart Inst., Bethesda, Md., U.S.A.)

The pressure-diam. relationships of the main pulmonary artery have been determined in normal and hypertensive patients undergoing open-heart surgery.

H.Clones

4411. PULMONARY VASOCONSTRICKTION IN STEERS AT HIGH ALTITUDE. R.F.Grover, T.T.Reeves, D.H.Will and S.G.Blount jun.: J. appl. Physiol., 1963, 18, 567-574 (Cardiovasc. Lab., Med. Dept., Univ. Colorado Med. Center, Denver, Colo., U.S.A.)

A rapid increase in pulmonary arterial pressure was seen in steers kept at a high altitude, this appeared to be due to pulmonary vasoconstriction induced by chronic hypo-oxia.

H.C.Jones

4412. PULMONARY CIRCULATION AND OXYGEN TRANSPORT IN LAMBS AT HIGH ALTITUDE. J.T.Reeves, E.B.Grover and R.J.F.Groven: J. appl. Physiol., 1963, 18, 560-566 (Cardiovasc. Lab., Med. Dept., Univ. Colorado Med. Center, Denver, Colo., U.S.A.) Lambs native to low altitude showed good adaptation and normal growth at high altitude. Depressed arterial 62 satn. and reduced a-v. O₂ pressure were seen, usually without an increase in pulmonary arterial pressure.

H.C.Jones

4413. BLOOD FLOW IN THE CAROTID AND VERTEBRAL ARTERIES OF THE SHEEP AND CALF. B.A.Baldwin and F.R.Belk: J. Physiol., Lond., 1963, 167, 448-462 (Dept. Physiol., Royal Vet. Coll., London, England)

Blood flow in the carotid and vertebral arteries of the sheep and calf have been measured using the Density Flowmeter. The rate of blood flow in the carotids in both spp. is considerably greater than in the vertebrals. The comparative rate of flow in the vertebral of the calf is greater than the sheep. In both spp. occlusion of one common carotid causes an increase in flow in the remaining carotid and in both vertebrals but occlusion of one vertebral causes only an increase in flow in the opposite vertebral. In both spp. as more of the vessels contributing to the cephalic blood supply are occluded an immediate increase in flow occurs in the remaining patent vessels. The evidence collected suggests that the cerebral circulation depends upon physical processes, mainly differences in pressure. *

4414. THE EFFECT ON BLOOD PRESSURE IN THE SHEEP AND CALF OF CLAMPING SOME OF THE ARTERIES CONTRIBUTING TO THE CEPHALIC CIRCULATION.

B.A.Baldwin and F.R.Belk: J. Physiol., Lond., 1963, 167, 463-479 (Dept. Physiol., Royal Vet. Coll., London,

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England) The changes which occur in the cephalic and systemic b.p. on occluding some of the arteries contributing to cephalic blood flow in the sheep and ox have been examined. Because the vertebral arteries in the sheep do not provide blood to the Circle of Willis, occlusion of the occipital and carotid arteries produces complete cerebral ischaemia resulting in a profound fall in cephalic b.p. but a marked systemic hypertension. Death occurs if the occlusion is maintained. The same result occurs if the external carotids are occluded in the sheep. By contrast in the calf, the pressure of an arterial connexion between the vertebrates and the rete mirabile, namely the basi occipital plexus prevents development of cerebral ischaemia when the external carotids are clamped or when the carotids and occipitals are clamped at the same time. The results support the view that the haemodynamics of the cerebral circulation is governed by physical mechanisms and not by baroreceptor reflexes. *

4415. INVESTIGATION OF CEREBRAL BLOOD-FLOW IN HYPERTENSION, USING RADIOACTIVE-XENON INHALATION AND EXTRACRANIAL RECORDING. B.L. Mallett and N.Veall: Lancet, 1963, i, 1081-1082 (Radioisotopes Lab., Dept. Expt. Med., Guy's Hosp. Med. Sch., London, England) There is no difference in the cerebral perfusion-rates of normal subjects and patients with essential hypertension; and therefore there is no evidence of cerebral ischaemia in the hypertensive group. CH.Bell

4416. CEREBRAL CIRCULATION STUDIES DURING HYPOTENSIVE ANAESTHESIA USING RADIOACTIVE XENON. W.K.Black and W.W.Walther: Lancet, 1963, i, 1082-1083 (Whipps Cross Hosp., London, England) Cerebral perfusion-rates were studied by means of a recently developed method using radioactive Xe in 30 patients under anaesthesia with induced hypotension, and also in 24 of them while conscious and normotensive. In 7 patients the clearance-rate was accelerated in the hypotensive state compared with their conscious level. In 23 it was slowed by 6-33% (in 1 case by 37-57%) compared with the average normal rate, but this slowing might be more apparent than real. In 19 cases the clearance-rate in the conscious patient was slower than the average normal. CH.Bell

4417. CHANGES IN CORTICO-PIAL CIRCULATION DURING HAEMORRHAGIC SHOCK IN RABBITS. G. Breda, M.Concioli and R.Villani: Atti. Acad. med., Lombarda, 1962, 17, 247-251 (1st. Farmacol., Univ. Milano, Italy) Arterial bleeding of rabbits caused arteriolar vasodilation of the cortico-pial circle which lasted only a short time and fell after blood transfusion. This effect occurred after successive bleedings, unless shock was induced by excessive, repeated bleedings, in which case the vasodilation did not fall even after massive blood transfusion. Vasodilation may be due to release of bradykinin. Similar effects were not observed in the conjunctival circle. (Italian) CN.Gjdson

4418. STUDIES OF RETINAL CIRCULATION WITH FLUORESCCEIN. C.T.Dollery, J.V.Hodge and M.Enget: Brit. med. J., 1962, ii, 1211-1215 (Postgrad. Med. Sch., London, England) Fluorescein was given via a polythene catheter in the antecubital vein and its passage across the retina photographed. Dye passes rapidly along arterties, through capillaries, and layers into veins from small tributaries as individual bright streams along their walls. Mixing of streams is slow except where a-v. nipping

sets up turbulence in veins. Laminar flow is seen in arteries. Individual capillaries are visible in some photographs. Vascular abnormalities invisible by ophthalmoscope are revealed as are changes in vascular permeability.

M.E.Nutt

4419. UMBILICAL VENOUS PRESSURE IN NEONATES DURING EXCHANGE TRANSFUSIONS. I. EFFECT OF CATHETER POSITION ON AMPLITUDE AND OSCILLATIONS OF VENOUS PRESSURE. A.Hintze: Z.Kreisl.-Foisch., 1963, 52, 209-217 (Kinderklin., Univ. Bonn, Germany) Venous pressure measured by strain gauge was determined in the catheterised umbilical vein of 28 neonates. The mean pressure was 62 n.i7'6 mm. H₂O. Inspiration caused a rise in pressure. Pulse waves were recorded when the catheter was advanced into the vena cava especially after infusion of 20-30 ml. blood; their form differed from the usual venous pulse presumably as a result of tachycardia and of damping effects.

(German) PJ Meyer

4420. MECHANISM OF THE RESPONSE OF THE CHRONICALLY SYMPATECTOMIZED FOREARM OF INTRAVENOUS ADRENALINE. W.E.Glover and R.G.Shanks: J. Physiol., Lond., 1963, 167, 263-267 (Dept. Physiol., Queen's Univ., Belfast, N. Ireland) Adrenaline (10 jg./min.) given i.v. to 3 subjects after unilateral cervical sympathectomy caused a sustained increase in blood flow to the normal forearm only. Following i.a. infusion of dibenlyline (0.5 mg./min. for 6 min.) the sympathectomised forearm showed the same response. It is suggested that the change in response to i.v. adrenaline following sympathectomy is due to an increased sensitivity to the constrictor but not the dilator action of adrenaline. *

4421. FOREARM BLOOD FLOW DURING PROLONGED INTRA-ARTERIAL INFUSIONS OF ADRENALINE, AND THE EFFECTS OF INTRA-ARTERIAL ADRENALINE ON POST-EXERCISE HYPERAEMIA. W.E.Glover and R.G. Shanks: J. Physiol., Lond., 1963, 167, 268-279 (Dept. Physiol., Queen's Univ., Belfast, N. Ireland) When adrenaline is infused into the brachial artery in doses of 0*25-0*5 jg./min. the marked fall in blood flow seen during the 2nd-5th min. decreases as the infusion is continued and frequently gives way to a vasodilatation. This dilatation does not occur with prolonged infusions of noradrenaline in the forearm or with adrenaline and nor-adrenaline in the hand. The i.a. infusion of 0.1 jg./min. noradrenaline causes a fall in the size of post-exercise hyperaemia in the forearm, whereas the i.a. infusion of 0*25 jg./min. adrenaline causes an increase. It is suggested that the level of metabolic activity in skeletal muscles may play a part in determining the effect of adrenaline on blood vessels. *

4422. OBSERVATIONS ON THE RELATION BETWEEN THE VASODILATOR AND METABOLIC ACTIONS OF ADRENALINE IN THE HUMAN FOREARM. W.E.Glover and R.G.Shanks: J. Physiol., Lond., 1963, 167, 280-287 (Dept. Physiol., Queen's Univ., Belfast, N.Ireland) Dichloroisopropylnoradrenaline [DCI] infused i.a. at 0.05 mg./min. blocked the vasodilator action of 0*25 jg./min. adrenaline administered into the brachial artery. DCI did not affect the rise in the lactic acid concn. of forearm muscle venous blood produced by adrenaline. Larger doses of DCI, 2 mg./min., reduced the rise in the lactic acid concn. It is concluded that the vasodilator action of

adrenaline is not due to its ability to raise die lactic acid content of muscle venous blood. *

4423. RESPONSE OF SPLANCHNIC BED OF CHRONICALLY SPLENECTOMISED DOGS TO ADRENALINE AND NOR-ADRENALINE INFUSION. A.D.Bender and S.M.Horvath: Arch. int. Physiol., 1962, 70, 523-532 pept. Physiol., Jefferson Med. Coll., Philadelphia, Pa., U.S.A.)

Sixteen dogs, splenectomised 1-24 months previously, were anaesthetised with Na pentobarbital (30 mg./kg. body wt.) and heparinised (5 mg./kg. body wt.). Hepatic blood flow was measured by BSP and total O₂ consumption and femoral arterial and hepatic venous O₂ content also recorded. Splanchnic O₂ consumption and splanchnic vascular resistance were calc. Infusion of 1 jg./kg./min. adrenaline for 10 min. produced an increase in splanchnic blood flow with no change in mean b.p. During the first 5 min. of infusion increase in flow was less than that Previously reported in intact animals, presumably due to absence of splenic contribution to portal flow. After the infusion blood flow was markedly reduced in splenectomised dogs, but returned to control values in normal animals. Reduction in flow in splenectomised animals is probably due to absence of the splenic bed since splenic-mesenteric systems form a parallel circuit. Infusion of 1 fig./kg./min. of (-)-noradrenaline for 10 min. caused no change in flow during the infusion, but flow decreased after the infusion was stopped.

M.E.Nutt

4424. DYE DILUTION METHOD OF MEASURING RENAL BLOOD FLOW IN MAN, WITH SPECIAL REFERENCE TO THE ANEURIC SUBJECT. F.C.Reubi, R.Gurtler and N. Gossweilen: Proc. Soc. exp. Biol., N.Y., 1962, 111, 760-764 (Med. Polyclin., Univ. Berne, Switzerland)

A dye diln. method of determining renal blood flow in man is described involving catheterisation of renal artery and vein but no urine sampling. Comparison with PAH clearance indicates that the results of the dye method are probably valid.

M.M.Shapland

4425. EFFECT OF LOW OXYGEN AND OF CARBON MONOXIDE ON RENAL CIRCULATION IN UNANAESTHETISED RABBITS. P.J.Komen: Circulat. Res., 1963, 12, 361-374 (Sch. Physiol., Univ. New South Wales, Sidney, Australia) Renal blood flow and GFR during diuresis were both reduced when the animal breathed either 9*6% £2 in N2 or 0*1-2% CO in air. Evidence is given suggesting ^at in hypo-oxia these reductions were due to renal vascular constriction (nervous) and in carboxaemia to hypo-nis-on.

R.E.Moore

4426. RENAL BLOOD FLOW, GLOMERULAR FILTRATION RATE, RENAL PAH EXTRACTION RATIO, AND THE ROLE OF THE RENAL VASOMOTOR NERVES IN THE UNANAESTHETISED RABBIT. P.I.Komer: Circulat. Res., 1963, 13, 353-360 (Sslj. Physiol., Univ. New South Wales, Sidney, Australia) Catheters were inserted under local or general anaesthesia. A series of control values are presented, and evidence is given that ^nervation of a kidney only increases the renal blood flow and GFR by about 6%.

R.E.Moore

4427. EFFECT OF BED REST ON RESTING CALF BLOOD FLOW OF HEALTHY ADULT MALES. N.L.Browse: Brit. med. J., 1962, i, 1721-1723 (Dept. Surg., Univ. Bristol, England) Resting calf blood flow was measured in 29 healthy patients, 12 living normal ward life and 17 confined to bed. Resting flow (principally due to

calf muscle flow) was very const, and there was no day to day variation in the 12 active patients. Rate of flow did not change when another 12 patients were confined to bed for 12 hr. and a further 5 for 2-5 days. Calf blood flow reaches its resting level before 1 hr. of rest and this explains why early ambulation after surgery has no effect on incidence of post-operative deep vein thrombosis.

M.E.Nutt

4428. EFFECT OF SURGERY ON RESTING CALF BLOOD.

N.L.Browse: Brit. med. J., 1962, i, 1714-1721 (Dept. Surg., Univ. Bristol, England) Resting calf blood flow was measured in 45 patients undergoing routine surgery. In 75*5% of cases resting flow fell after surgery, the fall being immediate in 53*3% and gradual in 22-2%. Mean flow was 47% below the pre-operative level and the effect lasted 8 days. In some cases flow fell by 70-80%. Calf flow rose post-operatively in 15% of subjects and in 9% there was a rise followed by a fall in blood flow. Extent and duration of fall in flow is related to the age and fitness of the subject and the severity and length of his operation. Resting calf flow is constant from day to day in patients in normal ward life and is not decreased by long periods of bed rest or by anaesthesia alone. Changes in flow after surgery occur after local as well as general anaesthesia. It thus appears that surgical trauma alone is responsible for changes in blood flow.

M.E.Nutt

4429. STUDY OF BONE-MARROW CIRCULATION IN MAN BY ISOTOPE TECHNIQUE. Y.Najean and F.Clemenc

Nouv. Rev. franc. Hemat., 1963, 3, 133-138 (Inst. Rech. maladies du sang, Fac. Méd., Paris, France)

5-7 fie. of 51Cr were inj. into the bone-marrow and the appearance of radioactivity in the inguinal area measured every 30 sec. The obtained curves consist of a very brief first component which may be related to the intravascular transport of SICr and therefore to the medullary blood flow. It is reduced in myeloid splenomegaly. A second, exponential component corresponds to the diffusion and equilibration of 51cr. (French)

V.Eisen

4430. INDUCED ARTERIAL OSCILLATIONS OF BLOOD PRESSURE AS A METHOD FOR INVESTIGATING REGULATION OF LEVEL OF BLOOD PRESSURE. P.Rudomin and L.Macpherson: Nature, Lond., 1963, 197, 1266-

1267 (Dept. Physiol., Centro de Invest. y de Estudios Avanzados del Inst. Politécnico Nacional, Mexico,

D.F.) The regulation of arterial b.p. in the rabbit was investigated by stimulating the aortic depressor nerve so that b.p. oscillation fell; at a certain min. value, the stimulus ceased, the pressure rose, and the cycle repeated. Simult* pressure, e.c.g., heart rate and stimulus records were made. Two patterns of oscillations were described differing in the lengths of stimm. and non-stimm. periods. The mechanism of the homeostatic system controlling b.p. in vivo is discussed.

G.M.Lewis

4431. ARTERIAL BLOOD FLOW DURING ELEVATED INTRA-PULMONARY AND INTRA-ABDOMINAL PRESSURES.

S.F.Marotta: Proc. Soc. exp. Biol., N.Y., 1962, 111, 611-615 (Aeromed. Lab., Univ. Illinois Med. Center, Chicago, 111, U.S.A.)

In the dog under Na pentobarbital carotid and femoral arterial blood flow and mean carotid pressure decreased inversely proportional to increasing continuous pos. pressure breathing while femoral pressure remained unaltered. Raised levels of intra-abdominal pressure had no effect except for a slight depression of femoral flow.

M.M.Shapland

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NERVOUS SYSTEM

4432. AN ANALOGUE CROSS-CORRELATOR TO STUDY NATURALLY INDUCED ACTIVITY IN INTACT NERVE TRUNKS. J.U.Casby, R.Siminoff and T.R.Houseknecht. *J. Neurophysiol.*, 1963, 26, 432-448 (E. Pennsylvania Psychiat. Inst., Philadelphia, Pa., U.S.A.) An analogue cross-correlator has been devised to sort peripheral nerve traffic as to velocity and direction. This is done by the simult. recording of intact nerve activity from at least two sets of electrodes. The recorded data are then fed into the cross-correlator which performs the task of displacement, multiplication and integration. A cross-correlogram is plotted which relates activity to delay time. Natural stimuli only are used to induce activity; thus, the instrument is capable of giving the spectrum of afferent and efferent fibres responding to a 'physiol.' stimulus such as touch, pressure, noxious stimulus, etc. The validity of the method was demonstrated by the use of various differential blocks such as pressure, temp, and local anaesthetic. In addition, the cross-correlogram showed the typical pattern of temporal dispersion. In response to mechanical stimuli, three peaks were shown and identified as a, 0, and C. Noxious stimuli were especially effective in inducing C activity* * *

4433. INFLUENCE OF Ca IN STABILISING STRUCTURE OF MYELIN SHEATH. M.Wolman and H.Wienei: *Bull. Res. Counc. Israel A*, 1963, 11, 297-301 (Dept. Path., Tel Hashomer Govt. Hosp., Israel) The migration of granular material from the myelin sheaths of transversely cut nerves immersed in water or various soln. was described. Cations inhibit the migration, especially Ca and Mg, probable due to their stabilising effect on the sheath structure. This might be caused by metal bridges between phospholipids and proteins. The force responsible for the migration was not identified, osmotic or colloid-osmotic pressure was ruled out.

L.G.Gillies

4434. RELEASE OF CALCIUM IN MYONEURAL JUNCTION. B.Csillik and G.Sávay: *Nature, Lond.*, 1963, 198, 399-400 (Dept. Anat., Univ. Med. Sch., Szeged, Hungary) In rat diaphragm in which fasciculation was evoked by prostigmine and in the deep plantar muscle after stimn. of the sciatic nerve, Ca is detectable by staining with Alizarin Red after liberation in the sole plates. It is confined to the 1-2 μ granules histochem. resembling telosomes. The role of Ca in myofibrillar contraction is discussed.

G.M.Lewis

4435. CHANGES IN NERVOUS EXCITABILITY DURING PHYSIOLOGICAL DEFICIENCY IN CALCIUM. PREVENTIVE AND CURATIVE EFFECTS OF LACTOSE. H.Mazoue, Y.Dupuis, P.Chauchard and P.FournieK C.R. Soc. Biol., Paris, 1962, 156, 1596-1598 (Hautes Etudes, Lab de Neurophysiol., Fac. Sci., Paris, France) In rats kept on a Ca-free diet there was a decrease in the blood Ca level from 96 to 64 mg./l. after 36 days, with an increase in chronaxie of the extensor and flexor nerves to the toes. Addition of 20% lactose to the diet prevented the decrease in blood Ca and the increase in chronaxie. Administration of a diet containing lactose to animals which had received a Ca-free diet for 40 days restored the blood Ca and the nerve chronaxie.

(French) M.A.Price

4436. REFRACTORY AND SUPERNORMAL PERIODS OF HUMAN MEDIAN NERVE. R.W.Gilliat and R.G.Willison: *J. neurol. neurosurg. psychiat.*, 1963, 26, 136-147

fDept. Appl. Plectrophysiol., Nat. Hosp., Queen Sq., London, England) In 4 healthy subjects it was found that after stimn. of the wrist with a single supramax. shock a second propagated response could not be obtained for 0*6-0*7 msec. Normal excitability was complete by 2-5-5*5 msec, after which there was a period of supernormality lasting for a further 5-15 msec. The conduction velocity of an action potential travelling in the relative refractory period was reduced, normal velocity was not recovered with 30 cm. of the site of stimn. A 12 min. period of nerve ischaemia increased the duration of the refractory period by at least 50% and abolished supernormality.

A.Angel

4437. REGENERATION OF THE SPINAL CORD IN RAT. EFFECTS OF PIROMEN^R AND ACTH UPON THE REGENERATIVE CAPACITY. R.E.McMasters: *J. comp. Neurol.*, 1962, 119, 113-125 (Dept. Anat., Univ. Texas Med. Branch, Galveston, Tex., U.S.A.) Following spinal cord transections in 5-7 day old rats, only a relatively small no. of those specially treated showed evidence of functional return, the majority dying within 2 months due to urinary tract infection and gangrene. Piromen and ACTH, by inhibiting the formation of a pia-glial scar barrier, permitted the growth of neuronal processes and allowed true spinal cord regeneration in some instances. Sensory perception preceded motor return by 2 weeks and became manifest 2-3 weeks post-operatively.

G.M.Lewis

4438. REFLEX REGULATION OF PRIMARY (ANNULOSPPIAL) STRETCH RECEPTORS VIA GAMMA MOTONEURONES IN THE CAT. R.B.Wuerker and E.Henneman: *J. Neurophysiol.*, 1963, 26, 539-550 (Harvard Med. Sch.* Boston, Mass., U.S.A.) Reflex regulation of primary stretch receptors by Y" motoneurones has been studied by recording the discharges of single end organs during stimn. of peripheral nerves in the ipsilateral hind limb of the cat. Single shocks applied to skin and muscle nerves did not alter the rate of discharge significantly, but repetitive stimn. at 50-100/sec. caused prompt acceleration or deceleration of firing. By limiting the intensity of stimn. these effects could usually be elicited without accompanying contraction of the extrafusal muscle fibres, hence they may be attributed to reflex excitation or inhibn. of Y motoneurones. The range of freq. produced by Y reflexes alone, unsupported by stretch, was large. By stimn. of the sural nerve or the nerve to the lateral gastrocnemius muscle the rate of discharge of end organs in the medial gastrocnemius muscle was transiently increased to levels equiv. to those produced by 1000 g. loads. By stimulating the tibial or lateral peroneal nerves, receptors in the same muscle could be almost completely silenced for many seconds. Acceleration of primary endings frequently occurred in conjunction with reflex discharge of a-motoneurones. Examples of opposite effects upon a and Y-motoneurones were observed, however, indicating that these 2 kinds of motoneurones are to some extent served by different spinal mechanisms functioning independently. As a part of the control observations the tensions produced by 13 single motor units in the media gastrocnemius muscle were measured by direct methods. The max. tetanic tensions ranged from 0*7 to 55-4 g.

4439. IPSILATERAL EXCITATION OF EXTENSOR MOTONEURONES. V.J.Wilson: *Nature, Lond.*, 1963, 198, 290-291 (Rockefeller Inst., New York, N.Y., U.S.A.) In unanaesthetised, decerebrate cats, stimn. of group II fibres in certain muscle nerves can elicit an excitatory action of brief latency in gastrocnemius-soleus motoneurones, and stimn. of group III fibres in several muscles

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leads to later excitatory effects, thus demonstrating that both group II and in afferent* have an excitatory pathway to ipsilateral extensor motoneurones. G.M.Lewis

4440. LOCATION AND MODE OF ACTION OF PRESYNAPTIC INHIBITORY PATHWAYS ON TO GROUP I AFFERENT FIBRES FROM MUSCLE. J.C.Eccles, R.F. Schmidt and W.D.Willis: *J. Neurophysiol.*, 1963, 26, 506-522 (Dept. Physiol., Australian Nat. Univ.,

Canberra, Australia) The presynaptic inhibitory action of Group I afferent fibres has been further investigated by the standard techniques: the intracellular and extracellular recording of depolarisation of the primary afferent fibres; the testing of excitability changes of the Primary afferent fibres; the recording of dorsal root potentials and potentials from the cord dorsum. Group Ia afferent fibres are depolarised by synaptic action of both Group Ia and Ib afferent volleys from flexor muscles. Three properties demonstrated for the central pathways subserving presynaptic inhibitory action indicate their Polysynaptic character: temporal facilitation, spatial facilitation, and post-tetanic potentiation. During prolonged repetitive stimm. there is firstly a building up of Primary afferent depolarisation by the first few impulses, [hen a progressive decline to a plateau that is reached in half to one sec, after which it is well maintained over many sec. *

4441. MODE OF OPERATION OF SYNAPTIC MECHANISM PRODUCING PRESYNAPTIC INHIBITION. J.C. Eccles, R.F.Schmidt and W.D.Willis: *J. Neurophysiol.*, 1963, 26, 523-538 (Dept. Physiol., Australian Nat. Univ., Canberra, Australia) Several procedures have ^een employed in investigating the synaptic mechanism that produces primary afferent depolarisation [PAD] and so effects presynaptic inhibn. It was assumed that the syn-^Aptic transmitter acted on the primary afferent fibres in the same manner as transmitters at other synapses and ^au_{sec}i a sp. increase in ionic permeability. The equilibrium potential probably is at a level of more than 30 mV ^Polarisation relative to the resting membrane potential. /*fc PAD recorded intracellularly from an afferent fibre has been subjected to the action of an impulse propagat-^{ing} down that fibre to its central terminals. The slow ?e course of the PAD is thus shown to be due to a trans-puter action persisting for 100 to 200 msec. The spike Potential of an afferent fibre was reduced when super-^{J.J & ed}ed on a PAD in that fibre, and this effect was in-^{reased} when there was post-tetanic potentiation of the PAD. There was also a study of the effect of PAD in de-^{pressing} monosynaptic excitatory post-synaptic potentials that were potentiated either during or after a tetanus. •

4442. SEGMENTAL REFLEX RELATIONS OF CUTANEOUS AFFERENT INFLOW TO THORACIC RESPIRATORY MOTONEURONES. T^umi: *J. Neurophysiol.*, 1963, 26, 478-493 (Johns Hopkins Univ. Med. Sch., Baltimore, Md., U.S.A.) Recordings fr6m individual dorsal root ^suberving cutaneous sensations of thoracic wall as exten-** r@ cording fr^m muscle fibres of internal and exten-^la Intercostal muscles were obtained from uiianaes-therised, spinalised and from anaesthetised cats. Average cura-^sqeceptive fields for 144 afferent fibres was 53 an? . Excitatory reflexogenic fields for 29 expiratory 67 v^ inspiratory intercostal muscle fibres were 51 and 67 v^ respectively. Respiratory muscle fibres showed ^utal?^ respectivly. Respiratory muscle fibres showed ^utal?^ and / or equilibrating behaviour during repetitive fibres. J?* cu* aneous field at rates < 15/sec; afferent fibres aid not. Available evidence suggests participation

of intemuncial neurones in reflex regulation of spinal respiratory motoneurones. *

4443. ACTIVITY OF BRAIN-STEM RESPIRATORY NEURONES AND SPINAL RESPIRATORY MOTONEURONES DURING SWALLOWING. T.Sumi: *J. Neurophysiol.*, 1963, 26, 466-477 (Johns Hopkins Univ. Med. Sch., Baltimore, Md., U.S.A.) Extracellular action potentials from medullary respiratory neurones in unanaesthetised, decerebrate cats produced a short burst discharge and/or cessation of their spontaneous activity during reflexly induced swallowing. Spinal respiratory motoneurones also showed momentary activation during swallowing but of lesser intensity. Onset of burst discharge of medullary inspiratory neurones preceded activation of geniohyoid muscle. Modifications by swallowing of respiratory neurones activity was not abolished by motoparalysis. Data suggest a close relationship in central regulatory mechanisms for respiration and swallowing as well as complexity of efferent connections between medullary and spinal cord respiratory neurones. *

4444. INNERVATION OF THE DIAPHRAGM. B.R.Landau, K.Akert and T.S.Roberts: *J. comp. Neurol.*, 1962, 119, 1-10 (Dept. Physiol., Univ. Wisconsin Sch. Med., Madison, Wis., U.S.A.) Fibre composition of the phrenic nerve was studied bilaterally in dogs after unilateral destruction of dorsal root ganglia of segments giving rise to the nerve 3-6 weeks previously. The peripheral distribution of spinal roots making up the nerve was studied and responses of the diaphragm to electrical stimm. of the tributary branches was recorded. Within the diaphragm, a medial to dorsolateral arrangement of myotomes corresponding to the C5, C6 and C7 spinal roots was found, but no evidence of contralateral innervation. G.M.Lewio

4445. ANALYSIS OF ROLE OF PRESYNAPTIC AND POST-SYNAPTIC SLOW POTENTIALS IN SYMPATHETIC GANGLIA. LDempsher, LZabaia and R.Gelfand: *Int. J. Neuropharm.*, 1962, 1, 251-257 (Dept. Anat., Univ. Pennsylvania Sch. Med., Philadelphia, Pa., U.S.A.) Rat superior cervical ganglia infected with pseudo-rabies virus were studied in vitro. Dissimilar slow potential changes were recorded from pre- and post-ganglionic nerves which are considered to be associated with two different operations. Theoretical electronic and mathematical models are derived to account for the observations.

G.F.Blane

4446. ROLE OF ACETYLCHOLINE AND CHOLINESTERASE IN SYMPATHETIC GANGLIA. J.Zabara and J.Dempsher: *Int. J. Neuropharm.*, 1962, 1, 259-264 (Dept. Anat., Univ. Pennsylvania Sch. Med., Philadelphia, Pa., U.S.A.) The effects of applied ACh and cholinesterase were studied upon the slow potential changes recorded from pre- and post-ganglionic nerves in the prep, described in the preceding paper. The markedly different effects observed with the 2 drugs are interpreted in terms of the electronic model.

G.F.Blane

4447. SYNAPTIC TRANSMISSION IN THE SYMPATHETIC GANGLION OF THE FROG. J.G.Blackman, B.L.Ginsborg and CRay: *J. Physiol., Lond.*, 1963, 167, 355-373 (Dept. Pharmacol., Univ. Edinburgh, Scotland) Synaptic transmission in the sympathetic ganglion of the frog has been studied with intracellular electrodes. The action of the transmitter is similar to that at the neuromuscular junction of the frog. The action of ganglion blocking agents, anticholinesterases and ionophoretically applied ACh support the idea that the transmitter is ACh. •

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4448. SOME EFFECTS OF CHANGES IN IONIC CONCENTRATION ON THE ACTION POTENTIAL OF SYMPATHETIC GANGLION CELLS IN THE FROG. J.G.Blackman, B.L.Ginsborg and CRay: *J. Physiol., Lond., 1963, 167- 374-388* (Dept. Pharmacol., Univ. Edinburgh, Scotland) Action potentials were recorded with intracellular electrodes, and the effects of changes of (K_+)_o, (Na^+)_o and (Cl^-)_o were studied. Replacement of (Cl^-)_o by methyl sulphate was without effect; reduction in (Na^+)_o had no effect on the resting potential, but reduced the rate or rise and the amplitude of the response; increase in (K_+)_o reduced the resting potential and, to a greater extent, the membrane potential at the peak of the 'positive phase'. The membrane potential at the peak of the positive phase was also reduced during trains of stimuli, probably due to the accumulation of K^{+} immediately outside the cell. *

4449. SPONTANEOUS SYNAPTIC ACTIVITY IN SYMPATHETIC GANGLION CELLS OF THE FROG. J.G.Blackman, B.L.Ginsborg and CRay: *J. Physiol., Lond., 1963, 167, 389-401* (Dept. Pharmacol., Univ. Edinburgh, Scotland) Miniature synaptic potentials were recorded from single cells of sympathetic ganglia of Rana pipiens. They persist in K^{+} concn. which block orthodromic conduction, but are abolished by tubocurarine and they are presumed to be due to action of spontaneously released packets of ACh. The recurrence frequency of the miniature synaptic potentials is increased at least 50-fold in 10-14 mM K. This effect is reversed by high external Mg^{2+} . *

4450. ON THE QUANTAL RELEASE OF THE TRANSMITTER AT A SYMPATHETIC SYNAPSE. J.G.Blackman, B.L.Ginsborg and CRay: *J. Physiol., Lond., 1963, 167, 402-415* (Dept. Pharmacol., Univ. Edinburgh, Scotland) Synaptic potentials from single cells in sympathetic ganglia of the frog Rana pipiens have been recorded with intracellular electrodes. Successive evoked responses in the presence of a high external Mg/Ca ratio showed marked fluctuations, quant, consistent with the idea that they were composed of summated miniature synaptic potentials. The actions of Mg and Ca were mainly pre-synaptic, that of tubocurarine, post-synaptic. *

4451. SYMPATHOMIMETIC EFFECT OF ACETYLCHOLINE ON SPLEEN OF CAT. CB.Ferry: *J. Physiol., Lond., 1963, 167, 487-504* (Univ. Lab. Physiol., Oxford, England) Injn. of 10-250 / μ g. ACh into the splenic arterial blood caused centripetally directed activity in the C fibres of the splenic nerve of a chloralosed cat. This effect remained after section and degeneration of the splanchnics, which should remove most of the splenic sensory fibres. It was concluded that ACh excited the sympathetic post-ganglionic C fibres within the spleen. This could be abolished by hexamethonium, but not by atropine or 'hydergine' (Sandoz). It was considered that the excitation of C fibres by ACh might account for the sympathomimetic effect of this drug on the spleen. *

4452. PHARMACOLOGICAL EXPERIMENTS ON THE RELEASE OF THE SYMPATHETIC TRANSMITTER. A.G.M. Blakeley, G.L.Brown and C.B.Ferry. *I. Physiol., Lond., 1963, 167, 505-514* (Univ. Lab. Physiol., Oxford, England) Eserine, neostigmine and cocaine affect neither the liberation by the nerves nor the uptake of the sympathetic transmitter in the spleen of cats under chloralose anaesthesia. The release of noradrenaline by arterial injn. of large amounts of ACh is prevented by hexa-

methonium. Hexamethonium does not affect the motor response of the splenic blood vessels to nerve stimn. and has no effect on the output of transmitter'. The results throw doubts on the validity of some of the evidence advanced in support of a cholinergic link in the post-ganglionic sympathetic adrenergic neuro-effector pathway. *

4453. FUNCTION OF THE NUCLEUS SUPRA TRIGEMINALIS. CRJerge: *J. Neurophysiol., 1963, 26, 393-402* (Univ. Pennsylvania Sch. Med., Philadelphia, Pa., U.S.A.) Responses of cells of the nucleus supratrigeminalis were examined using stainless steel micro-electrodes for extracellular recording. All of the units studied responded to movements of the mandible and pressure stimn. of intraoral structures. There were three functional categories of cells: (1) those activated by pressure stimn. of intraoral peripheral fields; teeth, gingiva, palate, tongue, (2) those activated by jaw-opening movements, and (3) those inhib. by jaw opening. Many units showed convergence of afferent inflow from several types of peripheral stimn. The responses of units in the supratrigeminal nucleus closely resemble responses attributed to spinal interneurones. It is likely that cells of the nucleus participate in trigeminal motor reflexes. *

4454. REVERSIBLE COOLING OF CEREBELLUM IN AWAKE, UNRESTRAINED RATS. E.Manni, L.W.Mills and R.S. Dow: *J. appl. Physiol., 1963, 18, 597-599* (Neurophysiol. Lab., Good Samaritan Hosp., Portland, Ore., U.S.A.) The cerebellum of unrestrained rats was cooled by applying Pt foil followed by dry ice to the surface of the cerebellar cortex. The temp. of the tissue 2-6 mm. below the surface dropped 1(f in 4-5 min. H.Clones

4455. NEW INTERPEDUNCULO-DIENCEPHALIC PATHWAY IN RATS AND CATS. L.CMassopust, jun. and R.Thompson: *J. comp. Neurol., 1962, 118, 97-105* (Div. Neurophysiol., Cleveland Psychiat. List, and Hosp., Cleveland, Ohio, U.S.A.) Lesions in the interpeduncular nuclear area of the brains of rats and cats resulted in degeneration of fibres in a pathway which extended rostally along the roof of the interpeduncular space just medial and dorsal to the mammillary peduncles. The possibility that this pathway is involved in learning certain visual, auditory and kinaesthetic habits is discussed. G.M.Lewis

4456. EFFECTS OF THALAMIC LESIONS UPON CEREBELLAR DYSKINESIA IN THE RHESUS MONKEY. M.B.Carpenter and CRJianna: *J. comp. Neurol., 1962, 119, 127-147* (Dept.Anat., Coll. Physn. and Surg., Columbia Univ., New York, N.Y., U.S.A.) The physiol. effects of localised lesions in the thalamus on cerebellar dyskinesia in the monkey produced bilat. by large lesions destroying portions of the intracerebellar nucleus were studied. Modification of the cerebellar tremor was effected by interruption of thalamo-cortical fibre projections from the ventrolateral nucleus (pars oralis) or by removal of potent intrathalamic influences exerted by the centromedian nucleus over the activity of the ventrolateral nucleus. CM.Lewis

4457. THALAMIC LOCALISATION OF AFFERENTS FROM THE TONGUE IN ALBINO RAT. R.Emmers, R.M.Benjamin and AJ.Bлом奎斯 J. comp. Neurol., 1962, 118, 43-48 (Lab. Neurophysiol., Univ. Wisconsin Med. Sch., Madison, Wis., U.S.A.) The organisation of the lingual thalamic relay in the rat was analysed electrophysiol. The thalamic areas responsive to electrical and mechanical

stmn. of each of the 3 nerves innervating the tongue were mapped in detail. Both taste nerves projected to the most medial extension of a morphol. distinct sub-nucleus in the most ventral and post. part of the n.ventralis. The lingual nerve projection filled in the lateral part of the subnucleus, its projection was contralateral and co-extensive with the area activated by mechanical stmn. of the tongue. G.Me Lewis

4458. THALAMIC LOCALISATION OF AFFERENTS FROM THE TONGUE IN SQUIRREL MONKEY (SAIMIRI SCIUREUS). AJ.Bломquist, R.M.Benjamin and R.Emmers: J. comp. Neurol., 1962, 118, 77-87 (Lab. Neurophysiol., Univ. Wisconsin Med. Sch., Madison, Wis., U.S.A.) The organisation of the lingual thalamic relay in the squirrel monkey was analysed electrophysiol. The results paralleled those previously obtained in the rat and supported the proposition that the taste thalamic relay is confined to the post. portion of the ventromedial complex independent of other lingual modalities.

G.M.Lewis

4459. INTRACELLULAR RECORDING FROM THALAMIC NEURONES DURING RETICULOCORTICAL ACTIVATION. D.P.Puipura and RJ.Shofer: J. Neurophysiol., 1963, 26, 494-505 (Coll. Physn. and Surg., Columbia Univ., New York, N.Y., U.S.A.) Intracellularly

recorded activities of thalamic neurones during recruiting responses have been compared with activities elicited by hiⁱ-freq. (25-75/sec.) midline thalamic [CM] stmn. in encéphale isolé cats. Neurones in which long-latency inhibitory post-synaptic potentials [IPSP] were prominent during recruiting responses evoked by low-freq. (7/sec.) CM stmn. showed either increased discharge freq. without significant membrane depolarisation or long-latency sustained depolarisation during high-freq. CM stmn. Neurones with prominent excitatory synaptic drives during recruitment exhibited short-latency depolarisation during high-freq. CM stmn. Synaptically induced depolarisation inactivation of spikes was characteristically observed in these elements after variable periods of repetitive firing. Persisting effects of high-freq. CM stmn. on thalamic neurones consisted in elimination of evoked IPSP and marked potentiation of excitatory synaptic bombardment. These effects were observed in cells with residual post-activation depolarisation and elements in which repolarisation was complete. Blockade of inhib. and the development of sustained excitatory synaptic drives are major intrathalamic synaptic events involved in the transition from synchronisation to desynchronisation of thalamic neuronal activity. *

4460. UNIT ACTIVITY IN HYPOTHALAMUS OF CYCLIC FEMALE RAT : EFFECT OF GENITAL STIMULI AND PROGESTERONE. CJL.Barracough and B.A.Cross: J. Endocr., 1963, 26, 339-359 (Sub-Dept. of Vet. Anat., Univ. Cambridge, England) The firing-rate of hypothalamic unit neurones was studied using stereotaxic technique and suitable amplificati&n-recording systems. It was accelerated by a variety of stimuli including cold, stnell and noise as well as tactile stmn. of the cervix. Modifications of responsiveness at different stages of estrus are described and the significance of the selective J^APression by progesterone of response in lateral hypothalamic neurones to cervical probing discussed with reference to the neural control of LH secretion. CF.Blane

4461. GROWTH FOLLOWING HYPOTHALAMIC LESIONS IN WEANLING RAT. L.L.Bernardis, B.M.Box and J.A.F. Stevensnre Endocrinoloav- 1963. 72. fifi4-f?99. f#neveo

Dept., Univ. W. Ontario, London, Ont., Canada) The effect of hypothalamic electrolytic lesions on growth has been studied in rats. The results show that the most effective lesions for reduction of growth were in the supra-optic nucleus and posteromedial region. With some lesions food intake and temp. regulation were affected. H.Clones

4462. INHIBITORY SYSTEMS IN OLFACTORY BULB STUDIED BY INTRACELLULAR RECORDING. C.Yamamoto, T.Yamamoto and K.Iwama: J. Neurophysiol., 1963, 26, 403-415 (Univ. Kanazawa Med. Sch., Kanazawa, Japan) Responses of the olfactory bulb neurones to electrical stmn. of the lateral olfactory tract [LOT] olfactory mucosa and ant. commissure [AC] were studied in rabbits immobilised with Flaxedil. LOT stmn. generated in the mitral cell antidromic firing followed by the inhibitory post-synaptic potential [IPSP]. The deep layer cells discharged, often rhythmically, to a LOT shock. The mitral cell responded to olfactory mucosa stmn. with spike firings and/or the IPSP. This stmn. also excited the deep layer cells. Upon repetitive stmn. the AC generated the IPSP in the mitral cells and destroyed the IPSP produced by a LOT shock. A small no. of the deep layer cells were activated but most of them were inhib. by AC stmn. The neuronal pathways participating in generation and abolition of the IPSP were discussed. *

4463. CHICKEN TELECEPHALON, DIENCEPHALON AND MESENCEPHALON IN STEREOTAXIC CO-ORDINATES. A. van Tienhoven and L.P.Juhász: J. comp. Neurol., 1962, 118, 185-197 (New York State Coll. Agric, Cornell Univ., Ithaca, N.Y., U.S.A.) A series of semi-diagrammatic illustrations of the brain of Gallus domesticus in stereotaxic coordinates are presented to aid in the placing of electrodes for physiol. studies.

G.M.Lewis

4464. ORGANISATION OF AUDITORY, SOMATIC SENSORY AND VISUAL PROJECTION TO ASSOCIATION FIELDS OF CEREBRAL CORTEX IN THE CAT. R.F.Thompson, R.H.Johnson and JJ.Hoops: J. Neurophysiol., 1963, 26, 343-364 (Univ. Oregon Med. Sch., Portland, Ore., U.S.A.) Organisation of auditory, somatic sensory and visual projection to association cortex of the cat was studied, using chloralose anaesthetic. All modalities of stmn. resulted in identical topographical distributions of association responses in the 4 cortical association fields. These fields included two on the middle suprasylvian gyrus, one on the ant. lateral gyrus, and one on the cortex surrounding the cruciate sulcus, including ant. sigmoid gyrus, banks of cruciate sulcus and cingulate gyrus. Association responses were present after total bilat. removal of all other cortex. The depth distributions of association responses in cortex were identical for all modalities of stmn. and paralleled those for primary responses. All of the evidence presented in this and the other papers of the series supports the hypothesis that a peripheral stimulus delivered to any portion of the auditory, somatic, or visual receptive fields activates one and the same central association system in an undifferentiated manner. This system projects in an equiv. fashion to the same 4 cortical fields. Evidence is presented suggesting that primary type auditory responses of the ant. suprasylvian gyrus do not represent cortical activity in this region of the cortex. *

4465. AUDITORY, SOMATIC SENSORY, AND VISUAL RESPONSE INTERACTIONS AND INTERRELATIONS IN ASSOCIATION AND PRIMARY CORTICAL FIELDS OF THE CAT. R.F.Thompson, H.E.Smith and D.Bliss: J. Neurophysiol., 1963, 26, 365-378 (Univ. Oregon Med.

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Sch., Portland, Ore., U.S.A.) Interactions and inter-correlations of cortical association and primary responses to auditory, somatic sensory, and visual stimuli in the cat were studied. Relatively and abs. unresponsive periods for response amplitude to the second of two stimuli were found to be much longer for association than primary responses. Further, the same recovery cycle was found for association response amplitudes to the 2nd of two stimuli of different modalities as was found for the same stimulus delivered twice. Correlational analyses demonstrated perfect correlations between response amplitudes recorded simult. in any two association response fields to any modality of stimn., this in spite of the very large variability of association responses. Correlations of association and corresponding primary response amplitudes were all zero. All of the data are consistent with the hypothesis, that a peripheral stimulus of any modality activates one and the same central association system in an undifferentiated manner. This system projects in an equiv. fashion to the same 4 cortical fields. Visual responses of the suprasylvian sulcus were found to be unrelated to association responses, and not to interact with primary auditory responses. *

4466. LONG-LASTING NERVOUS SYSTEM RESPONSES TO PROLONGED SOUND STIMULATION IN WAKING CATS. A.Starr and R.B.Livingston: *J. Neurophysiol.*, 1963, 26, 416-431 (Nat. Inst. Hlth., Bethesda, Md., U.S.A.)

Conscious cats with multiple implanted bipolar electrodes were exposed to prolonged steady white noise. Summated electrical activity was recorded before, during, and after exposure to the unchanging stimn. All major stations along auditory pathway were examined in respect to their dynamic responses to this standard stimulus. Whereas click responses were obtained in widespread regions throughout the brain, sustained response to sustained sound stimn. was limited to the classical auditory pathway. Middle ear muscle and central neural mechanisms both powerfully and independently modify responses during continuing stimn. Central neural processes yield prolonged after-effects characterised by depression below control level of activity. These several phenomena of non-correspondence between characteristics of the physical stimulus and electrical activation of the auditory pathway may be related to perceptual effects and after-effects associated with long-continuing sensory stimn. *

4467. UNIT RESPONSES TO SOUND FROM AUDITORY NERVE OF THE CAT. A.Rupert, CMoushegian and R. Galambos: *J. Neurophysiol.*, 1963, 26, 449-465 (W.Reed Army Inst. Res., Washington, D.C., U.S.A.)

Tungsten microelectrodes were placed in the auditory nerve of both anaesthetised and unanaesthetised cats and the sound-induced activity of 45 units was recorded and studied. Three criteria (anatomical, slow-wave morphology, and spike latency) were used to establish unequivocally the location of the electrode tip and every 8th nerve unit described in this paper met all three criteria. The spontaneous discharges of auditory nerve units can be inhib. by sounds, but since some are inhib. promptly and others considerably after tone onset, two mechanisms of inhibn. are inferred. Some units discharge with interspike intervals related primarily to stimulus period while others do not. These latter units seem related to the stimulus intensity and presumably may mediate intensity information. Finally, some spontaneously active units respond to certain continuous tones by grouping their discharges with no increase in discharge rate. These results of the

behaviour of auditory nerve units suggest that highly complex processing occurs at the cochlear level where the impulses are generated. *

4468. CORTICAL INTERCELLULAR SYNAPTIC POTENTIALS IN RESPONSE TO THALAMIC STIMULATION.

Choh-Luh Li: *J. cell. comp. Neurol.*, 1963, 61, 165-179 (Surg. Neurol. Branch, N.I.H., Bethesda, Md., U.S.A.)

Changes in potential recorded from the interior of cortical neurones and from the surface of the post. sigmoid gyrus were produced by stimn. of the nucleus centromedianus and nucleus ventralis posterior lateralis in the thalamus of the cat. The results support the concept that a surface-neg. wave is caused by a wave of depolarisation travelling along ascending dendrites from cortical neurones to the cortical surface. A shift in the surface steady potential to negativity upon repetitive stimn. of the thalamus appeared to be closely related to sustained hyperpolarisation or increased negativity in the membrane potentials of cortical neurones. G.M.Lewis

4469. RELATION BETWEEN SECONDARY OPTIC FIBRE SYSTEM AND CENTRENCEPHALIC SYSTEM FOR CONVULSIONS. LOCALISATION OF A SUB-CORTICAL PACEMAKER FOR CONVULSIONS. JJ. van Straaten: *Arch. int. Physiol.*, 1962, 70, 483-495 (Lab. of Gen. Physiol., Roman Catholic Univ., Nijmegen, Netherlands)

Histol. methods have confirmed fibre connections from deep layers of dorsal lateral geniculate body and demonstrated fibre tract from the lateral post. thalamic nucleus to the ventral ant. and central lateral thalamic nuclei in the cat. Electrical stimn. of the lateral post. thalamic nucleus produced ipsilateral head movements, loss of posture and fully developed epileptiform seizures with loss of bladder control and e.g. spike-wave activity in the unrestrained cat. Stimn. of ventral ant. and central lateral nuclei produced only jerking of legs which ceased on termination of the stimulus. Stimn. of the dorsal lateral geniculate body resulted in shivering and a minor e.g. arousal reaction, whereas stimn. of rostral colliculus and nucleus cuneifonnis produced alertness and flight reaction with marked arousal. The lateral post. thalamic nucleus is a major part of the centrencephalic epileptic system having a direct connection to the occipital cortex and an indirect connection, through the ant. thalamic nuclei, to the frontal cortex.

M.E.Nutt

4470. SYNDROME OF INTENTION OR ACTION MYO-CLONUS AS A SEQUEL TO HYPO-OXIC ENCEPHALOPATHY. J.W.Lance and R.D.Adams: *Brain*, 1963, 86, 111-136 (Neurol. Serv., Massachusetts Gen. Hosp., Harvard Med. Sch., Harvard, Mass., U.S.A.)

It is suggested that the basic disturbance is the synchronous and repetitive firing of cells in the ventrothalamic nucleus in response to afferent impulses from the cerebellum resulting in thalamocortical volleys. R.H.Kimberlin

4471. ACTION TREMOR AND THE COGWHEEL PHENOMENON IN PARKINSON'S DISEASE. J.W.Lance, R.S. Schwab and E.A.Peterson: *Brain*, 1963, 86, 91-110 (Neurol. Serv., Massachusetts Gen. Hosp., Harvard

Med. Sch., Harvard, Mass., U.S.A.) Evidence is presented that the physiol. tremor mechanism is preserved in Parkinson's disease and that in the majority of cases it is exaggerated, giving rise to an 'action tremor' on exertion. R.H.Kimberlin

4472. E.E.G. CHANGES ACCOMPANYING THYROID DEFICIENCY IN MAN. R.W.Lansing and J.B.Trunnell:

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J. clin. Endocr., 1963, 23, 470-480 (Dept. Psychol., Univ. Arizona, ^Tucson, Ariz., U.S.A.) Serial e.e.g. were recorded during deprivation and replacement of thyroid hormone in patients who were dependent on exogenous hormone for maintenance of a euthyroid state. The results indicated that the e.e.g. is potentially useful in the detection of c.n.s. effects of thyroid deficiency and in monitoring the efficacy of hormone replacement therapy.

K. Jones

4473. ORBITOFRONTAL CORTICAL LESIONS AND LEARNING IN CATS. J.M.Warren, H.B.Warren and K.Akert J. comp. Neurol., 1962, 118, 17-41 (Dept. Psychol., Pennsylvania State Univ., Philadelphia, Pa., U.S.A.)

Cats with orbitofrontal lesions were retarded in serial learning (double alternation) and in learning to inhibit spontaneous or acquired stimulus preferences, while cats with prestriate lesions, were impaired on visual tasks (umweg problems or size discrimination). Lesions in both areas did not have summative effects on learning performance.

CM.Lewis

4474. LOCALISATION OF A MEMORY TRACE IN ONE CORTICAL HEMISPHERE AND TRANSFER TO THE OTHER HEMISPHERE. I.S.Russell and S.Ochs: Brain, 1963, 86, 37-54 (Dept. Physiol., Indiana Univ. Sch. Med., Indianapolis, Ind., U.S.A.) Spreading cortical depression of Leao was used to depress the cortical functions of one hemisphere in rats for several hr. During this time, animals were exposed to bar-press training, and testing showed the establishment of a memory trace in the functional but not in the non-functional hemisphere.

R.H.Kimberlin

4475. EFFECT OF PROLONGED SHOCK STRESS ON TIMIDITY AND EMOTIONAL ELIMINATION IN THE RAT. K.E.Moyen J. genet. Psychol., 1963, 102, 37-43 (Dept. Psychol., Carnegie Inst. Technol., Pittsburgh, Pa., U.S.A.)

Rats were subjected to shock every 3 min. for 22 hr. and 50 min./day for 5 days. Together with control animals they were tested in a timidity apparatus after each stress period. They were then given ad lib food and water for 48 hr. and tested in the open field. Increased emotionality was observed in the timidity box and also in the open field after 48 hr.

J.R.Broome

4476. PENETRATION OF LIGHT INTO BRAIN OF MAMMALS. W.F.Ganong, M.D.Shepherd, J.R.Wall, E.E. Vanbrunt and M.T.Clegg; Endocrinology, 1963, 72, 838-839 (Physiol. Dept., Univ. California, San Francisco Med. Center, San Francisco, Calif., U.S.A.)

Small amounts of light were found to penetrate the hypothalamus of rabbits and rats and the temporal lobes of sheep and dogs.

H.C.Jones

4477. INFLUENCE OF ALCOHOL ON GENERAL ACTIVITY OF RATS. H.Wallgreen and A.Arvala: Ann. Med., exp. Fenn. 1963, 41, 88-93 (Res. Lab., State Alcohol Monopoly (Alko), Helsinki, Finland)

The effect of a moderate dose (3 mg./g.) of alcohol on the general activity of mice for 1 hr. following its administration was studied in undisturbed conditions and during exposure to an irregularly recurring, intense rattling noise. When activity after administration of water was used as ref., no changes in total activity were observed in undisturbed conditions. However during noise, alcohol significantly increased the no. of impulses recorded. Noise changed the activity patterns of the animals radically and this changed pattern was to a significant degree 'normalised' after alcohol.

G.Faulkner

4478. ACCUMULATION OF CALCIUM BY BRAIN CORTEX SLICES. J.S.Chamock: J. Neurochem., 1963, 10, 219-223 (McGill-Montreal Gen. Hosp. Res. Inst., Montreal, Canada) Slices of rat brain were prepared in Ca-free media and ⁴⁵Ca added from the side arm of a Warburg vessel. 40% accumulation of ⁴⁵Ca occurred within 5 min. and was unaffected by anaerobiosis, or varying respiratory activity (QO₂ 3-17) by Na glutamate, ouabain, DNP, Na salicylate, phospholipase A or alteration of K/Na ratio in the medium. On this evidence a metabolically independent mechanism for Ca accumulation, such as binding, is suggested.

R.J. Woodman

4479. RESPONSE OF CEREBRAL CORTEX OF RAT TO PROLONGED PROTEIN DEPLETION. TISSUE WEIGHT, NITROGEN, DEOXYRIBONUCLEIC ACID AND PROTEINS. P.Lehr and J.Gayen J. Neurochem., 1963, 10, 169-176 (Lab. Gen. Physiol., Fac. Sci., Univ. Nancy, France) Rats were fed on a complete (defined) diet, partially protein-deficient and completely protein-deficient diet. Although protein depletion caused a fall in body wt. over 100 days from 250 g. to 50 g., there was scarcely any change in the cerebral content of DNA phosphorus (control value 57 pg./g. fresh wt.), protein N (14*7 mg. N/g. fresh wt.) or total -N (18.2 mg. N/g. fresh wt.). Constancy of cell no. and cytoplasmic mass during protein starvation are concluded from these results.

(French) R.J.Woodman

4480. GLIAL RNA CHANGES DURING A LEARNING EXPERIMENT IN RATS. H.Hyden and E.Egyhazi: Proc. nat. Acad.Sci., Wash., 1963, 49, 618-624 (Inst. Neurobiol., Univ. Gothenburg, Sweden) Pure-pyrimidine analyses

were carried out on glial RNA immediately surrounding Deiter's neurones from rats subjected to a learning expt. during which complicated motor and sensory behaviour was established. Adenosine:uracil ratio of glial RNA increased significantly while a significant decrease occurred in the cytosine value of glial RNA. Several control expt. precluded the possibility that formation of RNA with sp. base ratios was due to demands on neural function per se. Significance of glia-neurone RNA changes in learning is discussed.

J.R.Sargent

4481. ELECTROPHYSIOLOGICAL AND NEUROCHEMICAL STUDIES FOLLOWING INJECTION OF MONONUCLEOTIDES AND THEIR DERIVATIVES. V. Bonavita, N.Bonaser, M.Zito and E.Scarana J. Neurochem., 1963, 10, 155-164 (Dept. Neurol., Univ., Palermo, Italy) I.p.

injn. of uridylic, cytidylic and guanylic acids; uridine, cytidine, uracil and guanine produced changes in the e.e.g. pattern similar to that produced by Na pentothal. 0*5-1*5 hr. after injn. of nucleoside or nucleotide, levels of acid sol. u.v. absorbing materials and ribose in liver and brain rose to a max. and decreased thereafter. Total -P in brain and liver rose only after injn. of nucleotide and because of previous evidence that the brain is not permeable to inorg. PO₄ incorporation of the entire nucleotide mol. is concluded.

R.J.Woodman

4482. LOCALISATION OF CHOLINESTERASES IN ADULT MAMMALIAN BRAIN CELL CULTURES. R.S.Geiger and W.CStone: Int. J. Neuropharm., 1962, 1, 295-302 (Res. Ub., Dept. Psychiat., Univ. Illinois Coll. Med., Chicago, Ill., U.S.A.) The distribution of AChase and non-sp. butyrylcholinesterase in cells from long-term human and rabbit brain cortex cultures is described. Effects of adding Na barbital, adrenaline and anticholinesterases to the cultures upon the histochem. are also detailed and discussed. Both forms of cholinesterase could be identified in grey as well as white matter.

G.F.Blane

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4483. EFFECT OF LYSERGIC ACID DIETHYLAMIDE[LSD] ON ACETYLCHOLINESTERASE ACTIVITY OF SINGLE NERVE CELLS FROM RETICULAR FORMATION.

R.Pavlin: J. Neurochem., 1963, 10, 195-199 (Patho-physiol. Inst., Med.Fac, Ljubljana, Yugoslavia)

Using microdialysis techniques A Chase activity of single neurones in 4 regions of rat brain reticular system, was estimated. A Chase activity in cells from one region (nucleus reticularis ponds caudalis) was inhib. by LSD at 2×10^{-5} M and activated at lower concn.

R.J.Woodman

4484. ISOLATION OF SYNAPTIC VESICLES AND STRUCTURAL ORGANISATION OF ACETYLCHOLINE

SYSTEM WITHIN BRAIN NERVE-ENDINGS. E. De Robertis, G.R. De Lores Amaiz, L.Salganicoff, A.P.de Iraldi and L.M.Zieher: J. Neurochem., 1963, 10, 225-235 (Inst. Anat. Gen. Embriol., Fac. Sci. Med., Buenos Aires, Argentina)

An improved method is described for prep. of synaptLc vesicles from rat brain homogenate in sucrose and 10 μ M Ca by repeated centrifugation of die mitochondrial pellet in 0.032M sucrose which releases the vesicles from the nerve-endings by osmotic shock. Electron micrographs of the vesicles are shown. The vesicles are rich in ACh and choline acetylase whereas AChase activity is higher in the ruptured nerve-ending plus mitochondrial fraction. Evidence is discussed for the theory that AChase is confined to the nerve-ending membrane while the vesicles act as synthetic and storage sites of ACh.

R.J.Woodman

4485. UPTAKE OF LABELLED NORADRENALINE BY ISOLATED BRAIN AND OTHER TISSUES OF CAT. H.J.

Dengler, I.A.Michaelson, H.E.Spiegel and E.Titus: Int. J. Neuropharmac., 1962, 1, 23-38 (Lab. Chem. Pharmacol., Nat. Heart Inst., Bethesda, Md., U.S.A.)

Slices from brain and peripheral sympathetically innervated tissues were found to take up labelled noradrenaline against the concn. gradient and store (bind) it intracellularly. This transport activity was inhib. by reserpine and cardiac glycosides while an apparently passive outward diffusion continued, leading to eventual depletion of the amine from stores. Studies with inhibitors of the enzymes normally concerned in the catabolism of noradrenaline confirmed the 'non-available' nature of the cellular stores.

C.F.Blane

4486. INFLUENCE OF pH ON UPTAKE AND RELEASE OF NORADRENALINE [NA] IN ADRENERGIC NERVE GRANULES. U.S. Vom Euler and F.Iishajko: J. Neurochem., * 1963, 10, 145-149 (Dept. Physiol., Karolinska Inst., Stockholm, Sweden)

After expressing juice from bovine splenic nerves, the 1000 g. 10 min. sediment was discarded and die 50000 jj, 30 min. sediment retained as the storage granule prep. Granules suspended in isotonic phosphate lost their native NA at a linear rate which increased as the pH was reduced from 8.5 to 6.0 or if the temp. was raised from 20° to 37°. Rate of uptake of NA by depleted granules incubated with 20 μ g./ml. of Na, increased as pH was raised from 6.0 to 8.5 but was not affected by temp. (2(f-37°)). Re-depletion rates of these granules in a NA-free medium was similar to the initial depletion rates.

R.J.Woodman

4487. DIAMINE OXIDASE [DAO] IN BRAIN OF VERTEBRATES. W.J.Burkard, K.F.Gey and A.Pletscher: J. Neurochem., 1963, 10, 183-186 (Med. Res. Dept., F. Hoffman-La Roche and Co. Ltd., Basle, Switzerland)

Using radioactive cadavexine or putrescine as substrates DAO activity could be measured down to 1 m/mole

diamine/g. fresh wt./hr. In whole rat, mouse, guinea-pig and 6 regions of rabbit brain, lizard, frog, tortoise and Boa snake brain, no DAO activity could be detected. In pigeon and hen 1-1.5 μ moles/g./hr., was noted and in 8 spp. of fish (whole brain) 6-120 m/jmoles/g./hr. In carp, activity was highest in the diencephalon (99 μ jmoles/g./hr.), prosencephalon (37 m/jmoles/g./hr.), medulla oblongata (30 m/jmoles), metencephalon (15 m/jmoles) and mesencephalon (7 μ jmoles). These rates were similar to 5-OH tryptophan decarboxylase but *Vfo* those of MAO in the same regions.

R.J.Woodman

4488. CHEMICAL AND PHYSIOLOGICAL CHANGES PRODUCED BY ARTERIAL INFUSION OF DIHYDRCK Y-PHENYLALANINE INTO ONE CEREBRAL HEMISPHERE OF CAT. R.Dagirmanjian, R.Laverty, P.Mantegazzini, D.F.Sharman and M.Vogl: J. Neurochem., 1963, 10, 177-182 (A.R.C. Inst. Anim. Physiol., Babraham, Cambridge, England)

Dopamine was infused i.a. into one half only of the brains of anaesthetised cats and also in cats with partially transected brains producing an e.e.g. pattern with characteristic sleep spindles and max. constricted pupils (the cerveau isolé condition). Dopamine levels in caudate nucleus of the infused half were higher by 12, 27, 58, and 145% in anaesthetised animals and 130, 109, 138 and 138% higher than that of the non-infused side in cerveau isolé animals. Noradrenaline levels in hypothalamus and midbrain were unaffected in either case by dopa infusion but in anaesthetised animals dopa levels of these regions were higher in the* infused half by 30-200%.

R.J.Woodman

4489. UPTAKE OF 5HT BY SUBCELLULAR PARTICLES OF RABBIT BRAIN. AJnouye, K.Kataoka and J.Shinagawa: Nature, Lond., 1963, 198, 291-292 (Dept. Physiol., Univ., Kyoto, Japan)

Uptake of 5HT, but not histamine, by subcellular particles from rabbit brain is reported. The uptake was not affected by DNP, CN", j>chloromercuribenzoate, ATP, cysteine, glutathione, insulin or vasopressin, but slightly depressed by K.

G.M.Lewis

4490. SUBCELLULAR DISTRIBUTION OF HISTAMINE, SLOW-REACTING SUBSTANCE AND 5HT IN BRAIN OF RAT. E.A.Carlini and J.P.Green: Brit. J. Pharmacol., 1963, 20, 264-277 (Dept. Pharmacol., Yale Univ. Sch. Med., New Haven, Conn., U.S.A.)

Brain extracts are prepared with dil. and cone, acid, acetone and n-butanol. Histamine is found in small particulate material, slow-reacting substance in particulate material of greater density and 5HT in both. No relationship is found between the distribution of these substances and succinic dehydrogenase.

A. E. Brooks

4491. INFLUENCE OF COLD ENVIRONMENTAL TEMPERATURE AND HISTAMINE TREATMENT ON EFFECT OF RESERPINE IN RAT. R.Laverty: J. Neurochem., 1963, 10, 151-154 (Pharmacol. UrJc, A.R.C. Inst. Anim. Physiol., Babraham, Cambridge, England)

Exposure to 4° for 4 or 20 hr., and multiple injn. at hourly intervals of histamine (20 mg./kg.) had no effect on the rate of depletion of elevated brain 5HT induced by reserpine injn. (2-5 mg./kg.).

R.J.Woodman

4492. TRANSPORT OF 5HTP and 5HT INTO BRAIN. SM. Schanberg: J. Pharmacol. exp. Ther., 1963, 139, 191-200 (Yale Univ. Sch. Med., New Haven, Conn., U.S.A.)

Uptake by rat brain slices of [$1-^{14}$ C]labelled 5HTP but not of labelled 5HT, was enhanced by O₂ or glucose, DNP interfered. Various drugs which depress brain tissue

respiration or influence 5HT metabolism did not alter the facilitated transport of 5HTP. Naturally occurring amino acids decreased the uptake of 5HTP.

J.M.Whitmarsh

4493. TURNOVER OF ^{24}Na IN THE CEREBROSPINAL FLUID AND ITS BEARING ON THE BLOOD-BRAIN BARRIER. H.Davson and M.Pollay: J. Physiol., Lond., 1963, 167, 247-255 (Dept. Physiol., University Coll., London, England) It was shown that, during ventriculo-cisternal perfusion, the kinetics of penetration of ^{24}Na from blood to the perfusion fluid would be fundamentally different according as there was, or was not, a 'blood-brain barrier*' to this isotope. Equations describing penetration for the two cases were developed and it was shown that the expt. values accorded with the case in which the barrier was assumed. *

4494. INFLUENCE OF VARIOUS DRUGS ON THE TRANSPORT OF 1311 AND PAH ACROSS THE C.S.F.-BLOOD BARRIER. H.Davson and M.Pollay: J. Physiol., Lond., 1963, 167, 239-246 (Dept. Physiol., University Coll., London, England) The effects of various drugs on the rate of secretion of c.s.f. and on the absorption from the ventricles of 1311 and PAH have been studied in rabbits using the technique of ventriculo-cisternal perfusion. Diamox and DNP reduce the rate of secretion very markedly. The absorption of the substances is inhibited by ouabain and J>NP and β -chloramercurobenzoate; the effects of acetate, higher fatty acids and amino acids on the absorption of RAH were reminiscent of their action on renal tubular secretion. *

SENSE ORGANS

4495. VITREOUS HUMOUR: POSTMORTEM POTASSIUM CHANGES. W/2.Stumei: Lancet, 1963, i, 807-808 (Dept. Forensic Med. Guy's Hosp. Med. Sch., London, England) K concn. in the vitreous rises steadily after death for at least 100 hr. It gives a remarkably accurate measurement of the postmortem interval especially after 24 hr.

CH.Bell

4496. A THEORY OF BINOCULAR FUSION. P.C.Dodwell and G.R.Enget: Nature, Lond., 1963, 198, 39-40, 73-74 (Queen's Univ., Kingston, Ont., Canada) A theory is put forward to explain the binocular fusion of intermittent stimuli, which gives a rational explanation of the process of binocular fusion and recognition of depth.

CM.Lewis

4497. VISUAL FUNCTION IN PATIENTS WITH HOMONYMOUS HEMIANOPIA. II. OCULOMOTOR MECHANISMS. UM.Gassel and D.Williams: Brain, 1963, 86, 1"36 (Nat. Hosp., Queen's Sq., London, England) 15 patients were examined over 3 yr. to analyse their capacity for adjustment to the visual field defect. Eye movements were recorded by electro-oculography and a series of standardised tests were devised and the patients' performances compared with normals. Oculomotor defects were related to the site of the lesions, type of visual field deficit and the patient's visual functional proficiency in ordinary life.

R.H.Kimberlin

4498. PERCEPTION LAG AS FUNCTION OF STIMULUS LUMINANCE. J.A.J.Roefs: Vision Res., 1963, 3, 81-91

(Inst. voor Perceptie Onderzoek, Eindhoven, Netherlands) Perception lag as a function of stimulus luminance has been measured over the intensity range of about 10-1000 trolands using 3 techniques based on (1) a subjective concurrence of 2 flashes with different luminance, (2) a subjective concurrence of a flash and a tone pulse, (3) reaction time to a flash. The results of these methods agree reasonably and show a simple logarithmic relationship.

J.Whiting

4499. SPATIAL SUMMATION. P.E.Hallett: Vision Res., 1963, 3, 9-24 (Dept. Neurol., Churchill Hosp., Oxford, England) Ricco's law provides evidence for spatial summation in the human visual pathways. The literature is reviewed and it is found that spatial summation in all observers increases with distance from the fovea, is small for cone vision and is partly dependent on the test object. For a given test-object variation between observers is sufficiently striking to justify their division into 2 groups, A and B, according to whether summation is large or small at a given eccentricity. If 2 different sizes of rod receptive field co-exist at the same point, a no. of variables will determine the sensitivity of these receptive fields and hence, for an individual observer, regardless of the size of summation or the slope of the freq.-of-seeing curve. The freq. distribution of summation estimates is probably multimodal and many other visual data conform to this pattern. Limited evidence for the co-existence of two sizes of receptive field and the role pf techniques are also discussed.

J.Whiting

4500. EFFECTS OF CORTICAL AND COLLICULAR LESIONS ON BRIGHTNESS AND FLICKER DISCRIMINATION IN CAT. A.C.Norton and G.Clark: Vision Res., 1963, 3, 29-44 (Dept. Psychol., Univ., Buffalo, N.Y., U.S.A.)

The visual cortices and superior colliculi were removed bilat. in 6 cats previously trained in a modified Yerkes runway to make brightness and flicker discriminations. After a 2-week recovery period the animals were tested for retention and for ability to relearn these two discriminations. There was no retention and relearning was greatly impaired. Comparisons with previous expt. with only cortical removals indicated the additional effect of the collicular removals impaired learning. The neuro. basis for these findings is discussed.

J.Whiting

4501. ACQUISITION OF FLICKER DISCRIMINATION IN CORTICALLY BLIND CAT. A.C.Norton and G.Clark: Vision Res., 1963, 3, 75-79 (Dept. Psychol., Univ.

Buffalo, N.Y., U.S.A.) The visual cortex was removed from a cat who had been given training in lever pressing until he would press either of 2 levers for a milk reward. After the removal he was trained in the discrimination of IPS from a steady light. The discrimination was learned postoperatively, and transfer to higher freq. of IPS was possible up to 40 c/s. In the light of previous studies, this finding is interpreted as demonstrating a non-striate mechanism active in the acquisition of this discrimination, the mechanism acting in parallel with the visual cortex.

J.Whiting

4502. THE SUBJECTIVE DIFFERENCE OF LUMINANCE TEMPORAL GRADIENTS. H.Bomschein: Vision Res., 1962, 2, 463-467 (Physiol. Inst. der Univ., Wien, Austria) In the cat the influence of temporal gradients of luminance is very marked on the off-responses but less so on the on-responses of retinal ganglion cells. Using the same stimuli, similar results were obtained in psychophysical expt. with 6 subjects. The discrimination of stimuli with different rise times becomes progressively



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more difficult the higher the finally attained level of luminance. The opposite is true for decreasing stimuli. With a strong illumination (830 cd/m^2) over the entire visual field, a lengthening of decreasing time from 7 to 100 msec, can be easily detected, whereas a similar lengthening of rise time is scarcely perceived.

4503. EFFECT OF HYPERTHERMIA ON PERIPHERAL DARK ADAPTATION RATES. A.T.Kissen: *J. appl. Physiol.*, 1963, 18, 600-602 (Biomed. Lab., 6570th Aerospace Med. Res. Lab., Wright-Patterson A.F. Base, Ohio, U.S.A.) Rectal temp, in man was raised to and maintained at 0.56° above control temp, during which time, dark adaptation curves were obtained. Dark adaptation was facilitated under this thermal stress condition.

H.C.Jones

4504. CAN THE ENUCLEATED VERTEBRATE EYE GIVE AN ELECTRICAL RESPONSE TO ILLUMINATION? J.A. Bernards, G.P.M.Horsten and J.E.Winkelmann: *Arch. int. Physiol.*, 1962, 70, 356-363 (Lab. Gen. Physiol., Roman Catholic Univ., Nijmegen, Netherlands)

Potential changes with no measurable latent period were recorded en Xe flash illumination of the enucleated cat's eye. Similar changes were recorded on illumination of cats' eyes preserved at -6° for 24 hr. and of 2 unprotected electrodes in 0.9% NaCl soln. All the above changes are due to a photoelectric effect on the electrode surface and disappeared when an i.r. absorbing filter was placed in the light path. Illumination of the frog's eye immediately after enucleation gave a potential change, with latent period, identical in shape with the e.r.g. of the frog's eye in situ and which persisted after absorption of the i.r.

M.E.Nutt

4505. THE IMAGING PROPERTIES OF THE OPTICAL KIEDIA OF THE EYE. R.R.Thler: *Vision Res.*, 1962, 2, 391-429 (Inst. für medizinische Optik, Univ., München, Germany)

The optical image produced by the human eye was investigated using a point source focused on the retina, and analysing the light distribution leaving the eye after reflection from the retina. Animal eyes were used to test the adverse influence of scattered light from the optical surfaces and inhomogeneities of the optical media of the eye on the results, and the effects were found to be negligible. The imaging properties of human eyes were measured in the form of the contrast transfer function. By means of an analytical approximation of the results, the spread functions of point and line on the retina were calc. The dependence of the transfer function on the angle against the optical axis and on the diam. of the pupil were measured. The point and line spread functions, calc. from measured transfer functions, provide an easy explanation of the min. separable points and lines and vernier acuity. The contrast threshold of small circular objects as a function of diam. is explained quant. by the contrast loss in the optical image. (German) J.Whiting

4506. PROPERTIES AND NATURE OF THE R MEMBRANE OF THE FROG'S EYE. G.S.Brindley and D.L.Hamasaki: *J. Physiol.*, Lond., 1963, 167, 599-606 (Physiol. Lab., Univ. Cambridge, England)

The potential developed across the R membrane by a rectangular pulse of current is not simply exponential, but can be adequately represented by $E = a(1 - e^{-VO}) + b(1 - e^{VP}) + c$, where JL is about 10 msec, and g about 0.3 msec. The R membrane can persist, and its complex effect on a rectangular pulse of current remain unchanged, after complete removal of the pars optica retinae. Two 'R membranes' in series could never be detected. When a small advancement of a microelectrode had sent its tip through the R membrane,

withdrawal by as little as 12 ji would often bring it back. The observations support the hypothesis that the R membrane is die inner bounding membrane of the pigment epithelium, and exclude the hypothesis that it is the external limiting membrane or any other structure in the pars optica retinae. *

4507. POSSIBLE MECHANISM FOR AMPLIFIER EFFECT IN RETINA. T.L.Jahn: *Vision Res.*, 1963, 3, 25-28 (Dept. Zool., Univ California, Los Angeles, Calif., U.S.A.)

Light transforms the 11-cis¹¹-retinene of the rhodopsin mol. into all-trans-retinene, producing a longer and highly resonant mol. It is proposed that these changes permit electron flow through the lamellar membranes, with the electrons provided by and received by oxidation-reduction enzymes, one on each side of the membrane. This conductive state of retinene occurs only in the lumi- and metarhodopsins. While conductive, a mol. of retinene, under electron pressure from oxidation-reduction enzymes, might conduct many electrons, thus providing an amplifier system and causing depolarisation of the membrane.

J.Whiting

4508. ROLE OF RETINAL RECEPTORS IN FORMATION OF POSITIVE VISUAL AFTER-IMAGE. C.A.Padgham: *Vision Res.*, 1963, 3, 45-49 (Northampton Coll. Adv. Technol., London, England)

Pos. visual after-images have been formed with white light stimuli of different angular size, and measured with a binocular matching apparatus. Different power-law decay curves were found for large and small stimuli and these are attributed to the influence of rod receptors in the former. Monochromatic stimuli in the red, green and blue-green were used to form after-images. The different exponential decay curves produced are attributed to the action of 3 different types of colour receptor. From the tinjje const. of after-image decay it is suggested that the c\$e of the after-image may be predominantly electrical rather than photochem.

J.Whiting

4509. OFF-RESPONSE OF ELECTRORETINOGRAM INDUCED BY X-RAY STIMULATION. C.S.Bachofen and S.E. Wittry: *Vision Res.*, 1963, 3, 51-59 (Dept. Biol., Univ., Notre Dame, Ind., U.S.A.)

The retina of frog, *Rana pipiens* responds to flashes of X-rays and produces an e.r.g., the on-response of which resembles the on-response to light. The off-response to X-rays, besides differing considerably from that to light differs in different frogs. An alteration of nutritional status of the frog changes the off-response, well-fed animals showing a very small off-response and starved animals showing a very slow off-response characterised by considerable amplitude and duration. All degrees of response between these two extremes have been observed.

J.Whiting

4510. DUAL NATURE OF OCTOPUS ELECTRORETINOGRAM. K.Tasaki, T.Iokawa and A.C.Norton: *Vision Res.*, 1963, 3, 61-73 (Dept. Physiol., Tohoku Univ. Sch. Med., Sendai, Japan)

Micro-electrodes inserted through the octopus retina detect a sustained neg. response on the ant. surface, next an equipotential area, and deeper a sustained pos. response. The existence of at least 2 potential origins in the octopus retina was suggested on the basis of differences between the two responses with respect to stimulus variables. Evidence suggests the receptor cells of the squid retina act as a dipole, but the assumption of only one dipole does not account for the data from the octopus retina. *

J.Whiting

DIGESTIVE SYSTEM

4511. EFFECT OF ALDOSTERONE, CORTISOL AND CORTICOSTERONE UPON Na AND K CONTENT OF SHEEP'S PAROTID SALIVA. J.R.Blair-West, J.P.Coghlan, D.A.Denton, J.R.Goding and R.D.Wright: *J. clin. Invest.*, 1963, 42, 484-496 (Dept. Physiol., Univ. Melbourne, Parkville, Australia) Infused glucocorticoids at levels similar to those max. secreted by the sheep's adrenals had little or no effect on the parotid salivary Na/K concn. ratio, but infused aldosterone had equiv. effect of endogenous aldosterone in sheep. The sensitivity to aldosterone of the parotid gland in Na-replete and in Na-deficient sheep was strikingly different. The parotid gland of a 30 kg., Na-depleted sheep seemed to respond to as little as 1-2 µg./hr. KJones

4512. ELASTIC PROPERTIES OF OESOPHAGUS IN STATIC MEASUREMENT OF INTRATHORACIC PRESSURE IN MAN. K.P. van de Woestijne: *Arch. int. Physiol.*, 1962, 70, 533-546 (Clin. Univ. St. Raphael, Louvain, Belgium) Elasticity of the oesophagus varied during respiration, increasing as intrathoracic pressure became more neg. during inspiration. This variation in elasticity during the respiratory cycle also depends on the position of the balloon, in the oesophagus. Oesophageal elasticity decreases with increase in the vol. of air initially present in the balloon*. The above variations in elasticity cause only minor errors in measurements of intrathoracic pressure. They do not explain the differences in intraoesophageal pressure recorded at different levels in the oesophagus. Compression of the lower oesophagus by mediastinal structures is the most important factor in this.

(French) M.E.Nutt

4513. BIPHASIC NATURE OF GASTRIC SECRETORY RESPONSE TO HYPOGLYCAEMIA AND OTHER STIMULI WITH SPECIAL REFERENCE TO THE ROLE OF THE ADRENALS. W.Sircus, C.J.W.Huston, R.M.Preshaw, H.Bassoe and R.A.Harkness: *Gut*, 1963, 4, 42-57 (Dept. Med., Univ. Edinburgh, Scotland) Dogs with fundal pouches show 2 peaks of gastric secretory response to insulin hypoglycaemia. The 1st response depends upon intact innervation; the 2nd, which follows after some hr., does not. The 2nd peak neither coincides with a period of hypoglycaemia, nor with changes in plasma cortisol level. U is not abolished by adrenalectomy. It is only evident when there is long contact of acid secretion with the gastric mucosa, and it is removed by antrectomy. The suggestion is made that this second peak is evidence of the prolonged secretory activity mediated through the antrum and gastrin, being suppressed by an inhibitory period due to lowering of pH to some critical level over the antral mucosa. When this pH rises again the secretory activity mediated through the antral gastrin persists to produce the second peak. B.Greenwood

4514. PITUITARY-ADRENAL COMPONENT IN GASTRIC SECRETORY RESPONSE TO INSULIN HYPOGLYCAEMIA. W.H.Bachrach: *Gastroenterology*, 1963, 44, 178-189 (Univ. S. California Med. Sch., Los Angeles, Calif., U.S.A.) The evidence for their being a pituitary-adrenal activation of the acid-secretory mechanism of gastric glands in cases of insulin hypoglycaemia is weighed against the evidence for the effect being mediated via the prasynthetic system. The author argues strongly in favour of the latter hypothesis. 'A review). D.N.Wheatley

4515. PANCREAS AND GASTRIC SECRETION: FAILURE OF PANCREATECTOMY TO PREVENT INHIBITION OF GASTRIC SECRETION BY SECRETIN. J.A.Kennedy and G.A.Hallenbeck: *Gut*, 1963, 4, 58-60 (Mayo Clin., Rochester, Minn., U.S.A.) There is evidence that acidification of the duodenal contents can diminish, by some humoral mechanism, the secretory response of the stomach. A commercially available secretin used on dogs with Heidenhain pouches inhibits the acid secretion in response to food, but not to histamine. The pancreas, as the mediating factor, was excluded by pancreatectomy failing to prevent the inhibition.

B.Greenwood

4516. 'MUCOUS BARRIER': EVALUATION OF SIALIC ACID AS A PROTECTIVE FACTOR AGAINST DEGRADATION OF GASTRIC MUCUS BY PANCREATIC ENDO-PEPTIDASES. L.Choskins and N.Zamcheck: *Gastroenterology*, 1963, 44, 456-462 (Gastrointest. Res. Lab., Mallory Inst. Pathol., Boston City Hosp., Boston, Mass., U.S.A.) Warren's thiobarbiturate method was used to estimate sialic acid components of the gastric mucus. By simulating the conditions of the gut by using pancreatic at pH 8*1 and incubating at 37° for 24 hr., it was found that gastric mucus released very slowly small amounts of bound sialic acid. Subsequent treatment of this treated mucus with trypsin was no different from trypsin treatment of untreated mucus. It was concluded that sialic acid has no protective role in gastric mucus against endopeptidases. D.N.Wheatley

4517. IN VIVO EXTRALIJMINAL CONTRACTILE FORCE TRANSDUCER FOR GASTROINTESTINAL MUSCLE. H.I.Jacoby, P.Bass and D.R.Bennett: *J. appl. Physiol.*, 1963, 18, 658-665 (Pharmacol. Dept., Univ. Michigan Med. Center, Ann Arbor, Mich., U.S.A.) Longitudinal and transverse gastrointestinal motility has been recorded in unanaesthetised animals using an implanted miniature foil strain gauge bonded to a metal strip attached at 2 points to the outside of the intestine. The effects of expt. conditions on the muscular activity are described.

H.C. Jones

4518. EFFECTS OF TEMPERATURE AND Ba ON ISOLATED VAGUS-STOMACH PREPARATION OF RAT. D.Della Bella, A.Gandini and U.M.Teotino: *J. Pharmacol. exp. Ther.*, 1963, 139, 208-215 (Selvi and C, Milano, Italy) At a bath fluid temp. of 22-25° motor responses to electrical presynaptic vagal stimm. were inhibited but response to ACh or a ganglionic stimulant drug was not. The cold block is therefore located at the ganglionic synaptic site and may be due to reduced ACh output at lower temp. Ba strongly antagonised the cold block effects. J.M.Whitmarsh

4519. ANOREXIA AND GASTRIC EMPTYING IN THIAMINE DEFICIENT RATS. M.J.Veen: *Canad. J. Biochem.*, 1963, 41, 826-829 (Dept. Nutr., Sch. Hyg., Univ. Toronto, Canada) There was no delay in gastric emptying time, as measured by the rate of emptying of a BaSO₄ test meal, in thiamine deficient rats at the time when food consumption began to fall, only in the terminal stages of the deficiency, these effects were confirmed by quant. measurement of the rate of emptying of Phenol Red. Prelim. comm. J.B.Parish

4520. EFFECT OF GASTRIC DISTENSION ON DUODENAL ASPIRATES IN MAN. T.T. White, R.A.Me Alexander and D.F.Magee: *Gastroenterology*, 1963, 44, 48-51 (Dept. Surg., Univ. Washington Med. Sch., Seattle, Wash., D.C., U.S.A.) Previous expt. with dogs

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had suggested that gastric distension played a role in increased pancreatic secretions probably by a reflex response mediated primarily by the vagus and secondarily by the splanchnic nerves. The same has been found in the case of man. The blocking action of atropine and vagotomy presents further evidence for there being neural rather than hormonal reflexes involved. D.N.Wheatley

4521. ABSENCE OF HYDROCHLORIC ACID, THE CAUSE OF ASCORBIC ACID DEFICIENCY AFTER GASTRECTOMY. J.Warter, H.Schirardin and P.Metais: C.R. Soc. Biol., Paris, 1962, 156, 1921-1923 (Clin. Méd.A, Fac. de Méd., Strasbourg, France) Blood ascorbic acid level was estimated in man during 2 hr. following ingestion of 500 mg. ascorbic acid. After gastrectomy where no HC₁ was secreted, ascorbic acid absorption was decreased. The absorption of ascorbic acid was normal in acid secreting subjects after gastrectomy. Simult. administration of vit. C and HC₁ to the 1st group increased the level of absorbed ascorbic acid. (French) M.A.Price

4522. POST-GASTREXCTOMY DUMPING SYNDROME. L.D.Miller and G.W.Peskin: Amer. J. med. Sci., 1963, 245, 218-243 (Harrison Dept. Surg. Res., Univ. Pennsylvania Sch. Med., Philadelphia, Pa., U.S.A.) Review. 147 ref. E.E.Jiobbiger

4523. MUCOSAL BLEEDING MECHANISM IN UPPER PART OF GASTROINTESTINAL TRACT. T.R2s3nen: Gastroenterology, 1963, 44, 168-177 (Dept. Pathol., Sect.n, Univ., Helsinki, Finland) Mice and rats were used to study the effect of stress and hormones on gastrointestinal bleeding in the mucosa. The mast cells were followed closely and it was found that there was degranulation of these cells in cases of haemorrhage within a short time (3 hr.) after treatment of the animals with insulin and histamine; ACTH and glucocorticoids did likewise only far more slowly and it was found that large doses of glucocorticoids were necessary to induce haemorrhage over a short period of treatment (7 hr.)- Growth hormone increased mast cell no. in the mucosa and inhibited the glucocorticoid effect. Subjection of mice to severe stress, to near drowning, was found to cause considerable mucosal bleeding in both heparinised and non-heparinised animals. D.N.Wheatley

4524. RELATIONSHIP BETWEEN PEPTIC ULCER AND CORONARY OCCLUSION. F.P.Brooks, DJ.Sandweiss and J.F.Long: Amer. Joined. Sci., 1963, 245, 277-282 (Dept. Physiol., IMi' Pennsylvania Sch. Med., Philadelphia, Pa., UJJ.A.Y Expt. in dogs indicate that the enterogastrone mechanism for the inhibn. of gastric secretion is activated equally well by fats containing a high % of polyunsat. fatty acids and by fats containing mainly sat. fatty acids. E.E.Hobbiger

4525. ROLE OF HC₁ AND PEPSIN IN MECHANISM OF CINCHOPHEN ULCER. K.J.HartLala and L.G.Antila: Ann. Med., 1963, 41, 9-15 (Dept. Physiol., Univ. Turku, Finland) Segmental gastrectomy was performed on 36 dogs. Cinchophen, known to produce pyloric and duodenal ulcers in dogs, failed to do so after gastrectomy. Feeding of 0*1 N HC₁ with or without pepsin 5 times daily also failed to produce ulcers. One ulcer was seen in 1/9 dogs, which received 0-1 N HC₁, pepsin and cinchophen together. When acidity was raised to 0*146 N HC₁ cinchophen feeding constantly produces typical duodenal ulcers. Acid alone did not produce ulcers. These studies indicate that interference with protective

mucoprotein production plus gastric acidity participate in this type of expt. ulcer formation. " G.Faulkner

4526. PRESENT STATUS OF INTESTINAL TRANSPLANTATION. R.C.Iillehei, S.Goldberg, B.Gott and J.K. Longerbeam: Amer. J. Surg., 1963, 105, 58-72 (Dept. Surg., Univ. Minnesota Med. Sch., Minneapolis, Minn., U.S.A.) The small intestine, except for a few cm. of the duodenum, was removed from dogs, stored at 5° for 5 hr. and replaced in the donor without reconstituting its nerve supply. Animals appeared normal through 3 yr. after recovery from the operation: normal fat absorption through regenerated lymphatics occurred within 1 month. Homografts of 10-15 cm. segments of small intestine to a pouch in the neck, with vascular attachment to the carotid-jugular vessels, were rejected in 6-30 days. Orthotopic homografts of the whole* small intestine were not rejected, but the animals died after 6-9 days. The cause of death is thought to have been a graft-v-host reaction.

B.Cruickshank

4527. EFFECT OF VAGOTOMY ON SMALL INTESTINAL MOTILITY USING THE RADIO-TELEMETERING CAPSULE. B.Ross, B.W.Watson and A.W.Kay: Gut, 1963, 4, 77-81 (Univ. Dept. Surg., Royal Infirmary, Sheffield, England) In a group of human patients, 11 patients had vagotomy, 11 patients had upper gastro-intestinal surgery, and 4 patients had operations involving no handling of the abdominal viscera. After vagotomy- the mean time for inhibn. of small bowel movements was 10 hr. The longest time was 25 hr. Without vagotomy, the longest time was 9*5 hr. The time for the radio pill to be excreted was similar in these groups. The height of the peristaltic waves on their return was similar in the groups.

B.Greenwood

4528. CALCIUM ACCUMULATION AND RESPIRATORY ACTIVITY OF SMALL INTESTINE OF RAT. L.S.Charnock: Canad. J. Biochem., 1963, 41, 1013-1022 (McGill-Montreal Gen. Hosp. Res. Inst., Montreal, Que., Canada) The O₂ consumption of rings of tissue prepared from the small intestine of young hooded rats was measured manometrically at 37° in a medium containing Na, K, Mg, and Sr in a Tris-HCl buffer pH 7. 45 Ca was added from the side arm of the flasks. O₂ consumption was relatively insensitive to Ca concn. The accumulation of Ca by the tissue was dependent on the ambient Ca concn. and at low concn. of Ca in the medium it accumulated against die concn. gradient whether in a gas phase of O₂ or N₂. J.B.Parish

4529. INFLUENCE OF THE CALCIUM CHELATOR, EDTA, ON CONTRACTIONS OF ISOLATED INTESTINE OF RABBIT. S.Cottin and J.Paupe: C.R. Soc. Biol., Paris, 1962, 156, 1557-1559 (Lab. de Physiol. anim., Fac. des Sci., Montpellier, France) Variations in amplitude of contraction of the isolated rabbit intestine, in a medium where the Ca was progressively removed by EDTA, were different from those obtained by increasing the amount of Ca in an initially Ca-free medium. In the presence of EDTA the contractions disappeared when the Ca concn. was 15-35 mg./l. When Ca was added to the medium contractions appeared with a Ca concn. of 1*5-3-5 mg./l. (French) M.A.Price

4530. LOSS OF 45Ca FROM ISOLATED GUINEA-PIG ILEUM. G.Valette, Y.Cohen and C.Carron: C.R. Acad. Sci., Paris, 1962, 255, 415-417 (Lab. de Pharmacodyn.. Fac. de Pharm.de Paris, Paris, France) 10 J guinea-pigs were given 20 JJC. 45CaCl₂ i*o. 5 hr. before being killed. 0-4 g. sections of ileum were immersed in 10 ml*

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TVrode soln. or Tyrode soln. without Ca at 37° with and without aeration and at OP without aeration for 30 to 150 min. The 45ca less of the ileum increases with the temp, and with aeration but is unaffected by the Ca concn. in the bath. In a medium containing Ca the loss is replaced by 40ca. (French) S.A.Thistlewood

4531. ELECTRON MICROSCOPIC CHANGES ASSOCIATED WITH ABSORPTION IN THE JEJUNUM. A.W.Williams: Gut, 1963, 4, 1-7 (Dept. Pathol., Univ. Edinburgh Med. Sch., Edinburgh, Scotland) Rats, deprived of food and water for 24 hr., were given injn. of water into clamped-off mid-jejunal segments, with intact blood supply. Groups of the animals were killed at intervals from 10 sec. to 1 hr. E.M. demonstrated rapid movement of water from the free surface of the mucosal cells to the lateral intercellular spaces. Ten min. after water injn., some epithelial cells showed changes in the size and alignment of the microvilli, and swelling of the mitochondria. B.Greenwood

4532. INTERACTION BETWEEN ACTIVE SODIUM TRANSPORT AND ACTIVE SUGAR TRANSPORT IN THE ISOLATED RABBIT ILEUM. S.C.Schultz and R.Zalusky: Biochim. biophys. Acta., 1963, 71, 503-505 (Bi-nucleonics Dept., U.S.A.F. Sch. of Aerospace Med., Brooks A.F. Base, Tex., U.S.A.) Active Na transport appeared to be stimulated by the active transport of sugar per se. B.M.Stevens

4533. ACTIVE ABSORPTION OF (+)-GLUCOSE BY INTESTINAL SEGMENTS OF THE GROUND SQUIRREL, CITELLUS TRIDECEMLINEATUS. X.J.Musacchia and S.S.Neff: Comp. Biochem. Physiol., 1963, 9, 37-40 (Dept. Biol., St. Louis Univ., Mo., U.S.A.) Segments of various parts of the gut were filled with and suspended in soln. of 1 mg./ml. (+)-glucose made up in Krebs Ringer. Incubation was carried out for 1 hr. after which glucose was estimated within the gut lumen. The Active transport of glucose from the mucosal surface to the serosal side varied from 23-48 fmole/g. dry wt./hr. There was no difference in uptake rates shown by the duodenum, jejunum or ileum. Considerable amounts of ¹⁴C glucose do not pass to the serosal fluid but are retained * & the gut wall. M.S.Laverack

4534. DIGESTION AND ABSORPTION OF SUCROSE BY THE INTACT RAT. A.Dahlqvist and D.L.Thomson: J. Physiol., Lond., 1963, 167, 193-209 (Dept. Physiol. Chem., Univ., Lund, Sweden) The digestion and absorption of sucrose and an equivalent amount of a water-sol. non-absorbable marker, polyethylene glycol. This allowed the calcn. of the % gastric emptying, the intestinal transit and the absorption indices. Information about the rate of absorption of the sugars and their sites of absorption was obtained. The marker was recovered virtually quant. The hydrolysis of sucrose was not rate-limiting for its absorption. After the intracellular hydrolysis of sucrose, the fructose diffused back into the gut lumen to a large extent and was then absorbed further down in the intestine. Some of the fructose was absorbed in the large intestine. The efficiency of small intestinal lactase was high in vivo when compared with its efficiency in vitro. *

4535. INTESTINAL ABSORPTION: EXPERIMENTAL FAT AND (-)-XYLOSE STUDIES. W.O.Bamett, J.K.Goodrich and T.L.Kilgore: Amer. J. Surg., 1963, 105, 73-79 (Dept. Surg., Univ. Mississippi Med. Center, Jack-

son, Miss., U.S.A.) The absorption of [131I]glyceryl trioleate was observed 2, 4, 6 and 8 hr. after the ingestion of 50 jic doses in mongrel dogs after various operative procedures. Laparotomy alone depressed absorption for 7-10 days; diversion of bile from the duodenum to the jejunum had no effect; diversion of bile/pancreatic juice to the colon caused marked depression of absorption; this was more severe when bile and pancreatic juice were so shunted; partial gastrectomy with several methods of reconstruction of continuity also depressed absorption. All procedures depressed the absorption of (-)-xylose throughout the 4-hr. period of study. B.Cruickshank

4536. ABSORPTION OF [¹⁴C]TRIOLEIN AND [¹⁴C]OLEIC ACID BY DIFFERENT REGIONS OF THE SMALL INTESTINE. J.F.Grenier, M.Hatano and A.C.Weiss: C.R. Soc. Biol., Paris, 1962, 156, 1695-1697 (din. Chirurg. B., Fac. Med., Strasbourg, France) Oleic acid was absorbed preferentially from the duodenum of dog with little absorption by the ileum. Triolein was absorbed by the ileum and to a lesser degree by the duodenum. The onset of absorption of triolein occurred more rapidly than of oleic acid. The max. absorption of oleic acid occurred after 4 hr* and of triolein between the 5th and 8th hr.

(French) M. A .Price

4537. INTESTINAL ABSORPTION OF VITAMIN B12 IN LIVER CIRRHOSIS. K.Okuda: Bull. Yamaguchi med. Sch., 1962, 9, 19-23 (Dept. Med., Yamaguchi Med. Sch., Ube, Japan) Cirrhotic patients absorbed the test dose of vit. B12 less than healthy individuals, suggesting the general impairment of intestinal absorption of nutrients. The clinical implications are discussed.

K.Jones

4538. ENHANCEMENT OF JEJUNAL ABSORPTION OF HEPARINOID BY SODIUM EDTA IN THE DOG. C.S. Tidball and R.J.Lipman: Proc. Soc. exp. Biol., N.Y., 1962, 111, 713-715 (Dept. Physiol., G.Washington Univ. Sch. Med., Washington, D.C., U.S.A.) The presence of Na EDTA in die lumen of isolated canine jejunal segments in situ produced significant enhancement of intestinal absorption of heparinoid as measured by die loss of heparinoid from the lumen. Increases in clotting time of recalcified citrated plasma accompanied the enhanced absorption verifying that heparinoid had been absorbed without loss of activity. M.M.Shapland

4539. SMALL INTESTINE TRANSIT TIME AND MAGNESIUM ABSORPTION IN THE CALF. R.H.Smith: Nature, Lond., 1963, 198, 161-162 (Nat. Inst. Res. in Dairying, Shinfield, Reading, Berks., England) % of Mg absorbed from digesta by calves was significantly correlated with the time taken for digesta to traverse the small intestine. The mean transit time for digesta in the small intestine was $3 \cdot 7 \pm 0 \cdot 2$ hr. J.R.Sargent

4540. HISTAMINE-FAST ACHLORHYDRIA AND IRON ABSORPTION. A.Goldberg, A.C.Lochhead and J.H. Dagg: Lancet, 1963, i, 848-850 (Univ. Dept. Med., Gardiner Inst. Med., Western Infirmary, Glasgow, Scotland) The mean absorption of radio-Fe in 7 achlorhydric patients was 18*5% of the dose given ; and in 8 patients with acid gastric juice 57-&70. G.H.Bell

4541. INTERFERENCE WITH FAECAL EXCRETION OF ZINC-65 BY CADMIUM. S.A.Gunn, T.C.Gould and W.A.D.Anderson: Proc. Soc. exp. Biol., N.Y., 1962, 111, 559-562 (Dept. Path., Univ. Miami Sch. Med., Coral Gables, Fla., U.S.A.) Cd caused a block in faecal excretion of ⁶⁵Zn followed by a build up of liver, kidney and pancreatic 65zn. M.M.Shapland

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4542. USE OF SCINTILLOGRAPHY IN LIVER DISEASE

DIAGNOSIS. L.J.Minetti and F.Reisi: Atti. Acad. med. Lombarda, 1962, 17, 103-110 (Ist. di Clin. Med. Gen., Univ., Milano, Italy) An autoradiogram [ARG] of the liver, obtained after i.v. injn. of 100 μ g colloidal ^{198}Au , when used in conjunction with an X-ray picture, is useful for diagnosis of human liver diseases. A technique of scanning the ARG is described which can be used to detect malposition of the liver, hepatic size, localisation of areas of radioactivity which indicates tumours, abscesses, cirrhosis and hepatitis. (Italian) G.N.Godson

4543. EFFECT OF PERFUSING INSULIN VIA PORTAL VEIN

ON ARTERIAL BLOOD SUGAR AND HEPATIC GLUCOSE OUTFLOW IN THE DOG. J.R.M.Frankson, H.A. Ooms, R.Bellens, Y.Arnoold and V.Conard: Arch. int. Pharmacodyn., 1963, 142, 293-311 (Expt. Med. Lab., Univ. Brussels, Belgium) In anaesthetised dogs, infusion of [^{131}I]insulin into the portal vein was compared with infusion via the femoral vein. With portal infusion, fall of blood sugar was less marked than after femoral vein infusion, and glucose hepatic outflow was increased during the infusion. Hypoglycaemia, which occurred was due only to increased peripheral utilisation. The speed of the latter was proportional to the quantity of insulin passing through the liver.

(French) T.J.Sullivan

4544. EFFECT OF COLD AND RESTRAINT ON INTRACELLULAR DISTRIBUTION OF GLUTATHIONE IN RAT LIVER.

D.A.Stout, R.L.McCartney, B.M.Lewis, H.M. Smith and U.D.Register: Proc. Soc. exp. Biol., N.Y., 1963, 112, 334-335 (Dept. Biochem., Med. Sch., Univ. Loma Linda, Calif., U.S.A.) Sprague-Dawley \ddagger rats were stressed by keeping them at 17° ; controls were kept at $19\text{-}20^\circ$. The intracellular glutathione level in the liver of the stressed rats was at a lower level in the sol. fraction than in the control animals. Mitochondria! non- protein -SH (mainly glutathione) was not significantly changed. D.N. Wheatley

4545. DEVELOPMENT OF FATTY LIVER DUE TO MAL-NUTRITION OR PHYSIOLOGICAL INSULT ACCORDING TO STRAIN AND SEX OF RAT.

E.Chany: Arch. Sci. physiol., 1962, 16, 255-272 (Centre de Rech. physiol. sur la cell. normal, *et* cancéreuse, C.N.R.S., 16 bis, avenue Vaillant-Couturier, Villejuif, Seine, France) The liver fat contents of δ and γ rats were studied after (1) maintenance on a protein, vit. B12 and choline deficient diet (2) 18 hr. at 4° and (3) partial hepatectomy. In rats of the same sex the degree of fatty infiltration depends on the strain. Rats on a low protein diet showed infiltration of the left and left medial lobes only. Females show significant fatty infiltration after sudden stress, but only moderate transient infiltration rapidly removed by oestrogenic effects during malnutrition. Males showed less response to stress but their liver fat content slowly increases to a const. level during malnutrition.

(French) S.A.Thistlewood

4546. ULTRASTRUCTURAL STUDIES OF HEPATIC PIGMENT FOLLOWING ADMINISTRATION OF I.V.

FAT. W.Neglia, L.Burrows, S.W.Tompson and F. Schaffner: Lab. Invest., 1963, 12, 378-385 (Pathol. Dept., Mt. Sinai Hosp., N.Y., U.S.A.) Lv. administration of fat emulsion to dogs daily for 30 days results in the accumulation of pigment in hepatic cells, macrophages and granulomas. Eventually a lipofuscin pigment

results. E.M., the pigment alters from a round fat-like body to clusters of granules in lysosomes of pinocytic origin.

- A.M.Mackay

4547. EXPERIMENTAL INVESTIGATION OF SECONDARY

BILIARY STRICTURES. J.T.Goswitz, C.R.Macpherson and D.W.Elliott: Amer. J. Surg., 1963, 105, 221-227 (Dept. Surg., Ohio State Univ. Coll. Med., Columbus, Ohio, U.S.A.) Primary stricture of the common bile duct was produced in dogs by suturing cellophane around the duct: 5-10 days later the stricture was excised and end-to-end anastomosis performed. In animals given penicillin and streptomycin i.m. for 2 days before and 5 days after repair no evidence of secondary stricture was found 4-8 months later; pos. bile cultures (*E. coli*, enterococci, *Clostridium perfringens*) were present in 3 out of 7 animals; serum alkaline phosphatase was normal. In animals where the duct was devascularised or put on tension at repair, or were untreated except for the repair, secondary stricture and pos. bile cultures were invariably present; serum alkaline phosRjiamse was elevated in 4 out of 13 animals.

B.Cruickshank

KIDNEY AND URINE

4548. A THREE-DIMENSIONAL STUDY OF JUXTA-GLOMERULAR APPARATUS IN RAT. LIGftT AND E.M. FINDINGS.

L.Barajas and H.Latta: Lab. Invest., 1963, 12, 257-269 (Pathol. Dept., California Univ. Med. Center, Los Angeles, Calif., U.S.A.) The ascending loop of Henle runs closely apposed to the efferent arteriole, briefly touches the afferent arteriole and becomes the distal convoluted tubule. The efferent arteriole becomes sinusoidal some distance from the hilus and granular cells may lie in its wall. The importance of the efferent arteriole and its relations in the juxtaglomerular apparatus is discussed.

A »M Mackay

4549. RETENTION OF POTASSIUM BY RABBIT KIDNEY SLICES AT 0° .

J.R.Robinson: J. Physiol., Lond., 1963, 167, 328-343 (Physiol. Dept., Univ. Otago Med. Sch., Dunedin, New Zealand) Rabbit kidney slices equilibrated for 4 hr. at tf still contained K^+ in concn. up to 8 times the external concn., but ratios of concn. of Na^{+} and Cl^- in tissue and medium were never far from unity. Hence Id^+ appeared to be bound to constituents of the tissue. 'Bound IC^{+} ' was calc. as excess of tissue K^+ over K^{+} expected from Donnan ratios for CV . In neutral media 'bound K^+ ' was proportional to the external concn. of Na^+ . As pH was lowered towards 2 in media containing 40 to 80 mequiv. Na^+/l , $(\text{Na}^+ + \text{K}^+ - \text{Cl}^-)$, an index of fixed anionic changes in die tissue, passed through zero between pH 4 and 3 and became negative. 'Bound id' changed parallel with $(\text{Na}^+ - \text{K}^+ - \text{Cl}^-)$ and little or none remained at pH 2 \cdot 1. 'Bound K^+ ' in cortical tissue varied inversely with tissue water over a wide range of pH and external $[\text{Na}^+]$.

4550. ROLE OF THE KIDNEY IN CATABOLISM OF THYR0"

STIMULIN. L.Asch and C.Aron: C.R. Soc. Biol., Paris, 1962, 156, 1693-1694 (Clin. Méd. A_f Fac. de Méd., Strasbourg, France) The level of TSH was estimated in the kidney of rats 10 min. and 1 hr. after injn. of TSH. 80% of the hormone disappeared from the blood and was fixed by die kidney. A small amount of hormone was eliminated in the urine. (French) M.A.Pr»rc

4551. OSMOLAR AND FREE WATER CLEARANCE DURING HAEMORRHAGIC SHOCK IN THE DOG. E.E.^elkurt: Proc. Soc. exp. Biol., N.Y., 1962, 111, 626-629 (Dept. Physiol., Indiana Univ. Sch. Med., Ind., U.S.A.) Comparison of renal venous and arterial concn. of osmolality and Na^+ and relating these to changes in GFR and effective renal plasma flow, evidence was supplied that indicated that the loss of concentrating power during haemorrhagic shock was due to wash-out of the papillary zone of hyperosmolarity. M.M.Shapland

4552. POLYURIA IN PAROXYSMAL TACHYCARDIA AND PAROXYSMAL ATRIAL FLUTTER AND FIBRILLATION.

P. Wood: Brit. Heart J., 1963, 25, 273-282. An analysis of 64 cases of paroxysmal tachycardia showed that a brisk water diuresis of limited duration frequently accompanied any form of paroxysmal tachycardia with a heart rate of over 120/min. and that this occurred especially in cases of paroxysmal atrial fibrillation; diuresis was more profuse in recumbency; it was prevented by left heart failure and by mitral valve disease. The diuresis suggested a state of temporary diabetes insipidus, Possibly caused by inhibn. of ADH as a result of impulses from stretch receptors on the left atrium distended by a rise in pressure and vol. P.F.Meyer

4553. REABSORPTION OF GLUCOSE, FRUCTOSE AND MESO-INOSITOL BY THE FOETAL AND POST-NATAL SHEEP KIDNEY. D.P.Alexander and D.A.Nixon: I. Physiol., Lond., 1963, 167, 480-486 (Physiol. Dept., St. Mary's Hosp. Med. Sch., London, England)

Studies have been made upon the reabsorption of glucose, fructose and meso-inositol by the renal tubules of the foetal, neonatal and adult sheep. Elevation of the plasma glucose has shown that active tubular reabsorption of glucose is developed by the middle of gestation. *

4554. DECREASE IN TUBULAR REABSORPTION OF SODIUM IN HYPOTHYROID RATS DURING OSMOTIC POLYURIA DUE TO MANNITOL. H.Jahn, P.Reville and F.Stephan: C.R. Soc. Biol., Paris, 1962, 156, 1927-1931 (Fac.de Méd., Strasbourg, France) The urine of normal and hypothyroid rats was analysed during perfusion of the animal with 20% mannitol soln. The osmotic concn. of the urine, the urinary osmotic output, urine/plasma osmotic ratio and clearance were lower in hypothyroid rats. The urinary concn. of Na was increased by hypothyroidism. The concn. and output of urinary urea and the concn. of plasma urea were similar in both groups of animals. (French) M.A.Price

4555. ADRENAL CORTEX AND RENAL SODIUM AND POTASSIUM EXCRETION IN NEWBORN RAT. P.J. Bentley: J. Endocr., 1963, 26, 361-365 (Dept. Pharmacol., Univ., Bristol, England) Rats were sensitive to endogenous aldosterone from the 1st day after birth but exogenous aldosterone-antagonist failed to influence the urinary Na/K ratio until the 12th day, it is concluded that endogenous aldosterone is not secreted before that time, Results are also given for the effect of exogenous cortisol and ACTH on urinary Na and K of neonatal rats. G.F.Blane

4556. URINARY EXCRETION OF PHOSPHORUS IN DOGS. L.Brull and G.Barac: C.R. Soc. Biol., Paris, 1962, 156, 1920-1922 (Inst. de Clin. méd., Univ. de Liège, Belgique) Evisceration did not modify the increase in P^{32} induced in chloralose anaesthetised dogs by injn. of P^{32} U. parathormone. Connection of the perfused kidney to the heart-lung circulation decreased urinary P in animals

receiving parathormone. Injn. of pituitary extract increased urinary P in hypophysectomised dogs and hypophysectomy decreased the effect of parathormone injn. (French) M.A.Price

4557. EFFECT OF CALCIUM INFUSION, PARATHYROID HORMONE, AND VITAMIN D ON RENAL CLEARANCE OF CALCIUM. D.Bernstein, C.R.Kleeman and M.H. Maxwell: Proc. Soc. exp. Biol., N.Y., 1963, 112, 353-355 (Dept. Med., Mt. Sinai Hosp., Los Angeles, Calif., U.S.A.) Ca clearance was measured in the urine of human patients and expressed as a % of the serum diffusible Ca^{2+} concn. This relationship was studied in two cases of hypoparathyroidism in §. When Ca and vit. D infusion were performed, renal Ca clearance was higher than when parathyroid extract was inj. as well. Vit. D had no direct effect on renal Ca clearance.

D.N.Wheatley

4558. RENAL EXCRETION OF BILIRUBIN IN COMMON DUCT LIGATED DOG. M.M.Laks, I.J.Pincus and D. Goldberg: Gastroenterology, 1963, 44, 469-474 (Inst. Med. Res., Cedars of Lebanon Hosp., Los Angeles, Calif., U.S.A.) The ligation of the common duct and removal of the gall-bladder in dogs resulted in elevated levels of serum bilirubin. When this was at a peak some 6 to 8 days later, the stop-flow technique was used to study renal excretion of the bilirubin. Active secretion of the bilirubin as a conjugate in the distal region of the renal tubule must occur.

D.N.Wheatley

4559. VARIATION WITH AGE AND SEX OF KIDNEY TUBULAR READSORPTION OF CITRIC ACID. M.Bertolini, F.Palo and L.Mombelli: Atta. Acad. med. Lombarda, 1962, 17, 122-126 (1st. di Patol. Speciale Med., Univ. Milano, Italy) Blood and urinary levels and the tubular readsorption of citrate were determined in 78 healthy human subjects, between 29-90 yr. old. Withincreasing age, there is a steady, marked decrease in urinary citrate; a decrease of from 7.69 to 1.94 mg./kg./24 hr. citrate excreted in the 20-30 age group to 1.95 ± 1.04 mg./kg./24 hr. in the > 70 yr. old age group. There is a corresponding increase in tubular reabsorption and plasma citrate content, with age. (Italian) G.N.Godson

4560. GONADOTROPHIC ACTIVITY IN URINE OF YOUNG CHILDREN. R. Van Den Driessens and M.J.Hans-Berteaut: C.R. Soc. Biol., Paris, 1962, 156, 1732-1733 (Lab. Pharmacodyn., Univ., Bruxelles, Belgium)

24 hr. urine samples were collected from children aged 3-5 yr. Extracts of total urine inj. into young mice resulted in an increase in uterine wt. A greater increase was obtained with urine extracts from which mucoproteins had been removed. (French) M.A.Price

4561. UPTAKE OF GLUCOSE DEPENDENT ON INSULIN IN THE ISOLATED BLADDER OF THE TOAD. B.F. Bower and CM.Grodsky: Nature, Lond., 1963, 198, 391-392 (Metabol. Res. Unit., Dept. Med., Univ. California Sch. Med., San Francisco, Calif., U.S.A.)

The isolated toad bladder is capable of glucose uptake from the medium in which it is incubated at the rate of 0.94 fmole/2hr.; this was stimulated on addition of insulin to 1.55 fmole/2 hr.

G.M.Lewis

4562. STIMULATION OF Na TRANSPORT AND 32p INCORPORATION INTO PHOSPHOLIPIDS OF ISOLATED TOAD BLADDER. S.Hestrin-Lemer and L.E.Hokin: Bull. Res. Coun. Israel A, 1963, 11, 345-350 (Dept. Physiol. Chem., Univ. Wisconsin, Madison, Wis., U.S.A.) The effect of oxytocin, aldosterone and

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carbamyl choline as well as the combined effect of oxytocin and aldosterone on Na and water transport and on the incorporation of 32p into toad bladder tissue phospholipids was studied. Gycytocin alone and with aldosterone stimulated Na and water transport to the same extent while aldosterone alone had only a slight stimulatory effect, and carbamyl choline had no effect. The first two agents, alone and together, had no effect on 32p incorporation into phospholipids except, with oxytocin, into phosphatidyl ethanolamine. Carbamyl choline increased incorporation into total phospholipids, the most striking increase being into phosphoinositide. L.G.Gillies

4563. EFFECT OF NEUROHYPOPHYSIAL HORMONES ON OXIDATIVE METABOLISM OF TOAD BLADDER IN VITRO. T.Goodfriend and J.Kirkpatrick: Endocrinology, 1963, 72, 742-748 (Med. Dept., Washington Univ. Med. Sch., St. Louis, Mo., U.S.A.) Oxytocin and vasopressin stimulated the metabolism of glucose, pyruvate, lactate and palmitate in the toad urinary bladder. The effect does not appear to be related to the effect of these hormones on permeability and Na⁺ transport.

H.C.Jones

ENDOCRINE GLANDS

4564. EFFECT OF ADRENALECTOMY AND ADRENODEMULLATION ON EXPERIMENTAL OEDEMA AS MEASURED UNDER REPEATED ETHER ANAESTHETISATION. A.C.Levy, T.H.Beaver, R.D.Strain and D.E. Holtkamp: Proc. Soc. exp. Biol., N.Y., 1962, 111, 576-578 (Sci. Lab., W.S.Merrell Co., Cincinnati, Ohio, U.S.A.) Two or more anaesthetisations with ether within a 6 hr. period decreased the amount of expt. oedema inducible in the hind limb of intact rats. This decrease was not observed in comparably anaesthetised adrenalectomised or adreno-demullated rats or in unanaesthetised intact rats. M.M.Ehapland

4565. ACTH AND LIPID CONTENT OF THE ADRENAL CORTEX OF CRICETOMYS GAMBIANUS. A.Quenou: C.R. Soc. Biol., Paris, 1962, 156, 1681-1682 (Fac. Med., Dakar, W. Africa) Administration of 50 I.U.-ACTH/week for 25 days to *C. gambianus* decreased the sudanophilic content of the adrenal medulla and the Schutze-pos. granules. Administration of ACTH to castrated rats depleted the lipid content of the external zones with *inx?* appearance of a large sudanophobic area. (French) M. A.Price

4566. FUNCTIONAL INTERRELATIONSHIP BETWEEN THYMUS AND ADRENAL CORTEX. J.Fachet, E.Stark, K.Vallent and M.Palkovits: Acta med. Acad. Sci. hung., 1962, 18, 461-466 (Dept. Pathophysiol., Res. Inst. exp. Med., Acad. Sci., Budapest, Hungary) Corticosterone levels in the peripheral blood of rats had fallen by 30% within 5 days after thymectomy although the in vitro corticosterone-producing activity of the adrenals taken from these animals was not reduced. At the same time aldosterone production was increased, an effect which could be reversed by treatment with heparin. Stress-induced thymic involution may be associated with disturbances in mucopolysaccharide metabolism which influence the aldosterone producing activity of the adrenal cortex. G.F.Blane

4567. ASCORBIC ACID AND CORTICOSTERONE CONCENTRATION OF INNERVATED AND DENERVATED ADRENAL GLANDS. S.Shapiro: Endocrinology, 1963, 72, 836-837 (Psychiat. Dept., Univ. California Med. Center, Los Angeles, Calif., U.S.A.) Denervation or sham operations on the adrenal glands of rats did not affect the ascorbic acid or corticosterone concn. of the gland following mild stress. H.C.Jones

4568. RELATIONSHIP OF THYMOLYTIC AND GLYCOGENIC ACTIVITIES OF ADRENOCORTICOIDS. L.Ringler and J.L.Haynes: Proc. Soc. exp. Biol., N.Y., 1962, 111, 606-609 (Dept. Metabol. Chemother., Lederle Lab., Pearl River, N.Y., U.S.A.) Steroids exhibiting a thymolytic potency equiv. to hydrocortisone, possessed liver glycogen activity averaging 40% higher. In compounds of greater potency the divergence was smaller, reaching zero when the relative thymolytic potency was about 16. Beyond this point a reversal was apparent, a thymolytic potency of 100 being equiv. to a glycogenic activity of 75. M.M.Shapland

4569. BINDING CAPACITY OF CORTICOSTEROID-BINDING GLOBULIN IN PLASMA. B.P.Murphy and C.J.Pattee: J. clin. Endocr., 1963, 23, 459-464 (C.U.N. Invest. Unit, Queen Mary Veterans' Hosp., Montreal, Canada) Oestrogen administration increased values of corticosteroid-binding globulin [CBG] binding capacity to approx. twice the control levels in various human subjects. No change was found after the administration of ACTH. A good correlation was found between CBG binding capacity and plasma corticosteroid levels when the latter were determined at a sp. time of the day. CBG levels showed no diurnal variation. K Jones

4570. EFFECT OF ANGIOTENSIN INFUSIONS ON ALDOSTERONE AND ELECTROLYTE EXCRETION IN PATIENTS WITH HYPERTENSION AND ADRENOCORTICAL DISORDERS. P.Biron, M.Chretien, E.Koiv, and J-Genes t: Brit. med. J., 1962, i, 1564-1575 (Hôpital-Dieu, Montreal, Canada) In 6 normal subjects given infusions of angiotensin (1-6 hr.) creatinine clearance decreased by a mean of 23% and Na excretion by 63%. In 6 patients with essential hypertension creatinine clearance decreased by only 5% and Na excretion rose by 290%. Similar increase in Na excretion occurred in 1 case of Cushing's syndrome and 1 of primary aldosteronism. Na retention occurred in 1 bilaterally adrenalectomised patient, 2 with Addison's disease and 1 with coarctation of aorta. There was no close relation between creatinine clearance and Na excretion. In all normal and hypertensive subjects aldosterone excretion increased markedly during angiotensin infusion. This increase persisted after infusion and was then accompanied by Na retention. Metabolic effects of angiotensin were produced by doses with no pressor effect. The greater effect on Na retention than on GFR in normal subjects indicates a direct effect, through aldosterone, on tubular reabsorption of Na. Haemodynamic and tubular responses in hypertensive subjects differ from those in normal controls. M.E.Nutt

4571. HORMONAL FACTORS AFFECTING SODIUM EXCRETION IN THE RAT. M.F.Lockett and C.N.Roberts: J. Physiol., Lond., 1963, 167, 581-590 (Dept. Physiol. Med. Sch., Birmingham, England) Adrenalectomised rats were approx. 12 times more sensitive than normal rats to the renal salt retention caused by i.m. aldosterone mono' acetate in oil. In hypophysecomised rats i.m. injn. of

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aldosterone caused, diuresis and an increased rate of Na excretion. This diuretic natriuretic effect of aldosterone in hypophysectomised rats was converted to one of salt retention either by administration of growth hormone, or by removal of part of the diencephalon underlying the Pineal stalk, or by adrenalectomy. Growth hormone caused retention both of Na and K in adrenalectomised, hypophysectomised and adrenalectomised-hypophysectomised rats, *

4572. ACTIONS OF A SPIROLACTONE AND TWO RELATED COMPOUNDS IN HYPOPHYSECTOMISED RATS.
M.F.Lockett and C.N.Roberts: *J. Physiol., Land,*
1963, 167, 591-598 (Dept. Physiol., Med. Sch.,

1963, 107, 591-596) (Dept. Physiol., Med. Sch., Birmingham, England). The actions of salts of the 3 steroid acids, SC-11480, SC-11927 and SC-9420 were examined in normal and operated rats in the presence and absence of exogenous aldosterone. In the absence of exogenous aldosterone these compounds increased the rates of excretion of urinary Na and Na/K of normal water-laden rats kept at 30-32°, but were inactive in adrenalectomised and in hypophysectomised animals. They caused Na retention in adrenalectomised-hypophysectomised rats. SC-11480 and SC-9420 failed to antagonise the Na retention caused by aldosterone in adrenalectomised-hypophysectomised rats but SC-11927 did so. None of these compounds antagonised the effects of aldosterone in hypophysectomised animals. *

4573. 'SUCCESSFUL' PARATHYROID TRANSPLANTATION. S.W. Jacob and J.E. Dunphy: Amer. J. Surg., 1963, 105, 196-204 (Dept. Surg., Univ. Oregon Med. Sch., Portland, Ore., U.S.A.) A review. 51 ref.

Review by Prof.
B Cruickshank

B.C. Cuckshank
4574. TOLERANCE TO HYPOCALCAEMIA DURING EXPERIMENTAL PARATHYROID DEFICIENCY IN DOG.

J.F.Cier and A.Frederich: C.R. Soc. Biol., Paris, 1962, l&b, 1844-1846 (Inst. de Physiol., Lyon, France)
 JTyro-parathyroidectomised dogs received injn. of parathyroid hormone for 4 weeks, maintaining the blood Ca level at 80-100 mg./l. Interruption of the hormone administration did not result in the tetany characteristic of the immediate post-operative period. Although blood Ca fell ¹⁰ a low level (50 mg./l.) these dogs remained without convulsions for 2-4 weeks. (French) M.A.Price

4575. PROBLEMS OF HYPERPARAIIHYROIDISM. C.E.
Dent: Brit. med. J., 1962, ii, 1419-1425, 1495-1500
⁴⁵ (University Coll. Hosp., London, England) A lecture.
ref. M.E.Nutt

4576. HOMOPLASTIC TRANSPLANTATIONS OF PITUITARY GLAND TO MAMMARY GLAND IN GUINEA-PIG.
 A.Russel: C.R. Soc. Biol., Paris, 1962, 156, 1919-1920 (Inst. d'Histol., Fac. Méd., Strasbourg, France)
 In 17 of 60 expts a transplant of pituitary beneath the skin of the mammary gland of guinea-pig was successful, there was no modification in the structure of ducts and acini of the mammary gland receiving an implant.

4577 (French) M.A.Price
 PITUITARY-ADRENAL DYNAMICS DURING SURGICAL STRESS. H.L.Estep, D.P.Island, R.L.Ney and G.W.Iiddle: J. clin. Endocr., 1963, 23, 419-425
 (Dept. Med., Vanderbilt Univ. Sch. Med., Nashville, Tenn., U.S.A.) A study was made to determine what role, if any, the neg. feedback mechanism plays in regulating ACTH secretion during the acute stress of ^{Pa}Parotectomy. It is concluded that during the stress of ^{Pa}parotectomy the behaviour of the human pituitary-adrenal

system does not conform to the specifications of a negative feedback mechanism. K.Jones

45¹ X T **MAN^{R0}** WIH HORMONE IN PITUITARY INFANTILISM. J.A.P.Trafford, D.A.Lillicrap and M.H. Lessof: Lancet, 1963, i, 1128-1130 (Guy's Hosp., London, England) Four patients with pituitary dwarfism - two primary and two due to craniopharyngioma were treated with human growth hormone for periods from £, £¹ r⁰ ! ^ ! ?! ^{ab} cases *^ te of growth has been more than doubled. Ab to growth hormone were found in two cases. G.H.Bell

4579. HYPOPHYS ^, L.H RELEASE m ANDROGENEKED
FEMALE RATS AFTER ADMINISTRATION OF SHEEP
BRAIN EXTRA^ D.C.Johnson: Endocrinology,
J 2 V 2 : 832-836 (Zooh Dept - state Univ - **).

Iowa Cny, Iowa, U.S.A.) Ovulations were obtained in androgensed ? rats following injn. of sheep hypothalamic extracts. Hypophysectomy abolished the ovulatory effect. H.C.Jones

4580. GONADOTROPHIN AND PROLACTIN CONTENT OF PITUITARY OF DUCK UNDERGOING LIGHT OR RESERPINE TREATMENT. I. Assenmacher, A. Tixier-¹ and J. Boissin: C.R. Soc. Biol., Paris, 1962, 156-1559 (Lab. de Physiol. anim. Fac. Sci. M.

* J%S%~??K " ^ PJMtt^ In young ? mice, die pituitary of ducks receiving 25 fig, reserpine/100.a.) day or kept in artificial Ught showed a decrease in the gonadotrophic hormone content compared with normal birds, as shown by a decrease in follicle maturation of the ovary. Implantation of the pituitary of ducks to the crop of pigeons showed that prolactin level was higher in ducks stimulated by Ught than in normal ducks. The former contained the same amount of prolactin as ducks stimulated by Ught and receiving reserpine and more than iliose receiving reserpine. (French) M.A.Price

4581. ENZYMIC ACTIVITY IN PITUITARY OF EQUUS CABALLUS L. L.Arvy: C.R. Soc. Biol., Paris, 1962, 156, 1758-1759 (Lab. Physiol. du C.N.R.S., Jouy-en-Josas, S.-et-O.. France) The pars intermedia of the pituitary of *E. caballus* contained the highest activity of phosphomonoesterase and 5-nucleotidase. With the exception of the cells of the pars tuberalis, the cells of the pars distalis hydrolysed Na glycerophosphate in acid media. The pars intermedia hydrolysed a-naphthol acetate but not ACh or butyryl choline. The cells of the pars distalis and pars nervosa hydrolysed the choline esters. The pars intermedia contained the highest S-alucuronidase activity. (French) M.A.Wce

**4582. MODIFICATIONS IN NEUROSECRETORY ACTIVITY
OF HYPOTHALAMUS AND VOLUME TO C V A R & T I O N S
IN PITUITARY OF WHITE MICE: DURING PROMNGED
PERIODS WITHOUT WATER.**

WATER : . s . ol.
W S ^ 15¹⁶ ^ 1666 K^HiSot Sc^de
 (e., Nn^y, France) Involution of the pars intermedia, observed in mice after a period without water, was explained by hyperactivity of the hypothalamus accompanied by an increase in vol. of the pan nervosa. A measurement of the diam. of the cells of the supraoptic nucleus showed a marked decrease during the first 4 months of life, remaining const. up to 10 months. (French) M.A.Ptice

45 \wedge S ? » SK B C T S \wedge SLOW INFUSIONS OF HYPER-TONIC SOLUTIONS ON DRINKING AND DRINKING

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THRESHOLDS IN RATS. J.T.Fitzsimons: *J. Physiol., Lond.*, 1963, 167, 344-354 (Physiol. Lab., Univ. Cambridge, England) The amounts of water drunk by nephrectomised rats after slow infusions or rapid injn. of varying amounts of hypertonic NaCl, Na₂SO₄, sucrose or urea so In. were the same. NaCl and Na₂SO₄ were diluted to isotonicity by drinking. Sucrose was less effective as a drinking stimulus, and urea least effective. The threshold of drinking of normal rats infused with hypertonic NaCl was 1>6% increase in osmotic pressure. The NaCl and NtySty threshold of nephrectomised rats was about 2%, the sucrose threshold 2-4% and the urea threshold 5 *6%. The rate of infusion did not affect threshold. When drinking water was withheld up to 24 hr. after injn. of hypertonic NaCl into nephrectomised rats the amount of water drunk subsequently was the same as when drinking was allowed immediately after injn. Receptors for thirst do not adapt. *

4584. ESTIMATION OF VASOPRESSIN IN THE BLOOD AND URINE OF HYDRATED AND DEHYDRATED SUBJECTS. J.Lee: *J. Physiol., Lond.*, 1963, 167, 256-262 (Physiol. Lab., Charing Cross Hosp. Med. Sch., London, England) Blood samples from hydrated and dehydrated subjects were cone, and extracts prepared. In the majority of cases an extract of urine was prepared. The assays for antidiuretic activity were carried out on the water loaded rat under ethanol anaesthesia, using i.v. injn. As the antidiuretic activity was inactivated by Na thioglycollate, it was believed justifiable to assume that the activity when present was due to vasopressin. Normal hydrated subjects excreted < 10 mU./24 hr. of vasopressin, but it was never possible to detect the hormone in the blood even in subjects dehydrated for 24 hr.; the threshold of sensitivity of the method varied between 0*002 and 0*015 mU of vasopressin/ml. of blood. In dehydration (24 hr.) the rate of excretion of vasopressin amounted to 2 to 3 mU/hr., and with more severe dehydration it rose to 10 to 12 mU/hr. *

4585. STUDY OF INTERPHASE IN EXPERIMENTAL DIABETES INSIPIDUS. J.D.Crawford and L.R.Jrost: *Endocrinology*, 1963, 72, 677-683 (Pediat. Dept., Harvard Med. Sch., Boston, Mass., U.S.A.) The interphase of diabetes insipidus induced by electrolytic interruption of the supra-optic tract in rats has been studied in detail. Changes in water turnover observed are due to fluctuations in circulating vasopressin. H.C.Jones

4586. NEUROENDOCRINE CONTROL OF IHYROTROPHIN SECRETION IN RAT. W.H.Florsheim, N.S.Austin and S.M.Velcoff: *Endocrinology*, 1963, 72, 817-823 (U.S. Veterans' Hosp., Long Beach, Calif., U.S.A.) Hypothalamic lesions do not affect pituitary TSH function via control of pituitary blood flow. Cross-circulation expt. showed the presence of a neurohumour from the hypothalamus of a hypophysectomised rat which reversed goitre block induced by hypothalamic lesions in a 2nd rat. H.C.Jones

4587. NORMAL IHYROID FUNCTION AND RESPONSE TO HEMITHYROIDECTOMY IN CAT. K.M.Kuigge: *Anat. Rec.*, 1961, 141, 151-158 (Dept. Anat., Sch. Med., Univ. Cincinnati, Ohio, U.S.A.) Several parameters of normal thyroid function and response to hemithyroidectomy were studied in adult <f cats. A method of calculating the wt. of the intact lobe at the time of operation is presented. Two weeks after hemithyroidectomy 131I uptake of the intact lobe increases 230%, conversion ratio

and wt. of the lobe increases 110% and 44% respectively at 4 weeks, PBI levels reach supranormal levels (+ 40%) at 12 weeks. A steady state is achieved 32-48 weeks after operation with the intact lobe exhibiting 40% greater 131I uptake, a 15% wt. increase, a 45% decrease in ¹²⁷I concn. and a conversion ratio elevated 37%. F.Beck

4588. EFFECT OF RELAXIN ON THYROID FUNCTION IN RAT. E.R.Plunkett, B.P.Squires and F.C.Heagy: *J. Endocr.*, 1963, 26, 331-338 (Collip Med. Res. Lab., Univ. W. Ontario, London, Ont., Canada) Administration of relaxin to intact oestrus rats or oestrogen-treated spayed rats resulted in increased uptake of 131I by the thyroid. In the latter group plasma PB 131I and thyroid wt. were also elevated. Since these effects of relaxin were absent in hypophysectomised animals it is suggested that the thyroid-stimulating activity is mediated by release of increased amounts of pituitary TSH. CF.Blane

4589. THYROID FUNCTION IN CHICKENS AND RATS. **EFFECT OF IODINE CONTENT OF DIET AND HYPOPHYSECTOMY ON IODINE METABOLISM IN WHITE LEGHORN COCKERELS AND LONG-EVANS RATS.** L.R.Rosenberg, M.K.Dimick and G.Laroche: *Endocrinology*, 1963, 72, 749-758 (Anat. Dept., Univ. California, Berkeley, Calif., U.S.A.) In expt. using 131I, cockerels on a low I diet showed hyperthyroid activity with low levels of circulating thyroid hormone. When the diet was supplemented with I the thyroid activity fell. After hypophysecomy high thyroid activity was observed but there was reduced labelling of thyroglobulin thyroxine. Similar results were obtained in rats. H.C.Jones

4590. UPTAKE OF *31I BY THYROIDS OF RATS DURING HEALING OF FRACTURES. F.A.Soliman, A.H.Said, M.K.Soliman and M.S.Abdo: *Nature, Lond.*, 1963, 198, 203 (Dept. Physiol., Fac. Vet. Med., Giza, U.A.R.) In rats with expt. induced tibial fractures, thyroid function was estimated after injn. of 131I. Thyroid activity increased during the stage of cellular regeneration of callus formation, after which it dropped to normal value. G.M.Lewis

4591. THYROKINE AND THE OXIDISED FLAVOUR IN MILK. H.Astrup: *Nature, Lond.*, 1963, 198, 192-193 (Agric. Coll. of Norway, Vollebekk, Norway) Oral administration of thyroxine (200 mg. twice a day for 3 days) to cows significantly increased die oxidised flavour of the milk. Thiouracil (in 9 g. portions) had no effect. G.M.Lewis

4592. EFFECTS OF D-THYROXINE ON NORMAL SUBJECTS. R.Bames, J.A.P.Trafford and P.M.F.Bishop: *Brit. med. J.*, 1962, ii, 20-22 (Guy's Hosp., London, England) Results of a double blind trial indicate that Na D-thyroxine reduced mean serum cholesterol of normal euthyroid subjects by 48 mg./100 ml. (22*3%). This finding is contrary to previous reports. Thejy* was no significant change in wt. or B.M.R. in the groups, but radio-iodine uptake was reduced in all but 2 of 32 subjects after thyroxine. M.E.Nutt

REPRODUCTION AND GONADS

4593. MATERNAL BEHAVIOUR IN RABBIT: CRITICAL PERIOD FOR NEST BUILDING FOLLOWING CASTRATION DURING PREGNANCY. M.Zanow, A.Jaroor and

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V.H.Denenberg: Proc. Soc. exp. Biol., N.Y., 1962, 111, 537-538 (Dept. Biol. Sci., Purdue Univ., Lafayette, Ind., U.S.A.) Circulation of ovarian steroids for a period of 16-17 days, after onset of gestation, is necessary for the occurrence of nest building.

M.M.Shapland

4594. RESPONSE TO HANDLING AS A FUNCTION OF SEX AND EMOTIONAL DIFFERENCES IN THE ALBINO RAT. L.A.Stone and CSJ.Cnutson: J. genet. Psychol., 1963, 102, 69-74 (Dept. Psychol., Univ. N. Dakota, Grand Forks, N.Dak., U.S.A.) When T and ? rats were handled the ? showed more uncooperative response than cf. Uncooperative response to handling was significantly related to urinary response but not to defaecatory response. There was no relationship between urinary response and defaecatory response during testing under the same stress conditions. J.R.Broome

4595. HORMONAL REQUIREMENTS FOR INTERPUBIC LIGAMENT FORMATION IN HYPOPHYSECTOMISED MICE. B.C.Steinert and V.L.Beach: Endocrinology, 1963, 72, 771-776 (Warner-Lambert Res. Inst., Morris Plains, N.J., U.S.A.) Hypophysectomy of mice prevented or reduced interpubic ligament formation due to injn. of oestradiol cyclopentyl propionate [ECP] and combinations of ECP with relaxin. Thyroid administration improved the effect of ECP combined with relaxin, and GH prep, improved the pubic ligament response to both ECP alone and ECP with relaxin. H.C.Jones

4596. ACTION OF PINEAL GLAND EXTRACTS ON RESPONSE OF GENITAL TRACT OF RATS EXPOSED TO CONTINUOUS LIGHT. A.Moszkowska and M. des Gouttes: C.R. Soc. Biol., Paris, 1962, 156, 1750-1757 (Lab. de Histophysiol., Coll. de France, Paris, France) Water sol. extracts of pineal glands retarded vaginal opening and the first oestrus in rats exposed to continuous light. They inhib. hypertrophy of the ovary & development of follicles and opposed the maintenance of permanent oestrus. The extracts prevented the decrease in wt. of the pineal gland which occurred in untreated animals exposed to continuous light.

(French) M.A. Price

***597. ACTIVE LIPIDS IN MENSTRUAL FLUID.** V.R. Pickles: Biochem. Pharmacol., 1963, 12, 429-430 (Dept. Physiol., Univ. Sheffield, England) A group of lipid smooth muscle stimulants is liberated from the human endometrium during menstruation and may in part be recovered from the menstrual fluid. These stimulants cause the strong rhythmical uterine contractions that ext. the decidua menstrualis. L.G.Gillies

4598. EFFECTS OF GONADOTROPHIC HORMONES ON CONCENTRATION OF ASCORBIC ACID OF RAT OVARY. D.Foreman: Endocrinology, 1963, 72, 693-700 (Biol. Dept., Squire Vall^ue Farm, Western Reserve Univ., Cleveland, Ohio, U.S.A.) Ovarian ascorbic acid concn. of rats was found to be highest in dioestrous and lowest at oestrus. I.v. FSH and LH administration increased the ascorbic acid concn. but LTH, and GH did not. s.c. administration of FSH resulted in an increase in ascorbic acid concn. and s.c. IH and LTH resulted in a decrease in concn. H.C.Jones

599. GENETIC AND HORMONAL INFLUENCES ON OVULATION AND IMPLANTATION IN ADULT MICE TREATED WITH GONADOTROPHINS. R.G.Edwards and J.D.Wilson: J. Endocr., 1963, 26, 389-399 (Nat. Inst. Res., M.I.U. Hill, London, England) Details are

given of the effects of the strain of mice used, the dose of hormone, the innate oestrus cycle, and the injn. of prolactin on ovulation and implantation after treatment with gonadotrophins. Pre-treatment consisted of pregnant mare's serum gonadotrophin followed after 40 hr. by human chorionic gonadotrophin. While a suitable dose schedule would induce ovulation in all ? mice, the proportion of ova which implanted decreased with increasing dose of gonadotrophin. G.F.Blane

4600. RESPONSES TO GONADOTROPHIN IN INTACT AND HYPOPHYSECTOMISED IMMATURE FEMALE RATS AS RELATED TO AGE. E.H.Soper and A.J.Ladman: Proc. Soc. exp. Biol., N.Y., 1962, 111, 573-576 (Dept. Anat., Univ. Tennessee Med. Units, Memphis, Tenn., U.S.A.) Ovarian and uterine responses of 28-, 30-, and 33-day old normal and hypophysectomised rats to a single injn. of gonadotrophin 24 hr. prior to killing indicate that the intact pituitary is elaborating measurable amounts of hormone during this time interval.

M.M.Shapland

4601. OVULATION IN RABBIT: TIME OF FOLLICULAR RUPTURE AND EXPULSION OF EGGS, IN RELATION TO INJECTION OF LH. M.J.K.Harper: J. Endocr., 1963, 26, 307-316 (A.R.C. Unit of Reproductive Physiol., Univ. Cambridge, England) In rabbits treated with 25-50 I.U. IH no ovulation occurred within 10 hr., 50% ovulation between 104 and 10J hr., and 100% by 14 hr. (% of total no. of ripe follicles counted which had ruptured). From observations on the position of the released ova it appeared that appreciable time may elapse between follicular rupture and entry of ova into the Fallopian tube. G.F.Blane

4602. QUANTITATIVE STUDY OF RESPONSE TO LH AFTER HYPOPHSECTOMY IN OVARIAN ASCORBIC ACID DEPLETION TEST: EFFECT OF PROLACTIN. R.Guillemin and E.Sakiz: Endocrinology, 1963, 72, 813-816 (Lab. de Morphol. exp. et Endocrinol., Coll. de France, Paris, France) Using the ovarian ascorbic acid test for LH in rats it was found that the ascorbic acid content and response to inj. LH fell markedly a few hr. after hypophysectomy. Administration of prolactin at hypophysectomy prevented these effects. H.C.Jones

4603. ACTION OF PURIFIED GONADOTROPHIN ON CORPORA LUTEA IN TOE CYCLIC MOUSE. H.C.Brown, C.A.Large and W.D.White: Proc. Soc. exp. Biol., N.Y., 1962, 111, 686-690 (Dental Branch, Univ. Texas, Houston, Tex., U.S.A.) The life of hyperaemic (functional) corpora lutea in intraocular ovarian transplants in castrated ♀ mice was between one and two days. It was not affected by injn. of 0-1 mg. of FSH or LH every 12 hr. It was extended to approx. 5, 8 and 7 days respectively by 0*025, 0*1, or 0-2 mg. of luteotropic hormone [LTH] and to 17 days by 0-1 mg. of IH with 0*1 mg. of LTH. Deciduoma occurred in animals receiving 0*1 mg. LTH, or 0*1 mg. IH and LTH, but not in those receiving 0*025 mg. LTH or 0*1 mg. LH.

M.M.Shapland

4604. UTERUS AND OCCURRENCE OF OESTRUS IN PIGS. L.L.Anderson, R.L.Butcher and R.M.Melampy: Nature, Land., 1963, 198, 311-312 (Dept. Anim. Sci., Iowa State Univ., Ames, Iowa, U.S.A.) The persistence of corpora lutea and occurrence of oestrus in pigs after sub-total hysterectomy (from post, halves of oviducts to mid-cervix) was studied. Uterine autotransplants were made in immature gilts; after puberal oestrus, the transplants remained well developed only in cycling gilts.

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indicating that a certain amount of functional endometrium is necessary to provide a luteolytic stimulus for the regression of corpora lutea. Results from both expt. suggested that direct neural pathways from the uterus are not necessary for supplying the luteolytic stimulus.

G.M.Lewis

4605. EFFECT OF ALCOHOL ON RELEASE OF OXYTOCIN. A.R.*Fuchs and G.Wagner: *Nature*, Lond., 1963, 198, 92-94 (Inst. Med. Physiol., Univ. Copenhagen, Denmark) Uterine motility was measured in rabbits by means of a water-filled rubber balloon inserted into the uterus after delivery of young. Studies were made of the effect of inj. oxytocin and suckling young on uterine motility. Ethanol inhib. the release of oxytocin from the neurohypophysis. These results were confirmed on a human patient post-partum in which uterine motility was recorded externally.

CM.Lewis

4606. METABOLIC ACTIVITY OF OXYTOCIN IN THE Puerperium. R.L.Burt, N.H.Leake and W.N.Dannenburg: *Nature*, Lond., 1963, 198, 293 (Dept. Obstet., Bowman Gray Sch. Med., Winston-Salem, N.C., U.S.A.) I.v. administration of oxytocin to normal women within 36 hr. of delivery resulted in a decrease in blood glucose, increase in non-esterified fatty acid and little change in inoig. PO₄. The significance of these metabolic effects is discussed.

G.M.Lewis

4607. ORIGIN AND MODE OF PROPAGATION OF CONTRACTION WAVE IN HUMAN UTERUS. H.Niu and A.Nakajima: *Bull. Yamaguchi med. Sch.*, 1962, 9, 73-80 (Dept. Physiol., Yamaguchi Med. Sch., Ube, Japan) Excitation could originate from any part of the fundus, as studied by simult. recording of action potential from 3 parts of human uterus. In vertical aspect of the uterus, the excitation usually was conducted downwards, but sometimes it was conducted upwards. It is suggested that the pacemaker area may be also found somewhere in the middle or lower part of the uterus as well.

K.Jones

4608. EFFECT OF AN INFUSION OF PHOSPHOLIPID ON HUMAN MYOMETRIUM EARLY IN PREGNANCY. P.A. Jarvinen, T.Luukkainen, R.V.Short, H.Adlercreutz, S. Pesonen and E.Huhmar: *Ann. Med. exp. Fenn.*, 1963, 41, 21-26 (2nd Dept. Obstet and Gynec., Central Hosp., Univ., Helsinki, Finland) An i.v. fat emulsion, 'Infonutrol' was given to 11 patients admitted to hospital for legal abortions. After infusion of this substance, 8 of the patients showed increased myometrial activity and 5 of them showed an increased oxytocin sensitivity in Smyth's test. Pregnaneadiol excretion was increased after treatment, but there were significant changes in oestriol excretion or the blood progesterone level.

G.Faulkner

4609. VITAMIN B12 DEFICIENCY IN PREGNANCY AND PUERPERIUM. SJ.Baker, E.Jacob, K.T.Rajan and S.P. Swaminathan: *Brit. med. J.*, 1962, i, 1568-1661 (Dept. Haematol., Christian Med. Coll. Hosp., Vellore, S. India) Seven women with tropical malabsorption syndrome had moderate to severe megaloblastic anaemia of pregnancy with low serum vit. B12 levels. Breast milk B12 levels were similar to those of serum. Babies had no anaemia and their serum B12 levels were higher than in their motheis. One baby had 'intermediate*' megaloblasts in the bone marrow. Two stillborn foetuses had reduced B12 liver stores compared with those in normals. Babies born of and suckled by B12-deficient motheis are in danger of developing frank deficiency.

M.E.Nutt

4610. WATER CONTENT OF RAT FOETAL TISSUES FOLLOWING ADMINISTRATION OF WATER TO THE DAM. MJ.Seller: *Nature*, Lond., 1963, 198, 91 (Paediat. Res. Unit, Guy's Hosp. Med. Sch., London, England)

I.v. administration of excess water to pregnant rats increased the water content of the forebrain, skin and muscle and caused a fall in haematocrit. In the foetus, significant water increase occurred only in the skin.

G.M.Lewis

4611. FOETAL ANOXIA. L.Woodiw Cox: *Lancet*, 1963, i, 841-844 (Univ. Adelaide, S.Australia) A lecture.

G.H.Bell

4612. MILK EJECTION REFLEX AND MAINTENANCE OF LACTATION IN RABBIT. J.S.Tindal, C.Beyer and C.H.Sawyer: *Endocrinology*, 1963, 72, 720-724 (Anat. Dept., Univ. California, Los Angeles, Calif., U.S.A.) The milk yield of lactating rabbits anaesthetised with barbiturate and inj. with oxytocin was the same as the normal milk yield when the animals were suckled without anaesthesia or oxytocin.

H.C.Jones

4613. EXPERIMENTAL ^fLACTATIONAL MAMMARY GLAND GROWTH IN THE RAT AS MEASURED BY DNA. D.R.Griffith and C.W.Tumer: *Proc. Soc. exp. Biol.*, N.Y., 1963, 112, 424-427 (Dept. Dairy Husb., Univ. Missouri, Columbia, Mo., U.S.A.) The relative DNA content has been used as a comparative measure of cell growth in the development of the mammary glands in Sprague-Dawley-Rolfsmeyer rats. Animals were ovariectomised then treated with oestradiol and progesterone to induce growth of the mammary glands. The effects of hydrocortisone acetate, lactogen and growth hormone were studied separately and in combination treatments. All stimulated lactogenesis but growth hormone was least effective as a lactogenic agent. However, growth hormone and hydrocortisone treatment together had the most significant effect in enhancing the growth of the mammary gland tissue.

D.N.Wheatley

4614. TRANSFER OF OESTRADIOL-17g TO MILK IN CATTLE. T.Lunaas: *Natuie*, Lond., 1963, 198, 288-289 (Dept. Reprod. Physiol., Vet. Coll. of Norway, Oslo, Norway) After i.m. injn. of oestradiol-17g into a non-pregnant, lactating cow, negligible amounts of the free oestrogen were detected in the milk; it was secreted in an ether-insol. form, presumably conjugated in the mammary gland.

G.M.Lewis

4615. COMPARISON OF TOPICAL AND SUBCUTANEOUS METHOD OF ADMINISTRATION OF SIXTEEN OESTROGENS. C.F.Morgan: *J. Endocr.*, 1963, 26, 317-329 (Anat. Dept., Univ. Minnesota Med. Sch., Minneapolis, Minn., U.S.A.) The oestrogens were either inj. s.c. or applied to the shaved subscapular skin of rats at each of the dose levels 0*01, 0*1 and 1-0 jig. for both routes. Several of the hormones were found to be equally or in some cases more effective given by the percutaneous route as judged by the uterine and vaginal wt. response. The potency of the oestrogens was postulated as being related more to their mol. structure and activity within target organs than to the ease with which they were absorbed from either skin route.

G.F.Blane

4616. BIOASSAY OF OESTROGEN AND RECURRING OESTRUS IN OVARIECTOMISED EWES. M.W.Tomaszewska: *Nature*, Lond., 1963, 198, 299-301 (Whatawhata Hill Country Res. Stn., Dept. Agric, Hamilton, New Zealand) Measurement of ovine vaginal, dilatability may be a useful technique for bioassay of oestrogenic

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hormones. After a single injn. of stilboestrol recurrent oestrus occurred in some ovariectomised sheep.

G.M.Lewis

4617. OESTROGENS OF SOW IN EARLY PREGNANCY: ACCUMULATION OF OESTRONE IN ALLANTOIC FLUID. T.Lunaas: *J. Endocr.*, 1963, 26, 401-406 (Dept. Reproduct. Physiol. and Path., Vet. Coll. of Norway, Oslo, Norway) The concn. of oestrogens in pvarian, placenta and foetal tissues was determined during the 4th-5th week of pregnancy when urinary oestrogens are known to be elevated. A relatively high level of conjugated oestrone was found in the allantoic fluid and it is postulated that this is placental in origin.

C.F.Blane

4618. INTERRELATIONSHIP OF OESTROGEN CONCENTRATIONS IN MATERNAL CIRCULATION, FOETAL CIRCULATION AND MATERNAL URINE IN LATE PREGNANCY. F.D.Maner, B.D.Saffan, R.A.Wiggins, J.D. Thompson and J.R.K.Preedy: *J. clin. Endocr.*, 1963, 23, 445-458 (Dept. Med., Emory Univ., Atlanta, Ga., U.S.A.) K.Jones

4619. CRITICAL INTERACTION TIME BETWEEN OESTROGEN AND UTERINE TISSUE INDICATED BY CORTISOL INHIBITION AND INHIBITION RELEASE. E.Spaziani: *Proc. Soc. exp. Biol.*, N.Y., 1962, 111, 637-639 (Dept. Zool., Univ. Iowa, Iowa City, Iowa, U.S.A.)

Cortisol given within 2 hr. after oestradiol administration depressed or prevented oestrogen-induced oedema and cell division in uteri of ovariectomised rats. When injn. ^as delayed longer than 2 hr., cortisol no longer completely inhib. these responses. M.M.Shapland

4620. RELATIONSHIP OF OESTROGEN AND VITAMIN K. P.B.R.Rao, A.M.Paolucci and B.C.Johnson: *Proc. Soc. exp. Biol.*, N.Y., 1963, 112, 393-396 (Div. Anim. Nutr., Univ. Illinois, Urbana, Ill., U.S.A.) Very

voing rats maintained on a vit. K deficient diet were given each a single injn. of oestradiol at a very low dosage. This effectively lowered the plasma prothrombin &me to a normal value. Testosterone administration to + rats caused an increased plasma prothrombin time, oestradiol at far greater concn. had no effect on the hyporombinaemia in chicks fed on a vit. K deficient diet.

D.N.Wheatley

4621. CONVERSION OF [6:7³H]OESTRADIOL-17³ INTO OESTRONE AND OESTRADIOL-17^a IN TOE MATURE MALE DOG. E.T.Siegel, R.I.Dorfman, R.S.Brody and M.H.F.Friedman: *Proc. Soc. exp. Biol.*, N.Y., 1962, 111, 533-536 (Worcester Fdn. for Expt. Biol., Shrewsbury, Mass., U.S.A.) Oestradiol-17 OL h the major urinary metabolite after i.v. injn. of [3H]oestradiol-17g.

M.M.Shapland

***4622. GLUCURONIDE FORMATION IN PARTURIENTS.** L.Rauramo, M.Pulkkinen and K.Hartiala: *Ann. Med. exp. Fenn.*, 1963, 41, 32-38 (Dept. Physiol.Univ. Turku, Finland) Onehr. after oral administration of salicyl-^ide to parturients the blood content of free salicylamide and salicylamide glucuronide are considerably lower than in similarly treated non-pregnant women. After 4hr. both groups ^e similar blood concn. of these substances. The inhibn. of **Ucuronide formation or disturbances in resorption during We8nancy may be involved. G.Faulkner

4623. EFFECT OF OESTRADIOL, TESTOSTERONE AND PROGESTERONE ON GLUCURONATION [GLUCURON-JpE CONJUGATION] IN BITCHES. L.Rauramo, M. Pulkkinen and K.Hartiala: *Ann. Med., exp.Fenn.*, 1963, 41, 27-32 (Dept. Physiol. Univ., Turku, Finland) 30 bitches were used. Animals were given 200 mg. of salicyl-

amide/kg. body wt. Glucuronide was determined in plasma in the progesterone group, also free salicylamide and salicylamide glucuronide. The dogs were treated with oestradiol, testosterone and progesterone for 3 and 14 days. The hormones did not influence glucuronide level in plasma during fast 24 hr. nor did they affect presence of free salicylamide and salicylamide glucuronide in the plasma in the progesterone group. G.Faulkner

4624. MATING BEHAVIOUR IN MALE RATS AFTER REMOVAL OF SEMINAL VESICLES. F.A.Beach and J.R. Wilson: *Proc. nat. Acad. Sci. Wash.*, 1963, 49, 624-626 (Univ. California, Berkeley, Calif., U.S.A.)

10 sexually experienced rf rats were observed in standardised tests for sexual exhaustion before and after removal of seminal vesicles. Comparison of various quant. measures of mating performance before and after operation revealed no significant change in the pattern of behaviour or in the total capacity for sexual activity. J.R.Sargent

4625. PROSTAGLANDIN. PROPERTIES, ACTIONS AND SIGNIFICANCE. R.Eliasson: *Biochem. Pharmacol.*, 1963, 12, 405-412 (Dept. Physiol., Fac. Med., Karolinska Inst., Stockholm, Sweden) Prostaglandin is a lipid-sol. smooth muscle stimulating and b.p. lowering factor with acidic properties found in seminal fluid and in extracts of some accessory genital glands of man and sheep. A no. of cryst. active compounds were recently isolated from the total prostaglandin extract. The biol. activity of the most potent of these is of the same order as ACh and oxytocin. The effect on the isolated non-pregnant human myometrium is relaxation. It is suggested that prostaglandin is of importance in human fertility.

L.G.Giles

4626. 3SH^A(?) AND INSTRUCTION AS FACTOR m-AX^AJS^B?TM C^BJ^D T LOGICAL ACTIVITY OF CERTAIN S S f . f N D³-CYCLOPENTYL ENOL ETHERS CORRESPONDING. A.Meli: *Endocrinology*, 1963, 72, 715-719 (Warner-Lambert Res. Inst., Morris Plains, N.J., U.S.A.) Testosterone, testosterone propionate and methyltestosterone were all more active when administered s.c. than orally or i.p. Small doses of testosterone 3-cyclopentyl enol ether and methyl testosterone 3-cyclopentyl enol ether were less active when given s.c. and most active when given i.p. Single large doses of the enol ethers given s.c. were more active than the parent compounds. H.C.Jones

4627. NATURE OF PITUITARY LUTEOTROPHIC HORMONE ON ENZYMIC ACTIVITY OF THE TESTES OF GALLUS L. L.Arvy: *CR Soc. Biol. Paris*, 1962, 156, 1802-1804 (Lab. Physiol. du C.N.R.S., Jouy-en-Josas, S.-et-O., France) Interstitial cells of the testes of 48 hr. old *G. gallus* showed weak sulphatase, 0-glucuronidase and steroid-3 β -ol-dehydrogenase activity. Injn. of 0-3 mg. luteotrophic hormone/day for 7-10 days markedly increased development of interstitial cells. This tissue showed moderate alkaline glycerophosphatase activity and an increase in esterase, sulphatase, 3-glucuronidase and steroid-3 β S-ol-dehydrogenase activity. (French)

M.A.Pric

4628. INFLUENCE OF OXYTOCIN ON SPERMATOZOA TRANSPORT IN DUCTUS DEFERENS OF RAM. Z.Ewy, W.bielanski and Z.Zapletal: *Bull. Acad. pol. Sci.*, 1963, 11, 145-148 (Dept. Animal Hygiene, Agric. Coll., Cracow, Poland) The results of preliminary expt. in which the ductus deferens of 5 rams (2-3 yr. old) were cannulated demonstrated that there was an incessant passage of spermatozoa during 24 hr. After an injn. of

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oxytocin there was a considerable increase in the no. of spermatozoa flowing out of the fistula. The time elapsing between the injn. of oxytocin and the onset of increased flow of spermatozoa is required for the passage of spermatozoa through the epididymis and vas deferens.

E.Parkinson

4629. RE-INITIATION AND RESTORATION OF SPERMATOGENESIS WITH TESTOSTERONE PROPIONATE AND OTHER HORMONES AFTER LONG-TERM POST-HYPOPHYSECTOMY REGRESSION PERIOD. A.V.Boccabella: *Endocrinology*, 1963, 72, 787-798 (Anat. Dept., Seton Hall Med. Coll., Jersey City, N.J., U.S.A.)

Prolonged administration of testosterone propionate to rats 67-70 days after hypophysectomy partially restored spermatogenesis in 1/3 of the animals used. Administration of testosterone propionate with growth hormone and/or thyroxine in some cases gave a quicker response and restored spermatogenesis in 2/3 of the animals.

H.CJones

4630. SPERMATOZOA. Lord Rothschild: *Brit. med. J.*, 1962, ii, 743-749, 812-816 (Dept. Zool., Univ., Cambridge, England) *Reports of lectures*, 26 ref.

M.E.Nutt

4631. FREEZING OF DOG SPERMATOZOA TO -7(f). I.C.A.Martin: *Res. vet. Sci.*, 1963, 4, 304-314 (Sydney Univ. Vet. Physiol. Dept., Sydney, N.S.W.,

Australia) Methods of freezing dog spermatozoa to -70° were studied, and motility of the spermatozoa after thawing was used as the index of survival. 8% glycerol in the diluent gave better survival rates than 4% but to demonstrate strong motility it was necessary to suspend the spermatozoa in glycerol-free diluent. The basic phosphate buffer-Ringer soln. diluent was improved by the addition of fructose and bovine albumen or egg lecithin. Few spermatozoa survived deep-freezing when diluted 50-fold.

J.B.Derbyshire

4632. DEEP-FREEZING OF DOG SPERMATOZOA IN DILUENTS CONTAINING SKIM-MILK. I.C.A.Martin: *Res. vet. Sci.*, 1963, 4, 315-325 (Sydney Univ. Vet. Physiol. Dept., Sydney, N.S.W., Australia) The

survival of dog spermatozoa after deep-freezing was assessed by the % of motile spermatozoa, and the rapidity of their movement. Reconstituted skim-milk was a better diluent than Ringer-fructose-phosphate or citrate-fructose-phosphate. 12% skimmed milk gave greater longevity of spermatozoa after thawing than 6% or 9% skimmed milk. A 5 hr. equilibration period before deep-freezing depressed the activity of the spermatozoa after thawing, but viability as judged by the no. of spermatozoa which failed to stain with eosin-nigrosin, was increased.

J.B.Derbyshire

PHYSIOLOGY OF BEHAVIOUR

4633. EFFECTS OF ADRENAL DEMEDULLATION ON RETENTION OF A CONDITIONED AVOIDANCE RESPONSE IN THE MOUSE. D.F.Caldwell: J. comp. physiol. Psychol., 1962, 55, 1079-1081 (Wayne State Univ., U.S.A.) Mice were trained to avoid shock. The results of retention trials for the conditioned avoidance response showed that after bilateral adrenal demedullation more trials were required to attain the criterion and response latencies were greater than in sham-demедullated or non-operated controls. J.R.Broome

4634. ALTERATIONS IN LEARNING ABILITY CAUSED BY CHANGES IN CEREBRAL 5HT AND CATECHOL AMINES. D.W.Wooley and T. van der Hoeven: Science, 1963, 139, 610-611 (Rockefeller Inst., New York, U.S.A.) If brain 5HT levels were increased in mice by injn. of 5HTP and 1-benzyl-5-niethoxy-tryptamine, their learning ability in a simple *y* maze was decreased. An increase in catechol amines induced by treatment with phenylalanine and tyrosine, somewhat increased their learning ability. G.M.Lewis

4635. EFFECTS OF LESIONS IN THE CINGULUM ON MAZE LEARNING AND AVOIDANCE CONDITIONING IN THE RAT. G.J.Thomas and B.Slotnick: J. comp. physiol. Psychol., 1962, 55, 1085-1091 (Dept. Physiol., Univ. Illinois, 111, U.S.A.) Rats with lesions aimed at bilat. section of the cingulum, and operated controls, were trained post-operatively on avoidance responses in a double-grill box and then trained in a maze. A 2nd group learned the two tasks Post-operatively in the reverse order. In both groups significant retardation of conditioned avoidance response acquisition occurred after damage to the cingulum, but maze learning was not significantly affected. J.R.Broome

4636. PREFERENCE THRESHOLD OF THE WHITE RAT FOR SUCROSE. R.G.Burright and W.E.Kappauf: J. comp. physiol. Psychol., 1963, 56, 171-173 (Univ. Illinois, 111, U.S.A.) Rats were given a series of **min. drinking tests involving a choice between sucrose soln. and water. The preference threshold, or concn. at which 75% of the animals made more tongue contacts with the sucrose soln., was found to be 0.32 gm./100 cc. of soln. J.R.Broome

4637. EFFECTS OF ATROPINE SULPHATE ON THE CONDITIONED AVERSION TO SACCHARIN FLUID WITH X-RAYS AS THE UNCONDITIONED STIMULUS. J.C.Smith and D.D.Morris: Radiat. Res., 1963, 18, 186-190 (Dept. Physiol., Florida Univ., Tallahassee, Fla., U.S.A.) It was found that injn. of atropine sulphate had no effect on the conditioning aversion of rats to soln. of saccharine, with X-rays as noxious stimulus, the dose level was inversely proportional to amount of saccharine soln. drunk for groups receiving saccharine or to irradiation. B.J.Payne

4638. ALKALINE TASTE IN GOATS ASSESSED BY THE PREFERENCE TEST TECHNIQUE. F.R.Bell: J. comp. Physiol. Psychol., 1963, 56, 174-178 (Royal Vet. Coll. ** London, England) An expt. using the 2-dif. Preference technique indicated that goats can discriminate between alk. soln. (sodium bicarbonate) and alk. soln. showing a marked preference for 1% sodium carbonate. This preference was changed to an aversion

by the administration of a supplement of sodium bicarbonate through a stomach tube. J.R.Broome

4639. CALLOSAL SECTION : ITS EFFECT ON PERFORMANCE OF A BIMANUAL SKILL. C.Ettlinger and H.J.B.Morton: Science, 1963, 139, 485-486 (Inst. NeuroL, London, England) Four out of 5 monkeys showed no lessening of the ability to perform a motor habit, requiring concurrent movement of the 2 hands in opposite directions, when the callosum was cut after training. However, in only 1 animal was there significant transfer, between the hands, of a shape -discrimination habit learned post-operatively, indicating that the callosum is involved in transmission of tactile learning between the hemispheres. G.M.Lewis

EXPERIMENTAL PSYCHOLOGY

4640. WAVE-LENGTH GENERALISATION AS A FUNCTION OF SPACING OF TEST STIMULI. H.Friedman: J. exp. Psychol., 1963, 65, 334-338 (Duke Univ., Durham, N.C., U.S.A.) Pigeons were trained in a Skinner-type key-pecking apparatus and then tested for generalisation using stimuli 5, 10, or 20 m|i apart. The generalisation gradients in terms of wave-length were virtually identical. There was no evidence to suggest the development of a frame of ref. during testing. J.R.Broome

4641. STIMULUS GENERALISATION ALONG ONE AND TWO DIMENSIONS IN PIGEONS. C.M.Butten: J. exp. Psychol., 1963, 65, 339-346 (Univ. Michigan, Mich., U.S.A.) Pigeons trained in a Skinner box were tested for generalisation to stimuli varied in wavelength, in angular orientation and in one or two dimensions. Generalisation to stimuli varied in 2 dimensions was less than generalisation to stimuli varied in either dimension alone. Also the 2 dimensions had interacting effects on generalisation. J.R.Broome

4642. CLASSICAL CONDITIONING IN THE PIGEON: EXPLORATORY STUDIES OF PARTIAL REINFORCEMENT. N.Longo, S.Milstein and M.E.Bitterman: J. comp. physiol. Psychol., 1962, 55, 983-986 (Bryn Mawr Coll., Bryn Mawr, Pa., U.S.A.) Classical conditioning was studied in the pigeon, using light-onset as the conditioned stimulus and electric shock as the unconditioned stimulus, by measuring the general activity evoked by the conditioned stimulus. The acquisition and extinction functions obtained showed this to be a satisfactory technique for this sp., but there was no substantial evidence of increased resistance to extinction following partial reinforcement. J.R.Broome

4643. POSITIVE AND NEGATIVE GENERALISATION GRADIENTS OBTAINED AFTER EQUIVALENT TRAINING CONDITIONS. W.K.Honig, C.A.**oneau, K.R.Burstein and H.S.Pennypacker: J. comp. physiol. Psychol., 1963, 56, 111-116 (Denison Univ., U.S.A.) Two groups of pigeons were trained to discriminate between the presence and absence of a vertical black line on an illuminated response key, presence was pos. for one group and neg. for the other. Pos. and neg. gradients, compared on the dimension of angular orientation (tilt), were initially very similar, although the neg. gradient became flatter during testing. J.Oroome

ANIMAL BEHAVIOUR

4644. BAR PRESSING AS A FUNCTION OF TEST ENVIRONMENT AREA. A.Baron, J.J.Antonitis and A.H.Clark: *J. genet. Psychol.*, 1963, 102, 159-165 (Dept. Psychol., Univ. Wisconsin, Milwaukee, Wis., U.S.A.) Observation of the unconditioned bar-pressing behaviour of mice in 4 test environments showed that increase in the area of the test box decreased the total no. of bar-presses, but the no. was greater than expected from the 'general activity' hypothesis. Wood-works behaviour primacy theory was held to provide a reasonable explanation of the results. J.R.Broome

4645. PERFORMANCE IN DIFFERENTIAL CONDITIONING AS A FUNCTION OF VARIATION IN MAGNITUDE OF REWARD. H.Goldstein and K.W.Spence: *J. exp. Psychol.*, 1963, 65, 86-93 (State Univ., Iowa City, Iowa, U.S.A.) Four groups of rats received a different no. of food pellets associated with traversing either a black or white alley. The rate of differentiation was positively related to differences in reward magnitude. The function relating asymptotic response speeds for both large- and small-reward discriminanda was found to be a negatively accelerated increasing one. J.R.Broome

4646. DISCRIMINATION AND STIMULUS GENERALISATION OF APPROACH, OF AVOIDANCE, AND OF APPROACH AND AVOIDANCE DURING CONFLICT. H.S.Hoffman and M.Fleshlen: *J. exp. Psychol.*, 1963, 65, 280-291 (Pennsylvania State Univ., Pa., U.S.A.) Three groups of rats were trained in a Skinner box, one on approach (plate press to obtain food), one on avoidance (bar press to prevent shock) and one on both responses. The discrimination stimulus was a 3500c/s tone. Tests showed that approach generalised more broadly than avoidance, but the animals learned to discriminate more rapidly for approach than for avoidance. J.R.Broome

4647. COMPARISON BETWEEN CORRECTION AND NON-CORRECTION METHODS IN DRIVE DISCRIMINATION. N.F.Besch, H.Morris and S.Levine: *J. exp. Psychol.*, 1963, 65, 414-419 (Columbus Psychiat. Inst. and Hosp., Ohio State Univ., Ohio, U.S.A.) Rats were trained in a T-maze in a hunger-thirst discrimination for social reward. The results showed that the non-correction method is superior to the correction method in promoting learning on the basis of drive stimuli. J.R.Broome

4648. INFLUENCE OF DEPRIVATION AND AVAILABILITY OF GOAL BOX CUES ON THE TEMPORAL GRADIENT OF REINFORCEMENT. K.E.Renner: *J. comp. physiol. Psychol.*, 1963, 56, 101-104 (Northwestern Univ., Ill., U.S.A.) The performance of rats in a straight alley was studied using a factorial design of 3 delay intervals, 2 levels of food deprivation and the presence or absence of goal-related stimuli in the delay chamber. The temporal gradient of reinforcement obtained was, at least in part, a function of drive level and availability of goal-related cues. J.R.Broome

4649. EFFECTS OF DRIVE INTENSITY ON SECONDARY REINFORCEMENT. E.L.Wike and B.J.Farrow: *J. comp. physiol. Psychol.*, 1962, 55, 1020-1023 (Univ. Kansas, Kans., U.S.A.) Rats were given secondary reward training, involving the differential method, in a runway, and then tested for secondary reinforcement in a T maze. The running times varied systematically in

training with changes in drive level and the presence and absence of reward. J.R.Broome

4650. EFFECTS OF MAGNITUDE OF WATER REWARD ON SELECTIVE LEARNING AND HABIT REVERSAL. E.L.Wike and B.J.Farrow: *J. comp. physiol. Psychol.*, 1962, 55, 1024-1028 (Univ. Kansas, Kans., U.S.A.) The influence on rats of 3 levels of water incentive upon acquisition and habit reversal was studied using a T maze. J.R.Broome

4651. RUNWAY PERFORMANCE FOLLOWING A REDUCTION IN THE CONCENTRATION OF A LIQUID REWARD. M.J.Homzie and L.E.Ross: *J. comp. physiol. Psychol.*, 1962, 55, 1029-1033 (Univ. Wisconsin, Madison, Wis., U.S.A.) Rats were trained on a 20% sucrose soln. and then changed to either a 1% sucrose soln., distilled water or no reward. Reduction in concn. of the incentive produced a decline in performance, but there was no abrupt shift in performance and no depression effect. J.R.Broome

4652. EFFECT OF INCENTIVE MOTIVATION ON AN UNRELATED REFLEX RESPONSE. M.A.Trapold: *J. comp. physiol. Psychol.*, 1962, 55, 1034-1039 (State Univ., Iowa City, Iowa, U.S.A.) In expt. with rats a conditioning stimulus was paired with a soln. containing either 6% or 24% sucrose. Two test trials daily were also given, one in which a startle stimulus was presented in addition to the conditioning trial, and one in which this was presented alone. The minimal instrumental response involved in obtaining the reward was facilitated by the incentive stimulus, but the startle response was not facilitated. J.R.Broome

4653. EFFECTS OF STIMULUS SIZE AND PROXIMITY UPON AVOIDANCE OF COMPLEX OBJECTS IN RHESUS MONKEYS. E.W.Menzel jun: *J. comp. physiol. Psychol.*, 1962, 55, 1044-1046 (Yerkes Lab. Primate Biol., Orange Park, Fla., U.S.A.) Three sizes of complex representational objects were presented to rhesus monkeys. Avoidance increased directly with object size and proximity. Familiarity with the objects led to the replacement of avoidance by object contact. J.R.Broome

4654. LEVER HOLDING AND BEHAVIOUR SEQUENCES IN SHOCK-ESCAPE. S.L.Campbell: *J. comp. physiol. Psychol.*, 1962, 55, 1047-1053 (Indiana Univ., Ind., U.S.A.) The responses of rats to shock were classified according to whether the lever was pressed in the presence (escape response) or the absence (extra response) of shock and whether the lever was released during the absence of shock (non-punished) or after the reintroduction of shock (punished). J.R.Broome

4655. ACQUISITION AND RETENTION OF ACQUIRED AVOIDANCE WITH GENTLING AS REINFORCEMENT. D.K.C and Land, S.H.Horowitz and J.L.Culbertson: *J. comp. physiol. Psychol.*, 1962, 55, 1062-1064 (Bucknell Univ., Lewisburg, Pa., U.S.A.) Rats either 23 or 53 days old were trained to avoid the black half of a black and white compartment when gentling was used as the reinforcement during acquisition. The avoidance response was retained for 15, but not 30, days, the young rats requiring more gentlings during avoidance training than the older rats. J.R.Broome

4656. TERMINAL RETARDATION IN ACTIVITY GRADIENTS. R.D.Meade and R.J.Newman: *J. comp. physiol. Psychol.*, 1962, 55, 1065-1068 (Trinity Coll..

Hartford, Conn., U.S.A.) In the first expt. rats had to traverse 3 alleys and 3 boxes before reaching the food box. In the 2nd they were trained to cross an electric grid at 3 different distances from the food chamber to reach food. It was found that motivation to reach the goal increased as the goal was approached. No terminal retardation was observed in either expt. J.R.Broome

4657. LOCUS OF MAXIMAL "KAMIN EFFECT* IN RATS. M.R.Denny and R.E.Ditchman: *J. comp. physiol. Psychol.*, 1962, 55, 1069-1070 (Michigan State Univ., East Lansing, Mich., U.S.A.) Rats were tested in a shuttle box using electric shock as the unconditioned stimulus and a buzzer as the conditioned stimulus, with delay intervals of 0, 0*5, 0*75, 1, 1-25 and 1*5 hr. The no. of avoidance responses during re-learning declined from 0 to 1 hr. and then rose from 1 to 1-5 hr. The min._r representing the max. Kamin effect, occurred between the 0-75 hr. interval and 1-5 hr. interval. J.R.Broom e

4658. EFFECTS OF PRIOR FEAR EXPERIENCES ON AN APPROACH-AVOIDANCE CONFLICT. K.H.Kurtz and G.C.Walters: *J. comp. physiol. Psychol.*, 1962, 55, 1075-1078 (Univ. Buffalo, N.Y., U.S.A.) A series of intense electric shocks was administered to rats, which were trained approx. 1 month later, together with unshocked controls, to traverse a straight runway for food. The animals were shocked at the goal box and subsequent running performance was measured. It appeared that the cues associated with approaching the goal elicited stronger fear in expt. than in control animals. J.R.Broome

4659. EFFECTS OF PREWEANING AND POSTWEANING MANIPULATIONS UPON PROBLEM-SOLVING BEHAVIOUR. V.H.Denenberg and L.R.C.Morton: *J. comp. physiol. Psychol.*, 1962, 55, 1096-1098 (Purdue Univ., Lafayette, Ind., U.S.A.) Rats received either handling or no extrinsic stimn. between birth and weaning, and were then reared in either a restricted, neutral or enriched environment. Tests indicated that handling does not affect problem-solving behaviour as measured by the Hebb-Williams maze. J.R.Broome

4660. CRITICAL PERIOD FOR THE FACILITATION OF EXPLORATORY BEHAVIOUR BY INFANTILE EXPERIENCE. W.J.Meyers: *J. comp. physiol. Psychol.*, 1962, 55, 1099-1101. Rats were stim. by being carried about at different ages during infancy. Study of exploration behaviour in an alley attached to the home cage indicated that a critical period for facilitating exploration occurs in the 2nd week of life. J.R.Broome

4661. ACTIVITY DECREMENTS AND RECOVERY DURING REPEATED DAY TO DAY EXPOSURE TO THE SAME ENVIRONMENT. E.Howarth: *J. comp. physiol. Psychol.*, 1962, 55, 1102-1104 (Univ. Alberta, Alta., Canada) The initial exploration of rats in a 1 hr. period repeated over 15 successive trials given at 24 hr. intervals declined significantly for the first 3 days only. Activity for ensuing periods recovered by the fourth day. J.R.Broome

4662. ACTIVITY DURING AND BETWEEN PERIODS OF STIMULUS CHANGE RELATED TO FEEDING. A.Amsel: *J. comp. physiol. Psychol.*, 1962, 55, 1114-1117 (Univ. Toronto, Ont., Canada) The activity of hungry rats between and during periods of stimulus change which signalled feeding were measured. Animals were

fed either at every period of stimulus change and then switched to 50% feeding, or were fed on 50% of occasions throughout. The results showed a slowly developing gradient of activity between successive periods of stimulus change. Activity gradients also develop during the period of stimulus change. J.R.Broome

4663. SOME EFFECTS OF MAINTENANCE LUMINANCE AND STRAIN DIFFERENCES UPON SELF-EXPOSURE TO LIGHT BY RATS. R.B.Lockard: *I. comp. physiol. Psychol.*, 1962, 55, 1118-1123 (Univ. Wisconsin, Madison, Wis., U.S.A.) Dark-treated and light-treated rats were left in test-chambers with self-controlled light of 5 different luminances. It was found that dim light is preferred to darkness and darkness to bright light. In a comparison between hooded rats and albinos, hooded rats kept even high test luminances on about 17 hr. per day, whereas albinos showed shorter daily durations as luminance increased. J.R.Broome

4664. REINFORCING EFFECTS OF ILLUMINATION CHANGE IN DIFFERENT PHASES OF THE RAT'S DIURNAL CYCLE. H.Sarry III and D.Symmes: *J. comp. physiol. Psychol.*, 1963, 55, 117-119 (Univ. Connecticut, Storrs, Conn., U.S.A.) Rats were maintained on a 24 hr. cycle of equal light and darkness. Bar-pressing was reinforced by illumination change, regardless of the level of bar-pressing activity or direction of illumination change. J.R.JJroome

4665. EFFECT OF STOMACH LOADING ON SUCKING BEHAVIOUR IN NEONATAL PUPPIES. E.Satinoff and W.C.Stanley: *J. comp. physiol. Psychol.*, 1963, 56, 66-68 (Univ. Pennsylvania, Philadelphia, Pa., U.S.A.) Neonatal puppies of various breeds were given a sucking test at different ages from 1 to 11 days. When the stomach was loaded with simulated bitch's milk, sucking was depressed, independently of breed and age. J.R.Broome

4666. PERFORMANCE AS A FUNCTION OF DEPRIVATION TIME FOLLOWING PERIODIC FEEDING IN AN ISOLATED ENVIRONMENT. J.S.Brown and M.Belloni: *J. comp. physiol. Psychol.*, 1963, 56, 105-110 (Univ. Florida, Gainesville, Fla., U.S.A.) Rats living in a sound-shielded room were fed at the same time of day for 35 days and then deprived for periods of 2 to 46 hr. Measurement of the freq. of depressions of the empty food troughs, together with starting and runway speeds in a straight runway, did not support the hypothesis that periodic feeding develops associations between drive stimuli and anticipatory drive-producing responses. J.R.JJroome

4667. DIFFERENTIAL REINFORCEMENT OF SHORT-LATENCY RESPONSES IN THE WHITE RAT. R.M.Church and J.Carnathan: *J. comp. physiol. Psychol.*, 1963, 56, 120-123 (Brown Univ., Providence, R.I., U.S.A.) Rats in a lever box were reinforced on all trials in which the response latency was less than the median of its latencies on the previous day. The mean log latency of response was similar in expt. and control animals, but the latency distribution was more variable in the expt. animals. J.R.Broome

4668. ACQUISITION, EXTINCTION, AND RETENTION OF AN AVOIDANCE RESPONSE IN RATS AS A FUNCTION OF AGE. R.H.Kirby: *J. comp. physiol. Psychol.*, 1963, 56, 158-162 (Princeton Univ., Princeton, N.J., U.S.A.) Rats 25, 50 and 100 days old were trained and extinguished in an avoidance response

ANIMAL BEHAVIOUR

in a runway. Neither randomly selected rats nor those matched for performance during acquisition showed significant differences in acquisition or extinction. In a 2nd expt. retention of an avoidance response was lowest in the 25-day old group.

J.R.Broome

4669. ESTABLISHMENT OF LEARNING SETS IN RATS. P.L.Wright, H.Kay and M.E.Sime: J. comp. physiol. Psychol., 1963, 56, 200-203 (Univ. Sheffield, England) Rats were trained to criterion on a series of 32 shape discriminations. Progressive improvement in the rate of learning occurred, but compared with most mammals so far investigated in learning-set studies the rat takes many more trials to learn individual problems.

J.R.Broome

4670. EFFECTS OF PRIOR EXPERIENCE WITH TEST STIMULI ON LEARNING-SET PERFORMANCE OF MONKEYS. H.A.Cross, H.J.Fletcher and H.F.Harlow: J. comp. physiol. Psychol., 1963, 56, 204-207

(Univ. Wisconsin, Madison, Wis., U.S.A.) Rhesus monkeys were given living-cage experience with stimulus objects which were subsequently used as the positively, negatively or inconsistently rewarded objects in a series of discrimination problems. The group rewarded for selecting the novel object was superior to that rewarded for selecting the familiar object on the first trial, but on subsequent trials the order was reversed.

J.R.Broome

4671. COERCIVE BEHAVIOUR IN THE RHESUS MONKEY. J.A.Horel, F.R.Treichler and D.R.Meyer: J. comp. physiol. Psychol., 1963, 56, 208-210 (Ohio State Univ., Ohio, U.S.A.) Seven rhesus monkeys (*Macaca mulatta*) and 1 *M. irus* were trained in pairs to turn a handle for food. Then the responses of the submissive animal only were rewarded, requiring the dominant animal to intercept pellets produced by the submissive. When the submissive animal was fed before testing the dominant monkeys only demonstrated coercive behaviour after several sessions or after special training.

J.R.Broome

4672. CONDITIONING IN THE NEONATAL PUPPY.

W.C.Stanley, A.C.Cornwell, C.Poggiani and A.Tratmen: J. comp. physiol. Psychol., 1963, 56, 211-214. Neonatal puppies received 7 days of conditioning using a manometer nipple paired with nipple-dropper feeding of either milk or quinine. Both appetitive conditioning, measured by no. of sucks per trial, and aversive conditioning, measured by vigour of struggling, occurred.

J.R.Broome

4673. CONDITIONING IN PIGS AS A FUNCTION OF THE INTERVAL BETWEEN CONDITIONED STIMULUS AND UNCONDITIONED STIMULUS. M.Noble and C.K.Adams: J. comp. physiol. Psychol., 1963, 56, 215-219 (Kansas State Univ., Kans., U.S.A.) Pigs were tested with conditioned stimulus-unconditioned stimulus of 0*5, 1'0, 1-5 and 2*0 sec. Conditioning was better at an interval of 2 sec. Conditioning improved as the interval was increased to 8 sec.

J.R.Broome

4674. CONDITIONING IN RHESUS MONKEYS AS A FUNCTION OF THE INTERVAL BETWEEN CONDITIONED STIMULUS [CS] AND UNCONDITIONED STIMULUS [US]. M.Noble and G.E.Harding: J. comp. physiol. Psychol., 1963, 56, 220-224 (Kansas State Univ., Kans., U.S.A.) Classical conditioning in rhesus monkeys was studied using CS-US intervals of 0*5, 1 *2 and 4 sec. The CS was an increase in illumination and the US was d.c. shock. The 2-sec. condition alone

gave more conditioned responses than the control condition.

J.R.Broome

4675. EFFECT OF TRANSITIONS FROM NON-REINFORCED TO REINFORCED TRIALS UNDER SPACED-TRIAL CONDITIONS. E.J.Capaldi and P.Wargo: J. exp. Psychol., 1963, 65, 318-319 (Univ. Texas, Austin, Tex., U.S.A.) Supplementary report.

J.R.Broome

4676. REPLICATION OF OVERLEARNING AND REVERSAL IN A T MAZE. W.F.Hill and N.E.Spean: J. exp. Psychol., 1963, 65, 317 (Northwestern Univ., U.S.A.) Supplementary report.

J.R.Broome

4677. COMPARISON OF THE EFFECTS OF DIFFERENT KINDS OF INFORMATION IN MAINTAINING EFFICIENCY ON AN AUDITORY MONITORING TASK. M.Loeb and E.A.Schmidt: Ergonomics, 1963, 6, 75-81 (U.S. Army Med. Res. Lab., Fort Knox, Ky., U.S.A.) 8 subjects had to respond as rapidly as possible to brief, infrequent, randomly occurring auditory signals over eight 50-minute sessions. The results indicate that if an operator merely has to detect the presence or absence of such a signal the no. of detections is unlikely to decrease as a function of the time on task.

A.A.Zimmerman

4678. NOISE AND HUMAN PERFORMANCE, A PSYCHOPHYSIOLOGICAL APPROACH. W.H.Teichner, E.Arees and R.Reilly: Ergonomics, 1963, 6, 83-97 (Univ. Massachusetts, Amherst, Mass., U.S.A.) A theoretical approach is given for the study of the effects of noise on human performance. Distraction studied in terms of changes in ambient noise levels was found to be a function of the amount of change.

A.A.Zimmerman

SPECIES STUDIES

4679. BEHAVIOUR IN HYDRA: CONTRACTION RESPONSES OF *HIPRARDI* TO MECHANICAL AND LIGHT STIMULI. N.B.Rushforth, A.L.Burnett and R.Maynard: Science, 1963, 139, 760-761 (Develop. Biol. Center, Western Reserve Univ., Cleveland, Ohio, U.S.A.) Contraction of

Hiprardi in response to mechanical stimn. is reduced after repeated stimn., and prevented by removal of the tentacles. Different receptors with an independent control mechanism must be responsible for the response to light, as this is not reduced after repeated exposure, and continues in the absence of tentacles.

G.M.Lewis

4680. THE EFFECT OF BRAIN EXTIRPATION ON LEARNING AND RETENTION IN NEREID POLYCHAETES. S.M.Evans: Anim. Behav., 1963, 172-178 (Dept. Zool., Univ. Bristol, England) Crawling to the exit of a glass channel could be abolished in *Nereis diversicolor*, *N.virens*, and *Perinereis cultrifera* by giving a slight electric shock at the exit. *N.virens* learnt much more rapidly than the other spp. Retention in *N.virens* was tested, and also learning and retention after removal of the supra-oesophageal ganglion.

Y.Spencer-Booth

4681. BEHAVIOUR OF YOUNG OCTOPUS BRIAREUS
ROBSON. J.B.Messenger: Nature, Lond., 1963, 197, 1186-1187 (Dept. Anat., University Coll., London, England) Observations of living adult and young *O. briareus* from the time of hatching are reported. G.M.Lewis
4682. SIMULTANEOUS DISCRIMINATION TRAINING OF OCTOPUS AND TRANSFER OF DISCRIMINATION ALONG A CONTINUUM. N.S.Sutherland, N.J.Mackintosh and J.Mackintosh: J. comp. physiol. Psychol., 1963, 56, 150-156 (Univ. Oxford, England) Octopuses (*Octopus vulgaris*) were trained to discriminate between various squares and parallelograms using either a simult. or a successive method. Animals pretrained to discriminate between shapes having a large difference along a dimension subsequently performed better on shapes having a small difference than those trained from the outset on the latter shapes. J.R.Broome
4683. EVENTS FOLLOWING QUEEN CELL CONSTRUCTION IN HONEYBEE COLONIES. W.E.Gary and R.A.Morse: J. apicult. Res., 1962, 1, 3-5 (Dept. Entomol., Cornell Univ., Ithaca, N.Y., U.S.A.) Queen rearing usually indicates prep. for swarming or replacement of an existing queen without swarming (supersedure). A study of 10 colonies for 6 months showed that several mature queens may be produced but their presence is not necessarily followed by either swarming or supersEDURE. J.R.Cockbain
4684. OBSERVATIONS ON THE BEHAVIOUR OF BEES IN A CONTROLLED ENVIRONMENT ROOM. W.P.Nye: J. apicult. Res., 1962, 1, 28-32 (Entomol. Res. Div., U.S.D.A., Logan, Utah, U.S.A.) A description of the room is given. Observations both inside and outside the hive showed that all aspects of behaviour were normal. The effect of light intensity on pollen collecting was studied. Collecting activity dropped from 100% to 6% when light was reduced from full to quarter strength. J.R.Cockbain
4685. IMPRINTING AND THE IMMOBILITY REACTIONS OF DOMESTIC FOWL. E.A.Salzen: Anim. Behav., 1963, 11, 66-71 (Dept. Zool., Univ. Liverpool, England) Chicks reared in isolation tended not to show the immobility response, and those reared socially did so chiefly when tested alone, so this fear reaction may be largely due to separation. The maturation of tearfulness is discussed. Y.Spencer-Booth
4686. OBSERVATIONS ON THE WOODPECKER-FINCH, CACTOSPIZA PALLIDA. LEibl-Eibesfeldt and H.Sielmann: Ibis, 1963, 105A, 279; J.Om., 1962, 103, 92-107. Some field notes on the Galapagos Woodpecker-finch introduce an account of the behaviour of a captive male sent alive to Germany. This bird not only retrieved food from crevices in a dead bough by means of a 'spine', but actually removed mealworms from a dish, stuck them into crevices and then used a 'spine' to get them out again. The origin of tool-using in this species, is uncertain, but it is pointed out that the Woodpecker-finch habitually hides food, such as seeds, in holes and crevices, as some tits and nuthatches do. Some of the movements used when extracting a seed from such a device suggest movements used when probing with a spine. (German) BIS

4687. FOOD MOTIVATION AND DELAYED RESPONSE IN GIBBONS. CBerkson: J. comp. physiol. Psychol., 1962, 55, 1040-1043 (Yerkes Lab. Primate Biol., Orange Park, Fla., U.S.A.) The food preferences of gibbons (*Hylobates lar*) were studied; grapes and raisins were liked best and celery and laboratory chow least. Preferred foods used as incentive improved delay response performance. Food deprivation produced an increased willingness to respond and improved performance for a non-preferred incentive. J.R.J.Broome

4688. EFFECTS OF ENVIRONMENTAL RESTRICTION UPON THE CHIMPANZEE'S RESPONSIVENESS TO OBJECTS. E.W.Manzel jun., R.K.Davenport jun., and C.M.Rogers: J. comp. physiol. Psychol., 1963, 56, 78-85 (Yerkes Lab. Primate Biol., Orange Park, Fla., U.S.A.) Nineteen chimpanzees of similar age were divided into one group of wild-born animals, and 4 groups raised in restricted environments. The latter were timid of objects, contacted them rarely and showed stereotyped self-activity. It is concluded, however, that restricted chimpanzees are retarded but potentially typical in their responsiveness to objects. J.R.Broome

GENERAL

4689. 'IMPRINTING*' IN NATURE. G.Gottlieb: Science, 1963, 139, 497-498 (Psychol. Lab., Dorothea Dix Hosp., Raleigh, N.C., U.S.A.) Observations of ground and hole-nesting duck spp., augmented by sound amplification equipment, indicate that hatchlings are exposed to the call of the mother for a relatively long period before they see her. It is suggested that in nature, imprinting is based primarily on auditory, rather than on visual, factors. G.M.Lewis
4690. SOCIAL FORCES DETERMINING SPACING AND HEAD ORIENTATION IN A FLOCK OF DOMESTIC HENS. G.McBride, J.W.James and R.N.Shoffner: Nature, Lond., 1963, 197, 1272-1273 (Dept. Anim. Husb., Univ. Queensland, Brisbane, Australia) The head spacing of poultry is more regular than it would be under random spacing. The regularity is probably based on visual interactions with neighbouring birds; they orientate their heads to avoid the frontal aspects of other birds, yet turn to face neighbours who approach closely. G.M.Lewis
4691. THE AVOIDANCE OF OVER-WRITING IN SELF-ORGANISING SYSTEMS. W.Ross Ashby and J.Riguet: J. theor. Biol., 1961, 1, 431-439 (Res. Lab. Elec. Eng., Univ. Illinois, Urbana, Ill., U.S.A.) Overwriting, i.e. results established early in the learning process being altered or destroyed by later learning, is a problem in a computer or brain which has to undertake a complex task. In the brain, natural selection may eliminate overwriting. But in self-organising computers there are only 2 ways of minimising overwriting (i) a necessary quantity of information must be used (ii) the design must reduce the chance level. J.A.Dawson

CYTOLOGY

CELL STRUCTURE AND CYTOCHEMISTRY

4692. FURTHER OBSERVATIONS ON STRUCTURE OF MAMMALIAN SPERM TAIL. A.Telkka, D.W.Fawcett and K.Christensen: Anat. Rec., 1961, 141, 231-245 (Dept. Anat., Cornell Med. Coll., Boston, Mass., U.S.A.) The sperm tail sheath is found to consist of a series of branching and interconnected ribs joining 2 longitudinal columns coursing along opposite sides of the sheath. This structure is widespread among mammals. Attention is drawn to spp. differences in the degree of development of the outer row of coarse longitudinal fibres. Observations of other investigators of flagella concerning the presence of the arms of one member of each double filament in the axial filament complex are extended to mammalian sperm tails and a significant difference in the internal density of the 2 subfibres is reported. F.Beck

4693. GOLGI APPARATUS OF AMELOBLAST OF RAT AT STAGE OF ENAMEL MATRIX FORMATION. E.Kallenbach, E.Sandborn and A.Warshawsky: J. cell Biol., 1963, 16, 629-632 (Dept. Anat., McGill Univ., Montreal, Canada) The secretory ameloblasts from the upper and lower incisors and pieces of the enamel organ of adult rats were investigated in the light and E.M. An elongated tube-like structure is described extending within the axis of the ameloblasts from the apical pole of the nucleus. The walls consist of several layers of flattened sacs typical of the Golgi apparatus. In immature and post-secretory ameloblasts the tubular structure was replaced by a reticular network characteristic of the usual Golgi apparatus. P.Barrow

4694. ULTRASTRUCTURE OF ISOLATED AND IN SITU HUMAN CARDIAC AGE PIGMENT. D.J.B.Malkoff and B.L.Strehler: J. cell Biol., 1963, 16, 611-616 (Gerontol. Branch, Nat. Heart List., N.I.H., Bethesda, Md., U.S.A.) The mitochondrial fraction of homogenised cardiac muscle and sections of myocardial tissue were studied in the E.M. Lipofuscin particles composed of small granules were seen in the mitochondria but there is no evidence for their mitochondrial origin. Their ultrastructure resembles that of lysosomes. P.Barrow

4695. JLM. OF PLASMOCYTOMA AND WALDENSTROM'S SYNDROME. M.Bessis, J.Breton-Gorius and J.L.Biner. Nouv. Rev. Franc. Hémat., 1963, 3, 159-184 (Centre Nat. de Transfusion Sanguine, Paris, France) Thirteen patients with plasmocytoma and 9 patients with Waldenstrom's syndrome (defined here as macro-globulinaemia with proliferation of mononuclear cells which are not plasmocytes) were studied. Abnormalities of the development, the cytoplasm, the nucleus and nucleolus are described. No clear correlation between abnormalities of the cells and of the plasma proteins could be established. (French) V.Eisen

4696. ELECTRICAL CONDUCTANCE AND POTENTIAL ACROSS THE MEMBRANE OF SOME CELL NUCLEI W.R.Lowenstein and Y.Kanno: J. cell Biol., 1963, 16, 421-425 (Dept. Physiol., Coll. Physn. and Surg., Columbia Univ., N.Y., U.S.A.) Direct measurements using microelectrodes were made on the nuclear and cell membrane of isolated oocytes of 300 p diam. of Triturus viridescens and Xenopus laevis, and salivary gland cells of Drosophila flavorepleta. The nuclear membrane of the

latter has a resistance of 1 *5 Q cm.2 and a resting potential of 13 mV between the nucleoplasm and the cytoplasm, constituting a diffusion barrier for particles of ion size. The former has a zero resting potential and relatively high permeability. P.Barrow

4697. CHROMOSOMAL DIFFERENTIATIONS OF LAMP-BRUSH TYPE FORMED BY Y CHROMOSOME IN DROSOPHILA HYDEI AND D.NEOHYDEL O.Hess and G.F.Meyer: J. cell Biol., 1963, 16, 527-539 (Max Planck-Inst. Biol., Tubingen, Germany) Cytol. examination of living spermatocytes by phase contrast and of OsO₄ fixed spermatocyte nuclei in the E.M. has shown that the paired loop-like structures seen in X/Y spermatocytes can only be formed in the presence of a Y chr. The loops appear to be phase-sp. morphol. differentiations of the Y chr. and are present in duplicate in XYY males. These structures are species-specific and characteristically different in D. hydei and D. neofrydei. P.Barrow

4698. MEASUREMENTS OF THE TOTAL SOLID MATERIAL IN THE BANDS AND INTERBANDS OF THE POLYTENE CHROMOSOMES IN LIVING CELLS OF CHIRONOMUS. H.D.Berendes and K.F.A.Ross: Chromosoma, Berlin, 1963, 14, 111-122 (Genet. Lab., Univ. Leiden, Netherlands) Using an interference microscope the n. of a no. of bands and interbands of the salivary gland chr. of 2 spp. of Chironomus were measured. The results indicated a higher % of solid material in the bands than in the interbands. The % in both regions was higher in intact living cells and in isolated chr. in 12% isotonic saline/protein medium than in isolated chr. in saline. S.A.Henderson

4699. OCCURRENCE AND POSSIBLE SIGNIFICANCE OF HAEMOGLOBIN IN CHROMOSOMAL REGIONS OF MATURE ERYTHROCYTE NUCLEI OF NEWT, TRURURUS CRISTATUS CRISTATUS. J.Tooze and H.C.Davies: J. cell Biol., 1963, 16, 501-511 (Wheatstone Lab., King's Coll., London, England) Whole blood was added to OsO₄ in veronal acetate buffer at pH 6 *3 and 7 -4 and the Hb distribution of their sections determined by absorption measurements in violet light (λ 4047A). A high concn. of porphyrin or ion-porphyrin compound was found within the chromosomal regions of the nucleus. The role of Hb in determining the nuclear structure of r.b.c. by interaction with nucleohistones is discussed. P^arrow

4700. NUCLEAR STABILITY DURING HISTOGENESIS, AGEING AND CARCINOGENESIS. B.E.Walker: Cancer Res., 1963, 23, 157-164 (Dept. Anat., Univ. Texas Med. Branch, Galveston, Tex., U.S.A.) Review. 82 ref. B.M.Stevens

4701. STUDIES ON CELL AGGREGATION: DEMONSTRATION OF MATERIALS WITH SELECTIVE CELL-BINDING ACTIVITY. A.A.Moscona: Proc. nat. Acad. Sci., Wash., 1963, 49, 742-747 (Dept. Zool., Univ. Chicago, ILL, U.S.A.) Reattachment of cells might be mediated by sp. materials functionally associated with the cell surface. Such materials could be dissolved off living cells and regenerated by cells under suitable conditions. Functional characteristics of these products might be involved in contact selectivity and preferential attachment of cells. The existence of such products was demonstrated by obtaining from living cells cell-free prep. with selective cell-binding activity. Their effectiveness was found to be Ca dependent and they contained no detectable nucleic acids. J.R.Sargent

4702. CYTO-ENZYMOLOGICAL STUDIES ON THE LIVING EGGS OF MICE INCUBATED IN THE PRESENCE OF ATP AND OTHER MONONUCLEOTIDES.

A.M.Dalcq: Arch. Biol., Liege, 1962, 73, 405-444
 (Lab. Anat. and Human Embryol., Univ. Brussels, Belgium) Mouse oocytes and fertilized eggs were incubated in the presence of various mononucleotides and of a lead salt. The results of this treatment were examined by mounting the specimens in toto. A distinct reaction occurs at the level of cortical and furrow granules, the enzyme present dephosphorylates the various triphosphates tested i.e. ATP, CTP, HP, UTP and also ADP. These granules are, it is suggested, not all of the same nature, since centrifugation distributes them irregularly at various levels. The small granules were best shown to be present using UTP. However the small internal granules, suggested to be mitochondria, also reacted to triphosphates, to ADP and even AMP. Attempts to isolate the nuclei and test their responses have not proved conclusive. The reaction at the cortex and along the furrows could be used for the determination of the doses of ATP necessary to initiate a reaction under definite conditions, to demonstrate the activating role of Mg, Ca and Co ions, and the effect of cysteine which appears to be inhibitory. (French) R.J.Walker

4703. FORMATION OF MITOCHONDRIA IN NEURO-SPORA CRASSA. A QUANTITATIVE RADIO-AUTOGRAPHIC STUDY. D.J.L.Luck: J. cell Biol., 1963, 16, 483-499 (Rockefeller Inst., New York, U.S.A.) A choline-requiring mutant was cultured in a medium containing 25 μ g./m. [3 H] or [14 C]-choline chloride. Labelled cells were transferred to flasks containing unlabelled medium and harvested at periods during their log. growth. The distribution of labelled choline was followed in the mitochondria by radioautographic analysis. During 3 mass-doubling cycles the distribution of grains among individual mitochondria followed a Poisson distribution. This suggests that mitochondrial mass increases by a continued process of addition of lecithin units to the existing framework. P.Barrow

4704. PATTERN OF X-CHROMOSOME DNA SYNTHESIS IN TWO WOMEN WITH ABNORMAL SEX-CHROMOSOME COMPLEMENTS. F.Giannelli: Lancet, 1963, i, 863-865 (Guy's Hosp., Med. Sch., London, England) G.H.^aeH

4705. [3 H]THYMIDINE INCORPORATION IN AN ISO-CHROMOSOME FOR THE LONG ARM OF THE X-CHROMOSOME IN MAN. S.Muldal, C.W.Gilbert, L.G.Lajtha, J.Lindsten, J.Rowley and M.Fraccaro: Lancet, 19G3, I, 861-863 (Cytogenet. Lab., Christie Hosp., Manchester, England) G.H.Bell

4706. HETEROCHROMATIN IN HUMAN MALE LEUKOCYTES. A.Lima-de-Faria and J.Reitlau: J. cell Biol., 1963, 16, 315-322 (Inst. Genet., Univ. Lund, Sweden) Peripheral blood cultures containing 113 Cytohaemagglutinin and [3 H]thymidine of concn. $2\text{J}^*\text{c/mL}_f$ sp. activity $1\text{*}9\text{ c/mM}$ were incubated for $3'$, hr. and prepared for autoradiography, nuclear and nucleolar staining. Non-tritiated cultures were stained with May-Grunwald-Giemsa's stain to identify the cell types. Unlabelled Feulgen-stained nuclei contained a central heterochromatic body composed of chr.segments around the nucleolus which is associated with 6 heteropycnotic segments. Cells of all sizes incorporated

[3 H]thymidine. DNA-synthesising nuclei occur in both eu- and heterochromatin but the latter has a higher DNA content and different rate of synthesis. P.Barrow

4707. HUMAN SEX CHROMOSOME ABNORMALITIES IN RELATION TO DNA REPLICATION AND HETEROCHROMATINEATION. M.M.Grumbach, A.Morishima and J.H.Taylor: Proc. nat. Acad. Sci., Wash., 1963, 49, 581-589 (Dept. Pediatrics, Coll. Phys. and Surg., Columbia Univ., N.Y., U.S.A.) pH_jThymidine and radioautography were used to study the sequence of DNA replication in X-chr. of the human complement. 5 individuals with extra X-chr. were found to have one X which replicates with the majority of the complement while all others replicate late. Results suggest that late-replicating chr. are heteropycnotic in interphase and their genetic expression is repressed. 2 patients with a structurally abnormal X were found to have this chr. consistently heteropycnotic and late-replicating. The observations are consistent with the 'fixed differentiation hypothesis*' of X-chr. behaviour. J.R.Sargent

4708. DIFFERENTIAL SYNTHESIS OF RNA AND SEXUAL DIFFERENTIATION OF ALLOMYCES. G.Turian: Develop. Biol., 1963, 6, 61-72 (Inst. Bot. gen. Univ. Geneva, Switzerland) In strains of *A.macrogyrus* x *A.arbuscula*, RNA: DNA and RNA: protein ratios increased sharply in the final stages of female gametangial maturation due to active RNA synthesis associated with formation of big nuclear caps. Increase in RNA: protein ratio was less marked in male garnetangia, RNA synthesis being proportional to the thinness of male gametic nuclear caps. The RNA: DNA ratio tended to decrease due to concurrent synthesis of DNA required by nuclear multiplication during gametangial maturation.

(French) J.W.S.Harris

NUCLEO-CYTOPLASMIC RELATIONS

4709. NUCLEOLAR EXTRUSION IN THYROID EPITHELIUM OF WHITEMOUSE. M.A.E.Ramadan: Naturwissenschaften, 1963, 50, 2, 44 (Zool.Inst., Univ. Cologne, Germany) Li galloycyanin- chromealum prep. of active follicles, nucleoli were seen in contact with the nuclear membrane and also in direct contact with the cytoplasm through a direct breach in the nucleolar-nuclear membrane. The substance apparently being voided from the nucleolus into the cytoplasm appeared to be related to basophilic cytoplasmic material.

(German) AJ.Wansbrough

4710. INTRASPECIFIC NUCLEAR TRANSPLANTATION IN FROGS. R.G.McKinnell: J. Hered., 1962, 53, 199-207 (Dept. Zool., Newcomb Coll., Tulane Univ., New Orleans, La., U.S.A.) A sexually mature male *Rana pipiens* produced by the transplantation of a somatic diploid blastula nucleus into an enucleated egg is described. D.A.Jones

4711. THE ECDSONE CONCENTRATION-DEPENDENT GENE ACTIVATION PATTERN IN THE SALIVARY GLAND CHROMOSOMES OF CHKONOMUS TENTANS. U.Cleven Develop. Biol., 1963, 6, 73-98 (Max-Planck-Inst. Biol., Abt. Beermann, Tubingen, Germany)

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Duration and degree of activity (measured by the size of puffs) at loci I-18-C and IV-2-B, is dependent upon the concen. of ecdysone inj., locus IV-2-B having a lower sensitivity than locus I-18-C.

(German)

J.W.S.Harris

NUCLEAR AND CELL DIVISION

4712. OBSERVATIONS ON LECANOID SPERMATOGENESIS IN THE MEALY BUG, PLANOCOCCUS CITRI. W.A.Nelson-Rees. Chromosoma, Berlin, 1963, 14, 1-17 (Max-Planck-Inst. Meeresbiol., Tubingen, Germany) The second spermatogenic division, in which a heterochromatic set of autosomes is eliminated, is not, as previously suspected, either monopolar or monocentric bipolar. Examination of living and fixed material shows the spindle to be a bipolar structure on which the centromeres of both euchromatic and heterochromatic chr. are active. Radiation-induced anaphase bridges resulting from euchromatic - heterochromatic translocations further support this finding.

S.A.Henderson

4713. TEMPERATURE AND CHIASMA FORMATION IN SCHISTOCERCA GREGARIA. L AN ANALYSIS OF THE RESPONSE AT A CONSTANT 40°. S.A.Henderson: Heredity, 1963, 18, 77-94 (Genet. Dept., Univ. Cambridge, England) A const. high temp. of 40° greatly reduces the chiasma freq. at male meiosis after an initial 5-day lag. Those chiasmata which do form tend to be localised, particularly to the distal chr. ends. Detailed analyses are presented of the relationships of chiasma freq. and position, and univalent freq. for each of the 7 size groups recognised within the complement.

S.A.Henderson

4714. INHIBITION OF PROTEIN SYNTHESIS DURING MEIOSIS AND ITS BEARING ON EXTRACELLULAR REGULATION. Y.Hotta and H.Stern: J. cell Biol., 1963, 16, 259-279 (Dept. Bot., Univ. Illinois, Urbana, 111, U.S.A.) Anthers of *Tritium erectum* were cultured in Hoagland's inorg. medium at 3-5°, containing RNA inhibitors. The uptake of labelled compounds by the microsporocytes and the capacity of the cells to phosphorylate thymidine were measured. RNA and protein synthesis was noted during the meiotic cycle after chr. duplication, and the different effects of inhibitors at varying stages indicates a periodicity in the activities of different systems connected with protein formation. Chr. morphology and the processes of chr. segregation, cytokinesis, wall synthesis and enzyme appearance are discussed.

P Barrow

4715. SUBMICROSCOPICAL CHANGES OF SEGMENTING OVUM IN ALBINO RAT. K.Mazanec and M.Dvorak: Csl. Mcfol., 1963, 11, 103-108 (Inst. Histol. Embryol., J.E.Purkyne Univ., Brno, Czechoslovakia) The changes occurring on the cell surfaces during the process of segmentation from fertilised ovum to the young blastocyst stage are described.

K.Jones

4716. FREQUENCY OF MITOSIS IN THE SHOOT-BORNE ROOTS OF THE POTATO. T.Schreiter and G.Meinl: Z.Pflanzenz., 1963, 49, 81-86 (List. Pflanzenz., Tross-Loschwitz, Deutsche Akad. Landwirtschaftswiss. zu Berlin, Germany) Two varieties were studied. In

one, an endogenous rhythm of mitosis was detectable, with max. freq. after mid-day, though day-by-day variation was large. The other variety did not show such a rhythm. (German, English summary) H.Opik

4717. OBSERVATIONS ON DEVELOPMENT AND CYTOLOGY OF SEXUAL ORGANS OF ACHLYA APLANES VAR. INDICA. R.Dayal: Cytologia, 1961, 26, 423-427 (Dept. Bot., C.M.P. Degree-College, Allahabad, India) The development of the oogonia and antheridia is described. Discharge of antheridial contents into each of the 1-12 oospheres was followed, but nuclear fusion could only be observed in fixed material. Antheridial nuclear behaviour was not established, but the oogonial nuclei remaining after the rest degenerate each undergo one mitotic division.

CA.Stace

EFFECTS OF RADIATION AND CHEMICAL AGENTS

4718. RADIATION RECOVERY ENHANCED THROUGH INHIBITORS OF PROTEIN SYNTHESIS AND AMINO ACIDS. A.V.Beatty and J.W.Beatty: Proc/nat. Acad. Sci. Wash., 1963, 49, 434-439 (Emory Univ., Atlanta, Ga., U.S.A.) *Tradescantia paludosa*

inflorescences treated for 1/2 hr. with dihydrostreptomycin, puromycin or chloramphenicol, then X-irradiated in He gave lower chr. aberration yields than did untreated controls. Similar effects to those obtained with their protein inhibitors were obtained by addition of exogenous citrulline, histidine, proline, glycine, phenylalanine, cysteine, isoleucine, alanine, threonine and serine prior to irradiation. It is concluded that protein synthesis is not necessary for chr. rejoining and that accelerated recovery in treated cells is mainly due to presence of ATP in higher amounts than normal.

J.R.Sargent

4719. QUANTITATIVE STUDIES OF MITOSES AND DNA' SYNTHESIZING CELLS IN BONE MARROW AND BLOOD OF GUINEA-PIGS RECOVERING FROM SUBLETHAL WHOLE-BODY γ -IRRADIATION. PJF.Harris, G.Haigh and J.H.Kuglen Brit. J. Haemat., 1963, 9, 385-405 (Dept. Anat. and Histol., Univ. Sheffield, England)

13 days after 200 or 150 r irradiation young guinea-pigs showed proliferation of medium-sized and small mono-nuclear cells with the high nuclear-cytoplasmic ratio typical of a lymphocyte but with fine nuclear chromatin and basophilic cytoplasm typical of blast cells. After 200 r, the fewer proliferating erythroid cells were mostly the early form of erythroblast. After 150 r proliferation of polychromatic erythroblasts were dominant. Granulocyte cells show a similar difference with radiation dose, although proliferation is least evident here and mitosis and DNA-synthesis are rarely seen in them. More than 40% of the total telophases were forming in small or medium-sized lymphocytes. DNA synthesis also occurred in mononuclear cells in the blood stream.

J.Sneath

4720. CELL POPULATION STUDIES ON THE INTESTINE OF CONTINUOUSLY IRRADIATED RATS. D.R.Wimber and L.F.Lamerton: Radiat. Res., 1963, 18, 137-146 (Biol. Dept., Brookhaven Lab., Upton, N.Y., U.S.A.) Total population counts were made from squash prep. of

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individual whole crypts from the intestine. Autoradiographs were made of pH]thymidine-labelled cells. At 415 rads per day the crypt cell population decreased rapidly to a steady level after 2 days. After 5 days decrease in population increased with dose rate. The ratio of mitoses present indicated that the relative duration of mitosis was not altered during chronic irradiation. At 415 rads per day [3H]thymidine incorporation per labelled cell was double that of controls. B.Payne

4721. QUANTITATIVE STUDIES OF RELATIONSHIPS BETWEEN TUMOUR CELL PLOIDY AND DOSE RESPONSE TO IONIZING RADIATION IN VIVO. MODIFICATION OF RADIATION RESPONSE IN A PREVIOUSLY IRRADIATED TUMOUR. R.J.Berry: Radiat. Res., 1963, 18, 236-245 (Nat. Cancer Inst., Bethesda, Md., U.S.A.) A difference in dose response to radiation between 2 related murine lymphocytic leukaemias one diploid and one tetraploid was demonstrated in vivo. The slopes of the dose-response curves were similar in aerobic and anaerobic conditions, but the extrapolation no. for the tetraploid tumour exceeded that of the diploid tumour by a factor of 2 in both the presence and absence of O₂. A diploid tumour line was subjected to 1000 rad X-rays at each of 50 sequential passages in vivo. The radiation response altered during passage, a greater no. of tumour cells survived, an increase in nucleic acid content per cell was noticed and tetraploid and aneuploid cells appeared. B.Payne

4722. EFFECTS OF X-IRRADIATION OF OVARIAN OVA ON THE MORPHOLOGY OF FERTILIZED OVA AND DEVELOPMENT OF EMBRYOS. E.B.Harvey and M.C.Chang: J. cell. comp. Physiol., 1963, 61, 133-144 (Worcester Fndn. Expt. Biol., Shrewsbury, Mass., U.S.A.) Stages of meiosis in ovarian ova of the hamster *Mesocricetus auratus* were determined at various times of the oestrus cycle. When 1 ovary only was irradiated with 200 r X-rays, the rate of meiosis and morphology of ova were not affected. Irradiation during the late diplotene stage of prophase I and during meiosis resulted in a high incidence of foetal abnormalities and embryonic deaths. G.M.Lewis

4723. AN EFFECT OF EXOGENOUS THYMIDINE ON THE MITOTIC CYCLE. H.J.Barn: J. cell. comp. Physiol., 1963, 61, 119-127 (Dept. Zool., Columbia Univ., New York, U.S.A.) 1 X 10⁻⁴M thymidine does not affect the growth rate or mitotic index of cells in the root tip of *Hordeum vulgare*. In cultures of HeLa cells, at 2 x 10⁻⁴M, thymidine causes an increase in mitotic index, due entirely to a prolongation of mitosis; there is no increase in rate of cellular proliferation. G.M.Lewis

4724. RADIO-MIMETIC EFFECTS OF 1-METHYL-3-N-RO-1-NITROSOGUANIDINE IN Vicia faba. T.Gichner, A.Michaelis and R.Rieger: Biochem. biophys. Res. Comm., 1963, 11, 120-124 (Inst. Expt. Bot., Prague, Czechoslovakia) Induced aberrations in ¹N chromatin type in *V.faba* were preferentially realised in the heterochromatin. Resemblances in action of 1-methyl-phenyl-nitrosamine and cupferron are noted. B.Ketterer

4725. JR^r W^P OF DNase ACTIO^N ON CHROMOSOMES. & ²⁴U^XT, Lond., 1963, 198, 36-38 (Dept. of Genetics, U of Minnesota, Minneapolis, Minn., U.S.A.) Electronic flash photography was used to estimate the no.

of breaks produced in chr. isolated from the newt (*Triturus viridescens*) in the presence of DNase! rhe ISM E? ^{rela?} JP ^ t e d for chr. breaks in bato loop ^{visible} K^r & T^r Of chr.; b = k^{1/t^n} * here b = no. of visible breaks, k₂ = proportionality const., t = time S ^ f n l f f W ? ^{1 sub, UTdts} attacked/ n was determined to be 4.8 ± 0.4. J-R.Sargent

4726. TETRAPLOID BEETS BY MEANS OF ACENAPHTHENE APPLICATION. H ^ 1 d L n iSHS¹⁹⁶⁴ ^ 49, 91-95 (List. Pflanzenz., anzeichen, Deutsch Akad. zu Berlin, Germany) Seedlings were treated by application of acenaphthene and enclosure in a acenaphthene A second treatment The yield and prop.

(German, English summary) H.Oplik

CYTOGENETICS

4727. ^L .S.S.Stewart: Surg., Queen's Coll.. Dundee. Scotland) Review. G.H.Bell

4728. POSSIBLE TRISOMY IN CHROMOSOME GROUP 6-12 IN A MENTALLY RETARDED P. O. Alföldi, H.C.Howell and J.J.Bieschke: SfEiB et, 1963, 7, 10-70 (Genet. Research, Univ. Texas, Austin, Tex.) The eBi element probably G.H.Bell

4729. A GIRL WITH TRIPLOM CELLS. J.R.Ellis: R.Marshall, L.C.S.Wormand and L.S.Penrose: Nature, Lond., 1963, 198, 411 (Galton Lab., Univ. Coll., London, England) G.Sieirli

4730. P*T S^{10M}f ? ^ f^S ^ HUMAN CANCER CELLS. A.L.Spriggs, M.M.Boddington and C.M.Clarke: Brit. med. J., 1962, ii, 1431-1435 (Dept. Pathol., United Oxford Hospitals, England) Cells of malignant karyotypes. Chr. no. varied al modal value usually more than 46, but was occasionally less. Secondary peaks were found at multiples of the modal no. Cells with normal karyotype are due to the presence of normal dividing cells in the same specimen, as is shown by their appearance in stained smears. In many tumour cell populations distinctive abnormal chr. are seen in all cells, though no. varies. This may indicate descent from the same malignant cell. M.E.Nutt

4731. SEX CHROMATIN IN THE NEWBORN. A.L.Taylor: Lancet, 1963, i, 912-914 (Guy's Hosp. Med. Sch., London, England) A high proportion of 484 newborn girls s: chrom e sex first 2 days of life. Studies on stillborn girls and perinatal deaths suggest that the factor responsible for the reduction disappears at death. This reduction may be a reflection of the extremely high levels of SSSSAK^t G.H.Bell

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4732. CYTOLOGICAL ASPECTS OF SPECIATION IN TWO NORTH AMERICAN TELEOSTS, SALMO GAIRDNERI AND SALMO CLARKILEWISL R.C.Simon and A.M.Dollar. *Canad. J. Genet. Cytol.*, 1963, 5, 43-49 (Coll. Fisheries, Univ. Washington, Seattle, Wash., U.S.A.) The chr. complements of a population of rainbow trout (S.gairdneri) and one of cutthroat trout were compared. The complement of rainbow trout consisted of 16 aero- and 44 metacentric chr. while the cutthroat trout had 22 aero- and 42 metacentrics. The karyotype differences indicate that the populations belong to 2 distinct spp. D.A. Jones

4733. SEX CHROMOSOMES AND SEX-DETERMINATION IN SOME CALLIPHORA (CALLIPHORIDAE, DIPTERA). F.-H.Ullerich: *Chromosoma*, Berlin, 1963, 14, 45-110 (Max Planck-Inst. Meeresbiol., Tubingen, Germany) The chr. of 11 spp. belonging to the Dipteran family Calliphoridae were examined in both males and females. Two species, Chrysomyia albiceps and Crufifacies were parthenogenetic while all other spp. examined were not. All spp. possess the same chr. no. (2n = 12) which includes 5 pairs of large autosomes and 1 pair of small, partially or totally heterochromatic chr. These latter are without sex determining function in C.albiceps and Crufifacies but in all other spp. function as sex chr. A study of XO and sex-autosome translocation individuals provided some information on the sex determining mechanisms present.

(German) S.A.Henderson

4734. RELATIONSHIPS OF DIPLOID PROGENITORS OF HEXAPLOID WHEAT. G.Kimber and R.Riley: *Canad. J. Genet. Cytol.*, 1963, 5, 83-88 (Plant Breeding Inst., Cambridge, England) Comparisons are made between the cyt. behaviour of haploids and nullisomic-5B haploids of Triticum aestivum and hybrids between the diploid progenitors of T.aestivum. The pairing observed in the nullisomic-bb napioias can be predicted from an amalgamation of the pairing observed in hybrids between the diploid progenies. The implications of these results for the specificity of the action of chr. 5B and the evolution of polyploid wheats are discussed. D.A.Jones

4735. DETERMINATION OF CHROMOSOME ARM CARRYING GENE FOR CHLOROPHYLL PRODUCTION IN AVENA SATIVA. R.C.McGinnis, G.Y.Andrews and R.I.H.McKenzie: *Canad. J. Genet. Cytol.*, 1963, 5, 57-59 (Canada Dept. Agric. Res. Stat., Winnipeg, Canada) An F3 line from the cross Rodney 5 x Exeter, was found to be segregating for albino and green plants. The albino plants were nullisomic for chr. 14, whereas the green plants were monosomic or disomic. One albino plant was monotelocentric possessing only the short arm of chr. 14 indicating that a gene for chlorophyll production is located on the long arm of this chr. D.A.Jones

4736. CHROMOSOME NUMBERS OF SOME SOUTHWEST ASIAN SPECIES OF ASTRAGALUS AND OXYTROPIS (LEGUMEMOSAE). G.F.Ledingham and B.M.Reven: *Canad. J. Genet. Cytol.*, 1963, 5, 18-32 (Univ. Saskatchewan, Regina, Sask., Canada) Chr. counts for 83 spp. of Astragalus and 11 spp. of Oxytropis are given. The spp. show considerable polyploidy, 21 of them being polyploid. D.A.Jones

4737. INVESTIGATIONS ON THE SOLANUM CULTIVARS OF THE ISLAND OF CHILOE. H.Brncher. *Z.Pflanzenz.*, 1963, 49, 7-54 (Mendoza, Argentina)

98 varieties of Solanum from Chiloe were investigated with ref. to morphology, photoperiodic response and cytogenetics. A comparison was made with varieties from Peru, Bolivia and N.Argentina. It was concluded that the potato is not native to Chiloe, but has been brought there from the northern Cordillera. The implications for nomenclature of the genus, and for theories of gene centres, are discussed.

(German, English summary) H.Opik

4738. AN ATTEMPT TO HOMOLOGISE THE CHROMOSOME ENDS OF EUENOOTHERAS WITH THOSE OF RAIMANNIA- AND RENNERIA-OENOOTHERAS. C.G.Arnold: *Chromosoma*, Berlin, 1963, 14, 31-44 (Bot. Inst., Univ. Erlangen, Nurnberg, Germany) Reciprocal crosses were carried out between members of the Eu-Oenothera group and of the Raimannia- and Renneria-Oenothera groups. The numeration of chr. ends was attempted as far as possible but was made extremely difficult by the irregular pairing behaviour of the chr. in the hybrids.

(German) S.A.Henderson

4739. INDUCED TETRAPLOIDY IN SPARAXIS KER. AND IXIA L. W.Horn: *Z.Pflanzenz.*, 1963, 49, 87-90 (Fruit and Food Techn. Inst., Stellenbosch, S.Africa) Tetraploidy could be induced by colchicine treatment in both genera. Reversion to the diploid state was, however, frequent. Tetraploid flowers were obtained only in Sparaxis. Fertility was strongly reduced.

(German, English summary) H.Opik

4740. A LARGE CHROMOSOME IN THE LAMINARIAN NUCLEUS. L.V.Evans: *Nature*, Lond., 1963, 198, 215 (Marine Sci. Lab., Menai Bridge, Anglesey, Wales). G.M.Lewis

4741. CYTOLOGICAL STUDIES ON THE PERFECT STAGES OF SOME SPECIES OF FUSARIUM. W.T.Howson, R.C.McGinnis and W.L.Gordon: *Canad. J. Genet. Cytol.*, 1963, 5, 60-64 (Canada Dept. Agric. Res. Stat., Winnipeg, Manitoba, Canada) The 5 spp. of Gibberella: cyanea, cyanogena, fijiukuroi, stilboidea and zeae all have 4 chr. Five chr. were counted in a homothallic strain of Nectria haematococca and 7 in Calonectria nivalis. The meiotic chr. of these spp. were studied but the mitotic chr. of G.cyanea and G.cyanogena were large enough for karyotype study. D.A.Jones

TECHNIQUES

4742. PREPARATION OF CHROMOSOMES FOR LIGHT MICROSCOPY UTILISING AN AGAR FIXATION PROCEDURE. R.E.Pacha and D.T.Kingsbury: *Proc. Soc. exp. Biol.*, N.Y., 1961, 111, 710-712 (Dept. Microbiol., Univ. Washington Sch. Med., Seattle, Wash., U.S.A.) A rapid agar fixation method for delineation of chr. has been applied to suspensions of cultured and uncultured mammalian cells. Various stages of mitosis have been observed by controlling the osmotic strength of the agar. M.M.Shapland

4743. NEGATIVE STAINING METHOD FOR CELL-ASSOCIATED VIRUS. J.D.Almeida and A.F.Howatson: *J. cell Biol.*, 1963, 16, 616-620 (Ontario Cancer Inst., Toronto, Canada) A technique is described in which

the virus retains its structural detail and may be examined in relation to surrounding particles. The virus-infected cells are disrupted by treatment with hypotonic culture medium, frozen, and 4/j sections cut and stained with 3% phosphotungstic acid. The method is illustrated by micrographs of vaccinia and measles-virus infected cells.

PJSarrow

4744. NEGATIVE STAINING OF THINLY SPREAD CELLS AND ASSOCIATED VIRUS. D.F.Parsons: *J. cell Biol.*, 1963, 16, 620-626 (Ontario Cancer Inst., Toronto, Canada)

Normal, neoplastic and virus-infected cells of leukaemic mice and rats were studied by a procedure involving collection of the cells on a needle, floating on potassium phospho-tungstate and spreading on a formavar grid for E.M. The cytoplasmic structures and viruses are clearly seen.

P.Barrow

4745. METHOD FOR OBTAINING SERIAL SECTIONS OF KNOWN ORIENTATION FROM SINGLE SPERMATOZOA.

I.R.Gibbons: *J. cell Biol.*, 1963, 16, 626-629 (Biol. Lab., Harvard Univ., Cambridge, Mass., U.S.A.) Semen from bull, sea urchin and porgy (*Calamus* sp.) were fixed in OSO₄ and embedded in araldite using a flat embedding technique. The structural assymetry of the "Perm tail and the relationship between fine-structure and direction of beat were studied.

P.Barrow

4746. A PREPARATION OF CELL NUCLEI OF PURITY CONFIRMABLE BY E.M. J.-P.Zalta, R.Rozencwajg, N.Carasso and P.Favard: *C.R.Acad. Sci., Paris*, 1962, 255, 412-414 (Lab. de Synthèse atomique, C.N.R.S., Ivry, Seine, France)

Cell nuclei were obtained from free cells or tissues by treatment in bicarbonate-free Earle's medium at pH 6.8 with firstly 0* 15% nonyl-phenol-polyoxyethylene containing 6 moles of ethylene oxide (Cemulsol NPT 6, Bezou) and then 0.15% nonyl-phenol-polyoxyethylene containing 12 moles of ethylene oxide (Cemulsol NPT 12). Other media, e.g. saccharose/magnesium, can be used. The nuclei are free from cytoplasmic contamination on inspection by E.M. and retain their membranes and their ability to incorporate amino acids.

(French) S.A.Thistlewood

4747. HIGH-POWERED PHASE CONTRAST EQUIPMENT WITH LONG WORKING DISTANCE FOR OBSERVATION OF CULTURE FLASKS. G.Petursson and J.Fogh: *Proc. Soc. exp. Biol. N.Y.*, 1963, 112, 523-524 (Div.

Expt. Pathol., Sloan-Kettering Inst. Cancer Res., New York, U.S.A.) A Zeiss 1-6mm. working distance objective and a Wild 20mm. (long-working distance) condenser are used to make high power observations of living cells in tissue culture T-15 flasks. D.N.Wheatley

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GENERAL

4748. SELECTION AT THE MOLECULAR LEVEL.

A.Lima-de-Faria: *J. theoret. Biol.*, 1962, 2, 7-15
 (Inst. Genet., Lund Univ., Sweden) Selection acts on the constitution and organisation of a chr., favouring mutations which conform to local chr. effects. At the organism level, selection only selects from individuals which have passed the first trial at the mol. level.

J.A.Dawson

4749. MIGRATIONAL SELECTION. A.W.F.Edwards:

Heredity, 1963, 18, 101-106 (Inst. Genet. Univ. Pa via, Italy) Fisher's migrational selection is discussed in relation to disruptive selection and a mathematical example given to show how an equilibrium gene distribution may result from it and how it will augment the genetic variance of a character. S.A.Henderson

4750. GENERATION OF SELF-INCOMPATIBILITY ALLELES.

D.Lewis: *J. theoret. Biol.*, 1962, 2, 69-71
 (Bot. Dept., Univ. Coll., London, England) Fisher's mathematical model predicts the generation of alleles by mutation or recombination at a rate of 10^{-4} . Self-pollination expt. reveal a rate of 10^{-8} . Until there is an explanation of this discrepancy, the biochem. of incompatibility cannot be profitably discussed.

J.A.Dawson

4751. ENVIRONMENTS OF ANIMALS AND PLANTS.

T.O.Browning: *J. theoret. Biol.*, 1962, 2, 63-68
 (Unit Anim. Ecol., Zool. Dept., Univ. Adelaide, Australia) In an amendment of the 'environment' concept of Andreartha and Birch (1954), for consideration of population no. weather, members of the same sp. and members of other spp. are analysed in relation to resources and hazards.

J.A.Dawson

4752. CONGENITAL ABNORMALITIES AND COMPETITION IN MAN AND OTHER MAMMALS AT DIFFERENT MATERNAL AGES. P.A.Parsons:

Nature, Lond., 1963, 198, 316-317 (Dept. Zool., Univ. Melbourne, Australia) Data are reviewed on the incidence of congenital defects in young born to mothers of different ages in mice, guinea-pigs and man. Differences between spp. may be due to the effect of overcrowding in utero in some cases. Developmental abnormalities in *Drosophila* increase in offspring from older females. G.M.Lewis

4753. METHOD FOR CALCULATING INBREEDING COEFFICIENT.

A.Kudo: *Amer. J. hum. Genet.*, 1962, 14, 426-432 (Maths. Inst., Kyushu Univ., Fukuoka, Japan) A novel method of computation of the inbreeding coeff. is described using a pedigree sheet. The method can be adopted for use in a high speed computer.

D.A.Jones

MICRO-ORGANISMS

4754. PLAQUE-SIZE MUTANTS OBTAINED FROM THE RNA PHAGE FR AFTER TREATMENT WITH NITROUS ACID.

F.Kaudewitz and P.Knolle: *Nature*, Lond., 1963, 198, 97 (Max-Planck-Inst. vergleichende Erbbiol. und Erbpathol., Berlin-Dahlem, Germany)
 The rate of inactivation of phage fr by nitrous acid is more

similar to that for TMV than that of DNA-phages. The treatment produced small plaque mutants Closely related to wild-type.
 G.M.Lewis

4755. PRELIMINARY GENETIC MAP OF 17 GALACTOSE MUTATIONS IN *E.COLI* K 12. M.L.Morse:

Proc. nat. Acad. Sci. Wash., 1962, 48, 1314-1318 (Webb Inst. Med. Res., Dept. Biophys. Univ. Colorado Med. Center, Denver, Colo., U.S.A.) A map of the galactose region of *E.coli* K 12 obtained by studying crossing over in heterogenotes showing position effect is presented. The order kinase cistron-operator region-transferase cistron is indicated. The relationship of the epimerase cistron to the above region is not known at present.
 J.R.Sargent

4756. INCORPORATION OF PARENTERAL DNA INTO GENETIC RECOMBINANTS OF *E.COLI*.

O.H.Siddiqi: *Proc. nat. Acad. Sci. Wash.*, 1963, 49, 589-592 (Div. Biol., Univ. Pennsylvania, Philadelphia, Pa., U.S.A.) Evidence is presented indicating that recombinants arising from mating to an HFr with^{an} F" strain of *E.coli* inhibit labelled DNA from the F" parent. The procedure for detecting incorporation of parental DNA into recombinants involved mating of a T6-resistant HFr to a T 6-sensitive F" carrying specifically labelled DNA. When mated cells are exposed to a high multiplicity of phage T6, sensitive cells are rapidly lysed. T6-resistant F" recombinants are then separated by filtration and examined for the presence of the parental label.

J.R.Sargent

4757. F-PRIME TRANSFER AND MULTIPLICATION OF SEXDUCED CELLS.

P.G.de Haan and A.H.Stouthamer: *Genet. Res.*, 1963, 4, 30-41 (Lab. Microbiol., State Univ., Utrecht, Netherlands) The sex factor, F in *E.coli* when transmitted by cell contact, may undergo a variable delay before it is transmitted. The earliest transfer occurs at 4 min. and some are not transferred until 11 min. after mating. Each recipient cell possesses at least 2 copies of the newly acquired F particle before the next cell division in liquid media, due to the rapid multiplication of the F particle. Anomalous results were observed in solid media. It was possible to infect a cell with 2 different F particles, but such strains were unstable and segregated the particles. The evidence suggests that the no. of F particles per cell is small and that these are not distributed at random to the daughter cells. J.Sneath

4758. EPISOMIC CONTROL OF MUTATION IN

SALMONELLA.

G.W.P.Dawson and P.F.Smith-Kearny: *Heredity*, 1963, 18, 1-20 (Genet. Dept., Trinity Coll., Dublin, Ireland) Unstable reversions at the su - leuA locus in strain leu - 151 of *Salmonella typhimurium* are explained in terms of the movement to and from the locus of units similar to controlling elements described in maize. These units are called controlling episomes.

S.A.Henderson

4759. DIRECTED MUTATIONS IN YEASTS AND

BACTERIA.

C.C.Lindgren: *Bull. Res. Coun. Israel*, A, 1963, 11, 363-368 (Biol. Res. Lab., S.minois Univ., Carbondale, HI., U.S.A.) On the receptor hypothesis of gene structure a gene may mutate in 2 different ways, and crossing over may occur either within the gene by nucleotide exchange or between genes by breakage and reunion of the histone backbone of the chr. Arguments are put forward favouring the view that adaptive mutations may result from changes in the folding of receptors of genes directed by contact with different mutagenic substances.

L.G.

Gillies

4760. EFFECT OF GENE DOSAGE ON LEVEL OF C_t-GLUCOSBDASE W YEAST. F.Rudert and H.O.Halvorson: Bull. Res. Counc. IsraeLA, 1963, 11, 337-344 (Dept. Biochem., Univ. Wisconsin, Madison, Wis., U.S.A.) *S.cerevisiae* contain a no. of unlinked structural genes (M or Ma) for C_t-glucosidase synthesis. Only one dominant form of the gene is necessary for enzyme synthesis. However, the different gene differ in the induced level of enzyme produced. Two allelic genes, Mi and Mai, also differed by 60%. The level of enzyme is directly proportional to the gene dosage. Isomaltose regulatory genes (MGi and MG2) influence the level of α-glucosidase. THS5^E findfigTSuggested that the structural genes for α-glucosidase differ in the nature of closely linked control genes. L.G.Gillies
4761. SUPPRESSION BY METHIONINE OR REVERSIONS TO ADENINE INDEPENDENCE IN SCHIZOSACCHARO-MYCES POMBE. C.H.Clarke: J. gen. Microbiol., 1963, 31, 353-363 (List. Animal Genet., Edinburgh, Scotland) Spontaneous, u.v.-induced and nitrous acid-induced reverse mutations conferring ability to grow on minimal medium lacking adenine were scored in adenine auxotrophs and in adenine and methionine diauxotrophs. 40-/*g./ml. L methionine suppressed appearance of revertants of adenine-1 mutants, thus accounting for the apparently lower mutability of the ad-1 mutants in the ad-met-diauxotrophic strains as compared with the ad- strains as being due to methionine in the plating medium. Reversions of an adenine mutant at another locus and reversion of a leucine auxotroph show a similar effect. K.Brew
4762. CO-ORDINATE CHANGES IN COMPLEMENTATION, SUPPRESSION AND ENZYME PHENOTYPES OF A PYR-3 MUTANT OF NEUROSPORA CRASSA. V.W.Woodward and R.H.Davis: Heredity, 1963, 18, 21-25 (Biol. Dept., Rice Univ., Houston, Tex., U.S.A.) A non-complementing pyr-3 mutant lacking aspartate transcarbamylase [ATC] can be converted by Jijutia to a complementing type which possesses ATC. These alterations of phenotype may be due to mutation of a modifier within the pyr-3 gene. Some evidence supports the previously inferred bifunctional nature of this locus. S.A.Henderson
4763. GENETIC AND EPIGENETIC FACTORS CONTROLLING FEMALE STERILITY IN NEUROSPORA CRASSA. P.H.Fitzgerald: Heredity, 1963, 18, 47-62 (Cytogenet. Unit, Christchurch Hosp., Christchurch, New Zealand) Female sterility, due to failure to form protopenthecia, was found in a biochem. wild-type strain of N.crassa. One genotype, s bk, existed in a wide range of phenotypes which were not due to genedifferences but to different equilibrium states of physiol. or cytoplasmic interactions. S.A.Henderson
4764. INDEPENDENTLY SEGREGATING GENETIC LOCI CONCERNED WITH NITRATE REDUCTASE ACTIVITY IN ASPERGILLUS NIDULANS. D.J-Cove and J.A.Pateman: Nature, Lond., 1963, 198, 262-263 (Dept. Genet., Univ. Cambridge, England) 40 mutants obtained by u.v.-irradiation were unable to use nitrate as a sole N source. Some combinations of these mutants in heterokaryons were able to use nitrate. Linkage groups indicated that mutation in at least 6 genetic loci, which segregated independently, could prevent die-back of detectable nitrate reductase. It is possible that a multi-enzyme system is involved or that the

enzyme may be a large complex mol. made up of polypeptide subunits determined by different structural genes. G.M.Lewis

4765. PARASEXUAL CYCLE AND LINKAGE RELATIONSHIPS IN THE STORAGE ROT FUNGUS PENICILLIUM EXPANSUM. G.L.Barlow: Canad. J. Bot., 1962, 40, 1603-1613 (Dept. Bot., Ontario Agric. Coll., Ont., Canada) 104 nutritional, morphol. and acriflavine-resistant mutants were produced. Nutritional mutants were induced more readily with u.v. than with Y radiation. Heterocaryons were established between strains involving up to 8 pairs of markers. Heterozygous diploids were readily obtained by treatment of the heterocaryons with D-camphor but with great difficulty in untreated heterocaryons. Analysis of 110 independent segregants from the heterozygous diploid M53/M67 has resolved 7 genes into 2 linkage groups, viz. LW3, bii, pyr^A, br3, and II.nic2, rii, acrj. A.Meany

4766. HETEROCARYOSIS AND SOMATIC RECOMBINATION IN CEPHALOSPORIUM MYCOPHILUM. R.W.Tuveson and D.O.Coy: Mycologia, 1961, 53, 244-253 (Dept. Bot., Univ. Chicago, Chicago, Ill., U.S.A.) Each of 3 heterocaryons between auxotrophic strains responded to growth on supplemented minimal medium by alteration of nuclear proportions. In 2 of the heterocaryons grown on minimal medium only one component nuclear type was detected in the conidia. Analyses of conidia produced by 2 presumptive somatic diploid colonies, yielded recombinant nuclei bearing markers characteristic of the 2 parental strains. J.G.J.Brown

PLANT

4767. PARTHENOCARPY AND APOMIXIS IN RBES GENUS INDUCED BY GIBBERELLINE ACID. J.M.Zatyk& Naturwissenschaften, 1962, 49, 212-213 (Inst. Plant Breeding, Fertod, Hungary) JJE.Hobbs

4768. NON-DISJUNCTION IN AN OENOOTHERA INTER-CHANGE HETEROZYGOTE. D.C.Catcheside: Heredity, 1963, 18, 63-75 (Microbiol. Dept., Univ. Birmingham, England) A two-chr. interchange heterozygote is potentially capable of producing 14 types of gamete. In an interchange heterozygote of Oenothera blanda, which shows a position effect variegation of 2 genes, most classes will produce viable progeny when combined with a normal blanda gamete. This corrects the previous interpretation of certain duplication-deficiency plants. S.A.Henderson

4769. ON THE INFLUENCE OF GENES AND GIBBERELLINS ON FLOWER FORMATION IN ARABIDOPSIS THALIANA. K.Napp-Zinn: Ber. dtsch. bot. Ges., 1963, 76, 77-89 (Bot. Inst., Univ. KOln, Germany) Prelim, c^Amm. (German) H.Opik

4770. DISTORTED INHERITANCE OF STEM-RUST RESISTANCE OF TIMSTEIN WHEAT CAUSED BY POLLEN-KILLING GENE. W.Q.Loegering and E.R.Sears: Canad. J. Genet. Cytol., 1963, 5, 65-72 (U.S.Dept. Agric, Beltsville, Md., U.S.A.) A partial ^ sterility in the wheat variety Chinese spring leads to aberrant

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segregations of susceptibility and resistance to Puccinia graminis amongst F2 and FQ progeny of the cross Chinese spring (susceptible) by Timstein (resistant). The rf sterility is nuclear in control the allele Ki (pollen killer) causing the abortion of ki microspores in Ki ki individuals. The Ki locus is aEout 9% recombination units from the resistance (Sr 11) locus. Certain varieties tested showed virtually no pollen abortion in their hybrids with either Chinese spring (Ki Ki) or Thatcher (ki ki). D.A.Jones

4771. DNA AND THE ANCESTRY OF WHEAT. H.Rees: Nature, Lond., 1963, 198, 108-109 (Dept. Agric. Bot., Univ. Coll. Wales, Aberystwyth, Wales) Estimates of DNA in root-tip nuclei confirm an allopolyploid origin of the cultivated wheats without appreciable change in the DNA content of genomes subsequent to hybridization. G.M.Lewis

4772. EVALUATION OF CLAIMS OF LE. GLOUCHT-CHENKO FOR VEGETATIVE HYBRIDISATION IN PLANTS. D.S.Dean: J. Hered., 1962, 53, 215-221 (Baldwin-Wallace Coll., Berea, Ohio, U.S.A.) Review. 35 ref. D.A.Jones

4773. HAPLOIDS IN GENETICALLY MARKED PROGENIES OF TOBACCO. L.G.Burte J. Hered.. 1962, 53, 222-225 (U.S.Dept.Agric., Beltsville, Md., U.S.A.) A technique for the ready identification of haploids is described. Some paternal haploids were obtained from the cross YgYg x ygyg (yg homozygotes have yellow-green cotyledons as seedlings). D.A.Jones

4774. THE EFFICIENCY OF HAPLOID METHOD OF PLANT BREEDING. M.Nei: Heredity, 1963, 18, 95-100 (Genet. Div., Nat. Inst. Radiolog. Sci., Chiba, Japan) The efficiency of the haploid method of plant breeding is examined in comparison with the conventional diploid method. Calen. show the haploid method to be advantageous when the no. of genes concerned is large and the freq. of favourable alleles in populations are small and when, as in forest trees, the generation time is long. S.A.Henderson

4775. REVIEWS IN GENETICS AND CYTOLOGY. I. PLANT BREEDING. C.J.Bishop: Canad. J. Genet. Cytol., 1963, 5, 1-11 (Canada Dept. Agric., Ottawa, Canada) Review. 89 ref. D.A.Jones

ANIMAL

4776. PHENOGNETICS OF HAIR MUTANTS IN THE HOUSE MOUSE: OPOSSUM AND RAGGED. S.J.Mann: Genet. Res., 1963, 4, 1-11 (BioU Dept., Brown Univ., Providence, R.I., U.S.A.) Results confirm previous linkage studies which suggested that the semi-dominant mutations Ragged (Ra) and Opossum (Ra°P) are alleles. Matings + + x Raop + show no deficiency in Ra°P embryos but Ra 4-x Ra>P 4- and Ra°P + x Ra°P + matings show in utero deaths of Raop 4- embryos in addition to RaRa°P and RaQRaP embryos. There is also a high freq. of oedema in the RaQP + embryos which increases with their age. Hair follicles develop later in the mutants and show the following order (in increasing delay). Ra +, Ra°P +, (when non-oedemic), RaRa and Raffi + "when

oedemic). The heterozygotes for Opossum and Ragged show failure of differentiation in some follicles and have a full complement of trichotrichs but variable concn. of awls. Ra + mice have fewer zigzags and fa22 + mice usually lack them. The mutants lack achenes. Their hair growth is asynchronous and often lacks the quiescent phase of the cycle. J.Sneath

4777. DEVELOPMENT OF SOMATIC MUTATIONS IN MICE WITH AGE. C.Crowley and H.J.Curtis: Proc. nat. Acad. ScL Wash., 1963, 49, 626-628 (Biol. Dept., Brookhaven Nat. Lab., Upton, N.Y., U.S.A.) Chr. aberrations in the liver cells of 2 strains of mice, one long-lived and the other short-lived, were measured as a function of age. Development of aberrations was inversely proportional to life expectancy. It is concluded that somatic mutations seem very likely to play a dominant role in the ageing process. J.J.Sargent

4778. GENETICS OF A Y-GLOBULIN KOANTKEN (ALLOTYPE) IN THE MOUSE. J.Wunderlich and LjV.Herzenberg: Proc. nat. Acad. ScL Wash., 1963, 49, 592-598 (Dept. Genet., Sch. Med., Stanford Univ., Calif., U.S.A.) Studies of a mouse yslobulin iso-Ag are presented which demonstrate that the iso-Ag is present on Ab molecules of 2 different Ab specificities. Inheritance of the Ag is controlled at a single genetic locus. J.R.Sargent

4779. SEX OF PARENT AND VARIATION OF RECOMBINATION WITH AGE IN THE MOUSE. D.H.Reid and P.A.Parsons: Heredity, 1963, 18, 107-108 (Zool. Dept., Univ. Melbourne, Australia)* S.A.Henderson

4780. REPEATABILITY OF LITTER SIZE AND WEIGHT IN LABORATORY RAT AS AFFECTED BY SELECTION AND PLANE OF NUTRITION. JJ.Kidwell, H.J.Weeth, L.H.Haverland, C.E.Shelby and R.T.Clark: J. Hered., 1962, 53, 247-250 (Animal Res. Inst., Central Exp. Farm, Ottawa, Ont., Canada) No definite conclusion could be reached as to whether selection for 70-day body wt. affected the repeatability of litter size and 28- and 70-day wt. A maternal effect on body wt. persisted to at least 70 days yet neither ratios nor method of selection had a significant effect on litter size. D.A.Jones

4781. RELATIONSHIP BETWEEN ROSE COMB AND REPRODUCTION IN DOMESTIC FOWL. R.D.Crawford and E.S.Merritt: Caaad. J. Genet. Cytol., 1963, 5, 89-95 (Res. Stat., Kentville, Nova Scotia, Canada) Subnormal reproductive ability in White Wyandotte fowl is attributable to low fertility rather than to poor hatchability or viability of the embryos. The condition is expressed only in males homozygous for the rose comb gene, heterozygotes being normal or nearly normal. D.A.Jones

4782. GENETIC DIFFERENCES IN GROWTH POTENTIAL ON AMINO ACID DEFICIENT DIETS. P.Griminger and H.Fisher: Proc. Soc. exp. Biol., N.Y., 1962, 111, 754-756 (Dept. Poultry ScL Rutgers, State Univ. of New Jersey, New Brunswick, N.J., U.S.A.) Chicks from hens of a random-bred flock raised to 4 weeks on either an arginine or a lysine-deficient diet showed an inherited growth potential. The majority of chicks from any one dam behaved differently on the 2 diets. The ranking of dams on the basis of growth potential of offspring given a complete ration was similar to that obtained on the arginine but not the lysine-deficient diet.

M.M.Shapland

4783. Hb PATTERNS OF PLAICE, FLOUNDER AND THEIR NATURAL AND ARTIFICIAL HYBRIDS. K.Sick, O.Frydenberg and J.T.Nielsen: Nature, Lond., 1963, 198, 411-412 (Inst. Genet., Univ. Copenhagen, Denmark) Agar electrophoretic patterns of Hb from Plaice, flounder, the F₁ hybrid and a mixture of Hb from the parent spp. are examined. A no. of novel Hb components in the hybrid individuals indicate that the tetrameric mol. of plaice and flounder Hb: are composed of at least 2 sub-units. G.M.Lewis

4784. THE GENETICS OF ARTEMIA SAUNA. I. THE REPRODUCTIVE CYCLE. S.T.Bowen: Biol. Bull. Woods Hole, 1962, 122, 25-32 (Dept. Biol., San Francisco State Coll., Calif., U.S.A.) A culture method is described. No evidence of parthenogenesis, Paedogenesis or pseudogamy was found in 2 races cultured In this way. Copulation was only effective when the eggs were in the oviducts, and females did not store sperm from one reproductive cycle to the next. G.J.Peakin

4785. THE CONTROL OF CROSSING-OVER IN THE X-CHROMOSOME OF DROSOPHILA MELANOGASTER. M.J.Lawrence: Heredity, 1963, 18, 27-46 (Genet. Dept., Univ. Birmingham, England) In a diallel cross of 5 inbred lines of D.melanogaster the X-chr. recombination freq. was scored among the backcross Progenies of the parent lines and their twenty F₁'s, at 2 temp. 18° and 25°. Crossing over in most parts of the X-chr. is under genetic control. Control is polygenic, with Part of the control exercised at the interchromosomal ^vel, and the additive component of genetic variation is die most important, there being only slight dominance and no genie interaction. S.A.Henderson

4786. SEX AND HETEROSESIS IN DROSOPHILA MELANO-GASTER. J.F.Kidwell: Canad. J. Genet. Cytol., 1963, 5, 50-56 (Canada Dept. Agric., Ottawa, Canada) An incomplete 5 x 5 diallel cross revealed significant sex x heterosis interactions for body wt. in 2 of the crosses between inbred lines. One line was common to both Crosses. Sex differences in the degree of heterosis for abdominal chaetae are not frequent and cannot be attributed to a consistently greater degree of heterosis expressed by the homogametic sex. There was evidence of neg. general combining ability for body wt. in one J^{ne}. Sex linkage was observed in 2 and maternal effect to one of 5 crosses for body wt. D.A.Jones

4787. ECOLOGICAL AND SEXUAL VARIATION IN DROSOPHILA RUBIDA INVERSION POLYMORPHISM. W.H.Mather: Heredity, 1963, 18, 109-111 (Zool. Dept., Univ. Queensland, Brisbane, Australia) S.A.Henderson

4788. GENETIC CONTROL OF CYTODIFFERENTIATION. T.M.Rizkfc J. cell Biol., 1963, 16, 513-520 (Dept. Zool., Univ. Michigan, Ann Arbor, Mich., U.S.A.) ^bat bodies of Drosophila melanogaster were separated into ^anterodorsal, ^bdorsolat. and caudal regions and implanted into 2-day old vermilion flies. The donor tissues were examined by fluorescence microscopy 16 hr. after transplantation. Anterior fat cells synthesised kynurenine only if the presence of the non-allelic suppressor gene, kynurenine was induced in the ant. and post. regions of *e normal Ore R strain by die precursor tryptophan. It is included that the absence of a physiol. process in a differentiated cell does not necessarily represent a loss of *e genetic potential for mat process. P.Bairow

4789. ATTEMPTS TO PRODUCE GENETICAL CHANGES IN DROSOPHILA BY CENTRIFUGATION. O.S.Reddi: Nature, Lond., 1963, 198, 316 (Radiation Genet. Project, Osmania Univ. Hyderabad, India) The freq. of sex-linked recessive lethals and translocations in D.melanogaster ♀ germ cells was not affected by centrifugation at 3000 r.p.m. for 60 min. G.M.Lewis

4790. GENETIC EVIDENCE OF X-RAY INDUCED EXCHANGES OCCURRING AT FOUR-STRAND STAGE IN DROSOPHILA SPERMATOCYTES. S.Zimmering: J. Hered., 1962, 53, 254-256 (Dept. Biol., Brown Univ., Providence, R.I., U.S.A.) Some genetic evidence is presented that X-ray induced exchanges between X and Y chr. occur at a 4-strand stage in spermatocytes. Some exceptional female progeny were recovered which had received both their X chr. from the irradiated male parent, one of these being a cross over and the other a non-crossover chr. D.A.Jones

4791. A PARTHENOGENETK SPECIES OF GRASSHOPPER WITH COMPLEX STRUCTURAL HETEROZYGOSITY (ORTHOPTERA: ACRIDOIDEA). MJ.D.White, J.Cheney and K.H.L.Key: Aust. J. Zool., 1963, 11, 1-19 (Dept. Zool., Univ. Melbourne, Australia). G.M.Lewis

HUMAN

4792. INFLUENCE OF SECRETOR AND LEWIS GENES ON SUSCEPTIBILITY TO DUODENAL ULCER. P.A.J.Ball: Brit. med. J., 1962, ii, 948-950 (Dept. Med., Univ. Coll. Hosp., Ibadan, Nigeria) There was an excess of group O subjects and of ABO non-secretors in Nigerian patients with duodenal ulcer in comparison with control subjects from the same tribe. The excess of non-secretors was entirely due to Le(a+b-) subjects, there were fewer than the expectefno. of Le(a-b-) non-secretors. Relative freq. of these groups in secretor patients did not differ from those in controls. Enhanced liability of ABO non-secretors to duodenal ulcer may depend on interaction of Lewis and secretor genes. M.E.Nutt

4793. BLOOD GROUPS AND DISEASE. ABH ANTIGENS IN HUMAN DUODENAL CELLS. W.K.Cowan: Brit. med. J., 1962, ii, 946-948 (Dept. Med., Univ. Liverpool, England) Examination of human duodenal mucosal cells by mixed cell aggltn. shows that blood group Ag is present in secretor subjects, but absent or scanty in non-secretors. M.E.Nutt

4794. BLOOD GROUPS AND DISEASE. PREVIOUS TRANSFUSIONS AS POTENTIAL SOURCE OF ERROR IN BLOOD TYPING. C.A.Clarke, W.T.A.Donohoe, R.B.McConnell, J.H.Martindale and P.M.Sheppard: Brit. med. J., 1962, i, 1734-1736 (Dept. Med., Univ. Liverpool, England) Transfusion of 1 pint of blood can lead to mistakes in determining a patient's Rh and MN genotype for at least 4 wefeks. An erroneously high Treq. of CDe/cDE and MN subjects may be found in surveys of hospital patfn's unless these are untransfused. Previous transfusion may explain the high CDe/cDE freq. found in duodenal ulcer by Buckwalter and Tweed (1962). M.E.Nutt

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4795. RHEUMATIC FEVER AND BLOOD GROUPS*

J.A.Buckwalter, G.S.Naifeh and J.E.Auer. Brit. med. J. 1962, ii, 1023-1027 (Coll. Med. State Univ., Iowa, U.S.A.) An investigation of blood group freq. in rheumatic fever patients seen at Univ. Iowa hospitals during 15 yr. M.E.Nutt

4796. BLOOD GROUPS IN RHEUMATIC FEVER.

J.H.Edwards: Brit. med. J., 1962, ii, 1027-1028 (Dept. Social Med. Univ., Birmingham, England) (Appendix to Buckwalter et al.). M.E.Nutt

4797. ABO BLOOD GROUPS IN RELATION TO ISCHAEMIC HEART DISEASE. B.B.Stewart.

M.CBotha and L.H.Krut: Brit. med. J., 1962, i, 1647-1650 (Dept. Med. Univ. Capetown, S.Africa) A statistical investigation of blood groups of 792 patients (Bantu, Cape Coloured, English speaking, Afrikaans speaking and Jewish whites) attending prothrombin clinics throughout the Cape Peninsula. The group as a whole showed excess of A and B and a deficiency of group O in comparison with controls, but deviation was not significant in those races where incidence of ischaemic heart disease was high. The findings exemplify the complex interplay of genetic and environmental factors in the development of ischaemic heart disease. M.E.Nutt

4798. LINKAGE OF COLOUR BLINDNESS TO HAEMOPHILIAS A AND B. D.L.Whittaker,

D.L.Copeland and J.B.Graham: Amer. J. hum. Genet., 1962, 14, 149-158 (Dept. Path., Univ. N.Carolina, Chapel Hill, N.C., U.S.A.) One family segregating for colour blindness and Haemophilia A and another segregating for colour blindness and Haemophilia B were large enough to give evidence of recombination between the loci. Recombination between deutanopia and Haemophilia A is about 6% while recombination between protanopia and Haemophilia B is about 50%. Assuming that the colour blindness genes are alleles or very closely linked there is thus evidence that the two forms of haemophilia are probably not allelic. D.A.Jones

4799. IS CHOLELITHIASIS ASSOCIATED WITH A SPECIFIC BLOOD GROUP? E.W.Hauch and F.J.Moore:

Gastroenterology, 1963, 44, 125-126 (Univ. S.Calif. Med. Sch., Los Angeles, Calif., U.S.A.) The distribution of blood ABO grouping of cholelithiasis sufferers shows fewer 'Jo in the B group and more in the AB group than is found in the control group of patients free from cholelithiasis. D.N.Wheatley

4800. BLOOD GROUPING IN THREE FAMILIES WITH KARTAGENER'S SYNDROME. C.D.Cook, F.Geller,

G.B.Hutchison, P.Gerald and F.H.Allen jun: Amer. J. hum. Genet., 1963, 14, 290-294 (Children's Hosp. Med. Center, Boston, Mass., U.S.A.) No evidence for linkage between Kartagener's syndrome and ABO, Rh, MNS, Kell, Duffy, Kidd, P, Lewis, Lutheran and Wright blood group systems was obtained. D.A.Jones

4801. ABNORMAL HAEMOGLOBINS IN THE NEONATAL PERIOD AND THEIR RELATIONSHIP TO THALAS-

SAEMIA. DJ.Weatherall: Brit. J. Haemat., 1963, 9, 265-277 (Div. Haemat., Dept. Med., Johns Hopkins Univ. Sch. Med., Baltimore, Md., U.S.A.) The families of 11 Negro infants with Bart's Hb in the neonatal period, were tested haematol. In each family one parent of the affected child showed abnormal red cell morphology

with reduced osmotic fragility. The presence of Bart's Hb in infancy is associated with a mild tfoalassaemia-like disorder resulting from defective α -chain synthesis which is extremely variable in adult life. There is no interaction with the gene for sickle-cells. Thus it seems likely that the 2% of American negroes affected by the non-interacting type of thalassaemia are suffering from defective α -chain synthesis which has such variable effects in adult life that the neonatal period is the only phase in which die affected individual can be accurately typed. J.Sneath

4802. HEREDITARY HAEMORRHAGIC TELANGIECTASIA AND GASTROINTESTINAL HAEMORRHAGE.

C.R.Smith juiu, L.G.Bartholomew and J.C.Cain: Gastroenterology, 1963, 44, 1-6 (Sect. Med., Mayo Clinic, Rochester, Minn., U.S.A.), A study of some 150 family histories in this no. of cases of hereditary haemorrhagic telangiectasia showed that about 20% of the cases had no predecessors with the complaint. It was found that about 89% of the patients suffered from haemorrhage and the vast majority of these from epistaxis. The telangiectatic lesions were found mainly on the face, the hands and the mucous membranes of the head. Oestrogen therapy was found to be moderately successful. In most cases the symptoms are found at very early ages but become progressively more severe and come to a climax in the sixth decade. As far as the gastrointestinal tract is concerned the symptoms of telangiectasia were found in only 20% of the cases. Resections of incriminated regions of the gut was found to be wholly unsuccessful. D.N.Wheatley

4803. HIGH LEVELS OF Hb F WITH Hb A, S AND C IN GHANA. G.R.Thompson and H.Lehmann: Brit. med. J., 1962, i, 1521-1523 (St.Bartholomew's Hosp., London, England) Members of two Ghanian families illustrate interaction between the Hb F gene and genes responsible for Hb A, S and C. Persistent high Hb F was not associated with anaemia or morphol. abnormalities except numerous target cells in the Hb C-F combination. M.E.Nutt

4804. Xg BLOOD GROUPS AND FAMILIAL HYPO-

GAMMA GLOBULINAEMIA. R-Sanger and R.R.Race: Lancet, 1963, i, 859-860 (Lister Inst., London, England). G.H.Bell

4805. SECOND EXAMPLE OF ANTI-Xg^a. LA.Cox,

M.J.Polley and P.L.Mollison: Lancet, 1963, i, 857-859 (Wright-Fleming Inst., St.Mary's Hosp., Med. Sch., London, England). G.H.Bell

4806. THREE INHERITED RED-CELL ABNORMALITIES IN A DISTRICT OF GREECE. THALASSAEMIA,

SICKLING, AND GLUCOSE 6-PHOSPHATE-DEHYDROGENASE [G6PD] DEFICIENCY. C.Choremis, P.Fessas, C.Kattamis, G.Stamatoyannopoulos, L.Zannos-Marioleta, A.Karaklis and C.Belios: Lancet, 1963, i, 907-909 (Univ. Athens, Greece) The freq. of thalassaemia, sickling, and G6PD deficiency was investigated in the Arta district, which was known for its high malaria endemicity. The freq. of sickling and G6PD deficiency was found to decrease with increasing altitude, and to run parallel with the freq. of malaria. This supports the malaria theory. On the other hand, the freq. of thalassaemia was found to be almost equally distributed in all altitudes. This finding is in agreement with a previous study in the island of Corfu. G.H.J.Bell

4807. RELATIONSHIP BETWEEN SERUM ANTIBODY LEVELS AND THE ABO BLOOD GROUP POLYMORPHISMS. E.R.Eichner, R.Finn and J.R.Krevans: Nature, Lond., 1963, 198, 164-165 (Div. Med. Genet., Johns Hopkins Univ., Baltimore, Md., U.S.A.) The levels of natural Ab in man to r.b.c. from rabbit, dog, hamster, and guinea-pig and to E.coli 086B7, which are assumed to be related to natural resistance to infection, are not randomly distributed with regard to the ABO blood groups of the subjects examined. It is postulated that ABO polymorphism influences the capacity for Ab formation. G.M.Lewis

4808. SELF MARKER CONCEPT AS APPLIED TO Rh BLOOD-GROUP SYSTEM. K-Mayeda: Amer. J. hum. Genet., 1962, 14, 281-289 (Dept. Biol., Wayne State Univ., Detroit, Mich., U.S.A.) There is no correlation between the mother's Rh type and her Rh neg. daughter's failure to produce Rh Ab. When the complicating factor of ABO incompatibility is removed, the data also lead to the conclusion that the self marker concept does not apply to Rh sensitisation. D.A.Jones

4809. ABNORMAL HAEMOGLOBINS IN BRAZILIAN NEGRO POPULATION. C.V.Tondo and F.M.Salzano: Amer. J. hum. Genet., 1962, 14, 401-409 (Dept. Genet., Univ. Ria Grande do Sul, Porto Alegre, Brazil) The freq. of abnormal Hb types amongst the Negroid population of Porto Alegre was AS, 5% AC 1% and AD 0-2%. The sample was further divided into light mulattoes, dark mulattoes and Negroes and the freq. of AS individuals increased with the amount of Negro Series present. No significant age or sex differences were found in the freq. of Hb^s and Hb^c. D.A.Jones

4810. ANALYSIS OF TRIHYPBRID POPULATIONS. F.Ottensooser: Amer. J. hum. Genet., 1962, 14, 278-280 (Lab. Genet. Humana, Univ. de São Paulo, Brazil) By estimating the freq. of blood group alleles in a mixed population of Whites, Indians and Negroes and by knowing the allele freq. of the population from which the races come it is possible to calculate the racial disposition of the mixed population. D.A.Jones

4811. CONTROL GENE MUTATIONS IN THE HUMAN HAPTOGLOBIN SYSTEM. W.C.Parker and A.C.Bear: Nature, Lond., 1963, 198, 107-108 (Rockefeller List., New York, U.S.A.) The control gene concept is applied to the human haptoglobin system and the available data explained. The observed distribution of phenotypes is in agreement with that expected under the Hardy-Weinberg equilibrium. G.M.Lewis

4812. CYTOGENIC STUDIES ON BONE-MARROW IN CHRONIC MYELOID LEUKAEMIA. L.M.Tough, P.A.Jacobs, W.M.C.J.Brown, A.C.Baikie and E.R.D.Williamson: Lancet, 1963, i, 844-846 (Western Gen. Hosp., Edinburgh, Scotland) The ^gakaryocytes in the marrow in chronic myeloid leukaemia are Phi +ve. It is suggested that both erythroid and granulocytic cells, as well as megakaryocytes, are J⁺ +ve, and that these cell-lines are derived from a ^maon type of ancestral cell. G.H.Bell

4813. SEARCH FOR AUTOSOMAL LINKAGE IN TRISOMIC POPULATION: BLOOD-GROUP FREQUENCIES IN MONGOLS. M.W.Shaw and ^Gershowitz: Amer. J. hum. Genet., 1962, 14, 317-334 (Dept. Human Genet., Univ. Michigan,

Ann Arbor, Mich., U.S.A.) Blood and saliva typing of 370 mongols indicated that the MNS, P, Kell, Duffy, Kidd and ABH secretor loci are not closely linked to the centromere of chr. 21 in man. There was a significant deficiency of blood-group O (at the 5% level) amongst 793 mongols typed for ABH. D.A.Jones

4814. ATYPICAL DUFFY INHERITANCE IN THREE CAUCASIAN FAMILIES: POSSIBLE RELATIONSHIP TO MONGOLISM. B.Chown, M.Lewis and H.Kaita: Amer. J. hum. Genet., 1962, 14, 301-308 (Dept. Ped., Univ. Manitoba, Winnipeg, Canada) Among 22 families in which mongolism occurred 3 were found to have atypical inheritance in the Duffy blood group system. A chance concn. of so-called Fy in these families is given priority as an explanation of the Duffy anomaly. It is considered possible that in some cases there may be a genetic factor that may affect the expression of a Duffy (or an ABO) gene and may also predispose, but not commit, chr. 21 to non-disjunction. D.A.Jones

4815. DERMAL PATTERNS OF 18 AND Di TRISOMICS. L.A.Uchida, K.Patau and D.W.Smith: Amer. J. hum. Genet., 1962, 14, 345-352 (Dept. Paediatrics, Univ. Manitoba, Winnipeg, Canada) The presence of arches on a large no. of digits is characteristic of the chr.-18 trisomic state. All the Di trisomics studied had a distal mean axial triradius on the palms. D.A.Jones

4816. FINAL PEDIGREES OF Y-CHROMOSOME INHERITANCE. R.R.Gates, M.R.Chakravarti and D.R.Mukherjee: Amer. J. hum. Genet., 1962, 14, 363-375 (Indian Statistical Inst., Calcutta, India) Six new pedigrees of hypertrichosis pinnae abundantly reinforce the conclusion that the gene is in the Y-chr. The pedigrees demonstrate that the daughters of affected males do not pass on the gene to their sons. There is evidence that the gene originated to the West of India and not to the East. D.A.Jones

4817. INHERITANCE OF ERYTHROCYTE ACETYL-ESTERASE VARIANT IN MAN. R.C.Tashian and M.W.Shaw: Amer. J. hum. Genet., 1962, 14, 295-300 (Univ. Michigan Med. Sch., Ann Arbor, Mich., U.S.A.) It is suggested that the acetyl esterase variant observed in 8 closely related individuals is transmitted as if due to a single, possibly dominant autosomal gene. D.A.Jones

4818. INHERITANCE OF GLUCOSE 6-PHOSPHATE DEHYDROGENASE [G6PD] DEFICIENCY IN ERYTHROCYTES AND IN LEUCOCYTES. J.C.Sabine, E.D.Jung, M.B.Fish, L.C.Pestaner and R.E.Rankin: Brit. J. Haemat., 1963, 9, 164-171 (Cancer Res. Inst., Univ. Calif. Sch. Med., San Francisco, Calif., U.S.A.) G6PD levels in r.b.c. and w.b.c. were determined in 14 normal subjects and in the 30 members of 5 families. In the 2 Caucasian families studied, the r.b.c. G6PD is inherited with intermediate dominance in heterozygous females but w.b.c. G6PD defect is strongly dominant irrespective of sex. The 2 defects are not coincident, out of 13 members with w.b.c. G6PD defect, only 7 had defective r.b.c. activity. Negro families gave more variable results. Some interrelationship between the defects is suggested but it is not the simple manifestation of a single variable trait. J.Sneath

4819. NEONATAL JAUNDICE IN GLUCOSE 6-PHOSPHATE DEHYDROGENASE [G6PD] DEFICIENT INFANTS. P.Jessas, S.A.Doxiadis and T.Valaes: Brit. med. J.,

GENETICS

1962, ii, 1359-1362 (Univ. Athens, Greece) Of 786 randomly selected male neonates 2 *92% showed G6PD deficiency. Incidence of moderate and severe neonatal jaundice was greater in deficient than in normal infants. The accumulation of cases in some G6PD deficient families suggests that the development of severe jaundice is dependent on additional genetically determined factors. Rh incompatibility was excluded as a cause of jaundice.

M.E.Nutt

4820. L-XYLULOSURIA IN LEBANESE FAMILY.

W.M.Politzer and H.Fleischmann: Amer. J. hum. Genet., 1962, 14, 256-260 (S.African Inst. Med. Res., Johannesburg, S.Africa) Ten cases of L-xylulosuria (pentosuria) were found among 127 members of a Lebanese family. The mechanism of inheritance appears to be that of a dominant gene with reduced penetrance.

D.A.Jones

4821. ESSENTIAL PENTOSURIA. A.K.Khachaourian: Amer. J. hum. Genet., 1962, 14, 249-255 (Sch. Med., American Univ. Beirut, Lebanon) Pentosuria cases in 10 males and 2 females from 3 highly inbred Lebanese families, living in 2 neighbouring and isolated villages are described. The independent inheritance of retinitis pigmentosa and the recessive pentosuria in one sibship suggests that these genes are not closely linked.

D.A.Jones

4822. FREQUENCY OF SPINA BIFIDA OCCULTA AND RIB ANOMALIES IN PARENTS OF CHILDREN WITH SPINA BIFIDA APERTA AND MENINGOCOCELE.

J.R.Miller, F.C.Fraser and D.W.MacEwan: Amer. J. hum. Genet., 1962, 14, 245-248 (Dept. Genet., McGill Univ., Montreal, Canada) In 46 parents of children with spina bifida aperta (with meningocoele) the freq. of vertebral and rib anomalies was no higher than that in 175 controls. The evidence does not support the idea that spina bifida occulta is a minimal manifestation of a genetic mechanism predisposing to spina bifida aperta.

D.A.Jones

4823. CORRELATIONS BETWEEN RELATIVES ARISING FROM SEX-LINKED GENES. L.K.Mather and

J.L.Jinks: II. S.M.Garn and C.G.Rohmann: Nature, Lond., 1963, 198, 314-315, 315-316 (A.R.C. Unit Biometrical Genet., Univ. Birmingham, England, and Fels Res. Inst., Yellow Springs, Ohio, U.S.A.).

G.M.Lewis

4824. HEREDITY IN HYPERTENSION. R.PlatC Lancet, 1963, i, 899-904 (Dept. Med., Univ. Manchester, England) Evidence from the study of twins and of 350 sibs of 178 patients with severe hypertension shows that essential hypertension is a sp. inherited disorder of middle age.

G.H.Bell

4825. DYNAMICS OF RACIAL INTERMIXTURE.

D.F.Roberts and R.W.Hiorns: Amer. J. hum. Genet., 1963, 14, 261-277 (Dept. hum. Anat>, Univ. Oxford, England) Procedures are described for calculating the change in gene freq. when 2 or more populations are intermixing. The methods are illustrated by examples from African and N.American human populations.

D.A.Jones

4826. HEREDITARY ABILITIES STUDY: HEREDITARY COMPONENTS IN PSYCHOLOGICAL TEST BATTERY.

S.G.Vandenberg: Amer. J. hum. Genet., 1962, 14, 220-237 (Inst. Human Biol., Univ. Michigan, Ann Arbor, Mich., U.S.A.) There is an indication that hereditary factors play a role in many human skilled performances in spite of the fact that these skills are highly practised. Some evidence is presented which suggests that psychol. tests which work well as predictors of social criteria, such as success in academic studies, may not be the most promising for studies of hereditary factors.

D.A.Jones

4827. SECULAR CHANGES IN RATES OF MULTIPLE BIRTHS IN UNITES STATES. O.Jeanneret and

B.MacMahon: Amer. J. hum. Genet., 1962, 14, 410-425 (Sch. Public Hlth., Harvard Univ., Cambridge, Mass., U.S.A.) During the period from 1923 to 1958

the freq. of twins among white births in the U.S.A. declined by a little more than 10%. Data on trends by maternal age and by sex of multiple sets suggests that the decline has affected dizygous sets only. A brief examination of the more limited data for non-whites indicates some features of similarity but the freq. of monozygous sets has declined by 14% and that of dizygous sets by 8%.

D.A.Jones

4828. DIABETES MELLITUS: A THRIFTY GENOTYPE RENDERED DETRIMENTAL BY PROGRESS. J.U.Neel:

Amer. J. hum. Genet., 1962, 14, 353-362 (Dept. Human Genet., Univ. Michigan, Ann Arbor, Mich., U.S.A.) Review. 61 ref. D.A.Jones

4829. ALBINISM AMONG HOPI INDIANS IN ARIZONA.

C.M.Woolf and R.B.Grant: Amer. J. hum. Genet., 1962, 14, 391-400 (Dept. Zool., Arizona State Univ., Tempe, U.S.A.) Twenty-two living albinos were found in a total population of about 5000. All the pedigrees obtained demonstrate autosomal recessive inheritance for albinism. The factors maintaining the gene in this population at such a high freq. are unknown.

D.A.Jones

4830. THE GENE AND THE ALIMENTARY TRACT.

W.J.Burdette: Amer. J. Surg., 1963, 105, 49-57 (Dept. Surg., Univ. Utah Coll. Med., Salt Lake City, Utah, U.S.A.) Review. 58 ref. B.Cruickshank

WATER RELATIONS

4831. DETERMINATION OF DISTRIBUTION OF WATER IN WHEAT GRAINS BY INTERFERENCE MICROSCOPY. F.Ruch, U.Bosshard and W.Saurer: Nature, Lond., 1963, 197, 1318-1319 (Inst. Gen. Bot.. Swiss Federal Inst. Technol., Zurich, Switzerland) The water content at every point in a section of wheat grains may be determined with relatively high accuracy by interference microscopy in indane before and after complete drying in vacuo. In wheat grains exposed to air sat. with water at 20°, the scutellum took up water most rapidly.

G.M.Lewis

4832. THE WATER RELATIONS OF TREE SEEDLINGS, in. TRANSPERSION IN RELATION TO OSMOTIC POTENTIAL OF THE ROOT MEDIUM. P.G.Jarvis and M.S.Jarvis: Physiol. Plant, 1963, 16, 269-275 (Inst. Physiol. Bot., Uppsala, Sweden) Decreased transpiration rates as a result of increasing soil-water stress was compared for pine, spruce, birch and aspen seedlings. Pine was most sensitive, spruce least and birch and aspen intermediate.

I.

D.J.Phillips

4833. TRANSPERSION OF FOREST TREES IN CLOSED STANDS. K.Ladefoged: Physiol. Plant, 1963, 16, 378-414 (Municipal Forest District, Arhus, Denmark) Transpiration of 39 sample trees were measured in relation to leaf area,* or kg-foliage. Rates of transpiration varied considerably from tree to tree as well as from sp. to sp. and this appeared to be mainly due to crown-shape. The interrelationships of the effects of relative humidity, light intensity, wind velocity and air temp, upon transpiration were studied.

LD.J.Phillips

PERMEABILITY AND SOLUTE UPTAKE

4834. RATE OF UPTAKE OF SALTS BY PLANT CELLS IN RELATION TO AN ANION PUMP. G.E.Briggs: J. exp. Bot., 1963, 14, 191-197 (Bot. Sch., Cambridge, England) The kinetics of accumulation of cations by plant cells is considered in relation to an anion pump with passive diffusion of cations and anions.

I.D.J.Phillips

4835. CHANGES IN THE PERMEABILITY OF CARROT TISSUES DUE TO γ -IRRADIATION AND OTHER PHYSICAL AND CHEMICAL TREATMENTS. J.P.Skov: Physiol. Plant, 1963, 16, 423-441 (Agric. Res. Dept., Danish Atomic Energy Commission, Risff, Roskilde, Denmark) Permeability was increased with increasing doses of radiation. Ca induced rigidity of the cell walls and reduced the permeability of the cells to sucrose. Na had the opposite effect. Low pH values increased cell permeability. Oxalate ions had no effect on water uptake, freezing of the tissue produced similar effects to those induced by radiation, but fixing fluids had the opposite effect. Respiration decreased simult. with increased permeability.

I.D.J.Phillips

4836. THE EFFECT OF HYDROSTATIC PRESSURE GRADIENTS ON THE MOVEMENT OF Na AND Ca ACROSS THE ROOT CORTEX. J.E.Jackson and P.E. Weatherly: J. exp. Bot., 1962, 13, 404-413 (Dept. Bot., Univ. Aberdeen, Scotland) Na flux from

medium to xylem was doubled by application of a hydrostatic pressure of 2 atm. around the roots. The flux was dependent on a maintained supply of Na in the medium, and was reduced by metabolic inhibitors to a passive flow. Metabolic inhibn. after the roots had been allowed to take up Na led to a large flux of Na into the xylem. Metabolism-facilitated processes also appeared to predominate in the flux of Ca to the xylem of *Ricinus*, but not in the flux through tomato roots.

I.D.J.Phillips

4837. RESOLUTION OF DUAL MECHANISMS OF POTASSIUM ABSORPTION BY BARLEY ROOTS. E.Epstein, D.W.Rains and O.E.Elzam: Proc. nat. Acad. Sci., Wash., 1963, 49, 684-692 (Dept. Soils and Plant Nutr., Univ. California, Davis, Calif., U.S.A.)

The relationship between the rates of absorption of K and Rb by barley roots and the concn. of these ions in the external soln. over the range 0.002 to 50mM, is predictable on the assumption that 2 carrier sites bind and transport the ions. One of these operates at half-max. velocity at a concn. of about 0.018mM, with very low affinity for Na, the 2nd at about 16mM, with severe competition by Na. The latter but not the former mechanism is inhibited when SO₄ is the anion instead of Cl.

J.R. Sargent

4838. ACCUMULATION OF Cs AND K, AND GROWTH OF BEAN PLANTS IN NUTRIENT SOLUTIONS AND SOILS. H.Nishita, D.Dixon and K.H.Larson: Plant and Soil, 1962, 17, 221-242. *Phaseolus vulgaris* (var.

Landreth) plants grown in nutrient soln. and soil were used to study the influence of Cs and K on the growth and uptake of K and ¹³⁷Cs and ¹³³Cs. ¹³⁷Cs uptake decreased with increasing concn. of K whilst K uptake increased. Application of ¹³³Cs increased plant uptake of ¹³⁷Cs. Ability of plants to discriminate between Cs and K varied with concn. of K and Cs. Cs was toxic to beans but the symptoms were different from K deficiency symptoms. Toxicity of Cs was alleviated by K. In the soils studied reduced plant yield occurred when Cs application was greater than 8% of the soil cation exchange capacity.

W.A.Stevens

4839. CALCIUM IN THE ROOT-HAIR WALL. R.G.H.Cormack, P.Lemay and G.A.Madachlan: J. exp. Bot., 1963, 14, 311-315 (Dept. Bot., Univ. Alberta, Canada) Seeds of white mustard, corn and tomato were treated with ⁴⁵CaCl₂ and allowed to develop in moist air. Bound ⁴⁵Ca was found by autoradiography to be present in walls of root-hair cells, with the greatest concn. at the base of the hair, except in the case of white mustard root-hairs where most radioactivity was detected at the tips.

LD.J.Phillips

4840. UPTAKE OF COPPER AND ITS PHYSIOLOGICAL EFFECTS ON CHLORELLA VULGARIS. K.A.Hassalk Physiol. Plant, 1963, 16, 323-332 (Dept. Physiol. Chem., Univ. Reading, Berks., England) Cu uptake was similar under aerobic and anaerobic conditions. A toxic effect was found under anaerobic conditions. Dead cells were found to absorb Cu very rapidly, but the total taken up was the same as when Cu itself kills die cells by prolonged anaerobic contact. Two thirds of Cu taken up is firmly retained by the cells. Glucose feeding conferred greater resistance to Cu. Measurements were made of die effect of Cu on P fraction* of the cells.

I.D.J.Phillips

4841. METHYL BROMIDE FOR INCREASING 131I UPTAKE BY PINE TREES. F.W. Woods, M.D.Ferrill and M.L. McCormack: Radiat. Bot., 1962, 2, 273-277 (Sch. Forestry, Duke Univ., Durham, N.C., U.S.A.)

EXPERIMENTAL BOTANY

Comparison of the uptake of 1311 by dead and live roots of Pinus taeda in soil sterilised by methyl bromide gas and in normal soil showed that uptake was greatest in dead roots in sterilised soil and least in live roots in normal soil.

J.R.Broome

4842. RADIOAUTOGRAPHIC STUDY OF 1311 FIXATION BY MARINE ALGAE. J.Roche and S.Andre: CH Soc. Biol., Paris, 1962, 156, 1968-1971 (Lab. de Biologie marine du Collège de France, Concarneau, France)

Uptake of 1311 added to sea water was studied in 9 spp. of marine algae by radioautography. Iodine was localised in various areas, in the thallus of higher algae and in the protoplasm of unicellular algae.

(French) M.A.Price

4843. THE SIGNIFICANCE OF CHEMICAL STIMULATION OF ABSORPTION OF [14c]GLUTAMIC ACID, 35SO4²⁻ AND 45Ca²⁺ BY DIONAEA MUSCIPULA. U.Littge: Naturwissenschaften, 1963, 50, 11 (Bot. Inst., Tech. Hochsch., Darmstadt, Germany)

The operation of the insectivorous glands was shown to stimulate the absorption of these substances.

(German) A.J.Wansbrough

4844. EFFECTS OF CHLORAMPHENICOL ON THE UPTAKE AND INCORPORATION OF AMINO ACIDS BY CARROT ROOT TISSUE. B.Jacoby and J.F.Sutcliffe: J. exp. Bot., 1962, 13, 335-347 (Dept. Bot., King's Coll., Univ. London, England)

Uptake of uniformly labelled L-[14c]glutamic acid, [14c]glycine and L-[14c]proline was inhib. by chloramphenicol [CHL] at a concn. of 2 g./l. L-glutamic acid uptake was affected to the greatest extent. 14c from the amino acids was incorporated into protein. The differential absorption of 14c into protein from different amino acids was studied, together with the effects of CHL upon this process. CHL w& also shown to inhibit net protein synthesis in carrot root slices in aerated soln. It is concluded that there are at least 2 mechanisms by which amino acids are incorporated into protein.

I. D.J.Phillips

NUTRIENT RELATIONS

4845. AN EXTERNAL EFFECT OF INORGANIC NITROGEN IN ROOT NODULATION. J.W.Tanner and I.C. Anderson: Nature, Lond., 1963, 198, 303-304 (Dept. Agronomy, Iowa St. Univ., Ames, Iowa, U.S.A.)

Addition of nitrate to Rhizobium spp. does not affect the conversion of tryptophan to IAA, but the IAA level is reduced owing to its destruction by nitrite formed from the nitrate. This result may partly explain the inhibn. of nodulation by combined N.

G.M.Lewis

4846. THE INFLUENCE OF NITROGEN ON THE FORMATION OF CHLOROPHYLL WITH SPECIAL REGARD TO A DIFFERENCE IN EFFECT BETWEEN NaNO₃ AND Ca(NO₃)₂. J.J.Lehr. J.M.Wybenga and J.A.Hoekendijk: Plant and Soil, 1962, 17, 68-86 (Plant Nutr. Res. Lab., Chilean Nitrate Agric. Serv., Wageningen, Netherlands)

The effect of N nutrition on spinach and wheat crops was studied by means of pot expt. Both crops nearly always gave greater chlorophyll per pot with NaNO₃ than with Ca(NO₃)₂. In Spinach the chlorophyll content per unit wt. was lower with NaNO₃ than Ca(NO₃)₂ owing to increase plant yield with NaNO₃. The ratio of

chlorophyll ^a to chlorophyll ^b varied with N level rather than with form of nitrate present. In young wheat leaves the chlorophyll to protein content ratio was 6*0:100 in 1958 and 5*7:100 in the 1959 expt. * W.A.Stevens

4847. DIFFERENCES BETWEEN NATURAL POPULATIONS OF TRIFOLIUM REPENS L. IN RESPONSE TO MINERAL NUTRIENTS. I. PHOSPHATE. R.W.Snaydon and A.D. Bradshaw: J. exp. Bot., 1962, 13, 422-434 (Dept. Agric. Bot., Univ. Coll. N. Wales, Bangor, Wales)

Natural local populations were collected from soil of different PO₄ contents, and transferred to sand culture. A marked correlation ($r = +0.96$) was found between response of populations to PO₄ at low PO₄ levels and the amount of PO₄ in the soil of origin. Populations also differed in response to very high levels of PO₄, and in the range of PO₄ levels tolerated. Populations tolerant of low PO₄ levels had higher concn. of P in the shoot material, and a higher uptake of P/unit wt. of roots, than did intolerant populations.

I.D.J.Phillips

4848. MANGANESE CONTENT OF MUSTARD LEAVES IN RELATION TO IRON AND MAJOR NUTRIENT

SUPPLY. P.C.Dekock and R.H.E.Inkson: Plant and Soil, 1962, 17, 183-190 (Macaulay Inst. Soil Res., Craigiebuckler, Aberdeen, Scotland)

Using Mustard plants grown in nutrient culture the ratios of MmFe, PsFe, and K:Ca in the leaves were shown to vary in the same way with changes in Fe concn. of the medium.. Cu showed similar inverse changes with Fe. The metabolic significance of these ratios is discussed.

W.A.Stevens

4849. A REVIEW OF CERTAIN ASPECTS OF SULPHUR AS A SOIL CONSTITUENT AND PLANT NUTRIENT. J.R.Freney, N.J. Barrow and K. Spencer: Plant and Soil, 1962, 17, 295-308 (Div. Plant Ind., C.S.I.R.O., Canberra, Australia)

Review. 126 ref. W.A.Stevens

PHOTOSYNTHESIS AND PHOTOSYNTHETIC PIGMENTS

4850. ON BICARBONATE UTILISATION BY MARINE PHYTOPLANKTON IN PHOTOSYNTHESIS. WITH A NOTE ON CARBAMINO CARBOXYLIC ACIDS AS A CARBON SOURCE. E.S.Nielsen: Physiol. Plant, 1963,

16, 466-469 (Bot. Dept., Royal Danish Sch. Pharm., Copenhagen, Denmark)

A critical review of the nature of the carbon source utilised in photosynthesis by marine phytoplankton. It is concluded that there is no evidence for the utilisation of either the bicarbonate ion, or the carbamino complex of alanine in preference to inorg. forms of CO₂.

D.J.Phillips

4851. EFFECT OF LIGHT QUALITY ON THE PRODUCTS OF PHOTOSYNTHESIS IN GREEN AND BLUE-GREEN ALGAE. AND IN PHOTOSYNTHETIC BACTERIA.

A.H.W.Hauschild, C.D.Nelson and G.Krotkov: Canad. J. Bot., 1962, 40, 1619-1630 (Dept. Biol., Queen's Univ., Kingston, Ont., Canada)

The effect of light quality on the products of photosynthesis was studied in Chlorella pyrenoidosa, Scenedesmus acuminatus, Microcystis aeruginosa and Chromatium sp. The test organism was placed in U4c]bicarbonate and illuminated with red, red plus supplementary blue, blue or white light.

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¹⁴O distribution was determined after 30 min. by paper chromatography and autoradiography. After a dark pre-treatment blue light increased the distribution of ¹⁴C in aspartic and glutaric acids in Chlorella, Scenedesmus and Microcystis. The results suggest that the nature of the effect of blue light is the same in all these organisms. No effect of light quality was observed in Chromatium.

A.Meany

4852. EFFECT OF FLASHING LIGHT ON PLANT GROWTH RATE. M.H.Dickson and S.E.Chua: Nature, Lond., 1963, 198, 305 (Dept. Hort., Ontario Agric Coll., Guelph, Ont., Canada) Max. growth rate of Lemna minor as measured by increase in dry wt. occurred at a Ught flash rate of 0.004 sec.; this was 4 times as great as the growth at 2 min. exposure and nearly twice as fast as 12 hr. light periods. G.M.Lewis

4853. EFFECT OF ISONICOTINYL HYDRAZIDE ON PHOTOSYNTHETIC INCORPORATION OF RADIOACTIVE CO₂ INTO ETHANOL-SOLUBLE COMPOUNDS OF CHLORELLA. G.G.Pritchard, C.P.Whittingham and W.J.Griffin: J. exp. Bot., 1963, 14, 281-289 (Dept. Bot., Queen Mary Coll., Univ. London, England) Treatment with the compound caused an increase in radioactivity in sucrose, glycollic acid and glycine, and decreased radioactivity in sugar monophosphates, serine and alanine. An unidentified strongly radioactive compound was present in INH-treated cells following short-term exposure to ¹⁴CO₂. I.D.J.Phillips

4854. CARBON DIOXIDE ASSIMILATION OF OCHROMONAS MALHAMENSIS DURING THIAMINE AND BIOTIN DEFICIENCY. II. PHOTOSYNTHESIS. H.Kauss and O.Kandlen Arch. Mikrobiol., 1963, 44, 406-420 (Inst. Angewandte Bot. der T.H., MUNCHEN, Germany) Photosynthesis is much reduced in thiamine deficient cells caused by decreased reduction of fixed CO₂ and inhibn. of the pentosephosphate cycle due to inactivation of transketolase. Biotin does not form the active group of a CO₂ activating enzyme for the carboxylation of ribulose-diphosphate. Heterotrophic and autotrophic CO₂ assimilation is not disturbed by vit. B12 deficiency.

(German) E.M.Ling

4855. SPECTRAL CHANGES OF CHLOROPLAST PIGMENTS IN RELATION TO OXYGEN, LIGHT AND SUBSTRATES. H.Lundegardh: Physiol. Plant, 1963, 16, 442-453. The absorption spectrum of chlorophasts showed neg. bonds at 500, 640, 554, 562-564 and 700 m/f. The first 2 have not been previously found. Quant. changes in the chlorophyll spectrum were found under various conditions. The new neg. band at 500 m/f attributed to carotenoids, and was strongly influenced by V variations in the steady state NADP ^ NADPH₂. The new band at 640 m/f was preferentially influenced by the steady state ADP + PO₄ ^ ATP. The spectrum of chlorophyll %U &, but not of chlorophyll f, was influenced by O₂. I.D.J.Phillips

4856. THE EFFECT OF AGE AND VARIOUS CHEMICALS ON THE LAG PHASE OF CHLOROPHYLL SYNTHESIS IN DARK GROWN BEAN SEEDLINGS. E.C.Sisler and W.H.Klein: Physiol. Plant, 1963, 16, 315-322 (Divn. Radiation and Organisms, Smithsonian Inst., Washington, D.C., U.S.A.) A lag phase occurred only after bean plants were 6 days old. Chlorophyll-synthesis in etiolated plants responded to the red-far red photoreceptor. Infiltration of leaves with 6-aminolaevulinic acid removed the S phase, and this effect was not increased by prior treatment with red light. LDJ.Phillips

4857. THE TIME COURSE FOR THE PHOTOCOMVERSION OF PROTOCHLOROPHYLL BY FLASH ILLUMINATION. A.Madsen: Physiol. Plant, 1963, 16, 470-473 (Dept. Plant Biol., Carnegie Inst. Washington, Stanford, Calif., U.S.A.) Chlorophyll formation from protochlorophyll in intact etiolated leaves was measured as the increase in absorption at 680 mp. The conversion was complete within 4 millisecl. after the beginning of a 1-millisecl illumination. Lowering the temp. had no measurable effect on the rate. In protochlorophyll-holochrome prep, the change in absorption was completed during 1 millisecl. illumination. I.D.J.Phillips

RESPIRATION

4858. OXYGEN ELECTRODE MEASUREMENTS OF POTATO SLICE RESPIRATION AT 0°. I.R.Macdonald and G.G.Laties: J. exp. Bot., 1962, 13, 435-442 (Dept. Plant Biochem., Univ. California, Los Angeles, Calif., U.S.A.) On transference from 27° to (f, a drop in respiration rate to approx. 10% of the rate at 24° occurred within 2 or 3 min. I.D.J.Phillips

4859. WATER CONTENT AND RESPIRATION RATE OF BEAN COTYLEDON. H.Opik and E.W.Simon: J. exp. Bot., 1963, 14, 299-310 (Dept. Bot., Univ. Manchester, England) The course of water uptake and respiration rate rise in cotyledons of Phaseolus vulgaris was found to be divided into 3 phases. In the first phase (10-16 hr. long) respiration rate was controlled by water content. This was followed by a second phase (3-8 hr. long) in which there was a pause in water uptake and in respiration rate rise. Subsequently there occurred a third phase (up to the 5th day) of rising respiration rate and metabolic activity. LD.J.Phillips

4860. THE MOVEMENT OF ¹⁴O₂ THROUGH BARLEY AND RICE PLANTS. D.A.Barber, M.Ebert and N.T.S. Evans: J. exp. Bot., 1962, 13, 397-403 (A.R.C., Radiobiol. Lab., Letcombe Regis, Wantage, Berks., England) The kinetics of movement of I&O₂ from shoot to root in rice and barley plants, are consistent with gaseous diffusion through continuous gas spaces. The size of the gas spaces in barley roots is considerably smaller than in rice roots. I.D.J.Phillips

METABOLISM

4861. METABOLISM OF ETHANOL IN GERMINATING PEA SEEDLINGS. E.A.Cossins and E.R.Turner: J. exp. Bot., 1963, 14, 290-298 (Chelsea Coll. Sci. and Technol., London, England) Several factors indicated oxidative degradation of ethanol during germination. Feeding ethanol to pea-cotyledon slices led to the formation of acetaldehyde and interconversion of acetaldehyde and acetone. Feeding with [14C]ethanol gave similar results, and confirmed the observations made on intact germinating pea seedlings. LD.J.Phillips

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4862. ENZYMES OF GLYOXYLATE CYCLE IN CHLORELLA VULGARIS. PJ.Syrett, MJ.Merrett and S.M. Bocks: *J. exp. Bot.*, 1963, 14, 249-264 (Bot. Dept., Univ. Coll., London, England) The detection and assay of the enzymes of the glyoxylate cycle in *Chlorella* are described. Activity of the enzymes in cells grown on acetate was approx. adequate to account for the rate of growth with acetate as the sole C source. Activities of some of the enzymes were affected by incubation with acetate, but not with glucose, or CO₂ under illumination.

I.D.J.Phillips

4863. THE UPTAKE OF CO₂ BY PLANT ROOTS.

M.C.Stemmet. J.A.De Bruyn and P.B.Zeeman: *Plant and Soil.* 1962, 17, 357-364 (Merensky Inst. Physics, Univ. Stellenbosch, S. Africa) The uptake of ¹⁴CO₂ by the roots of intact tomato plants from soln. containing Na₂¹⁴CC₃ was studied at different light intensities and darkness. Plants starved of CO₂ for 12 hr. showed a higher rate of ¹⁴C uptake than plants transferred directly from the soil. ¹⁴C was generally found in higher concn. in roots than shoots. At light intensities under the compensation point and in darkness ¹⁴C content of shoot relative to the roots decreased. This was accompanied by release of ¹⁴CO₂ during respiration, indicating that the absorbed ¹⁴C was translocated upwards and released as ¹⁴CO₂. No such release of ¹⁴CO₂ occurred at light intensities above the compensation point. W.A.Stevens

4864. STUDIES OF STOMATAL MOVEMENT OF CRASSULACEAN PLANTS IN RELATION TO THE ACID METABOLISM. K.Nishida: *Physiol. Plant.* 1963, 16, 281-298 (Bot. Inst.. Fac. Sci., Univ. Kanazawa, Japan) Light and temp. affected both stomatal opening and level of org. acids. CO₂ was absorbed during darkness by guard cells. Expt. measuring starch contents, pH and osmotic values of the guard cells were performed.

LDJ.Phillips

4865. CHANGE OF PHYTOL INTO CHLOROPHYLL *a* IN CHLORELLA VULGARIS. L.Bianco, E.Lazzarini and P.Paris: *Nature*, Lond., 1963, 197, 1219-1220 (Centro Studi Nucleari Enrico Fermi, Politecnico, Milan, Italy) During incubation of *C. vulgaris* with [14C]glycine, the sp. activity of chlorophyll, pheophorbide and phytol was followed. It is suggested from the data that at least 3 sources of ¹⁴C contribute to the phytol.

G.M.Lewis

4866. AROMATIC BIOSYNTHESIS IN HIGHER PLANTS. IV. THE DISTRIBUTION OF DEHYDROSHIKIMIC REDUCTASE AND DEHYDROQUINASE. D.Balinsky and D.D.Davies: *J. exp. Bot.*, 1962, 13, 414-421 (Dept. Bot., King's Coll., London, England) Dehydroshikimic reductase and dehydroquinase occurred mainly in the supernatant fraction of cauliflower buds. In pea epicotyls 30% of the reductase activity was associated with the mitochondria. Synthesis of both enzymes occurred in roots, shoots and cotyledons of germinating pea seedlings over 8 days, and were found to be present in a variety of plant materials.

LDJ.Phillips

TRANS LOCATION

4867. ROOT-EXUDATION STUDIES ON THE EXCHANGE OF ¹⁴C-LABELLED ORGANIC SUBSTANCES BETWEEN THE ROOTS AND SHOOTS OF THE NODULATED

LEGUMES. J.S.Pate: *Plant and Soil.* 1962, 17, 333-356 (Dept. Bot., Queen's Univ., Belfast, N. Ireland) Using *Pisum sativum* L. daily progress of root exudation was followed with samples taken at 1-21 hr. intervals. A pronounced 24 hr. rhythm was exhibited with max. cation and amino acid output from 10 a.m. to noon and at midnight. Changes in individual amino acids were recorded. ¹⁴CO₂ feeding expt. were conducted on minus N sand cultures. Heavy labelling of exudate was recorded where plant tops were excised after 1-1½ hr. of photosynthesis in 20-100 /μc ¹⁴CO₂ per plant. Minor exudates failed to show ¹⁴C in samples collected up to 30 hr. after excision of labelled tops. Similar results were obtained with purple vetch (*Vicia sativa* Desf.).

W.A.Stevens

GROWTH AND DEVELOPMENT

(GENERAL)

4868. STUDY OF PHYSIOLOGICAL ROLE OF DIFFERENT LEAVES OF WHEAT STEM AND THEIR RELATIVE IMPORTANCE. M.J.Carles: *Rev. gen. Bot.*, 1963, 70, 258-265 (Lab. Physiol. Veg. Inst. Catholique de Toulouse, Toulouse, France) The wt. of plants, length of stem, sugar, protein, sol. N and mineral elements were determined 4 days and 1 month after removal of the leaf lamina. The reduction in dry wt. and sugar concn. is related to the reduction in photosynthesis which also modifies the C/N ratio. (French) C.W.Smith

4869. DYNAMICS OF GROWTH AND DEVELOPMENT IN SPRING WHEAT. P.Strebeyko, M.Wislocka and T.Krzywacka: *Physiol. Plant.* 1963, 16, 359-367 (Dept. Plant Physiol., Univ. Warsaw, Poland) Dry wt. increases of leaves, roots and stems were determined. The assimilating surface area was recorded at intervals. O₂ uptake of detached leaves was measured, and photographic records made of growing point and ear development. The short period of leaf activity appeared to be the main limiting factor in wheat growth.

LDJ.Phillips

4870. GROWTH AND DEVELOPMENT IN THE YOUNG TOMATO. I. THE EFFECT OF TEMPERATURE AND LIGHT INTENSITY ON GROWTH OF THE SHOOT APEX AND LEAF PRIMORDIA. II. THE EFFECT OF DEFOLIATION ON THE DEVELOPMENT OF THE SHOOT APEX. G.Hussey: *J. exp. Bot.*, 1963, 14, 316-325, 326-333 (J.Innes Inst., Bayfordbury, Herts., England) I. The shoot apex enlargement rate increased with light intensity, but apical enlargement was delayed at higher temp., the delay being longer the lower the light intensity. The rates of leaf formation and leaf growth increased with both temp. and light intensity.

II. Removal of the first 2 leaves during early vegetative growth counteracted the effect of high temp. on shoot apex enlargement and leaf formation. Growth analysis results suggest that the first 2 leaves compete with the apex for supplies of assimilate.

I.D.J.Phillips

4871. EFFECT OF LIGHT ON GROWTH OF SPORELINGS OF INTERTIDAL RED ALGA PLUMARIA ELEGANS (BONNEM.) SCHM. A.D.Boney: *J. mar. biol. Ass. U.K.*, 1962, 42, 65-92 (Dept. Chem. and Biol., Tech. Coll., Plymouth, England) Sporelings of *P. elegans*.

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grown under continuous illumination from a fluorescent tube show a max. rate of cell production at a light energy flux of 10 ergs./sec.^{ymm.2} in the range 380-720 mji. Growth of the sporelings is much increased when they are screened from the light sources by weak soln. of phycoerythrin extracted from the adult plant. A similar result is obtained by replacing the phycoerythrin with an equiv. concn. of Eosin Yellow.

P.J. Baron

4872. PHYSIOLOGICAL AND BIOCHEMICAL STUDIES ON NITROGEN FIXATION BY BLUE-GREEN ALGAE. EI. GROWTH AND NITROGEN FIXATION OF *NOSTOC COMMUNE* AS INFLUENCED BY CULTURE CONDITIONS. E.E.M.Taha and A.M.H.EI Refai: Arch. Mikrobiol., 1983, 44, 356-365 (Microbiol. and Enzyme Chem. Res. Unit, Nat. Res. Centre, Cairo, U.A.R.) Optimum growth and N fixation of a local strain of *N. commune* was at pH 7[#]0-8[#]0, at 30-35° and at a light intensity of 6000 lux. E.M.Ling

4873. THE EFFECTS OF RNase ON THE GROWTH OF PEA ROOTS. M.M.Yeoman: J. exp. Bot., 1962, 13, 390-396 (Dept. Bot., Univ. Edinburgh, Scotland) RNase suppressed growth of cultured roots and changed the rate of extension of excised root segments. The enzyme also lowered the RNA content of the tissues.

L.D.J.Phillips

4874. CHEMICAL INDUCTION OF POLYEMBRYONY IN ANETHUM GRAVEOLENS L. B.M.Johri and C.B.Sehgak Naturwissenschaften, 1963, 50, 47-48 (Dept. Bot., Univ., Delhi, India) Polld. ovaries were cultured in vitro. Polyembryony could be induced by casein hydrolysate or yeast extract with or without IAA.

A.J.Wansbrough

*875. EFFECT OF FRUITING ON THE PHENOMENA OF HISTOGENESIS IN THE AUBERGINE AND THE TOMATO. J.L.Bonnemain: C.R. Acad. Sci., Paris, 1962, 255, 347-349 (Lab. Biol. veg., Coll. Sci. Univ., Limoges, France) In the aubergine and tomato fruiting produces a great acceleration in the ^{total} activity of the cells edging the internal phloem ^{islands} between the fruit and main stalk. A supernumerary system eventually develops. Removal of the flower events these changes. Infusion of 10⁻⁶ M IAA into the stalk produces identical effects at the level of infusion.

S.A.Thistlewood

**876. DEVELOPMENT OF ZOOSPORANGIUM AND LIBERATION OF ZOOSPORES IN ACHLYA APLANES VAR. INDICA. R-Dayal: Cytologia, 1961, 26, 372-377 (Dept. Bot., C.M.P. Degree Coll., Allahabad, India) Four stages in sporangial development were recognized. The liberated 'zoospores' release their contents to form secondary 'zoospores' which germinate by ^{ter}m-tubes. No motile stages are present. C.A.Stace

GROWTH SUBSTANCES

⁸^ THE EFFECT OF LIGHT ON THE UPTAKE AND TRANSPORT OF INDOLEACETIC ACID IN THE GREEN STEM OF PEA. K.V.Thimann and LF.Wardlaw: J.Physiol. Plant, 1963, 16, 368-377 (Harvard Biol. Lab., Cambridge, Mass., U.S.A.) High intensity light markedly promoted uptake of [14c]IAA by green Alaska stem segments, and also increased anti-polar move-

ment of IAA. Light had only a small effect on normal polar auxin transport. The action of light recorded was dependent on high light intensity and the presence of chlorophyll, and was not imitated by applied sugars. Active regions were in both red and blue wavelengths. The effect was restricted to the illuminated zone and not transported to adjacent darkened tissue. I.D.J.Phillips

4878. METABOLISM OF SOME INDOLE AUXINS IN EXCISED TOMATO ROOTS. D.A.Thurman and H.E. Street J. exp. Bot., 1982, 13, 369-377 (Dept. Bot., Univ. Coll., Swansea, Wales) Metabolic products of IAA were indolylacetylaspartic acid (IAAAsp.) and possibly indolylacetylglutamic acid. Little 'free' IAA remained in the tissue. A further unidentified substance reacting pink with nitric-nitrate reagent was formed. Further metabolism of these products occurred on transference to an IAA-free medium. IAA and IAAAsp. were inhibitory to excised root growth. No interconversion of IAA and indole-3-acetonitrile [IAN] was found. IAN-feeding caused accumulation of IAN and appearance of indolyl-carboxylic acid [ICA]. IAN was, and ICA was not, inhibitory to root growth. Excised tomato and wheat roots responded very differently to feeding with L-tryptophan, but in neither case was there evidence of conversion to ethyl-acetate-sol. auxins.

L.D.J.Phillips

4879. STUDIES OF THE GROWTH IN CULTURE OF EXCISED WHEAT ROOTS. IV. THE ACTIVATION OF DL-TRYPTOPHAN BY AUTOCLAVING. J.E.Carter and H.E.Street: Physiol. Plant, 1963, 16, 347-358 (Dept. Bot., Univ. Coll., Swansea, Wales) Two substances, one of which was IAA and the other unknown, were derived from tryptophan by autoclaving. Autoclaved tryptophan, but not unheated tryptophan, and also the unidentified substance alone enhanced lateral no., lateral length and dry wt. of excised wheat roots. IAA was, according to its concn., either without effect or inhibitory to extension growth and lat. emergence. IAA at 0*025-0*05 mg./l. plus unheated tryptophan at 50 mg./l. reproduced the effects of autoclaved tryptophan.

L.D.J.Phillips

4880. ACTION OF 2,3,5-TRIODOBENZOIC ACID [TIBA] AND GLUTATHIONE ON THE MORPHOLOGY AND AUXIN DESTRUCTION IN TISSUES CULTIVATED IN VITRO. P.E.Pilec Physiol. Plant, 1963, 16, 299-310 (Lab. Physiol. veg., Univ. Lausanne, Switzerland) Glutathione and TIBA caused sp. types of growth in tissue cultures of carrot. The effectiveness of glutathione in producing its effect was reduced by TIBA. Both compounds actively inhibited IAA-oxidase, in both *in vivo* and *in vitro* expt. The extent of TIBA-induced inhibn. of IAA-oxidase prep., was greater with higher levels of oxidase activity. TIBA caused a change in the distribution of IAA-oxidase activity within the tissues.

(French) I. D. J.Phillips

4881. SYNTHESIS OF GIBBERELLIN-LIKE SUBSTANCES IN MATTHIOLA INCANA UNDER DIFFERENT TEMPERATURE CONDITIONS. P.K.Biswas and M.N.Rogers: Physiol. Plant, 1963, 16, 311-314 (Dept. Hort., Univ. Missouri, Columbia, Mo., U.S.A.) The concn. of gibberellin-like substances in 2 varieties of *M. incana* were similar after 7 and 12 days cold treatment. Gibberellin levels increased from the end of the cold period up to flowering time. No such change was recorded in plants kept continuously at high temp. Spray-treatment with gibberellic acid increased the internal concn. of gibberellin in both varieties tested, and induced flowering in one.

L.D.J.Phillips

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4882. PRESENCE OF GIBBERELLINS IN EXCISED TOMATO ROOTS. D.N.Butcher. J. exp. Bot., 1963, 14, 272-280 (Dept. Bot., Univ. Coll., Swansea, Wales)

Gibberellin-like substances were detected by dwarf-pea and dwarf-maize bioassays in extracts of excised tomato roots. The chromatographic behaviour of the most active zone was similar to that of Gibberellin-A₁. Expt. using d-i and d-5 mutants of maize failed to reveal the presence of substances with differential effects on these 2 mutants.

I.D.J.Phillips

4883. GIBBERELLIN ACTIVITY OF STEVIOLE, A PLANT TERPENOID. M.Ruddat and A.Lang: Naturwissenschaften, 1963, 50, 23 (Divn. Biol., California Inst. Technol., Pasadena, Calif., U.S.A.) Stevole (10 µg./plant) gave the same reaction with the d-5 dwarf maize as did 0.1 µg. gibberellin A₃. AJ.Wansbrough

4884. THE EFFECT OF GIBBERELLIN A AND PHENYL-BORIC ACID [PBA] ON XYLEM DIFFERENTIATION AND EPIDERMAL CELL ELONGATION IN BEAN ROOTS. C.Odhnoff: Physiol. Plant, 1963, 16, 474-483

(Princeton Univ., Princeton, N.J., U.S.A.) GA₃ produced shortening of the meristematic zone, a small decrease in cell no. and slightly shorter roots. PBA stim. root elongation and epidermal cell elongation, and slightly stim. cell division. GA₃ stim. xylem formation, but PBA inhib. this process. The interactions of GA₃ and PBA were studied in this system.

I.D.J.Phillips

4885. USE OF KININ IN BREAKING REST IN BUDS OF VITIS VINIFERA. R.J. Weaver: Nature, Lond., 1963, 198, 207-208 (Dept. Viticul., Univ. California, Davis, Calif., U.S.A.) A kinin [benzyladenine] at 1000 p.p.m. broke the rest of dormant grape buds.

G.M.Lewis

4886. BETAINE: A PLANT GROWTH SUBSTANCE FROM SUGAR-BEET [BETA VULGARIS]. A.W.Wheeler: J. exp. Bot., 1963, 14, 265-271 (Rothamsted Expt. Stn., Harpenden, Herts., England)

Chromatographic and colorimetric evidence indicated presence of betaine in sugar-beet seed balls, leaves and roots. This substance inhib. growth of dwarf French bean leaf discs, promoted growth of wheat coleoptile-sections and cress hypocotyls, and inhib. growth of cress roots. Cress germination was unaffected by water-sol. betaine, but was inhib. by ethyl acetate fractions of the extracts.

I.D.J.Phillips

4887. EFFECTS OF 2,2-DICHLOROPROPIONIC [DALAPON], TRICHLOROACETIC AND 2,3-DICHLOROISOBUTYRIC [DCIB] ACIDS ON SYNTHESIS OF ANTHOCYANIN IN FLOWERS OF SALVIA SPLENDENS CULTIVAR AMEPICA. S.Asen, L.J.Jansen and J.L.Hilton: Nature, Lond., 1963, 198, 185-186 (Crops Res. Divn., Agric. Res. Serv., U.S.D.A., Beltsville, Md., U.S.A.)

Foliar applications of aq. sprays of the herbicides 'Dalapon', TCA and DCIB reduced synthesis of anthocyanins in flowers of S. splendens. The colour of the flowers on plants grown from seeds of the treated plants was normal.

G.M.Lewis

4888. STUDIES ON FOLIAR PENETRATION. I. FACTORS CONTROLLING THE ENTRY OF 2,4-DICHLOROPHOXYACETIC ACID. J.A.Sargent and G.E.Blackman: J. exp. Bot., 1962, 13, 348-368 (A.R.C. Unit Expt. Agronomy, Dept. Agric., Univ. Oxford, England)

Leaf discs of Phaseolus vulgaris and Coleus blumei were used in a study of the uptake of [¹⁴C]2,4-D. The effects of leaf age, temp., surfactant agent, pH, light,

stomatal densities, IAA and triiodobenzoic acid upon uptake of 2,4-D were measured.

I.D.J.Phillips

4889. THE TOXIC EFFECT OF CHLORINATED PHENOXY-ACETIC ACIDS ON ASPEN. L.Eliasson: Physiol. Plant, 1963, 16, 255-268 (Coll. Forestry, Stockholm, Sweden)

Rooted cuttings growing in nutrient medium were treated with various synthetic auxins at several concn. and the effects on shoot growth, and their toxicity investigated, as well as on transpiration.

I.D.J.Phillips

4890. OBSERVATION ON ACTION ON TRIMETHYL-P-CHLOROETHYLAMMONIUM CHLORIDE [CCC] ON PLANTS. I. LEMNA MINOR, CHLORELLA PYRENOIDOSA AND RICCIJA FLUITANS L. II. WHEAT, CARROT, BEET. J.H.Supniewska: Bull. Acad. pol. Sci., 1963, 11, 149-154, 155-159 (Inst. Pharmacol., Cracow Polish Acad. Sci., Poland)

I. The most highly organised of the 3 aquatic plants studied, L. minor was found to be the most sensitive to the action of CCC, being killed at concn. of 6×10^{-2} to 6×10^{-4} M, and deformed at concn. of 6×10^{-5} to 6×10^{-6} M. In the highly cone. soln. the plants first exhibited deeper colouration indicating higher chlorophyll content, and later the fronds became etiolated. Chlorella grew at all concn. of CCC which were investigated while Riccia was intermediate in behaviour between Chlorella and L. minor.

II. Carrot root growth was promoted by 10^{-3} to 10^{-5} M CCC. More cone. soln. (10^{-2} to 10^{-3} M) inhib. the growth of wheat, red beet and carrot plants, producing smaller and more intensely coloured plants.

E. Parkinson

DORMANCY AND GERMINATION

4891. GROWTH AND DORMANCY IN LUNULARIA CRUCIATA (L) DUM. E. THE RESPONSE TO DAY-LENGTH AND TEMPERATURE. W.W.Schwabe and S.Nachmy-Bascomb: J. exp. Bot., 1963, 14, 353-378 (A.R.C. Unit Plant Morphogenesis, Wye Coll., Kent, England)

In the Israel strain of Lunularia, long day treatment induced dormancy whilst short day breaks it. Photoperiod perception occurred in all regions of the thallus. Temp. interacted strongly with photoperiod. Rinsing apparently removed some of the inhibitory factor formed under long day. Drought resistance was improved by dormancy-inducing treatments.

I.D.J.Phillips

4892. DORMANCY STUDIES IN SEED OF AVENA FÄTUAIE. A RELATIONSHIP BETWEEN MALTASE, AMYLASES AND GIBBERELLIN. G.M.Simpson and J.M. Naylon: Canad. J. Bot., 1962, 40, 1659-1673 (Dept. Crop Sci., Univ. Saskatchewan, Saskatoon, Sask., Canada)

Germination of excised embryos requires an exogenous energy source. Dormant and non-dormant seeds contain similar amounts of a- and 3-amylase but hydrolysis of starch in dormant seeds is blocked. Alone or in combination the amylases are unable to break down raw starch granules to sugars in vitro. Exogenous maltase in combination with (X-amylase hydrolyses raw starch to glucose. Examination of the maltase content of imbibed dormant and non-dormant seeds showed a marked increase in non-dormant seeds during the first 40 hr. GA-treatment of dormancy caryopses enhances maltase activity.

A.Meany

4893. STUDY OF FACTORS DETERMINING GERMINATION OF SEEDS OF LYTHRUM SALICARIA. P.RolIn and Y.Bidault: Photochem. Phorobiol., 1963, 2, 59-71 (Lab. Physiol. Vegetale, Sorbonne, Paris, France) These expt. have shown that there exist 2 Independent Processes in the germination of seeds of *L. salicaria*. One is a heat-dependent process in which germination only takes place in the dark if there is an alternation of temp. The other is a light dependent process. Light red light stimulates germination while dark red light counteracts this stimn. Gibberellic acid sensitises the seeds to the action of light red light. (French) G.C.Barr

4894. DEPRESSION OF GERMINATION IN CEREALS TREATED WITH SEVERE CENTRIFUGAL FORCE. E.D.Dodson and C.K.Yu: Canad. J. Bot., 1962, 40, 1714-1717 (Dept.Expt.Med., Baylor Univ., Houston, Tex.. U.S.A.) A note. A.Meany

4895. GERMINATION OF MELAMPYRUM LINEARE SEED. H.Zalasky: Canad. J. Bot., 1962, 40, 1713-1714 (Contribution No. 881, Forest Entomol. and Patriot Branch, Depr. Forestry, Ottawa, Ont., Canada)

A note. A.Meany

4896. EFFECT OF KANAMYCIN ON THE GERMINATION OF POTATO TUBERS. B.Monruella C.R. Acad. Sci., Paris, 1963, 255, 353-354 (Inst. Bot., Lille, France) *Saskia* potatoes were completely immersed in 1% aq. kanamycin in soli?, for 1, 2, 3 or 4 days. No germination occurred after over 80 days at room temp. Bintje potatoes were immersed for 1, 2 or 4 days in 0-005, 0-01, 0*02, 0*03, 0*05, O'1, 0*2, 0-5 or 1% kanamycin and kept days at room temp. Germination occurred only in those kept 1 day at 0'005, 0-01 or 0-02% or 2 days at 005%. To avoid the effects of soaking sections of Bintje potatoes were placed with the cut surface in a little *•fcramycin soln-* Germination was reduced or stopped when it had already started. (French) S.A.Thistlewood

4897. THE EFFECT OF VARIOUS BORON COMPOUNDS ON IN VITRO GERMINATION OF POLLEN. R-G.Stanley and E.A.Lichtenberg: Physiol. Plant., 1963, 16, 337-346 (Inst. Forest Genet., Pacific 5.W. Expt. Sm., U.S. Forest Service, Berkeley, Calif., U.S.A.) The ability of different org. and inorg. forms of B to modify *V* of *Amaryllis hybrida* and *Pyrus communis* (Banlett¹) in vitro was studied. The compounds studied were, *aM*, *oora*te> borax, boric acid, potassium tetraborate, Q phenyl borate. Depending on concn. all compounds **•* pollen germination and growth. Amaryllis and pear pollen exhibit different responses to the compounds. Pine *xin* *asQr^ed unequal amounts of B from different B* *Cre*. The effects of the compounds on pollen respiration determined. I.D.J.Phillips

chronic ionising radiation of low Intensity (3-15 r/20 hr. day) for several yr. In *Pinus* there was a decrease in cone length with increase in radiation accumulated by the trees, and also a decrease in seed germination and seedling height for plants grown from irradiated cones. Visually detectable abberations in floral morphology were present only in *Q. alba* receiving 6-12 r/day, but internal abnormalities in acorn morphology were observed in all *Quercus* spp. for levels above approx. 4 r/day.

J.R.Broome

4899. EFFECTS OF IONISING RADIATION ON A NATURAL PLANT COMMUNITY. J-CMcCormick and R.B.Piatc Radiat. Bot., 1962, 2, 161-168 (Vanderbilt Univ., Nashville, Tenn., U.S.A.) An 'island community' of spring and summer annuals transplanted from a granite outcrop to a γ -radiation field received ionising radiation along a gradient ranging from 8000 to 130000 r at rates of 5-82 r/hr. from March to August. Ecological analyses over 3 yr. indicated that ionising radiation has both stimulatory and inhibitory effects upon plant growth and survival and that these effects were reflected by sp. interactions at the community level. Results of autoecological studies indicated that the physiol. tolerances of all spp. usually varied inversely with the level of radiation received,

J.R.Broome

4900. CUMULATIVE RADIATION DAMAGE IN OAK TREES. L.W.Mericlc, R.P.Mericle and A.H.Sparrow: RadUt. Bot., 1962, 2, 265-271 (Biol. Dept., Brookhaven Nat. Lab., Upton, N.Y., U.S.A.) *Quercus alb?* and *Q. coccinea* were exposed to 7*19 r/day for 20 hr./day for 2184 days, giving a total cumulative dose of 16000 r. Gross effects included sparseness of foliage, shorter internodes, and the leaves were fewer in no., enlarged and distorted in shape. Hiszol. effects included inhibn. of formation and development of apical meristems, inter-nodal elongation and viable pollen. The oaks were more radiation resistant than trees of *Pinus nigra* growing in the same area.

J.R.Broome

4901. EFFECTS OF ACUTE γ -RADIATION ON GROWTH AND MORPHOLOGY IN PINUS MONOPHYLLA TORR. AND FREM. (PINION PINE). M.K.Brandenburg, ILL. Mills, W.H.Rickard and L.M.Shields: Radiat. Bot., 1962, 2, 251-263 (Dept. Biol., New Mexico Highlands Univ., Las Vegas, N. Mex., U.S.A.) A young mature pinyon pine was exposed from a position near the base for 8 hr. to a ^{60}Co source, the dosage ranging from approx. 2000 r one foot from the source to 5"1 r thirteen feet from the source. All tissue exposed to above approx. 1300 r was killed within 4 months. The actively growing regions of the stem were killed by approx. 600 r, and below 500 r terminal bud inhibited. or death subsequent to stem elongation was accompanied by development of lateral (dormant) buds which assume a significant role in shoot recovery.

J.R.Broome

4902. EFFECT OF CAESIUM 137 V-RADIATION ON PLANT GROWTH AND FLOWER COLOUR OF GREEN-HOUSE CHRYSANTHEMUM VARIETIES. G.M.Weaver: Canad. J. Genet. Cytol., 1963, 5, 73-82 (Canada Dept. Agric. Res. Stat., Harrow, Ont., Canada) Chronic exposure of some colour varieties of the Indianapolis series of chrysanthemums resulted in growth stimn. at dose rates from 1*9 ID 5*7 r per hr. The freq. and direction of colour changes following irradiation provides evidence for the genetic nature of the chimaeral tissue relationship in pink, white and bronze flowers,

D.A.Jones

RADIATION EFFECTS

4898. LOW LEVEL CHRONIC V-IRRADIATION OF AITCH PINE-OAK FOREST. ITS PHYSIOLOGICAL AND GENETICAL EFFECTS ON SEXUAL REPRODUCTION. F.Meier and G.R.Staira: Radiat. Bot., 1962, 2, 205-216 (Yale Univ., Sch. Forestry, New Haven, Conn., U.S.A.) *Pinus nigra* and *Quercus* spp. trees received



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4903. ROLE OF THE QUIESCENT CENTRE IN THE RECOVERY OF VICIA FABA ROOTS FROM RADIATION. E.J.Hall, L.G.Lajtha and F.A.L.Clowes: Radiat. Bot., 1962, 2, 189-194 (Physics and Radiobiol. Lab., Radiotherapy Dept., Churchill Hosp., Oxford, England) Bean roots were exposed to a dose of 360 rad. and those which recovered were irradiated a second time with 100 to 200 rad. In a second expt. roots were irradiated either aerobically with 360 rad. or anaerobically with 1000 rad. The cells from which recovery takes place do not appear to be protected by anoxia in normal roots; also the progeny of these cells have the same radiosensitivity as normal meristems. This evidence does not exclude the possibility that cells of the quiescent centre are highly protected by some other means. J.R.Broome

PLANT CONSTITUENTS

4904. CHEMICAL STUDIES ON TAXONOMY OF HYPERICUM SPECIES. C.Mathis and G.Ourisson: Phytochemistry, 1963, 2, 157-171 (Fac Pharm., Strasbourg, France) The distribution of hypericin in 200 spp. of Hypericum has been studied by classical methods in conjunction with a new technique which involves 'printing*' on chromatographic paper. This technique has been used successfully on specimens up to 120 yr. old. Almost all hypericin-containing sp. belong to the sections Euhypericum and Kamyplosporus of Keller's classification. (French) B.H.Davies

4905. AN APPARENT SELENIFEROUS LEAF WAX FROM STANLEYA BIPINNATA. R.J.McColloch, J.W. Hamilton and S.K. Brown: Biochem. biophys. Acta, 1963, 11, 7-13 (Div. Agric. Biochem., Univ. Wyoming, Laramie, Wyo., U.S.A.) Evidence is presented that some of the org. selenium occurring in the leaves of Stanleya is in the form of a seleniferous wax. B.Ketterer

MISCELLANEOUS

4906. ON EFFECTS OF SOME CARCINOGENIC HYDROCARBONS ON GROWTH OF SPORELINGS OF MARINE RED ALGAE. A.D.Boney and E.D.Cornen: J. mar. biol. Ass. U.K., 1962, 42, 579-585 (Dept. Chem. and Biol. Coll. Technology, Plymouth, England) Various carcinogenic polycyclic aromatic hydrocarbons, in low concn., cause a considerable increase in cell production, when applied to sporelings of certain marine red algae. Low concn. of carcinogenic deriv. of benzanthracene stimulate cell production, but similar concn. of structurally related non-carcinogens inhibit it. P.J. Baron

4907. THE EFFECT OF SEED TREATMENT WITH THE EXTRACTS OF ORGANISMS AND THE SOLUTIONS OF SOME CHEMICAL SUBSTANCES ON THE RESISTANCE TO SALT CONCENTRATION IN WHEAT SEEDLINGS. T.Miyamoto: Physiol. Plant, 1963, 16, 333-336 (Inst. Pflanzenernährung, Justus Liebeg-Univ*, Giessen,

Germany) Distribution of substances which increase the resistance to salt concn. in wheat seedlings was studied in leaves of Hydrangea hortensis, in beef and in bakers' yeast. Treatment of wheat seed with 2-chloroethanol, LiBr or tannin soln. also increased resistance.

LD.J.Phillips

4908. CHEMISTRY OF ARENEBORONIC ACIDS. X. ACTION OF SOME ORGANOBORON COMPOUNDS ON WHEAT ROOTS AND ON POLLEN AND DISTRIBUTION OF 14C LABELLED BENZENEBORONIC ACID IN PLANTS. K.Torssell: Physiol. Plant, 1963, 16, 92-103 (Inst. Organ. Chem. and Biochem., Univ. Stockholm, Sweden) There was a variation in response of wheat root growth to various organoboron compounds. The effects of arenboronic acids were found to be similar with different plant spp. Benzeneboronic acid inhibited pollen germination and pollen-tube growth, and was also found to be readily and uniformly translocated in plants. Breakdown of benzeneboronic acid in plants was rapid, but the physiol. effects noted were due to the arenboronic acids themselves, rather than degradation products.

LD.J.Phillips

4909. COMPARATIVE BIOLOGY OF CLOSELY-RELATED SPECIES. VI. ANALYSIS OF GROWTH OF TRIFOLIUM REPENS AND T. FRAGIFERUM IN PURE AND MIXED POPULATIONS. J.L.Harper and J.N.Clatworthy: J. exp. Bot., 1963, 14, 172-190 (Dept. Agric, Univ. Oxford, England) Measurements were made of the first season's growth. T. repens achieved a faster early rate of leaf production than T.fragiferum in pure and mixed stands. Eighteen weeks after sowing T. fragiferum had more elongated petioles than T. repens and its leaves were borne higher in the canopy and contributed an increasing part to the leaf area index of mixtures. Increased leaf area of swards with time was largely associated with increased area of individual leaves. Differences between spp. were largely due to differences in no. of leaves.

I.D.J.Phillips

4910. ASPECTS OF BIOLOGY OF LAMINARIA HYPERBOREA. I. VERTICAL DISTRIBUTION. J.M.Kain: J. mar. biol. Ass. U.K., 1962, 42, 377-385 (Mar. Biol. Statn., Port Erin, Isle of Man, U.K.) Stable bottoms near the Isle of Man and of 2 areas of Scotland support Laminaria sacharina when sheltered from wave action of L. hyperborea when exposed. Downward penetration of L. hyperborea on exposed rocks near Port Erin is limited by an unknown factor.

P.J. Baron

4911. A RHIZOSPHERE EFFECT OF THE PEA ROOT ON SOIL ALGAE. D.R.Cullimore and M. Woodbine: Nature, Lond., 1963, 198, 304-305 (Microbiol. Unit, Dept. Agric. Sci., Univ. Nottingham, Leics., England) Germinated pea seedlings grown under sterile conditions on mineral agar were seeded with soil algae. Large colonies of algae were growing close to the roots within 10 days.

G.M.Lewis

4912. FUNGAL POPULATIONS IN THE RHIZOSPHERE OF PEANUT (ARACHIS HYPOGAEA L.). A.S.Rao: Plant and Soil, 1962, 17, 260-270 (Dept. Bot., S.V. Univ., Tirupati, (A.P.), India) The fungal populations of the rhizosphere of 8 varieties of peanut grown in soil amended with farmyard manure were compared using the diln. plate technique. Marked increases in rhizosphere fungi were recorded in 4 varieties and smaller increases in the remaining 4. High ratios of rhizosphere to soil fungi [R/S] were recorded at the time of max. vegetative growth, i.e. 30 days. The R/S ratio decreased for the next

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3 months and then rose, this rise being correlated with increased microbial activity around dead or senescent roots. Rhizosphere effect and root nodule no. could not be correlated.

W.A.Stevens

4913. BEHAVIOUR OF MUSHROOM STRAINS IN MIXED CULTURE. G.Eger: Arch. Mikrobiol., 1963, 44, 421-432 (Max-Planck-Inst. Kulturpflanzenzuchtung, Hamberg-Volksdorf, Germany) Mixed cultures of mycelium of 2 white or 2 brown strains of cultivated mushrooms had no effect on the yield of fructifications but with mixtures of brown and white there was a reduction in yield and relatively rapid disappearance of mycelium. This was caused by suppression of the brown strain.
(German) E.M.Ling

4914. THE BEHAVIOUR OF NUCLEIC ACIDS AND OTHER CONSTITUENTS IN PROTOMYCES INUNDATUS DANGEARD. L.R.G.Valadon, A.Myers and J.G.Manners: J. exp. Bot., 1962, 13, 378-389 (Dept. Bot., Univ. Southampton, England) DNA content per cell was doubled in cultures derived from fusion bodies or from mycelium, compared with that in cultures from unfused endospores. Dry wt./cell, vol./cell, insol. N/cell, and P_{tot} /cell, like RNA/cell, had similar values for all 3 types of culture. DNA content and all the other measured constituents were doubled by camphor treatments of cultures from infused endospores. RNA/DNA ratios in any one culture remained const., though abs. values decreased with age. RNA/DNA ratios of haploid and diploid cultures of *P. inundatus* were compared with those of yeast and other organisms. I. D.J. Phillips

4915. INDUCED THERMOSENSITIVITY IN OPHIOSTOMA AND RHODOTORULA. N.Fries: Physiol. Plant., 1963, 16, 415-422 (Inst. Physiol. Bot., Univ. Uppsala, Sweden) Vegetative cells germinated at temp. up to 30° . Preheating of cells for a few min. at a sublethal temp. of between 40° and 50° reduced their ability to germinate at temp. of 28° and above, but did not reduce their capacity for germination at temp. below 25° (induced thermosensitivity¹). Rapidly dividing cells of *Ophiostoma* from a submerged culture reacted in the same way as did non-dividing aerial conidia. Induced thermosensitivity gradually disappeared but was still noticeable after 12 hr. at 25° . LD.J.Phillips

4916. FINE STRUCTURE OF THE YOUNG VEGETATIVE HYphae OF PYTHIUM DEBARYANUM. LE.Hawker and P.McV. Abbott: J. gen. Microbiol., 1963, 31, 491-494 (Dept. Bot., Univ. Bristol, England) The fine structure of *P. debaryanum* Hesse differs from that of

Rhizopus spp. and some other fungi in the abundant regularly distributed endoplasmic reticulum, the presence of typical Golgi-bodies and the irregularly tubular structure of the cristae mitochondriae. The resemblance of some characters to those of some algae and the liverwort *Anthoceros* is discussed. Typical lomasomes are present.

K.Brew

4917. OBSERVATIONS ON THE FINE STRUCTURE OF THE ZOOSPORE OF OEDOGONIUM CARDIACUM WITH SPECIAL REFERENCE TO THE FLAGELLAR APPARATUS. L.Hoffman and LManton: J. exp. Bot., 1962, 13, 443-449 (Bot. Dept., Leeds Univ., England) An E.M. study of the flagella of zoospores from o plants. LDJ-Phillips

4918. THE MICROELECTROPHORETIC BEHAVIOUR OF PLANT MITOCHONDRIA COMPARED WITH RAT MITOCHONDRIA. H.W.Douglas, M.V.Laycock and D.Boulten: J. exp. Bot., 1963, 14, 198-209 (Dept. Bot. and Inorg. and Phys. Chem., Univ. Liverpool, England) Electrophoretic mobility of 'heavy' mitochondrial prep. of bean, cauliflower and rat liver were similar, as were also pH-mean mobility curves. A microelectrophoretic study was made of 'heavy' and 'light' mitochondrial fractions from rat liver and bean. LD.J.Phillips

4919. PHYSIOLOGICAL STATE OF THE PUPIL IN VEGETATIVE HYBRIDISATION. F.Chodac: C.R. Acad. Sci., Paris, 1962, 255, 358-359 (Inst. Bot. Gen., Univ. Geneve, Switzerland) Repeated grafting disturbs the 'pupil's' stability causing disorder or the appearance of characteristics of the 'mentor'sp. Either stock or scion may be 'pupil' or 'mentor'. The 'pupil' must be repeatedly almost completely defoliated, thus exposing it to the building and information bearing substances of the 'mentor'. The 'pupil' must also be younger than the 'mentor'. A similar situation occurs in tissue culture where organs (leaves and roots) are only formed on stimm. by products of autotrophy.

(French) S.A.Thistlewood

4920. STUDIES IN STOMATAL BEHAVIOUR. DC PHOTO-PERIODIC EFFECTS ON RHYTHMIC PHENOMENA IN XANTHIUM PENNSYLVANICUM. T.A.Mansfield and O.V.S.Heath: J. exp. Bot., 1963, 14, 334-352 (Univ. Reading Hort. Res. Labs., Shinfield Grange, Shinfield, Berks., England) Stomata opened towards the end of the night under short day but not under long day, and there were non-persistent differences in the rates of stomatal opening in the morning after different lengths of night. There appeared to be an endogenous rhythm affecting the stomata in continuous darkness.

LD.J.Phillips

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METABOLISM

4921. RADIOACTIVE PHOSPHORUS ACCUMULATION AND DISTRIBUTION IN TETRAHYMENA. J.V.Slater and J.W.Tremor: Biol. Bull. Woods Hole. 1962. 122. 298-309 (Donner Lab., Univ. California. Berkeley. Calif., U.S.A.) The uptake of 32p by mating types I and II of variety 4 of Tetrahymena pyriformis was investigated. Mating type II accumulated 10 times as much as Mating type I, while in both type phosphate accumulation was affected by the population density, being less/cell in dense populations. Glucose in the medium increased the amount of 32p absorbed three fold. Six hr. after induction of conjugation in low density populations there was a significant increase in uptake of 32p. G.J.Peaikin

4922. UREASE ACTIVITY IN TRYPANORHYNCH CESTODES. J.E.Simmons jun.: Biol. Bull. Woods Hole. 1961, 121, 535-546 (Dept. Biol., Emory Univ., Atlanta, Ga., U.S.A.) The urease activity of the cestodes from elasmobranchs was measured and found to be high in two spp.. Lacistorhynchus tenuis and Pterobothrium lintoni. The value for the latter was about 10 times greater than for the former at 140 mg. urea hydrolysed/g. dry wt. of tissue. Living worms retained this activity for at least 100 hr. The production of ammonia and 14CO₂ from [14C]urea was demonstrated. G.J.Peaikin

4923. POLYPHENOL OXIDASE IN THE TEGUMENTAL GLANDS IN RELATION TO THE MOULTING CYCLE OF THE ISOPOD CRUSTACEAN ARMADILLIDIUM VULGARE. J.R.Stevenson: Biol. Bull. Woods Hole, 1961, 121, 554-560 (Dept. Biol., Kent State Univ. 'Kent, Ohio, U.S.A.) A method of determining the moulting stage of A. vulgare is described. Throughout the moulting cycle an oxidase was found in the secretory droplets of the tegumentary glands and evidence indicated that it was the polyphenol oxidase involved in the sclerotisation of the cuticle. G.J.Peaikin

4924. THE n-ALKYL GROUP SPECIFICITY OF CHOLINESTERASE FROM THE HOUSEFLY, MUSCA DOMESTICA L. AND THE 2-SPOTTED SPIDER MITE, TETRANYCHUS TELARIUS L. W.C.Dauterman and K.N.Mehrotra: J. Insect Physiol., 1963, 9, 257-263 (Pesticide Residue Labs., North Carolina State Coll., Raleigh, N.C., U.S.A.) 17 n-alkyl substituted analogues of ACh were tested as substrates for cholinesterase from M. domestica heads and from T. telarius. The M. domestica enzyme hydrolysed the dimethyl and diethyl alkyl analogues rapidly while the activity towards the dipropyl and dibutyl alkyl ester was low. No clear pattern of specificity could be obtained using the mite enzyme. The propylene and butylene analogues of ACh were hydrolysed differently by the enzyme from the 2 sources. R J.Walker

4925. CHITIN IN THE HYALINE EXOCUTICLE OF THE SCORPION. S.R.A.Malek: Nature, Lond., 1963, 198, 301-302 (Dept. Zool., Univ. Alexandria, Egypt) A lipoprotein complex impregnating the hyaline exocuticle in Pandinus imperator and Buthus quinauestriatus prevents a pos. iodine-chitosan reaction despite the presence of chitin. G.M.Lewis

4926. TRYPTOPHAN PYRROLASE ACTIVITY IN THE LIVER OF ADULT RANA PIPiens. M.Spiegel: Biol. Bull. Woods Hole. 1961. 121. 547-553 (Dept. Zool..

Dartmouth Coll., Hanover, N.H., U.S.A.) The effect of a no. of compounds inj. i.p. on the liver tryptophan pyrrolase activity in adult <? and ? R. pipiens was investigated. L-Tryptophan produced a large increase but cortisone acetate and hydrocortisone acetate had no effect. ACTH and L-histidine caused a slight decrease while pituitary injn. brought about a marked decrease. In adult ? enzyme activity varied, increasing after hibernation until ovulation, when there was a sharp drop in activity. G.J.Peaikin

4927. ASSOCIATION OF PTERIDINES WITH AMPHIBIAN LARVAL PIGMENTATION AND THEIR BIOSYNTHESIS IN DEVELOPING CHROMATOPHORES. M.Obika: Develop. Biol., 1963, 6, 99-112 (Biol. Lab., Keio Univ., Yokohama-Hiyoshi, Japan) Appearance of pteridines during chromatophore differentiation in larvae and adults of Triturus pyrrhogaster, Hynobius nigrescens and Li.tokyoensis, and their association with different types of chromatophores is described, together with results of an expt. study of the site of pteridine synthesis in larval stages. J.W.S. Harris

4928. METABOLIC RATE OF TREE-SHREWS (UROGALE EVERETTI). L.E.Nelson and C.W.Aslings Proc. Soc. exp. Biol. N.Y.. 1962, 109, 602-604 (Dept. Anat., Univ. California, Berkeley, Calif., U.S.A.) Observations were carried out on *d* and ? animals. The precise ages of none of the animals was known, they were maintained on a fruit meat cereal diet and kept in pairs in 2j cu. ft. cages. Metabolic rates were determined in a closed circuit respiration apparatus. The O₂ consumption was measured on each animal after it had slept overnight. The tree-shrews had a standard metabolic rate in the lower range of that of rats of comparable wt. and maturity, no significant differences could be determined between the sexes. M.M.Faulkner

EMBRYOLOGY

4929. EFFECTS OF ACTINOMYCIN D ON MORPHOGENESIS. J.Brachet and H.Denis: Nature, Lond., 1963. 198. 205-206 (Lab. Morphol. animale. Univ. Libre Bruxelles. Belgium) Actinomycin D inhibits growth and development in the alga Acetabularia mediterranea, particularly in nucleate portions. In amphElian eggs (Pleurodeles and Xenopus) actinomycin does not inhibit cleavage but neural induction stops and the nervous system is practically absent. It is suggested that inhibn. of the synthesis of nuclear RNA by actinomycin drastically reduces cephalocaudal and dorsoventral differentiation. I G.M.Lewis

4930. SULPHYDRYL GROUPS AND MORPHOGENESIS. III. BIOCHEMICAL STUDY OF THE EFFECTS OF MERCAPTOETHANOL [ME] ON AMPHIBIAN EMBRYOS AND THE ALGA ACETABULARIA MEDITERRANEA. J.Brachet, M.Decroly and J.Quertier: Develop. Biol., 1963, 6, 113-131. An increase of total and sol. -SH groups occurred in eggs treated with 3-ME, and [35s]ME was incorporated into proteins of amphibian embryos and Acetabularia. In amphibians, incorporation was mainly into pigment granules and yolk platelets of the animal, and later the dorsal half of the embryo; in Acetabularia it was highest in the nucleus and apical part* of the stem*

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Electrophoretic studies of ME treated eggs failed to detect the presence of a new sol. -SH-containing protein. No ecto-ATPase was detected in amphibian eggs, and the endo-ATPase was unaffected by ME. The significance of the observations on current explanatory hypotheses of the morphostatic effects of ME is discussed.

(French) J.W.S.Harris

4931. GAMETOGENESIS AND SPAWNING OF THE EUROPEAN OYSTER, OSTREA EDULIS IN WATERS OF MAINE. V.LLoosanoff: Biol. Bull. Woods Hole, 1962, 122, 86-94 (U.S.Bureau Commercial Fish., Biol. Lab., Milford, Conn., U.S.A.) Gametogenesis

was found to start in May, with spawning starting in the Middle of July and continuing to the end of August. The shortness of the summer allowed only one sex phase to be completed by an individual oyster. Resorption of gonads, which may continue through the winter and early spring, is carried out principally by phago-leucocytes which enter the gonadal follicles from the blood vessels.

G.J.Peaikin

4932. TRACHEAL CAPTURE [TC] IN ONTOGENETIC AND PHYLOGENETIC PHASES OF INSECT WING DEVELOPMENT. D.Leston: Proc. roy. ent. Soc. Lond. A, 1962, 37, 135-144 (Dept. Zool., Univ. Oxford, England) TC is defined as a process in development whereby a wing trachea (a) comes to occupy a vein not originally associated with it or (b) departs from its associated vein and terminates in a non-venous structure. TAis is studied in the Heteroptera. TC during development is demonstrated in Dysdercus superstiosus and during phylogeny in Triatoma infestans. An example of (b) is TC by the pigment spot organ of some spp.

D.M.S.Perkins

4933. EXISTENCE OF TWO TYPES OF DEVELOPMENT IN THE ODONATA. P.Aguesse: C.R. Acad. Sci., Paris, 1962, 255, 368-370 (Stat. Biol. Tour du Volat, Le Sambuc, Bouches-du-Rhone, France) The various developmental cycles observed in the Odonata consist of two main types, those with and those without a delay in the growth from egg to imago. All spp. in cold temperate climates and 90% of those in hot temperate climates have a delay either physiol. in origin or conditioned by the climate, and so timed that the image emerges under optimum climatic conditions. Spp. without a diapause occur mainly in the tropics where climatic conditions are always favourable. Tropical spp. living in stagnant water are however more abundant during and immediately after the rainy season.

(French) S.A.Thistlewood

4934. EMBRYONIC STUDIES ON FLUORESCENT COMPOUNDS IN SILKWORMS. G.Jimbo and T.Nishiyama: Bull. Yamaguchi med. Sch., 1962, 9, 81-83 (Dept. Anat., Yamaguchi Med. Sch., Ube, Japan) In the Malpighian tubes of silkworms, granules with inherent fluorescence were found in the secreted substance on the 9th day after incubation. These granules grew and eventually into needle-like plates, on the 21st day after incubation.

K.Jones

4935. RESTITUTION OF WHOLE LARVAE FROM DISAGGREGATED CELLS OF SEA URCHIN EMBRYOS. G.Giudice: Develop. Biol., 1962, 5, 402-411 (Lab. Comp. Anat., Univ. Palermo, Italy) Structural characteristics of dissociated cells from blastula to stages of Paracentrotus lividus and Arbacia lixula are described. Isolated cells reaggregated to form structures which differentiated into quasi-normal larvae, the development attained prior to dissociation. J.W.S. Harris

4936. INHIBITION OF FERTILIZIN AGGLUTINATION AND FERTILISATION IN ARBACIA BY FUCUS EXTRACTS. J.M.Branham and C.B.Metz: Biol. Bull. Woods Hole, 1962, 122, 194-207 (Oceanographic Inst., Florida State Univ., Tallahassee, Fla., U.S.A.)

Extracts of the brown alga, Fucus vesiculosus, were found to inhibit fertilizin aggltn. of sperm, apparently by some action of the sperm, which removed the colour and inhibitory prop. from the extract. Inhibn. of the agglutinating prop. of the fertilizin soln. was not irreversible as they returned after removal of the Fucus extract with activated charcoal. Sperm motility and O₂ consumption were stim. by the Fucus extract. Inhibn. of fertilisation was due to an irreversible action on the eggs. Tannic acid was shown to have similar prop. to the extract. G.J.Peaikin

4937. EFFECTS OF NUCLEOTIDES ON NEURULATION IN AMPHIBIAN EMBRYOS. E.Ambellan and G.Webster: Develop. Biol., 1962, 5, 452-467 (Dept. Biochem., Ohio State Univ., Columbus, Ohio, U.S.A.) Adenine nucleotides (tri- more than diphosphates) were more effective than other nucleotides in promoting neurulation in embryos of Rana pipiens. Adenosine-3'-monophosphate was less effective, and adenosine-5'-monophosphate was inhibitory. Effect was dependent upon nucleotide concn., pH and duration and time of treatment. Neurulation effect and pH dependence were not related to extent of nucleotide penetration into the cells. [14c]ADP and [14c]ATP were principally limited to neural and chordamesodermal tissues.

J.W.S.Harris

4938. APPEARANCES OF CATECHOLAMINES DURING DEVELOPMENT OF RANA PIPIENS. J.D.Caston: Develop. Biol., 1962, 5, 468-482 (Biol. Dept., Brown Univ., Providence, R.I., U.S.A.) Appearances and accumulation of dopamine, noradrenaline and adrenaline has been studied in whole embryos and isolated neural crests at different embryonic stages. The order in which individual catecholamines appeared was similar to that observed during adrenaline synthesis in adult tissues. Dopamine and noradrenaline appeared in whole embryos and neural crests at Shumway stages 15 and 16, respectively. Adrenaline appeared in whole embryos at stage 17+ but was not detected in neural crest material at stage 20+. J.W.S.Harris

4939. RADIOSensitivity TO NEUTRONS OF FERTILISED EGGS OF PLEURODELES WALTLH MICHAH.

L.Gallien and M.Labrousse: C.R. Acad. Sci., Paris, 1962, 255, 371-373 (Lab. d'Embryologie, Fac. Sci., Paris, France) Eggs of the amphibian P. waltlii were irradiated with neutrons after fertilisation. At a dose of 2*5 x 10⁷ neutrons/egg/hr. the max. radiosensitivity occurred with eggs in the first mitosis of segmentation, and the minimum during the migration and meeting of the pronuclei. At doses below 2*5 x 10⁷ neutrons/egg/hr. the % of abnormal animals produced decreased.

(French) S. A. Thistlewood

4940. ORGANISATION AND COMPOSITION OF THE AMPHIBIAN YOLK PLATELET. I. INVESTIGATIONS ON THE ORGANISATION OF THE PLATELET.

D.A.Ringle and P. R.Gross: Biol. Bull. Woods Hole, 1962, 122, 263-280 (Dept. Physiol., Columbia Univ. Coll. Phys. and Surg., New York, U.S.A.) The yolk platelets of ovarian eggs were studied, by various techniques, as washed isolated platelets, unwashed extruded platelets or in ovo. The presence of a surface coat was suggested by some evidence but it was not unlikely that it in fact represented a prep. artifact. A faint Feulgen-pos.

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response was obtained with platelets in ovo. Washed yolk platelets showed a periodic arrangement of components under E.M.

G.J.Peaikin

4941. ORGANISATION AND COMPOSITION OF THE AMPHIBIAN YOLK PLATELET. II. INVESTIGATIONS ON YOLK PROTEINS. D.A.R.Lngle and P.R.Gross: Biol. Bull. Woods Hole, 1962, 122, 281-297 (Dept. Physiol., Columbia Univ. Coll. Phys. and Surg., New York, U.S.A.) Yolk platelet suspensions lysed with NaCl or CaCl₂ gave yolk soln. and insol. 'ghost' residue. Yolk fractions pptd. from NaCl lysed material could be of 3 kinds which all had the same electrophoretic prop., whether or not the lipids had been extracted. P/N ratios supported the view that 'ghost' material is largely non-yolk in origin. Nucleic acid P varied among different batches of yolk. A minimum of 5 Ag were found in solubilised yolk, 3 of which were also found in 'ghost' Ag.

G.J.Peaikin

4942. EFFECTS OF HETEROBOTIC MUSCULATURE ON MYOGENESIS DURING LIMB REGENERATION IN AMBLYSTOMA LARVAE. P.Pietsch: Anat. Rec., 1961, 141, 295-303 (Bowman Gray Sch. Med., Wake Forest Coll., Winston-Salem, N.C., U.S.A.) Regenerating limb blastema was transplanted in place of eye in larvae. Skeletal muscle with a pattern unlike that found in normal limb regenerates developed around blastema-derived cartilages. When a narrow band of stump was left attached to the transplant muscle of limb and orbit appeared to mix. Under these expt. conditions muscle that developed around regenerate cartilages was mixed in pattern.

F.Beck

RESPIRATION

4943. A REPETITION OF EGE'S EXPERIMENTS AND A NOTE ON THE EFFICIENCY OF THE PHYSICAL GILL OF NOTONECTA (HEMIPTERA-HETEROPTERA).

E.J.Popham: Proc. roy. ent. Soc. Lond. A, 1962, 37, 154-160 (Dept. Zool., Univ. Manchester, England)

From his expt., Ege claimed that Notonectids use the gas stores carried on the body surface when they submerge to obtain, by diffusion, O₂ from the surrounding water, the bubble of air thereby acting as a physical gill. Repetition of the expt. in the original and a modified form is described, and the functioning of the gas store as a physical gill is confirmed but only at temp. below about 15°. The variation in the efficiency of the gill, causes no surfacing, role of N₂ and related topics are discussed.

D.M.S.Perkins

4944. OXYGEN-HAEMOCYANIN RELATIONSHIPS IN THE LAND CRAB, CARDISOMA GUANHUMI.

J.R.Redmond: Biol. Bull. Woods Hole, 1962, 122, 252-262 (Dept. Biol., Univ. Florida, Gainesville, Fla., U.S.A.) The relationship between O₂ and haemocyanin has been characterised in the land crab C. guanhumi and shown to be similar to that found in other decapod crustaceans in most respects. The higher O₂ affinity possessed by the pigment is unusual, however, and it is suggested that this may represent an adaptation to high environmental temp. and water conservation.

G.J.Peaikin

4945. SEASONAL VARIATIONS IN THE OXYGEN CONSUMPTION OF UCA PUGNAX. H.M.Webb and F.A. Brown jun.: Biol. Bull. Woods Hole, 1961, 121, 561-

571 (Dept. Biol. Sci., Goucher Coll., Towson, Md., U.S.A.) The respiratory rate of U. pu^nax in the winter was approx. half that of the summer. An apparent annual rhythm in mean rate of respiration was found but no seasonal changes in the diurnal rhythm was detected. The lunar rhythm altered from a bimodal pattern from June-September to a unimodal curve from October to January.

G.J.Peaikin

4946. METABOLISM OF THE MEXICAN FREE-TAILED BAT. C.F.Herreid, It J. cell. comp. Physiol., 1963, 61, 201-207 (Dept. Comp. Behav., Sch. Hyg. and Publ. Hlth., Johns Hopkins Univ., Baltimore, Md., U.S.A.) O₂ consumption of Tadarida brasiliensis mexicana was measured hourly at a series of temp. for 24 hr. The minimum metabolism was directly dependent on ambient temp. Some bats roused spontaneously to activity and some did not, resulting in a wide variation in max. metabolic rate. The ratio of max. to min. levels was greater than for other mammals of comparable size. No evidence of circadian rhythm was obtained.

G.M.Lewis

FEEDING AND DIGESTION

4947. A HISTOCHEMICAL STUDY OF DIGESTION AND DIGESTIVE ENZYMES IN THE RHYNCHOCOELAN LINEUS RUBER (O.F.MULLER). J.B.Jennings: Biol. Bull. Woods Hole, 1962, 122, 63-72 (Dept. ZODL, Univ. Leeds, England) Digestion of L. ruber has been shown to be both extra- and intra-cellular. The course of these processes is described and some of the enzymes concerned have been located and identified with histochem. methods.

G.J.Peaikin

4948. UNIDENTIFIED GROWTH FACTORS IN BREWERS' YEAST. IV. RELATIONS BETWEEN THESE FACTORS AND LEVEL OF N IN DIET OF TRIBOLIUM CONFUSUM DUVAL. R.Charbonneau and A.Lemonde: Arch. int. Physiol., 1962, 70, 379-392 (Dept. Biochem., Fac. Med., Laval Univ., Quebec, Canada) Larvae of T. confusum were reared on diets containing various proportions of casein and glucose, with the addition of cholesterol, salt mixture and B vitamins. Larvae on a casein free diet failed to grow, but addition of whole yeast replaced casein and gave optimal growth. Water insol. fraction was almost as effective as whole yeast, water sol. fraction ineffective. The larval period lasted 35 days on 20% casein. Addition of b% yeast reduced this to 20 days. Water insol. fraction reduced the period to 23 days and water sol. fraction to 30 days. On 95% casein and optimal B vitamins the larval period was 36*7 days, reduced to 27 days by addition of yeast. Water insol. fraction gave a similar reduct&n when B vitamins were optimal, but the water sol. fraction was as active as whole yeast whatever the vitamin mixture used. Thus the water insol. yeast fraction is most active in diets low in casein and the water sol. fraction in diets with a high casein content. (French, English summary) M.E.Nutt

4949. ANTIMETABOLITES IN THE NUTRITION OF AEDES AEGYPTI L. LARVAE. PYRIDOXINE ANTAGONISTS, S.Akov and K.Guggenheim: Comp. Biochem. Physiol., 1963, 9, 61-68 (Dept. Entomology* Israel Inst. Biol. Res., Ness-Ziona, Israel)

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The effects of 4-deoxypyridoxide, uu-methylpyridoxine and INH on *A. aegypti* larvae grown on synthetic medium containing known amounts of pyridoxine were studied. Pyridoxine reverse[^] the inhibitory effect of 4-deoxy-Pyridoxine, but not competitively. UU-Methylpyridoxine replaced the vitamin partially but was inhibitory in large amounts. Isoniazid was least toxic of the antimetabolites.

M.

S.Laverack

4950. BEHAVIOURAL ASPECTS OF PROTEIN INGESTION BY THE BLOWFLY, PHORMIA REGINA MEIGEN.

V.G.Dethien Biol. Bull. Woods Hole, 1961, 121, 456-470 (Zool. Lab., Univ. Pennsylvania, Philadelphia, Pa., U.S.A.) Males of *Phormia*, whether mated or not, gradually increased their protein ingestion from the time of emergence until the 4-8th day and thereafter little is taken. Virgin ♀ show a similar pattern but the vol. ingested is greater. Mated ♀ showed an increased ingestion after each batch of eggs had been laid. The removal of ovaries, corpus allatum or medial neurosecretory cells did not alter the pattern of protein ingestion.

G.J.Peaikin

4951. A TOXIC PRINCIPLE IN THE DIGESTIVE FLUIDS OF PIERIS BRASSICAE. G.Benz: J. insect Path., 1962, 4, 492-495 (Entom. Lab., Swiss Federal Inst. Tech., Zurich, Switzerland) Digestive fluid of healthy

larvae of *P. brassicae* were subjected to different treatments and then tested for paralysing action. The toxic substance is dissolved in the digestive fluid and it is not ppt. in neutral or slightly acid soln. The substance is not heat stable; it may be ppt. by freezing and thawing; and it is not dialysable. Partial purification was attempted. It may be salted out with cone, ammonium sulphate and this product does not readily redissolve in neutral saline but dissolves at pH 8. It is suggested that the toxic substance may be a protein. Expt. indicate that the paralysing substance is produced only by certain sp. of lepidopterous larvae but that it acts on other insects when inj. The primary action of the toxin is to cause leakage of the gut wall.

R.J.Walker

4952. A FURTHER FUNCTION OF THE AIR SACS IN SOME INSECTS. V.B. Wigglesworth: Nature, Lond., 1963, 198, 106 (Unit Insect Physiol., Dept. Zool., Univ. Cambridge, England) With particular ref. to *liriomyza*, it is suggested that the air sacs in the mature insect cause a reduction in blood vol. by one third, thereby increasing the efficiency of transport of sugar reserves during flight.

G.M.Lewis

4953. SEASONAL VARIATIONS IN THE FEEDING OF THE GUDGEON (GOBIO GOBIO L.). G.Moreau: C.K. Acad. Sci., Paris, 1962, 255, 397-399 (Stat. biol. des Eyzies, Dordogne, France) From June to September gudgeon in outside ponds were spontaneously active and hunting food, throughout the day and in the evening. From November to February the fish were inactive throughout the day even when food was offered but were active and fed at night even at 4°. Between March and May, and in October a gradual transition occurred, artificial darkness in winter induced activity but artificial lengthening of the day to 18 hr. had no effect on the activity observed. Warming a lighted aquarium to 20° produced only slight increase in activity, unless the period of illumination/day was prolonged when intense activity occurred. (French) S.A.Thistlewood

4954. TRICHOBEZOARS (HAIR BALLS) IN RATTUS ASSIMILIS. B.E.Hornen: Nature, Lond., 1962, 196,

553-554 (Smith Coll., Northampton, Mass., U.S.A.) In laboratory-maintained *R. assimilis*, hair-ball formation is facilitated by the ingestion of large amounts of hair in association with a relatively low intake of cellulose-containing food materials and high fat intake.

G.M.Lewis

OSMOREGULATION AND EXCRETION

4955. IONIC AND WATER BALANCE OF PLANARIANS.

H.B.Steinbach: Biol. Bull. Woods Hole, 1962, 122, 310-319 (Dept. Zool., Univ. Chicago, Chicago, Ill., U.S.A.) The concn. of Na, K and Cl has been determined in *Dugesia tigrinum* and *Bdelloura* sp., an ectoparasite of *Limulus*. FIUX rates for these ions and water were found to be higher in the marine worms, while the exchange rates for water were high for both forms. *Bdelloura* on exposure to dil. sea water swelled to a new const. vol. In this condition it did not lose K, but the concn. fell with the vol. increase.

G.J.Peaikin

4956. IONIC BALANCE IN BLOOD AND COELOMIC

FLUID OF EARTHWORMS. F.L.Kamemoto, A.E.S. Spalding and S.M.Keisten: Biol. Bull. Woods Hole, 1962, 122, 228-231 (Dept. Zool., Univ. Missouri, Columbia, Mo., U.S.A.) The concn. of Na, K, Ca and Cl in the blood of coelomic fluid was determined in *Lumbricus terrestris*, *Helodrilus caliginosus* and *Eisenia fetida* (coelomic flu13 only) which had been kept in moist soil, tap water and 0.1M NaCl soln. The concn. of cations was higher in the blood than in the coelomic fluid, while the chloride was evenly distributed. The ionic concn. were similar in the 3 spp. The concn. of Na in the blood and coelomic fluid was greater than the medium in 0.1M NaCl.

G.J.Peaikin

4957. ASPECTS OF OSMOREGULATION IN TWO

SPECIES OF INTERTIDAL CRABS. P.A.Dehnel: Biol. Bull. Woods Hole, 1962, 122, 208-227 (Dept. Zool., Univ. British Columbia, Vancouver, B.C., Canada)

The total osmotic pressure of the blood of *Hemigrapsus oregonensis* and *H. nudus* was determined for a range of salinities extending from 6‰ to 175‰ sea water and for temp., extending from 5° to 25° in both summer and winter. Both spp. were hypertonic to all expt. concn. Their osmoregulatory abilities changed seasonally a change which could be related to temp. conditions. Blood concn. increased significantly with decreasing temp., as the salinities became less. No detectable wt. changes were noted when animals were subjected to the extreme expt. sea water concn. No simple relationship between respiratory and osmoregulatory data was established.

G.J.Peaikin

4958. ADAPTATION TO SEA WATER OF SPECIMENS OF ERIOCHEIR SINENSIS HAVING A HIGH FREE AMINO-ACID CONTENT IN THE MUSCLES IN FRESH WATER.

G.Duchateau-Bosson and M.Florkin: Arch. int. Physiol., 1962, 70, 345-355 (Inst. Léon Fredericq, Univ. Liège, Belgium) On adaptation to sea water specimens of *E. sinensis* with a high free amino acid content in their muscles show a further increase in this component, due mainly to rise in alanine, total glutamic acid, glycocoll and proline. Arginine concn. is unchanged. On returning

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to fresh water these changes are reversed and concn. of total glutamic acid and proline returns to the value found in controls kept continuously in fresh water. Alanine and glycocoll concn. decrease further and approach the lower levels found in animals newly caught from fresh water.
(French) M.E.Nutt

4959. INTRACELLULAR ISOSMOTIC REGULATION IN ERIOCHEIR SINENSIS AFTER ABLATION OF OCULAR PEDUNCLES. G.Duchateau-Bosson and M.Florkin: Arch. int. Physiol., 1962, 70, 393-396 (Inst. Léon Fredericq, Univ. Liège, Belgium) Ablation of the ocular peduncles of *E. sinensis* is without effect on the osmoregulatory changes in free amino acid concn. of muscles which occur on transfer of animals from fresh to sea water and their replacement in fresh water.
M.E.Nutt

4960. THE LARVAL EXCRETORY SYSTEM OF CHAO-BORUS CRYSTALLINUS (DEGEER) DIPTERA: CULICIDAE. B.W.Staddorff Proc. roy. ent. Soc. Lond. A, 1962, 37, 99-103 (Dept. Zool., Univ. Coll. S.Wales and Monmouthshire, Cardiff, Wales) The structure and histology of the hindgut and Malpighian tubules [MT] are described. The cytoplasm of the MT cells has an inner striated region bordering the lumen of the tubule. The cells of the distal and prox. parts of die MT show differences in size and character suggesting differences in function. Granules in the MT were observed moving into the hindgut. N excretion is probably mostly as NH₃. The haemolymph has an abnormally high NH₃ content.
D.M.S.Perkins

4961. IDENTIFICATION OF XANTHINE IN EXCRETA OF THE GREATER WAX MOTH, GALLERIA MELLONELLA (L.). J.L.Nation: J. insect Physiol., 1963, 9, 195-200 (Dept. Biol., Univ. Florida, Gainesville, Fla., U.S.A.) Xanthine was identified as an excretory product of *G. mellonella* larvae, pupae and adults using paper electrophoresis. Purine spots were located with an u.v. light and also with the mercury-diphenylcarbazone re* agent. At least 2 other unknown substances are also present in the excreta.
R.J.Walker

4962. THE EFFECT OF SALINITY ON THE AMINO ACID CONCENTRATION IN RANGIA CUNEATA (PELECYPODA). K.Allen: Biol. Bull. Woods Hole, 1961, 121, 419-424 (Zool. Dept., Univ. California, Los Angeles, Calif., U.S.A.) The concn. of alanine, glycine, glutamic acid and aspartic acid was determined in specimens of *R. cuneata* which had been acclimatised to salinities ranging from 3 p.p.t. to 25 p.p.t. Alanine was the most and aspartic acid the least abundant of these amino acids all of which increased in concn. with salinity increase.
G.J.Peakin

4963. SURVIVAL AND GROWTH OF THE LARVAE OF THE EUROPEAN OYSTER, OSTREA EDULIS AT LOWERED SALINITIES. H.C.Davis and A.D.Ansell: Biol. Bull. Woods Hole, 1962, 122, 33-39 (U.S. Bureau Commercial Fish., Biol. Lab., Milford, Conn., U.S.A.) Growth of larvae and intensity of setting was significantly different at salinities of 25 and 22*5 p.p.t. from the controls at 26-27 p.p.t. At salinities of 20 p.p.t. and below there was a progressive reduction in setting out, growth and metamorphosis until at 10 p.p.t. all larvae died within 4 days. Some larvae which had been reared at 26-27 p.p.t. were capable of setting at 15 p.p.t. No normal larvae were obtained from oysters kept at 20 p.p.t. or below.
G.J.Peakin

4964. NITROGENOUS EXCRETA IN HELIX POMATIA AND THEIR METABOLIC ORIGIN. S.Bricteux-Gregoire and M.Florkin: Arch. int. Physiol., 1962, 70, 496-506 (Inst. Léon Fredericq, Univ. Liège, Belgium) Production of uric acid, the chief nitrogenous metabolite of *H. pomatia*, is not the result of biosynthesis with urea as an intermediate stage. It is probably produced by a similar path to that in the pigeon, a lepidopteran, *E. coli* and *Neurospora crassa*, by synthesis of purine nuclei from amino acids. Uric acid results from the action of xanthine oxidase, proved present in the snail, on the purine nucleus. Uricase, allantoinase and allantoicase are absent in the snail, thus purine breakdown ceases at the uric acid stage. The small quantities of urea found in the excreta are probably derived from arginine since arginase is present in the organism. It is uncertain whether there is an arginine-ornithine cycle as in mammalia.
(French) M.E.Nutt

4965. ACCUMULATION OF CALCIUM AND STRONTIUM BY BROWN TROUT FROM WATERS IN THE U.K. W.L.Templeton and V.M.Brown: Nature, Lond., 1963, 198, 198-200 (Radiobiol. Group, U.K.A.E.A., Windscale Works, Cumberland, England) Relationships between the Ca and Sr concn. in the water and in bone and muscle of brown trout (*Salmo trutta* L) were examined.
G.M.Lewis

4966. SITE OF SODIUM OUTFLUX FROM THE GILL OF FUNDULUS KANSAE. W.R.Fleming and F.L.Kamemoto: Comp. Biochem. Physiol., 1963, 8, 263-269 (C.L.Thiv. Missouri, Columbia, Mo., U.S.A.) The cells of the pseudobranch of the killifish *F. kansae* do not contain cholinesterase as shown by chem. and histochem. techniques. Group 1 cholinesterase in the gill is distributed throughout the gill epithelium and not restricted to the base of the leaflets which is the site of the Keys-Willmer cells. Na outflux from the animal reached a min. rate within 4-5 hr. after transfer from 0'60M NaCl to tap water and during this time no morphol. changes were observed in the Keys-Willmer cells.
M.S.Laverack

4967. OSMOTIC STUDIES OF AMPHIBIAN EGGS. III OVULATED EGGS. O.de Luque, A.S.Hunter and F.R.Hunter: Biol. Bull. Woods Hole, 1961, 121, 497-506 (Dept. Biol., Univ. of the Andes, Bogota, Colombia) The permeability of the eggs of *Bufo marinus* and *Hyla labialis* to water, Na and K after Key had been laid was investigated and compared with ovarian eggs.
G.J.Peakin

4968. TISSUE CONSTITUENTS OF REPTILES IN RELATION TO THEIR MODE OF LIFE. III. NITROGEN CONTENT AND SERUM PROTEINS. F.Khalil and G.Abdel-Messeih: Comp. Biochem. Physiol., 1963, 9, 75-79 (Zool. Dept., Cairo Univ., U.A.R.) The skin, skeletal muscles, heart, ileum, kidney, liver, lung, brain and spinal cord of *Crocodilus niloticus*, *Tropidonotus tessellatus*, *Chalcides ocellatus*, *Varanus criseus* and *Testudo leithii* have been analysed for their content of N, and the serum proteins of all except *C. ocellatus* have also been determined. Aquatic reptiles, *C. niloticus* and *T. tessellatus* have a high water content correlated with low N and low lipid content. On the other hand desert reptiles *V. griseus* and *T. leithii* have low water but high N and lipid content. Semi-desert animals *C. ocellatus* are somewhat intermediate between these extremes. Serum results indicate no relationship between habitat and composition although albumin was lower in aquatic sp. and globulin higher, than in desert animals.
M.S.Laverack

NERVOUS SYSTEM

4969. A SIMULATION STUDY OF A DIFFUSE CONDUCTING SYSTEM BASED ON COELENTERATE NERVE NETS. R.K.Josephson, R.F.Reiss and R.M. Worthy: J. theor. Biol., 1961, 1, 460-487 (Zool. Dept., Univ. California, Los Angeles, Calif., U.S.A.) Mathematical and mechanical models of the diffuse, random, mono-planar network of interlacing neurons in Coelenterates can be constructed. The mathematical model for digital computers shows reduction in variability, and enables a study of expected behaviour of nerve nets of defined structure to be made. The model is described in 3 parts (i) net topology, (ii) function of the crossings, (iii) method of simulation of excitation spread. Detailed descriptions of expt. are given. The results indicate that the type of spread found in the model could be applied to other types of nets. J.A.Dawson

4970. THE MOTOR AXON TERMINATION OF ANELIDS. D.A.Dorsett: Nature, Lond., 1963, 198, 406 (Marine Sci. Lab., Menai Bridge, Anglesey, Wales) The termination of motor endings on the parapodial muscle in Nereis diversicolor is described in Methylene Blue stained Prep. G.M.Lewis

4971. SOME OBSERVATIONS ON FINE STRUCTURE OF GIANT FIBRES OF CRAYFISHES (CAMBARUS VIRILIS AND CAMBARUS CLARKE) WITH SPECIAL REFERENCE TO SUBMICROSCOPIC ORGANISATION OF SYNAPSES. K.Hama: Anat. Rec., 1981, 141, 275-293 (Dept. Anat., Sch. Med., Univ. Washington, Seattle, Wash., U.S.A.) The giant axon is surrounded by a lamellated sheath consisting of alternating layers of cell cytoplasm intervening between connective tissue layers. The innermost cell layer is Schwann cell cytoplasm. The segmental septum between lat. giant axon segments contains representatives of each sheath component of adjacent nerve units. These elements are pierced by many small synaptic areas where no sheath structure exists and where synaptic membranes face each other across gaps of 8-12 mji. Vesicles and small tubules are cone, in both giant axons near synaptic areas. The giant fibre to motor neurone synapse is formed by close apposition of synaptic processes from the motor fibre. The membranes of the 2 adjacent nerve axon units lie close to each other separated by a space of 10 mji. Synaptic vesicles and a highly developed system of small tubular components are associated with these synaptic membranes. F.Beck

4972. MEMBRANE CURRENT OF CRAB MUSCLE. A.Strickholm: Nature, Lond., 1963, 198, 393-394 (Dept. Physiol., Univ. California Med. Sch., San Francisco, Calif., U.S.A.) Expt. performed on the Closer muscle of the walking legs of Cancer magister. J^th related transmembrane current for a given transmembrane potential with time showed that the crab muscle membrane behaved similarly to the squid axon membrane. The observations showed a weak membrane current generating system, quite different from results on ^{fr} sartorius muscle membrane. G.M.Lewis

4973. AMINO ACID SENSITIVITY OF THE DACTYL CHEMORECEPTORS OF CARCINIDES MAENAS. J.Case and G.F.Gwilliam: Biol. Bull. Woods Hole, *'81, 121, 449-455 (Dept. Zool., Univ. Iowa, Iowa City, Iowa, U.S.A.) The presence of dactyl chemoreceptors was demonstrated in C. maenas, Libinia

emarginata, Callinectes sapidus and Pagurus pollicaris. In Carcinids the receptors responded to diln. in excess of 5×10^{-6} M of L-glutamic acid and to boiled dialysate of Mytilus. Deriv. of glutamic acid and other amino acids produced smaller responses. A few of the receptors distinguished optical isomers of glutamic acid, aspartic acid and leucine. G.J.Peakin

4974. ON THE RESPONSE OF THE STRETCH RECEPTOR NEURONES OF CRAYFISH TO 3-HYDROXYTYRAMINE AND OTHER COMPOUNDS. H.McLennan and B.A. Hagen: Comp. Biochem. Physiol., 1963, 8, 219-222 (Dept. Physiol., Univ. British Columbia, Vancouver, Canada) The effects of GABA, 3-hydroxytyramine, imidazoleacetic acid and homotaurine upon the slowly adapting stretch receptor, neurones of the abdomen of 4 spp. of crayfish have been investigated. Pacifastacus leniusculus and Procambarus clarkii neurones are inhibited by 3-hydroxytyramine whilst the neurones of Oncorhynchus propinquus and Procambarus blandus are not. The other substances are approx. equal on all spp. Homotaurine is 1-3 times as active as GABA. M.S.Laverack

4975. E.M. STUDY OF AN ABDOMINAL STRETCH RECEPTOR OF THE COCKROACH. M.P.Osborne: J. insect Physiol., 1963, 9, 237-245 (Dept. Zool., Physiol., Univ. Birmingham, England) The longitudinal stretch receptor from the abdomen of the cockroach, Blaberus craniifer, was used in this study. It consists of a single multipolar neurone associated with a strand of connective tissue. The cell body of the neurone is about 30 by 10 ji. Schwann cells invest the axon, cell body, and dendrites. The terminal portion of the dendrites are naked and embedded in the connective tissue matrix. There are no connections between the naked sensory endings and the collagen-like connective tissue fibrils. The only obvious cytoplasmic inclusions in the dendritic terminations are mitochondria. The ultrastructure is compared with vertebrate and invertebrate mechanoreceptors and related to electrophysiological data. R.J.Walker

4976. BRISTLE FIELDS: GRAVITY RECEPTORS OF SOME HYMENOPTERA. H.Markl: Nature, Lond., 1963, 198, 173-175 (Zool. Inst. Univ., MOnchen, Germany) The morphology of bristle fields in Hymenoptera are described in at least 16 spp.; they are located on the antenna at the base of the scapus and at the proximal end of the pedicellus. The function of these sense organs as gravity receptors is investigated in detail in ants by observing their orientation on a perpendicular surface after blinding and following various expt. manipulations of the appendages. G.M.Lewis

4977. STUDIES ON THE HEXAPOD NERVOUS SYSTEM. IV. A CYTOLOGICAL AND CYTOCHEMICAL STUDY OF NEURONS AND THEIR INCLUSIONS IN THE BRAIN OF A COCKROACH, PERIPLANETA AMERICANA (L.). R.L.Pipa: Biol. Bull. Woods Hole, 1961, 121, 521-534 (Dept. Ent. and Parasitol., Univ. California, Berkeley, Calif., U.S.A.) Using a variety of staining methods it was shown that the neurosecretory material in the A-cells of the pars intercerebralis was rich in cystine or cysteine phospholipoprotein. p-Granules possibly containing lipid or glycolipid were found in most neurons, being most conspicuous in the axon hillock and around the periphery of the cell. Granules of another kind, 6-granules, were found in some of the smaller neurons, occurring singly in each cell, and apparently composed of lipo- or glycolipoprotein with phospholipid. The Golgi

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apparatus consisted of sudanophilic crescent-shaped or spheroidal bodies. G.J.Peaikin

4978. RESPONSE OF INSECT MUSCLE TO DENERVATION. I. RESTING POTENTIAL CHANGES. P.N.R.Usherwood: J. insect Physiol., 1963, 9, 247-255 (Dept. Zool., Univ. Glasgow, Scotland) The metathoracic extensor tibiae prep. of the locust Schistocerca gregaria was used in this study. The metathoracic nerves were sectioned on one side only. Resting potentials were recorded from single muscle fibres using glass intracellular microelectrodes of 5-15M ohm resistance and tip potentials of less than 5 mV. During the first 2 post-operative days, the resting potential of denervated muscles fell below normal. The potential then rose rapidly during the next 2-6 days, and then fell again to a level about 10-30% below normal. R.J. Walker

4979. STUDY OF PHOTONHIBITION IN LOCUSTA MIGRATORIA MIGRATORIOIDES (R. AND F.) (ORTHOPTEROID INSECT). P.Cassier: C.R. Acad. Sci., Paris, 1962, 255, 385-387 (Lab. Evolution des Êtres organisés, 105, Boulevard Raspail, Paris, France) Immature adult (/insects, phase gregaria, aged 12 to 30 days, were exposed to lights of 2000, 540, 185 or 50 lux with and without an opaque, coloured or clear varnish over the ocelli. The latent period before phototaxis increased with the intensity of illumination. Varnishing the median ocellus decreased the latent period for intensities over 50 lux. The opaque varnish was most effective. Varnishing all 3 ocelli facilitated phototaxis for intensities over 185 lux. The colourless varnish was most effective. Varnishing the compound eyes did not reduce the inhibn. of phototaxis by excess light. (French) S.A.Thistlewood

4980. ORGANISATION AND INNERVATION OF LUMINESCENT ORGAN IN FIREFLY, PHOTURIS PENNSYLVANICA (COLEOPTERA). D.S.Smith: J. cell Biol., 1963, 16, 323-359 (Dept. Zool., Univ. Cambridge, England) Intact light organs were removed from OsO₄ fixed abdomens and embedded in Epon or methacrylate. The ultrastructure of the cells of the tracheal system, the peripheral and terminal axons, the photocytes and cells of the dorsal layer is described. Specialised nerve endings containing axoplasmic components identical with synaptic vesicles and neurosecretory droplets lying between the tracheal end-cell and tracheolar cell are described. The mechanism of light emission is discussed. P. Barrow

4981. 'DESENSITISATION' OF CHOLINERGIC RECEPTORS BY ACh IN MOLLUSCAN CENTRAL NEURONES. L.Tauc and J.Bruner: Nature, Lond., 1963, 198, 33-34 (Centre Etudes de Physiol. Nerveuse du Centre Nat. Rech. Sci., Paris, France) Expt. were performed on ganglion cells of Aplysia depilans and Archachatina marginata to determine the kinetics of desensitisation of the somatic membrane by repeated doses of ACh. Desensitisation is similar in both D and H central neurones and also when ACh is replaced by carbachol. G.M.Lewis

4982. ELECTRONMICROSCOPICAL EXAMINATION OF THE EPIPHYSIS CEREBRI OF RANA ESCULENTA L. A.Oksche and M.Vaupel-von Harnack: Z. Zellforsch., 1963, 59, 582-614 (Anat. Inst., Univ. Kiel, Germany) The fine structure of the epiphysis cerebri of R. esculenta is described; it possesses sensory cells which bear a strong similarity to the cones of the retina; its organisation

agrees to a far reaching extent with the structure of the frontal organ; 6 specimens of R. esculenta and of R. temporaria were examined. (German) J.E.Linder

4983. THE HABENULA AND THE DORSAL THALAMUS OF SOME TELEOSTS. H.N.Schnitzlein: J. comp. Neurol., 1962, 118, 225-267 (Dept. Anat., Univ. Alabama Med. Center, Birmingham, Ala., U.S.A.) G.M.Lewis

4984. COLOURING OF THE TENCH. RELATION TO THE STATE OF THE SPINAL CORD AND SYMPATHETIC NERVOUS SYSTEM. J.Ripplinger, M.Joly, J.Cardot and R.Guyetant: C.R. Acad. Sci., Paris, 1962, 255, 377-379 (Lab. Zool., Fac. Sci., Besancon, France) The paraspinal sympathetic nervous chain was cut in tench. For section behind the dorsal fin the parts caudal to the section darkened on exposure to bright light and those in front paled. Section in front of the dorsal fin had the reverse effect. Section at the level of the dorsal fin had no effect. When the spinal cord was cut in front of the dorsal fin all pigmentary reactions were obtunded. Colouration of the tench is controlled by 2 centres which receive stimuli from the eyes via the spinal cord and inhibitory stimuli from neurones in the cord itself at the level of the dorsal fin. (French) S.A.Thistlewood

4985. AUTOACTIVE SENSORY ORGANS IN THE SKIN OF GYMNARCHUS NILOTICUS (A MORMYROID FISH). T.Szabo: C.R. Acad. Sci., Paris, 1962, 255, 177-178 (Centre d'Etudes de Physiol. nerv. et d'Electrophysiol., Paris, France) Local rhythmic potentials with freq. between 310 and 340 per sec. were measured in the skin of the electric fish G. niloticus, a relative of Mormyrides (African electric fishes). The activity was best observed when the electric organs were denervated to prevent interference, and continued even in the spinal fish or in detached portions of skin. (French) S.A.Thistlewood

4986. PIGMENT IN THE DURA MATER OF MAMMALS. W.Sokolov: Nature, Lond., 1963, 198, 105-106 (Dept. Vert. Zool., Univ. Moscow, U.S.S.R.) The dura mater of the desert rodent Spermophilopsis leptodactylus Licht. is deeply pigmented due to the presence of melanophores, while the pia mater is poorly pigmented. It is suggested that this pigmentation prevents penetration of harmful rays from the sun to the brain and spinal cord; it was found that 80% of rays with wavelength 750 m/i and 85% at 700 m/j were detained. G.M.Lewis

4987. COMPARATIVE ANATOMICAL EXAMINATION OF THE MICROMORPHOLOGY OF THE NERVOUS APPARATUS OF THE KIDNEY: II. THE MORPHOLOGY OF THE NERVOUS APPARATUS OF THE REPTILIAN KIDNEY. Ch.G.Waleewa: Aiiat. Anz., 1963, 112, 165-171 (Anat. Inst., Med. Inst., Kasan U.S.S.R.) Using the silver impregnation technique of Bielschowsky-Gros, the renal innervation of Testudo ibera, Tropidonotus natrix and of Lacerta apilis is examined. A complex pattern of innervation was found to exist in the parenchyma of the reptilian kidney; most of the nerve plexus are associated with blood vessels; some fine nerve-fibres were found to end with free brushlike endings in the epithelial cells of the uriniferous tubules and some fibres were seen on the capsule of the Malpighian corpuscle. (German) J.E.Linder

RR PRODUCTION

4988. ON THE REPRODUCTIVE CYCLE AND BREEDING HABITS OF TWO WESTERN SPECIES OF *HALIOTIS*. R.A.Booloontian, A.Farmanfarmaian and A.C.Giese: Biol. Bull. Woods Hole, 1962, 122, 183-193 (Univ. California, Los Angeles, Calif., U.S.A.) The annual reproductive cycles of *Haliotis cracherodii* and *B. rufescens* was studied by methods which are described. *H. cracherodii* was found to have a well marked summer breeding season, while *B. rufescens* spawned throughout the yr. These findings are compared with similar data from 8 other spp. of *Haliotis* from various parts of the world. G.J.Peakin

4989. RESTORATION OF THE BISEXUAL CYCLE BY BIOPTERIN AND FOLIC ACID IN THE PARTHENOGENETIC APHID *SAPPAPHIS PLANTAGINEA*. C.L'Hélias: CR. Acad. Sci., Paris, 1962, 255, 388-390 (Lab. Genet. evolutive C.N.R.S., Gif-sur-Yvette, S.-et-O., France) Fertile cfand ? of *S. plantaginea*? Pear with increasing length of darkness and decreasing temp, and contain more isoxanthopterine, bipterin, hydroxybipterin, xanthopterin and riboflavin than Parthenogenetic ?. O'l jug./il- of pterin was inj. into wingless, live bearing, parthenogenetic ♀ during the last larval stage. The insects were fed on plantain under continuous light at 20°. Isoxanthopterin and xanthopterin had no effect. With bipterin and folic acid, oviporous ? appeared in generation F3 and again in F6 and c? in F3. The delay is ascribed to the state of development of succeeding generations in the parent's body at the time of injn. (French) S.A.Thistlewood

4990. THE STRUCTURE OF THE REPRODUCTIVE ORGANS OF THE EUROPEAN RABBIT-FLEA, *SPILOPSYLLUS CUNICULI* (DALE) (SIPHONAPTERA). A.R.Mead-Briggs: Proc. roy. ent. Soc. Lond. A, 1962, 37, 79-88 (Min. Agr., Infest. Control Lab., Tangley Place, Worplesdon, Surrey, England) The structure of ? and ? reproductive organs are described and figured. Attention was paid to maturational changes that might be Elated to the flea *s reproductive history. Results were not as definite as in previous work on mosquitoes. A pigmented corpus luteum is produced both after ovulation and after egg resorption. However, the presence of corpora lutea and of sperm in the spermatheca was Warded as evidence that eggs had been laid. D.M.S. Perkins

4991. THE MUSCULAR STRUCTURE OF THE OVIPOSITOR AND ITS MODE.QF FUNCTION IN *NASONIA VITRIPENNIS* (WALKER)(HYMENOPTERA: PTEROMALIDAE). P.E.King: Proc. roy. ent. Soc. Lond. A, 1962, 37, 121-128 (Univ. Coll. Swansea, Wales) The ^ipositor and its musculature and their action during ^Position in the host puparium are described and combined with other Hymenoptera, both parasitic and non-asitic. D.M.S. Perkins

4992. THE STRUCTURE AND ACTION OF THE SPERMATHECA IN *NASONIA VITRIPENNIS* (WALKER) (HYMENOPTERA: PTEROMALIDAE). P.E.King: Proc. X- ent. Soc. Lond. A., 1962, 37, 73-75 (Univ. Coll.

of Swansea, Wales) The single spermatheca is composed of capsule, gland and duct which connects the capsule with the vagina, so allowing entry and exit of sperm. The gland secretes some substance through small canals into the duct which has an inner spiral thickening but no valves, unlike conditions previously found in other Chalcidoids. When quiescent, the spermatozoa are arranged in the capsule with their heads near the duct opening, their tails passing around the periphery and undulations passing from head to tail. These alter to lashing movements with change of pH and the sperm spin in the capsule, suggesting that they might be able to screw themselves along the duct. D.M.S.Perkins

4993. SOME BRITISH PSYCHODIDAE (DIPTERA, NEMATOCERA): DESCRIPTIONS OF SPECIES AND A DISCUSSION ON THE PROBLEMS OF SPECIES PAIRS. D.A.Duckhouse: Trans. roy. ent. Soc. Lond., 1962, 114, 403-436 (Univ. Leicester, England) Sp. pairs occurring among Psychodidae have the cf quite distinct and the ? morphol. inseparable, the 2 spp. having similai ecology and occurring side by side. This problem is discussed in relation to reproductive isolating mechanisms. D.M.S.Perkins

4994. ENVIRONMENTAL CAUSES OF VARIATION IN SEX RATIO OF ARRHENOTOKOUS INSECT, DAHBO-MINUS FULIGINOSUS (NEES) (HYMENOPTERA: EULOPHIDAE). A.Wilkes: Canad. Ent., 1963, 95, 183-202 (Entom. Res. Inst. Br., Canada Dept. Agric, Ottawa, Ont., Canada) Variations occurred in unfavourable environmental conditions before, during and after mating. Males more than middle-aged inseminated less than half the mated ?. Above 27° postembryonic <? larvae were sterilised. Larval mortality from super-parasitism above 65 per host favoured o* survival so natural pairing is increased when hosts are less numerous. Extension of oviposition period at low temp, reduced the 2 %. H.W. Spencer

4995. FACTORS AFFECTING THE ATTRACTIVENESS OF FOLIAGE FOR OVIPOSITION BY CARDIOASPINA ALBITEXTURA (PSYLLIDAE). L.R.Clarkz Aust. J. Zool., 1963, 11, 20-34 (Div. Entomol., C.S.I.R.O., Canberra, Australia) The attractiveness of leaves of *Eucalyptus blakelyi* as oviposition sites for *C albitextura* is increased by the presence of eggs but decreased when heavy feeding by nymphal or adult psyllids has occurred. G.M.Lewis

4996. THE EGG OF AGRAPTOCORKA GESTROI KIRKALDY (HEMIPTERA-HETEROPTERA: CORDCIDAE). G.A.Walton: Proc. roy. ent. Soc. Lond. A, 1962, 37, 104-106 (Dept. ZODL, Univ. Coll., Cork, Ireland) The large eggs are stalked with an expansion at the base of the stalk which ensures a firm grip when the eggs are fastened to submerged plants or other material during oviposition. The ovaries and the position of the eggs in them are described. D.M.S.Perkins

4997. SURVIVAL AND DIFFERENTIATION IN IN VITRO CULTURE OF GONADS OF LATE LARVAE OF *GALLERIA MELLONELLA* (LEPIDOPTERA, PYRALIDAE). Th.Lender and J.Doveau-Hagege: Develop. Biol., 1963, 6, 1-22 (Lab. Biol. Animate, S.P.C.N., Fac. Sci. de Paris, centre d'Orsay, France) 67% of the gonads cultured as a solid medium survived for at least one week. Multiplication of germ cells occurred in both sexes, spermatocytes were transformed into spermatozooids and oogonia entered into previtellogenesis with differentiation of follicles. (French) J.W.S.Harris

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ENDOCRINES

4998. EFFECT OF EYESTALK EXTRIPATION ON METAMORPHOSIS OF MEGALOPS OF THE BLUE CRAB, CALLINECTES SAPIDUS RATHBUN. J.D.Costlow, jun.: Gen. Comp. Endocr., 1963, 3, 120-130 (Duke Univ. Marine Lab., Beaufort, N.C., U.S.A.) One or 2 eyestalks were removed from the megalops of the blue crab on days 0-5 following the final zoeal moult. The post larval stages were studied over 4-6 consecutive moulting periods. Removal of both eyestalks within 12 hr. of the final zoeal moult considerably accelerated metamorphosis to the first crab stage, but results obtained were not completely compatible with current concepts of the control of moulting. S.A.Carney

4999. EFFECT OF AMPUTATING THE OCULAR PEDUNCLES ON THE LENGTH OF TIME BETWEEN MOULTS AND THE GROWTH OF A DECAPOD NATANTIA: LEANDER SERRATUS (PENNANT). C.Tchernigovtzeff: C.R. Acad. Sci., Paris, 1962, 255, 400-402 (Station Biol. Roscoff, France)

150 *L. serratus* 40 to 45 mm. long were kept in running sea water in individual tanks at 12, 16 or 2(f). In 69 the ocular peduncles were removed immediately before a moult. The interval before the next moult was shortened by 16 to 20% and sex differences in this interval appearing at 12° in controls were abolished. The increase in size between moults was greater. The optimum temp, for growth was 16° but the effects of temp, were less in the expt. group. (French) S.A.Thistlewood

5000. THE PROBLEM OF THE HORMONE DEPENDENCE OF THE MATING BEHAVIOUR OF INSECTS. INVESTIGATION IN *GALLERIA MELLONELLA* (L.). H. Roller, H.Piepho and L.Holz: J. insect Physiol., 1963, 9, 187-194 (Zool. Inst., Gottingen Univ., Germany) It has been shown that allatectomy, gonadectomy and a combination of the 2, do not influence the mating behaviour of <\$ or ? wax moths, *G. mellonella*. The implantation of additional corpora allata in pupae or adults did not influence the mating behaviour. (German) R.J.Walker

5001. THE ROLE OF PHOTOPERIOD AND TEMPERATURE IN THE DETERMINATION OF PARTHENOGENETIC AND SEXUAL FORMS IN THE APHID MEGOURA VICIAE BUCKTON. III. FURTHER PROPERTIES OF THE MATERNAL SWITCHING MECHANISM IN APTEROUS APHIDS. A.D.Lees: J. insect Physiol., 1963, 9, 153-164 (Agric. Res. Council, Unit Insect Physiol., Cambridge, England) Photosensitivity first develops when the parent is still an embryo, some 2 days prior to birth. The prenatal light regime influences the progeny sequence, e.g. a reversal from a long to a short day photostimn. at birth accelerates the response to a second reversal, e.g. from short to long days, during the adult life of the same individual. Photoperiods 30 min. longer or shorter than the critical length exert weak long and short day effects. Short photoperiods of 4-14 hr. are strong, but permanent darkness exerts a weak short day effect. At 15°, the critical daily photoperiod is approx. 14 hr. 55 min. Within the range of 10-20°, the critical photoperiod shortens by about 15 min./5° rise. Above 23°, the temp. compensation is gradually lost and virginoparae are produced even under strong short day conditions. It is suggested that the photoperiodic mechanism involves a light receptor and a humoral component, both possibly located in the neuroendocrine system.

RJ.Walker

5002. THE JUVENILE HORMONE- II. ITS ROLE IN THE ENDOCRINE CONTROL OF MOULTING, PUPATION AND ADULT DEVELOPMENT IN THE CECROPIA SILKWORM. CM.Williams: Biol. Bull. Woods Hole, 1961, 121, 572-585 (Biol. Lab., Harvard Univ., Cambridge, Mass., U.S.A.) Using a method of standardised 'pupal assay' for juvenile hormone it was shown that the corpora allata in each of the larval instars are least active just before and most active shortly after moulting. At pupation their activity is low but definite, while during the pupal stage they are inactive. This inactivity persists for the first two-thirds of adult development, but during the final week of development the corpora allata recover and are maximally active at emergence of the adult.

G.J.Peakin

5003. PHOTOPERIODIC INDUCTION OF DIAPAUSE IN AN INSECT. S.D.Bek: Biol. Bull. Woods Hole, 1962, 122, 1-12 (Dept. Ent., Univ. Wisconsin, Madison, Wis., U.S.A.) Induction of diapause in the larvae of *Ostrinia nubilalis* was dependent on the no. of hr. of the photoperiodic phases, the dark phase being more critical than the light phase. A 12-hr. dark phase was most effective when combined with a light phase ranging from 5-18 hr. and a significant incidence of diapause was obtained with light phases extending from 4*5-32 hr. with this dark phase. The incidence of diapause was inversely proportional to the ambient temp, during the dark phase. A 1 hr. interruption of the dark phase modified the photoperiodic response, the effect depending on the position of this interruption in the dark phase.

G.J.Peakin

5004. DATA ON THE NEUROSECRETION OF A SUB-TERRANEAN OLIGOCHAETE, PELODRILUS LERUTHI HRABE. CJuberthie and M.Mestrov: C.R. Acad. Sci., Paris, 1962, 255, 394-396 (Lab. souterrain du C.N.R.S., Moulis, Ariège, France) The c.n.s. of *P. leruthi*, a cave-dwelling Oligochaete of the family Haplotaxidae, contains various types of neurosecretory cells in the brain, the sub-oesophageal ganglion and the nervous chain. (French) S.A.Thistlewood

5005. NEUROSECRETION AND CRUSTACEAN RETINAL PIGMENT HORMONE: DISTRIBUTION OF THE LIGHT-ADAPTING HORMONE. L.H.Kleinholz, P.R.Burgess, D.B.Carlisle and O.Pflueger: Biol. Bull. Woods Hole, 1962, 122, 73-85 (Biol. Lab., Reed Coll., Portland, Ore., U.S.A.) Nervous tissue from 8 decapod crustaceans was tested for distal retinal pigment light-adapting hormone. It was demonstrated in a no. of tissues and its distribution agreed with the histol. demonstration of neurosecretory cells and axons in these tissues.

G.J.Peakin

5006. NEUROSECRETORY MATERIAL FROM THE NUCLEUS LATERALIS TUBERIS IN THE HYPOPHYSIS OF THE EASTERN BROOK TROUT, SALVELINUS FONTINALIS. D.CBillenstien: Z. Zellforsch., 1963, 59, 507-512 (Dept. Anat., Einstein Coll. Med., New York, U.S.A.) The neurosecretory pathway from the nucleus preopticus into the hypophysis can be demonstrated using aldehyde fuchsin or chrome-alumhaematoxylin; the secretory substance of the nucleus lateralis tuberis can be stained with either acid Fuchsin or Azocarmine.

J.E.Linder

5007. FIXATION AND ASSIMILATION OF 131I BY A BRYOZOAN, BUGULA NERTITINA L. J.Roche, S.Andrs and LCovelli: C.R. Soc. Biol., Paris, 1962, 156, 1817-1822 (Lab. Biol. Marine, Coll. France, Concabeau, France) *B. neritina* actively cone. 131I from sea water. This process which was reversibly

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inhibited by thiourea, resulted in the formation of iodo-Proteins which were localised in the zooids. Alk. hydrolysis of these proteins showed the presence of 3-monoiodotyrosine and 3,5-diiodotyrosine. (French) M.A.Price

5008. COMPARATIVE OBSERVATIONS ON IODINE BINDING BY SACCOGLOSSUS HORSTII BRAMBELL AND GOODHART, AND BY THE TUNIC OF CIONA INTESTINALIS (L.) E.J.W.Barrington and A.Thorpe: Gen. Comp. Endocr., 1963, 3, 166-175 (Dept. Zool., Univ. Nottingham, England) Chromatographic and autoradiographic studies were made of the J-311-labelled compounds in extracts of whole *S. horsti*, and of the surface layer of the tunic of *C. intestinalis* maintained in sea water containing 200 JIC 1311 per l. In the former case only iodine and 3-iodotyrosine were found, but 3-iodotyrosine, 3,5-diiodotyrosine, and a no. of unknowns were present in the *Ciona* extracts. S.A.Carney

5009. ON THE RESPONSES OF THE GLANDULAR TRACTS AND ASSOCIATED REGIONS OF THE ENDOSTYLE OF THE LARVAL LAMPREY TO GOITROGENS AND THYROXINE E.J.W.Barrington and M.Sage: Gen. Comp. Endocr., 1963, 3, 153-165 (Dept. Zool., Univ., Nottingham, England) Histol. and autoradiographic techniques were used in a study of the developmental relationships existing between the glandular tracts and the types 2a and 2b regions of the endostyle. The responses of the tracts to thiourea and thiouracil were essentially hypersecretory and the responses of the 2a and 2b cells resulted in an increased rate of replacement of the exhausted cells of the tracts. The responses were not Polished by simult. treatment of the animals with fcoitogens and thyroxine. S.A.Carney

6010. FUNCTIONAL RENAL THYROID FOLLICLES IN WILD SPECIMENS OF THE FRESHWATER TELEOST BARBUS STIGMA (CUV. ET VAL.) A.G.Sathyanaesan: Z. Zellforsch., 1963, 59, 530-534 (Dept. Zool., Banaras Hindu Univ., Varanasi-5, India) Thyroid follicles were found to occur in the kidney of *B. stigma*; the renal thyroid follicles were similar in appearance to those in the pharyngeal area. Over 320 specimens were examined. J.E.Linder

5011. THE EFFECT OF THIOUREA, ADMINISTERED BY THE IMMERSION OF THE MATERNAL ORGANISM, ON THE EMBRYOS OF LEBISTES RETICULATUS, WITH NOTES ON THE ADULT GONADAL CHANGE. L.L.Grosso Biol. Bull. Woods Hole, 1961, 121, 481-496 (Dept. Biol., Coll. Saint Teresa, Winona, Minn., U.S.A.) Exposure of the adult thyroid of *L. reticulatus* to a 0.4% thiourea soln. resulted in the increase in the number of the cells and the follicles they formed and their establishment in abnormal areas such as the heart, kidney, spleen and intestine. Similar changes were found in young fish obtained from females treated in the same way. Breeding capacity was also affected by producing abortions, reducing brood size, decreasing their freq. and reducing the no. of ova in the gonad. G.J.Peakin

5012. A STUDY OF THE ADRENAL TISSUE OF THE MALE AFRICAN BULLFROG, RANA ADSPERSA. D.E.MoDrhouse: Quart. J. micr. ScL, 1963, 104, 51-56 (World Health Organization, P.O. Box 13, Kuala Lumpur, Malaya) Adrenal tissue, investigated by histological and histochem. techniques, contains steroid, lymphoid and chromaffin tissues. The structure of the adrenal in the bullfrog does not support a theory of

zonation within the cortical tissue of the Anura. There is no alteration in the appearance of no. of 'summer cells' of stilling that can be correlated with the time of year or with the sexual activity of the animal, these cells are therefore called 'stilling cells'. There is evidence that structural differences are to be found between the stilling cells and granulocytes of the lymphoid tissue.

W.A.Stevens

5013. PROPERTIES OF THE OXYTOCIC MILK EJECTION AND ANTIDIURETIC PRINCIPLE OF THE NEURO-INTERMEDIATE LOBE OF THE ELASMOBRANCH PITUITARY. A.M.Perks and M.H.I.Dodd: Gen. Comp. Endocr., 1963, 3, 184-195 (Gatty Marine Lab., Univ. St. Andrews, Scotland) The prop. of the oxytocic, milk ejection, and antidiuretic agent of the neurointermediate lobes of the pituitaries of various elasmobranchs were studied. The results obtained indicate close chem. and pharmacol. similarity between this agent and oxytocin. S.A.Carney

5014. EFFECT OF ADAPTATION TO BLACK AND WHITE BACKGROUNDS ON THE TELEOST PITUITARY. B.I.Baker: Nature, Lond., 1963, 198, 404 (Lab. d'Histophysiol., College de France, Paris, France) Cells in the meta-adenohypophysis of teleost pituitaries were studied after adaptation of the fish for prolonged periods to dark or light backgrounds. It appeared that cellular activity was promoted during black adaptation but release of chromatophore-regulating hormones was not necessarily accompanied by pronounced cytol. changes. G.M.Lewis

5015. EFFECT OF STARVATION ON THE ACTIVITY OF THE HYPOTHALAMO-HYPOPHYSIAL SYSTEM OF VARANUS GRISEUS DAUD. G.Abdel-Messeih and J.Tawfik: Z. Zellforsch., 1963, 59, 395-404 (Zool. Dept., Univ. Coll. for Girls, Ain-Shams Univ., Heliopolis, Cairo, U.A.R.) Gomori stainable neurosecretory substance of the neurohypophysis may be related to antidiuretic hormone; histol. changes which occur in the neurosecretory system of *V. griseus* under conditions of starvation for variable periods were investigated to elucidare some problems of the water economy of desert reptiles. Adult *V. griseus* were kept without food and water for 2 months and 3 months. Changes in the histol. picture of the nucleus supraopticus, the nucleus paraventricularis and amount of stainable Gomori material indicate an increased rate of release of vasopressin - adiuretin during starvation. Severe starvation causes degeneration of neurosecretory cells of the nucleus supraopticus and paraventricularis as well as depletion of Gomori material in die pars nervosa of the pituitary of *V. griseus*. J.E.Linder

5016. REPRODUCTIVE CYCLE OF THE BIG FRUIT-EATING BAT, ARTIBEUS LITURATUS OLFRS. J.R-Tamsitt and D.Valdivieso: Nature, Lond., 1963, 198, 104 (Dept. of Biol., Univ. of the Andes, Bogota, Colombia) *A. lituratus* is polyoestrous and breeds throughout the yr.; 6 remain in full sexual activity.

G.M.Lewis

PARASITOLOGY

5017. SURVIVAL OF ECHINOCOCCUS GRANULOSUS AND TAENIA HYDATIGENA EGGS IN TWO EXTREME

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CLIMATIC REGIONS OF NEW ZEALAND- G.K.Sweatman and R.J.Williams: Res. vet. Sci., 1963, 4, 199-216 (N.Z. M.R.C., Otago Univ. Med. Sch., Dunedin, New Zealand) The survival and availability of E. granulosus and T. hydatigena eggs on pasture in a region of oceanic climate were compared with survival and availability in a quasicontinental climate region. The results showed that heavy rainfall reduced the availability of the eggs more than meteorological dryness with freezing and thawing and wide diurnal temp, variation. J. B. Derbyshire

5018. EXPERIMENTS ON EPIDEMIOLOGY OF NEMATO-DIRIASIS. T.E.Gibson: Res. vet. Sci., 1963, 4, 258-268 (Cent. Vet. Lab., Weybridge, England)

In studies with grass plots artificially-infected with N. battus or N. filicollis it was shown that infection could be built up to epidemic level by grazing lambs on the plots each yr.. but a pasture could be made safe by resting it for 1 grazing season. Resistant adult sheep perpetuated infection on the pastures. Outbreaks of disease due to N. battus occurred only in spring, but N. filicollis caused disease at other times of yr. because of the more rapid rate of hatching of the larvae of this sp. J.B.Derbyshire

5019. THE NOSEMA-INHIBITORY ACTIVITY OF ALCOHOL I. A COMPONENT OF FUMAGILLIN.

T.A.Gochnauer and B.Furgala: J. insect Path., 1962, 4, 489-491 (Entom. Res. Inst., Canada Dept. Agric., Ottawa, Canada) Honey bees, Apis mellifera, were individually inoculated with 30000 Nosema spores and kept in batches of 100. Nearly complete suppression of Nosema development was produced by feeding sucrose with levels of 12*5 mg. fumagillin and 500 mg. alcohol I/I. respectively. All treatments reduced the longevity of the test bees compared with the controls. R.J. Walker

5020. THE EFFECT OF THE INTENSITY OF NOSEMA INOCULUM ON QUEEN SUPERSEDURE IN THE HONEY BEE APIS MELLIFERA L. B.Furgala: J. insect Path., 1962, 4, 429-432 (Entom. Res. Inst., Canada Dept. Agric., Ottawa, Canada) 60 queens of A. mellifera were established in 5 frame nuclei. When the queens were performing normally, each received one of 6 levels of inocula. of Nosema apis. Inocn. with as few as 1000 spores led to supersEDURE. All the superseded queens were infected. With a given dose, it was found that the degree of infection and the time before supersEDURE became apparent varied. Some of the inoc. queens recovered and were free of spores from which it would appear that selection for resistance to the spores is possible.

R.J.Walker

5021. A REVIEW OF THE INSECT ENEMIES OF ACRID-QIDEA (ORTHOPTERA). D.J.Greathead: Trans, roy. ent. Soc. Lond., 1962, 114, 437-517 (Commonwealth Inst. Biol. Control, P.O. Box 265, Kampala, Uganda) Insect parasites and predators of the eggs and of the post-embryonic stages are listed with a review of their biology and geographical distribution. D.M.S.Perkins

5022. SOME ECOLOGICAL ATTRIBUTES OF PTEROMALID PARASITE AND ITS HOUSEFLY HOST.

W.P.Nagel and D.Pimentel: Canad. Ent., 1963, 95, 208-213 (Dept. Entom., Cornell Univ., Ithaca, N.Y., U.S.A.) Nasonia vitripennis? parasitise Musca domestica pupae. When hosts and parasites were kept together with cf and ? parasite longevity averaged 1*62 and 6*96 days respectively. Average progeny per 2 was

139*8. With 3 sizes of host pupae percentage parasitism for the small, medium and large was 45*0, 72*8 and 65*7 respectively. For each pupal size 2?20, 4*30 and 6*11 parasites resulted. Parasites in multicell cages dispersed more quickly when unfed. With increasing parasite-host ratio, parasitism rate became 100% in 24 hr. at 1:1. 11*jo parasitised hosts produced parasites at 1:2 and 0% above 10:1 due to superparasitism.

H.W.Spencer

5023. CAUSES OF VARIATIONS IN EFFECTIVENESS OF BRACON CEPHI (GAHAN) (HYMENOPTERA: BRACONIDAE) AS PARASITE OF WHEAT STEM SAWFLY.

N.D.Holmes, W.A.Nelson, L.K.Peterson and C.W. Forstad: Canad. Ent., 1963, 95, 113-126 (Entom. Sect., Canada Agric. Res. Stn., Lethbridge, Alta., Canada)

Parasite and host adults emerge at the same time. Sometimes there is a complete 2nd generation of parasites. Fluctuations in the amount of parasitism were due to: (1) lack of synchronisation of development between host and parasite, this being the most important cause, (2) temp, and moisture of the soil in the growing season, (3) differences in development rates of different host plants, their resistances to host attack and the date of seeding, (4) high host density of hollow-wheat stems which lessens parasitism because unparasitised larvae destroyed parasite larvae and (5) longer host survival which leads to higher parasitism.

H.W.Spencer

5024. DAILY SELECTION BY DRINO BOHEMICA MSEN. (DIPTERA: TACHINIDAE) OF FOUR SPP. OF HOSTS.

L.G.Monteith: Canad. Ent., 1963, 95, 162-166 (Entom. Res. Inst. Biol. Control., Res. Br., Canada

Dept. Agric., Belleville, Ont., Canada) Daily selection of sawfly host larvae Diprion hercyniae, Neodiprion sertifer, N. swainei and N. lecontei by D. bohemica was observed at $21^{\circ} \pm Y$ and $70 \pm 1\%$ R.H. Four generations of parasites were used, 2 which had been reared on D. hereynfee and 2 on N. lecontei. Generation fluctuation was apparently unrelated to that between generations but was influenced by the host preferences of its generation.

H.W.Spencer

5025. STUDIES ON THE BIONOMICS OF HEXAMERMIS ARVALIS POINAR AND GYRISCO, A MERMITHID PARASITE OF THE ALFALFA WEEVIL, HYPERA POSTICA (GYLLENHAL). G.O.Poinar, jun. and G.G.Gyrisco: J. insect Path., 1962, 4, 469-483 (Cornell Univ., Ithaca, New York, U.S.A.)

The life cycles of the weevil, H. postica and the nematode H. arvalis are described with ref. to the parasitism of the nematode on the weevil. Parasitised larvae are most abundant in early July. The pre-parasitic H. arvalis larvae probably penetrate the weevil larvae by direct penetration. The developmental period within the weevil is 7-12 days. The weevil larvae die soon after the emergence of the mermithid larvae. Most of the nematodes emerging from the weevil are <?, ? would appear to parasitise other insects in the field. Parasitism may reach 33% but it is very sparse and irregular and so it has no general economic importance at present.

R.J.Walker

5026. STORAGE OF AMBROSIA FUNGUS SPORES BY PITTED AMBROSIA BEETLE, CORTHYLUS PUNCTATISSUMUS ZIMM. (COLEOPTERA: SCOLYTIDAE).

R.J.Finnegan: Canad. Ent., 1963, 95, 137-139 (Forest Res. Lab., Quebec, P.Q., Canada) The d beetles store spores inside a long folded tube on each side of the pro thoracic coseal cavity and is closed by a coseal process. As no attached muscles are visible the spores are probably discharged by

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squeezing of the insects retracted head against the pro-thoracic wall. Such tubes were not found in ? beetles.

H.W. Spencer

50127. PROGRESSIVE HISTOCHEMICAL CHANGES IN VIRUS-INFECTED FAT BODY OF THE WESTERN OAK LOOPER. O.N.Morris: J. insect Path., 1962, 4, 454-464 (Forest Entom. and Path. Lab., Dept. Forestry, Victoria, British Columbia, Canada) The changes in DNA, glycogen, and protein in the fat body following infection with a nuclear polyhedrosis virus was investigated. DNA and protein increased progressively until just prior to the formation of the polyhedron, the 6th to the 7th day following infection. After this, there appeared to be a breakdown in DNA and a further rise in the rate of nuclear protein synthesis. Glycogen was reduced to a mere trace between the 4th to the 5th day following infection. Symptoms of starvation appeared at this time and this may account for the glycogen depletion.

R.

J.Walker

5028. A CYTOPLASMIC POLYHEDROSIS IN AN AUSTRALIAN SATURNIID. ANTHERAEE EUCALYPTI. T.D.C.Grace: J. insect Physiol., 1963, 9, 201-205 (Div. Entom., C.S.I.R.O., Canberra, Australia)

During laboratory rearing of A. eucalypti, a cytoplasmic Polyhedrosis infection was observed. Infected larvae at first are lethargic and cease to feed, then the cuticle becomes soft and changes colour. The mid-gut of infected larvae are white, very thin, approx. 4/5 of their normal length and the gut cells are packed with polyhedra. In electron micrographs, the polyhedra show cubic symmetry with 42 Å spacings between the centres of the Protein molecules. The virus particles are spherical and ^aPProx. 370 Å in diam. The virus is extremely pathogenic to A. eucalypti larvae. Five of the 6 spp. of Lepidoptera fed with the virus developed symptoms of a cytoplasmic polyhedrosis. R. J.Walker

5029. HOST-CONTAMINANT BIOLOGY OF MUSCOID FLIES. HI. EFFECT OF HIBERNATION. DIAPAUSE, AND LARVAL BACTERICIDES ON NORMAL FLORA OF BLOW-FLY PREPUPAE. B.Greenberg: J. insect Path., 1962, 4, 415-428 (Univ. Illinois, Coll. Pharmacy, Chicago, 111., U.S.A.) There is no significant quant.

Variation in the bacterial content of the crop, midgut, and hindgut of normal prepupae of Lucilia sericata and Oxomyopsis cadaverina. Mean counts at the beginning 5th after 7th moults hibernation revealed the following feline in bacteria content; crop, 500-fold; midgut, 10-fold; hindgut, 10-fold. Diapaused induced prep. Pae maintained at room temp, for 30 days showed a significant loss of bacteria from the crop and midgut. In these expt. the hindgut population increased in the ant. Portion, remained stable in the middle, and fluctuated in the rectum. Homogenates of gut and washings from several spp. of blowfly larvae yielded no bacterial activity ^against various Gram-pos. and Gram-neg. bacteria.

3..

R.J.Walker

MISCELLANEOUS

5030. BIOELECTRIC POTENTIALS IN RELATION TO MOVEMENT IN AMOEBAE. M.S.Bingley and CM. Thompson: J. theor. Biol., 1962, 2, 16-32 (Zool. Dept., King's Coll., Univ. London, England)

Movement of Amoeba proteus can be redirected by application of electric potentials to the rear of the cell. An electric potential gradient which is related to the medium, exists in the cytoplasm along the axis of movement. It is suggested that bioelectric potentials should be taken into account when discussing amoeboid movement.

J.A.Dawson

5031. MORPHO-PHYSIOLOGICAL STUDY OF AMOEBOID MOVEMENT. I. DYNAMIC ORGANISATION OF STRIATA AMOEBAE. T.H.Abe: Cytologia, 1961, 26, 378-407 (Lab. Biol., Hosei Univ., Tokyo, Japan)

The morphology of living organisms named Amoeba striata is described in detail. The flow-speeds of various parts of the amoeboid surface during locomotion are measured by observation on adhering particles, and the flow-lines mapped. The formation and fate of the contractile vacuole is also described, as is the origin and behaviour of the gelled strands found in the endoplasm. These observations are used to explain in part amoeboid movement, and more especially the method of change of direction by the organism.

C.A.Stace

5032. PREPARATION AND USE OF INSECT HAEMOCYTE MONOLAYERS IN VITRO. M.E.Martignoni and R.J. Scallion: Biol. Bull. Woods Hole, 1961, 121, 507-520 (Dept. Insect Pathology, Univ. California, Berkeley, Calif., U.S.A.) A method of prep. of monolayers of haemocytes which could be maintained for 10-15 days is described. The source of the cells was 2-4 day old 6th instar larvae of Peridroma saucia.

G.J.PeaWn

5033. RESPONSES OF MYTILUS EDULIS LARVAE TO INCREASES IN HYDROSTATIC PRESSURE. B.L.Bayne: Nature, Lond., 1963, 198, 406-407 (Marine Sci. Lab., Menai Bridge, Anglesey, Wales) Young larvae of M. edulis respond positively to increased hydrostatic pressure, thus remaining in the surface layers of the water. The response weakens as the larvae approach metamorphosis and settlement.

G.M.Lewis

5034. RELATION BETWEEN PLANT GROWTH SUBSTANCES AND AN OXYTRICHIDEN [PROT].

C.Petroff: Z. Naturforsch. B, 1962, 17, 614-615 (Inst. of Vet. Bacteriology, Pleven, Bulgaria) 2:4-D, its sodium salt, IAA and indolebutyric acid all inhibited the growth of Oxytrichidien at all concn. between 1-8 and 910 p.p.m. Lysis of the cells occurred at concn. of 450 p.p.m. and above. (German) J.C.Crawhall

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5035. ADVANCES IN BIOLOGICAL AND MEDICAL PHYSICS. 1962. Vol. 8.

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5036. ANNUAL REVIEW OF PHYSICAL CHEMISTRY, 1963. 14.

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5037. BACTERIOLOGICAL REVIEWS. 1963. 27, No. 1.

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5038. THE BIOCHEMICAL JOURNAL. 1963, 88.

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5039. BIOLOGICAL REVIEWS, 1963. 38. No. 3.

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5040. BULLETIN OF THE NEW YORK ACADEMY OF MEDICINE, 1963. 39.

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5041. CIBA FOUNDATION STUDY GROUP, No. 15, 1963. Ed. G.E.W.Wolstenholme and M.O'Connor.

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5043. THE HARVEY LECTURES, Series 57, 1961/62.

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5044. INTERNATIONAL JOURNAL FOR VITAMIN RESEARCH, 1962, 32, 4.

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5045. JOURNAL OF GENERAL MICROBIOLOGY. 1963. 32.

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5047. REVUE D'IMMUNOLOGIE ET DE THERAPIE ANTIMICROBIENNE, 1962. 2G. 5-6.

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5048. SYMPOSIA OF THE INTERNATIONAL SOCIETY FOR CELL BIOLOGY. 1962. 1.

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5049. A STRIATED INTERCELLULAR MATERIAL IN RAT BRAIN. R.A.Naumann and D.E.Wolfe: Nature, Lond., 1963, 198, 701-703 (Lab. of Neuroanatomical Sci., Nat. Inst. of Neurol. Dis., Bethesda, Md., U.S.A.)

A unique intercellular material has been observed by t'M. beneath the subcommissural organ of brains of young adult rats of both sexes in 2 strains. At the vascular poles of the cells of the subcommissural organ, it occupies the renvascular space and may be seen intercellularly as much as 4-5 [i from a vessel. G.M.Lewis

5050. AN E.M. STUDY OF THE STRATUM RADIATUM OF THE RAT HIPPOCAMPUS (REGIO SUPERIOR, CA1) WITH PARTICULAR EMPHASIS ON SYNAPTOLOGY. L.E.Westrup and T.W.Blackstad: J. comp. Neurol., 1962, 119, 281-316 (Anat. Inst., Univ., Oslo, Norway). G.M.Lewis

5051. NUCLEAR STRUCTURE OF THE THALAMUS OF THE FERRET. J.Herbert: J. comp. Neurol., 1963, 120, 105-127 (Dept. Anat., Univ., Birmingham, England) Differences from other CarriLvor are noted in the representation of the medianum and in the structure of the post, part of the lat. group of G.M.Lewis

5052. AN E.M. STUDY OF THE INFERIOR OLIVE OF THE CAT. F.Walberg: J. comp. Neurol., 1963, 120, 1-17 (Anat. Inst. Univ., Oslo, Norway). G.M.Lewis

5053. ULTRASTRUCTURE OF NERVE FIBRES IN TRIGEMINAL GANGLION OF RAT. A.D.Dixon: J. ultrastructure Res., 1963, 8, 107-121 (Anat. Dept., Univ. Med. Sch., Manchester, England) Myelinated fibres of the trigeminal ganglion in 4-48 day old rats had a

similar structure to that of peripheral nerve fibres elsewhere in the body. Some Schwann cells contained supplementary myelin sheaths in the form of protrusions into the surrounding cytoplasm. Unmyelinated nerve fibres were observed between myelinated ones. The axons of the former were contained in imaginations of the Schwann cell plasma membrane. H.B.Waynfirth

5054. ULTRASTRUCTURE OF PLASMA MEMBRANE AND MYELIN SHEATH OF PERIPHERAL NERVE FIBRES AFTER FIXATION BY FREEZE-DRYING. L.-G.Elfvin: J. ultrastructure Res., 1963, 8, 283-304 (Zool. Dept., Univ. California, Los Angeles, Calif., U.S.A.)

The plasma membrane of frozen-dried unmyelinated and myelinated splenic nerve fibres, stained with uranyl acetate is a 3-layered structure. The cell boundaries between axons and the Schwann cells usually have a 5-layer appearance due to close packing of adjacent membranes. H. Waynfirth

5055. COMPARISON OF EFFECTS OF FREEZING AND OF TREATMENT WITH HYPERTONIC SOLUTIONS OF STRUCTURE OF NERVE MYELIN. R.T.Joy and J.B. Fincair: J. ultrastructure Res., 1963, 8, 264-282 (Med. Biochem. and Pharmacol. Dept., Univ., Birmingham, England) Low angled X-ray diffraction patterns of frog peripheral nerves indicated that the lipoprotein structure of their myelin contracted when the nerve was frozen or immersed in hypertonic soln. Re-expansion took place after thawing or in isotonic saline. The normal structure was usually then attained. Hypertonicity, which normally accompanies freezing and thawing could therefore be responsible for the expansion in thawed specimens. H.B. Waynfirth

5056. PARANODAL APPARATUS OF PERIPHERAL MYELINATED NERVE FIBRES OF MAMMALS. P.L.Williams and D.N.Landon: Nature, Lond., 1963, 198, 670-673 (Dept. Anat., Guy's Hosp. Med. Sch., London, England) Microscopic examination of muscle nerves from rabbits, rat and mouse gives evidence that the paranodal apparatus

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comprises a complex series of alterations of the form and quant. relationships of both axon and myelin sheath with the development of columns of Schwann cell cytoplasm containing a large population of mitochondria; these may provide an energy source for the surface membrane of the axon at the node.

G.M.Lewis

5057. MORPHOGENESIS OF SCHWANN CHANNELS IN SQUID NERVE G.M.Villegas and R.Villegas: J. ultrastructure Res., 1963, 8, 197-205 (Biofisica Dept., I.V.I.C., Caracas, Venezuela) E.M. study of the whole contour of cross sections of the giant nerve fibres of the squid, *Dorytenthis plei*, has shown the existence of about 8 Schwann cell nuclei. The non-synctial nature of the Schwann cell was demonstrated. Digitations of the Schwann cell surface were seen and these, from two or more cells, may interdigitate. The slit channels of the giant fibres were thought to originate in the opposition of the digitations of neighbouring cells.

H.B.Waynforth

5058. E.M. STUDY ON THE REGENERATIVE PROCESS OF PERIPHERAL NERVES OF MICE R.Wettstein and J.R.Sotelo: Z. Zellforsch., 1963, 59, 708-730 (Inst. Investigacion de Ciencias Biol., Montevideo, Uruguay) The post, branch of dorso-spinal nerves of mice were sectioned to study the regenerative process taking place. The sectioned stumps were left in contact and the skin incision closed as soon as possible. Fixation was performed at various times ranging from 30 min. to 30 days. Early after sectioning (30 min.) the nerve membrane becomes masked by microvesicles which appear to originate from the membrane; some of the microvesicles coalesce and give the appearance of a row of vesicles. At a later stage this reactive process becomes more general in the nerve stump and large areas of microvesicles appear in the neuroplasm of the fibre; the microvesicles become later on elongated and lead to the formation of tubules with a progressively thinner diam.

J.E.Linder

5059. E.M. OF WALLERIAN DEGENERATION J.C.Y.Lee: J. comp. NeuroL, 1963, 120, 65-79 (Dept. Anat., Univ. Saskatchewan, Saskatoon, Canada) Wallerian degeneration was studied in sectioned sciatic nerves of rats and rabbits in the E.M., observations being continued for more than 35 days.

G.M.Lewis

5060. OCCURRENCE OF MYELINATED AND UNMYELINATED NERVES IN IRIS ANGLE OF MAN AND RHESUS MONKEY G.B.Chapman and W.W.Spelsburg: Exp. Eye Res., 1963, 2, 130-133 (Dept. Anat., Cornell Univ. Med. Coll., New York, U.S.A.) E.M. of ultra-thin sections of portions of human and the rhesus monkey iris angle and its immediate vicinity was carried out on tissues fixed in buffered OSO₄. Myelinated and unmyelinated nerve fibres were found in human and rhesus monkey iris angle. In the human angle, the nerve fibres were seen in the collagen core of a trabecula. In the monkey sclera, adjacent to Schlemm's canal, the nerve fibres were observed in an area set apart by attenuated processes of epithelial cells. Basement membrane appeared on both sides of the trabecular endothelial cells. The myelinated fibres revealed a myelin periodicity in the range typical for this material. The possible role of these nerve fibres in appreciating ciliary muscle tonus and regulating aq. outflow is discussed. J. Whiting

5061. DISTRIBUTION OF MAST CELLS IN NORMAL EYE. METHOD OF STUDY. G.K.Smelser and S. Silver: Exp. Eye Res., 1963, 2, 134-140 (Dept. Ophthalmology,

Columbia Univ., New York, U.S.A.) The no. and structure of connective tissue mast cells was studied in various ocular tissue and comparisons were made with non-ocular tissue in four spp. The post; choroid of the eye of several laboratory animals contained many mast cells, shown in whole mounts of the entire uvea stained with Toluidine Blue at pH 1⁶. A greater no. of mast cells/unit area were found in the post, uvea than in peritoneal and pericardial membranes. The iris of all spp. studied was devoid of mast cells. The ocular mast cells were readily degranulated by a histamine liberator, showing their similarity in this respect to mast cells in other connective tissues. The uvea of a carnivore, in contrast to that of a rodent, contained very few mast cells, although they were abundant in non-ocular tissues.

J. Whiting

5062. NEURONE-GLIA RELATIONSHIP IN BIPOLAR CELL LAYER OF FISH RETINA G.M.Villegas and R.Villegas: J. ultrastructure Res., 1963, 8, 89-106 (Biofisica Dept., I.V.I.C., Caracas, Venezuela) The ultra-structure of the horizontal cells of the fish retina suggest that they are glial cells rather than neurones. This is further supported by electrical and osmotic studies. The amacrine and Muller bipolar cells are found among the innermost layer of horizontal cells. The amacrine cells can be glial or neuronal. A study of the cellular osmotic behaviour of the retina in anisotonic media is presented and indicates the greater susceptibility of the horizontal cells to anisotonicity.

H.B.Waynforth

5063. OPTICAL PROPERTIES OF THE HUMAN EPIDERMIS R.Elam, D.W.Goodwin and K.L.Williams: Nature, Lond., 1963, 198, 1001-1002 (Hilger and Watts, Ltd., London, England) The emissivity of a specimen of human abdominal epidermis was calculated from the variation of transmittance with wavelength. The absorption which occurs is primarily a function of moisture content, the epidermis acting only as a light scatterer between 1 and 6 ft? beyond 6 p the epidermis acts as a black body.

G.M.Lewis

5064. FINE STRUCTURE OF DEVELOPING DOWN FEATHER C.W.Kischnen: J. ultrastructure Res., 1963, 8, 305-321 (Entomol. and Zool. Dept., Iowa State Univ., Ames, Iowa, U.S.A.) Numerous granules were seen in the cytoplasm and mitochondrial matrix of the cells of the developing down feather of the chick embryo. Clusters of granules were also seen in the barb ridge cells, especially in the light zone of the dermo-epidermal boundary and in the cytoplasm surrounding the mitochondria. The basement membrane showed no pores or breaks and was granular in appearance. H.B.Waynforth

5065. E.M. OF MILK SECRETION IN MAMMARY GLAND OF C3H/Crgl MOUSE. II. CYTOMORPHOLOGY OF INVOLUTING GLAND S.ftY/ellings and K.B.DeOme: J. nat. Cancer Inst., 1963, 30, 241-267 (Pathol. Dept., Oregon Univ. Med. Sch., Portland, Ore., U.S.A.) A descriptive account.

J.G.Bennette

5066. EFFECT OF AGE ON THE ACIDOPHILIA OF AORTIC ELASTIN D.W.Menzies and J.T.Roberts: Nature, Lond., 1963, 198, 1006-1007 (Dept. Pathol., Univ., Melbourne, Australia) In the infant, Bromphenol Blue staining of aortic elastin resists water extraction almost indefinitely. This stability diminishes rapidly as the somatic age rises to 5, and fades out at an upper level in the 3rd to 4th decaae.

G.M.Lewis

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5067. X-RAY STUDY OF HUMAN AORTAS.

R.W.G.Wyckoff and O.Croissant: *J. Infrastructure Res.*, 1963, 8, 154-160 (Physics Dept., Arizona Univ., Tucson, Ariz., U.S.A.) A description of, and a discussion on the microradiographs of healthy and calcified human aortas using the K X-rays of Ti and Al are Presented. Also described are the X-ray probe and macro X-ray spectrographic analyses of these aortas.

H.B.Waynfirth

5068. E.M. OF NEWBORN RAT AORTA. W.J.Paule:

J. ultrastructure Res., 1963, 8, 219-235 (Anat. Dept., Med. Sch., S. California Univ., Los Angeles, Calif., U.S.A.) A comparison between the aortas of newborn and adult rats is made. The subendothelial space in the newborn is more prominent, the elastic membranes are thinner than in the adult and the elastin in the newborn has a vesicular organisation as in the adult but the vesicles are more variable and larger. Many stages between mature and immature elastin can be observed in the newborn. The elastic membrane is PA-Schiff pos. in the young rat and neg. in the adult. H.B.Waynfirth

5069. INTIMAL CHANGES IN THE ARTERIES OF

AGEING SWINE. J.E.French, M.A.Jennings, J.C.F. Poole, D.S. Robinson and Sir H.Florey: *Proc. roy. Soc. B*, 1963, 158, 24-42 (Dept. Path., Univ., Oxford, England) Studies by light and E.M. of the aorta, coronary arteries and other main arteries in pigs between 4-10 yr. of age revealed intimal thickenings including changes in elastic tissue and accumulation of Upids resembling early human atherosclerosis. Total Plasma lipid concn. was lower than in man. In ?a higher Proportion of total plasma lipid was associated with low-density lipoproteins, incT, with the high-density fraction. No correlation was found between individual values for Plasma lipids and the extent and severity of the arterial lesions, which, in general, increased with age.

G.M.Lewis

5070. THE FINE STRUCTURE OF THE PIG AORTA IN EXPERIMENTAL LATHYRISM. K.Seifert and F.Hartmann:

2. *Zellforsch.*, 1963, 59, 878-907 (Path. Inst., Univ., Kiel, Germany) Changes of the fine structure of the aorta in osteo-lathyrism, produced in piglets by daily administration of g-amino-propio-nitril, are described. Degradation of the elastic tissue leads to a disintegration of the elastic lamellae and finally results in necrotic foci and complete structural disorganisation of the media. The ^cOagenous-elastic fibre network of the intima disintegrates, the subendothelial intima becomes swollen; the Jftuscle fibres of the media become transformed into [fibroblasts to a far reaching extent; the Langhans cells ^{be}come activated. (German) J.E.Linder

5071. STRUCTURE AND FUNCTION OF THE SHEATHED CAPILLARIES IN THE SPLEEN. L.O.Zwillenberg and H.H.L.Zwillenberg: *Z. Itselforsch.*, 1963, 59, 908-921 (Anat. Inst., Univ., Bern, Switzerland)

The fine structure of the sheathed capillaries in the spleen of cat and dog are described and compared; the endothelial ^{el}st lining it are supported by a fenestrated framework of ⁿ elastin-like intercellular substance. Non-myelinated ^{er}ve fibres and Schwann cells are present. The filtering ^a vasomotor functions of the sheathed capillaries are ^cussed. (German) J.E.Linder

5072. ORIGIN OF MYOBLASTS AND PROBLEM OF DIFFERENTIATION. B.E.Walker: *Exp. Cell Res.*, 1963, 30, 80-92 (Ddpt. Anat., Univ. Texas Med. Branch, Galveston, Tex., U.S.A.) The origin of

myoblasts was studied in mice by injuring the connective tissue and muscle. The results showed that the myoblasts regenerate from cells which form within injured muscle fibres. Results of expt. on muscle regeneration are discussed in relation to dedifferentiation and redifferentiation. It is concluded that cells in the adult are irreversibly differentiated in respect to being members of a particular cell population even though the morphol. of a cell might vary due to various environmental influences. K.Jones

5073. STAINING OF VASCULAR ELASTIC FIBRES IN MUMMIFIED AND DRIED HUMAN TISSUES.

A.T.Sandison: *Nature, Lond.*, 1963, 198, 597 (Univ. Pathol. Dept., Western Infirmary, Glasgow, Scotland) In Egyptian mummy tissue and in human tissues dehydrated and preserved by treatment with natron, elastic fibres markedly resist change and can be satisfactorily stained and studied microscopically in vascular tissues.

G.M.Lewis

5074. POST-MORTEM CHANGES IN THE COLOUR OF PIG LONGISSIMUS DORSI MUSCLE. J.V.McLoughlin and G.Goldspink: *Nature, Lond.*, 1963, 198, 584-585 (Agric. Inst., Animal Production Divn.,

Beaumont Rd., Dublin, Eire) The pale colour of exudative longissimus dorsi muscles in pigs occasionally observed after onset of rigor is shown to be due to a rapid fall in pH while the temp. was still high, causing rapid post-mortem glycolysis and pptn. of previously sol. sarcoplasmic protein, which adsorbed myoglobin and masked its colour.

G.M.Lewis

5075. E.M. OBSERVATIONS OF A DENSE, IRREGULARLY BANDED MATERIAL OCCURRING IN SOME PORCINE MUSCLE FIBRES. R.G.Cassens, E.J.Briskey and W.G.* Hoekstra: *Nature, Lond.*, 1963, 198, 1004-1005 (Dept. Meat and Animal Sci., Univ. Wisconsin, Madison, Wis., U.S.A.) Prelim. comm.

G.M.Lewis

5076. ON THE ALLEGED PRESENCE OF NON-ARGYROPHILE ARGENTAFFIN CELLS IN THE HUMAN GASTRO-INTESTINAL TRACT. I. Singh: *Z. Zellforsch.*, 1963, 59, 615-624 (Anat. Sch., Univ., Cambridge, England)

Foetal and adult human gastrointestinal material was used to study the precise relationship between argentaffin and argyrophile cells. Sections were stained by the Gomori hexamine-, Schmorl- or diazonium methods; after recording all reacting cells the sections were bleached and restained by the Bodian technique. Comparison of cells demonstrable by both methods show that all argentaffin cells of the human gastrointestinal tract are also argyrophilic.

J.E.Linder

5077. ACTION OF 2,4-DINITROPHENOL AND IODOACETATE ON ULTRASTRUCTURE OF OXYNTIC CELLS. J.D.Vial and H.Orrego: *Exp. Cell Res.*, 1963, 30, 232-235 (Dept. Anat., Univ. Catolica, Santiago, Chile)

The effects of some inhibitors of HCl secretion on the structure of the oxyntic cell in the albino rat were studied, to explore one of the hypotheses further.

K.Jones

5078. BEHAVIOUR OF SUCCINIC AND LACTIC DEHYDROGENASE IN HUMAN LARGE INTESTINE.

P.Gentilili, K.V.Mallegni, R.Dominici and G.Bufalini: *Sperimentale*, 1962, 112, 485-495 (1st. Semeioticci, Med. Univ. Firenze, Italy) The distribution of succinic dehydrogenase [SA] and lactic dehydrogenase [LA] was studied in a biopsy sample of normal human large intestine by the diformazone staining method. SA activity of the lining epithelium was

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intensely localised in the basal zone of the cells and less so in the apical zone. In the interstitial glands the SA was almost exclusively located at the basal zone, particularly near the fundus of the tubules. This distribution correlates with that of mitochondria on the cell. The caliciform cells, lamina propria, lymphatic follicles and muscularis mucosa show very little SA activity. The LA was distributed equally throughout the cytoplasm of most of the cells. (Italian) G.N.Godson

5079. FINE STRUCTURAL LOCALISATION OF ATPase IN SMALL INTESTINE, KIDNEY AND LIVER OF RAT. C.T.Ashworth, F.J.Luibel and S.C.Stewart: J. cell Biol., 1963, 17, 1-18 (Dept. Pathol., Univ. Texas Southwestern Med. Sch., Dallas, Tex., U.S.A.)

The best localisation was obtained with tissue quenched with liquid N₂, sectioned at 25 μ in a cyostat, fixed in formalin-sucrose at pH 7² followed by incubation in the substrate medium of Wachstein and Meisel and osmication. ATPase was demonstrated in the nuclei and within the nucleoli of all tissues. Localisation occurred on cell membranes at sites where active transport mechanisms are suspected, such as the microvilli of intestinal epithelium, bile canaliculi and proximal convoluted tubular epithelial cells, endothelial linings of capillaries, glomerular epithelial cell membranes and on mitochondrial cristae. P. Barrow

5080. LYSOSOMES AND VACUOLATION OF THE LIVER CELL. D.B.Brewer and D.Heath: Nature, Lond., 1963, 198, 1015-1016 (Dept. Pathol., Univ., Birmingham, England) Vacuolation of liver cells was produced by injecting adult rats with 6-8 ml. 50% sucrose. Histochem. studies by E.M. and light microscopy showed that the acid¹phosphatase-containing lysosomes develop into the vacuoles. G.M.Lewis

5081. HISTOCHEMICAL DISTRIBUTION OF LIPIDS IN THE LIVER OF NEW BORN MICE (0-60 HOURS). P. Malet, R.Lagarde and J.P.Turchini: C.R. Soc. Biol., Paris, 1962, 156, 2058-2060 (Lab. d'Histol., Fac de MSD., Clermont-Ferrand, France) At birth, the liver of mice contained a low concn. of lipids which disappeared in 8-10 hr. After 18 hr. there was a considerable accumulation of lipids throughout the hepatic parenchyma. From the 24th-60th hr. after birth the level of lipids remained high. (French) M. A.Price

5082. DEPHOSPHORYLATION OF DEOXYADENOSINE MONOPHOSPHORIC ACID BY LIVER AND KIDNEY OF MICE. P.Turchini, P.Bastide, J.C.Marcheix and G.Dastugue: C.R. Soc. Biol., Paris, 1962, 156, 2063-2064 (Lab. d'Histol., Fac. Méd., Clermont-Ferrand, France) Histochem. study showed that dephosphorylating activity was localised in the region of the parenchymatous nuclei and bile ducts of the liver and in nuclei and endothelium of the convoluted tubules of the kidney. Biochem. estimations of dephosphorylating activity showed an equal distribution of activity in the homogenate and supernatant of liver. (French) M. A.Price

5083. CARBOHYDRATES OF HUMAN VAGINAL TISSUE. A.T.Gregoire: Nature, Lond., 1963, 198, 996 (Strickler Root Lab., Dept. of Obst., Jefferson Med. Coll., Philadelphia, Pa., U.S.A.) Carbohydrates were extracted from normal human vaginal tissue obtained from surgical patients. Glucose*, maltose, maltotriose and maltotetraose were identified by paper chromatography. G.M.Lewis

5084. EFFECT OF OESTROGEN ON HISTOLOGY OF UTERINE EPITHELIUM OF MOUSE. E. CHANGES OF PA-SCHIFF-REACTIVE STRUCTURES IN BASEMENT MEMBRANE AND GLANDULAR CELL SURFACE. A.Nilsson and C.Wirsén: Exp. Cell Res., 1963, 29, 144-152 (Dept. Histol., Karolinska Inst., Stockholm, Sweden)

The basement membrane and glandular cell surface of the uterine epithelium of mice were PA-Schiff-reactive, the intensity of the reaction varying at different functional stages, as demonstrated histochem. E.M. revealed that the variations in staining intensity of the membrane were due to different degrees of folding with const. thickness, and that the length of microvilli increased together with the deposition of dense strands of an amorphous substance between them. K.Jones

5085. E.M. APPEARANCE OF THE MYOMETRIUM OF CERVIX UTERI IN CASTRATED GUINEA-PIGS TREATED WITH SEX HORMONES. O.H.Iversen and H.E.Christensen: Acta path. microbiol. scand., 1963, 57, 404-414 (Rheu. Res. Lab., Univ. Inst. Path. Anat., Copenhagen, Denmark) Treatment with oestrogen hormones increases the total amount of collagen. L.Friedmann

5086. LIGHT- AND ELECTRON-MICROSCOPIC INVESTIGATIONS OF THE UTERINE CONNECTIVE TISSUE IN PREGNANT GUINEA-PIGS. O.H.Iversen and H.E. Christensen: Acta path. microbiol. scand., 1963, 57, 415-426 (Rheu. Res. Lab., Univ. Inst. Path. Anat., Copenhagen, Denmark) There was a gradual increase of collagen in the interstitial spaces, partly due to the widening of these spaces and partly to the structural alteration of collagen which was loosely arranged. L.Friedmann

5087. ENZYMIC HISTOCHEMISTRY OF HUMAN PROSTATE. M.Niemi, M.Harkonen and T.K.Llarmi: Arch. Path. Chicago, 1963, 75, 528-537 (Dept. Anat., Univ., Helsinki, Finland) Eight tetrazolium reductase systems, non-sp. esterase and leucine aminopeptidase were studied in normal and hyperplastic human prostates. R.Mitchell

5088. SEASONAL VARIATION IN THE ADRENAL CORTEX* COMPARATIVE STUDY OF GENITALIA. H.Planel, A.Guilhem, J.F.David and R.Tixadom: C.R. Soc. Biol., Paris, 1962, 156, 2138-2142 (Lab. d'Histol., Fac. MSD., Toulouse, France) The seminiferous, epididymal, and prostatic epithelia of guinea-pig increased in thickness during the months September to June. These variations were observed in animals maintained at const. temp. No seasonal variations were found in the adrenal cortex of guinea-pigs kept under similar conditions. (French) M.A.Price

5089. GERMINAL CENTRES IN HUMAN THYMUS. M.Kostowiecki: Z. Zellforsch., 1963, 59, 790-803 (Dept. Anat., Graduate Sch. Med., Univ. Pennsylvania, Philadelphia, Pa., U.S.A.) During histol. examination of a normal thymus of a 3 yr. old girl, 4 germinal centres were found; they were situated in the medulla; 3 of them on the cortico-medullary junction. The germinal centres were composed of reticular cells, lymphocytes, reticular macrophages and large no. of thymocytes of various degrees of maturity. J.E.Linder

5090. USE OF LEAD CITRATE AT HIGH pH AS AN ELECTRON-OPAQUE STAIN IN E.M. E.S.Reynolds: J. cell Biol., 1963, 17, 208-212 (Dept. Anat., Harvard Med. Sch., Boston, Mass., U.S.A.) Cellular and extracellular structures have a higher affinity for lead citrate dissolved in NaOH at pH 12*0 than for lead citrate

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ions. High intensity staining of cytoplasmic membranes, ribosomes, glycogen and nuclear material of rat tissue embedded in Aralftite or Epon illustrates the procedure.

P.Barrow

5091. USE OF BISMUTH AS ELECTRON STAIN FOR

NUCLEIC ACIDS. P.Albereheim and V.Killias: *J. cell Biol.*, 1963, 17, 93-103 (Biol. Lab., Harvard Univ., Cambridge, Mass., U.S.A.) The phosphate of nucleic acids, particularly DNA, binds with Bi to provide an electron opaque stain. Bi has a low affinity for proteins and thus could be used to study the ultrastructure of chromatin in the presence of histones. P.Barrow

5092. RED-BLUE STAINING OF HYDROLYSED NUCLEIC ACIDS IN PARAFFIN SECTIONS. D.W.Menzies:

Stain Technol., 1963, 38, 157-160 (Dept. Pathol., Univ., Melbourne, Victoria, Australia) The author has overcome some of the difficulties met with in the use of basic fuchsin-Methylene Blue staining for nucleic acids by increasing the affinity of the nucleus for basic fuchsin. This is done using acid hydrolysis, but with the HCl dissolved in the hydrophilic organic solvent tetrahydrofuran instead of water; this allows the hydrolysis of DNA and increased intensity of basic fuchsin staining of nuclei before an appreciable amount of RNA is dissolved from the cytoplasm. M.J.Bell

5093. FEULGEN STAIN STABILITY IN RELATION TO THREE MOUNTING MEDIA AND EXPOSURE TO LIGHT.

F.J.Swartz and E.R.Nagy: Stain Technol., 1963, 38, 179-185 (Dept. Anat., Univ., Sch. Med., Louisville, Ky., U.S.A.) For DNA quantitation by microdensitometry, fading of Feulgen staining must be minimal. Microdensitometric measurements of rat liver nuclei mounted in Eukitt, Clearmount and Permount all showed fading over a post-staining period of 160 days. Dark storage decreased fading in all cases. Though none of these media is considered ideal for quantitation of Feulgen staining, Eukitt is the nearest to satisfactory with least fading, though it requires longer to reach stability. M.J.Bell

5094. CYTOCHEMISTRY AND E.M. THE PRESERVATION OF CELLULAR ULTRASTRUCTURE AND ENZYMIC ACTIVITY BY ALDEHYDE FIXATION. D.D.Sabatini,

K.Bensch and R.J.Barnett: *J. cell Biol.*, 1963, 17, 19-58 (Rockefeller Inst., New York, U.S.A.) Several tissues from adult rats were used to demonstrate the combination of the enzyme histochemical technique with electron microscopy. The tissues were fixed for 0-5-24 hr. in different aldehydes prep, as cacodylate or phosphate buffered soln. of 0-1-0-2M and pH 6-5-7-6. Post fixation in OsO₄ preserved the cellular fine structure. Cytochrome oxidase, succinic dehydrogenase and glucose-6-phosphatase activity were localised after hydrazyl-aliphatic aldehyde fixation. Some esterase and phosphatase, ³⁵U²-labeled eotidase, ATPase and NADH and NADPH diaphorase activities survived fixation in the 7 fixatives. P. Barrow

5095. TANNIC ACID, IRON HAEMATOXYLIN, ALCIAN BLUE AND BASIC FUCHSIN FOR STAINING ISLETS AND RETICULAR FIBRES OF THE PANCREAS.

J.W.Monroe and B.Specton: Stain Technol., 1963, 38, 187-192 (Dept. Bioanatomy, Tufts Univ. Sch. of Med., Boston, Mass., U.S.A.) The authors give on the basis of a method developed to stain pancreas, tested on the Pancreatic tissue of rat, rabbit, dog, hamster, and man. & the technique alpha cells are stained with basic fuchsin, beta cells by iron hematoxylin, reticular

fibres by ferric tannate and mucin by Alcian Blue. Of 6 common fixatives, Bnuin's fluid proved the most reliable.

M.J.Bell

5096. FIXATION FOR E.M. S.K.Malhotra: *Nature*, Lond., 1963, 198, 611-612 (Cytol. Lab., Dept.

Zool., Univ., Oxford, England) Techniques of fixation for E.M. are discussed. Adequate preservation of pancreatic exocrine cells and convoluted tubule cells of the kidney has been obtained by fixation in simple unbuffered soln. of OSO₄ and embedding in Epikote 812 or methacrylate. Satisfactory fixation of tube feet of the sea urchin for E.M. was obtained by use of aq. soln. of OSO₄ or KM1104. G.M.Lewis

5097. EGG ALBUMIN EMBEDDING: A PROCEDURE COMPATIBLE WITH NEUROLOGICAL STAINING TECHNIQUES. A.B.Snodgress and C.H.Dorsey:

Stain Technol., 1963, 38, 149-155 (Naval Med. Res. Inst., Nat. Naval Med. Cent., Bethesda, Md., U.S.A.)

When frozen sections of the c.n.s. and peripheral nerves are dehydrated and cleared for use with resinous mounting media, gelatin, a satisfactory embedding medium for sections to be mounted in water sol. mountant, has proved unsatisfactory as an embedding medium. The authors have worked out an alternative method using egg albumin solidified by formaldehyde which will tolerate on-the-slide alcohol dehydration, xylene clearing and synthetic resin mounting with a minimal shrinkage and distortion. Embedding in albumin takes place in a two layered box, (inner layer of vegetable parchment paper, outer supporting layer, perforated aluminium foil), the tissue albumin block being hardened by formalin dialysis through the parchment paper. M.J.Bell

5098. TECHNICAL MODIFICATIONS IN MARAGLAS EMBEDDING. B.O.Spurlock, V.C.Kattine and J.A.

Freeman: *J. cell Biol.*, 1963, 17, 203-207 (Dept. Pathol., Louisiana State Univ. Sch. Med., New Orleans, La., U.S.A.) Complete hardening of tissue blocks combined with dehydration is achieved by passing fixed tissue through abs. alcohol, pure propylene oxide, 1:1 propylene oxide: Maraglas mixture and finally for 8-12 hr. at 10° in pure Maraglas mixture. Sections of 1-2 µ of Maraglas embedded tissue may be stained with the resin in situ for E.M. and light microscope comparison.

P. Barrow

5099. AN ELECTRICALLY CONTROLLED DRIVE WITH A SLOW CUTTING, FAST-RETURN CYCLE FOR

ROTARY MICROTOMES. P.F.Elbers: Stain Technol., 1963, 38, 173-178 (Centrum voor Submicroscopisch Onderzoek van Biologische Objecten der Rijks-Universiteit, Utrecht, Netherlands) The construction of a microtome drive, suitable for use with ultramicrotome, which gives a low cutting speed for the specimen (2-10 mm./sec.) and a fast return to cutting position (60 mm./sec.) is described in detail. Movement is vibration free; transition between high and low speeds is smooth; speed variation is governed by electric control giving a completely automatic operation especially useful for thermal feed microtomes. M.J.Bell

TISSUE CULTURE

5100. ISOLATION AND GROWTH OF ENDOTHELIAL CELLS IN TISSUE CULTURE. C.M.Pomerat and

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W.C.Slick: *Nature, Lond.*, 1963, 198, 859-861
 (Pasadena Foundn. Med. Res., Pasadena, Calif., U.S.A.) A procedure is described for the establishment of cultures of rabbit endothelium using die cells released by treatment with trypsin of the interior of the dorsal aorta. Characteristics of the cells in culture, which maintain the euploid chr. no. 44, are described.

G.M.Lewis

5101. INFLUENCE OF GLUCOSE ON THE GROWTH OF TISSUE CULTURE. L.Polna and H.Leszczyńska: *Med. dosw. Mikrobiol.*, 1962, 14, 365-377 (Zal'fad Wirusologii, Państwowy Zakład Higieny, Warszawa, Poland) The highest glucose utilisation by the cells of human kidney was observed in the initial stage of growth up to 72 hr. of incubation. Regenerated media can be used for cultures provided calf serum is added. pH of media depended upon glucose utilisation. The titre of poliomyelitis virus grown in cultures on various media did not show significant differences.

(Polish) H.Osowiecki

5102. EFFECT OF DEXTRAN ON EARLE'S L929 STRAIN OF MOUSE FIBROCYTES. A.R.Milnen *Brit. J. Cancer*, 1963, 17, 149-152 (Mount Vernon Hosp., Northwood, Middx., England) Soln. of dextran had been shown to damage HeLa cells undergoing mitosis in vitro. Cells of strain L929 were found to have greater resistance to dextran and there was no evidence of delayed toxicity. Addition of isotonic soln. of glucose produced severe damage to cells undergoing division at time of treatment, addition of dextran did not limit this effect. D.Hamer

5103. LOSS OF RADIOACTIVITY FROM LABELLED DNA OF PRIMARY HUMAN AMNIOTIC CELLS. R.S.Chang and H.Vetrov: *Science*, 1963, 139, 1211 (Dept. Iviicrobiol., Harvard Sch. Publ. Hlth., Boston, Mass., U.S.A.) After incubation of primary human amniotic cell cultures with [14C]glycine or [14C]thymidine, more radioactivity was released into the medium than could be accounted for by cell death and replacement. It was concluded that DNA or some related acid-insol. polydeoxyribonucleotides are being degraded in the living cells.

G.M.Lewis

5104. X-IRRADIATION SENSITIVITY OF NITROGEN MUSTARD-RESISTANT MAMMALIAN CELLS IN VITRO. A.G.Lewis: *Nature, Lond.*, 1963, 198, 498-499 (Inst. Zool., Univ., Padua, Italy) A guinea-pig cell strain resistant to N-mustard showed increased resistance to this agent at all concn. tested compared with the parent strain. Its resistance to X-rays, however, was the same as in the parent strain, indicating no cross resistance phenomena between these agents.

G.M.Lewis

5105. IN VITRO ACTION OF DIETHYLSTILBOESTROL ON GROWTH AND KINETIC ACTIVITY OF HUMAN CANCER CELLS. H.Planet, J.F.David and J.P.Soleilhavoue C.R. Soc. Biol., Paris, 1962, 156, 2142-2145 (Lab. d'Histol., Fac. Méd., Toulouse, France) 0*02 fig. diethylstilboestrol/ml. decreased the cell density of HeLa tumour cells in culture, with complete disappearance of cells at a concn. of 50 fig./ml. A marked decrease in cell density of KB tumour cells occurred with concn. of 5-50 pg. diethylstilboestrol/ml. Diethylstilboestrol increased the mitotic index of both tumour strains in concn. above 0*8 fig./ml.

(French) M. A. Price

5106. BEHAVIOUR OF TWO CELL STRAINS DERIVED FROM RAT RABDOMYOSARCOMAS. P.K.Basrur and J.P.W.Gilman: *J. nat. Cancer Inst.*, 1933, 30, 163-

201 (Anat. Dept., Ontario Veterin. Coll., Guelph, Canada) The cultural characteristics of the strains are described. The difference in the morphol., chromosomal and malignant traits and the possible mechanisms involved in the evolution of a normal* cell strain from rhabdomyosarcomatous tissue are discussed.

J.G.Bennette

5107. ORIENTATION BEHAVIOUR OF CHICK LEUCOCYTES IN TISSUE CULTURE AND THEIR INTERACTIONS WITH FIBROBLASTS. F.E.Oldfield: *Exp. Cell Res.*, 1963, 30, 125-138 (Dept. Anat. EmbryoL, Univ. Coll., London, England) Some chick w.b.c., polymorphonuclears and probably monocytes, showed neg. mutual chemotaxis, repelling each other by mechanisms involving a response to diffusion gradients. Polymorphonuclears and monocytes exhibited contact inhibn. between themselves, but both types failed to show contact inhibn. when confronted with fibroblasts. No influence on either the area or the mitotic index of growing fibroblast populations by cells from buffy coat, could be detected after 36 hr.

K.Jones

5108. EFFECTS OF PHYTOHAEMAGGLUTININ [PHA] ON NORMAL AND LEUKAEMIC LEUCOCYTES WHEN CULTURED IN VITRO. M.W.Elves and J.F.Wilkinson: *Exp. Cell Res.*, 1963, 30, 200-207 (Dept. Haematol., Royal Infirmary, Manchester, England) The transition from the small lymphocyte to a large more primitive cell is described in cultures of normal and leukaemic peripheral w.b.c. These results indicated that it is these large primitive cells which then divide, making this culture method so useful in the study of human chr. In all cultures the granulocytic cells degenerated whether PHA was present or not. Possible mechanisms for the action of PHA in this type of culture are discussed.

K.Jones

5109. IN VITRO STUDIES OF ULCERATIVE COLITIS. [U.C.]. I. REACTIONS OF PATIENTS' SERUM WITH HUMAN FOETAL COLON CELLS IN TISSUE CULTURES. O.Broberger and P.Perlmann. II. CYTOTOXIC ACTION OF WHITE BLOOD CELLS FROM PATIENTS ON HUMAN FOETAL COLON CELLS. P.Perlmann and O.Broberger *J. exp. Med.*, 1963, 117, 705-716. 717-733 (Wenner-Gren Inst. Expt. Biol., Stockholm, Sweden)

I. Immunofluorescent techniques showed that sera from children with u.c. contain Ab which react with foetal colon cells in tissue culture. Sera from healthy individuals failed to react. Inhibn. expt. confirmed the specificity of the reaction and the staining capacity of various sera could be correlated with their haemaggl. titre against phenol-water extracts of human colon. Blood group substances of the ABO system were shown to be present on the cells by fluorescent H agglutinins from eelf but these were different from the Ag reacting with Ab of u.c. sera. The cells showed optimal staining 4 to 5 days after culturing. Visible cytotoxic damage of cells in the presence of u.c. serum and C* was not obtained. Absence of cytotoxic activity in u.c. sera was confirmed by the more sensitive technique utilising die release of 32p from colon cells labelled with [32P]orthophosphate in the presence of cytotoxic factors.

II. Freshly isolated foetal human colon cells labelled with [32P]orthophosphate or 14c-amino acids were exposed to w.b.c. obtained from u.c. patients or healthy subjects. A higher release of 32p was obtained with the patients' w.b.c. than with the control cells. W.b.c. allowed to stand in nutrient soln. overnight, consisting of lymphocytes and large mononucle^r cells only, were also capable of releasing more ³²P than normal w.b.c. Sp cyt.

toxic activity could not be conferred on normal w.b.c. incubated with u.c. serum. The w.b.c. from die patients exerted no cytotoxic effect on labelled cells grown from other human tissues. The presence of 10 to 20% fresh guinea-pig serum in the incubation medium was necessary for a cytotoxic action by w.b.c. to be observed.

H.E.H.Jones

5110. REVERSIBLE ARREST OF GROWTH OF L-CELLS UNDER WEIGHTED AGAR. K.Nilausen and H. Green: *Exp. Cell Res.*, 1963, 30, 248-252 (Dept. Pathol., New York Univ. Sch. Med., New York, U.S.A.)

Under agar weighted with sterile glass beads agar cultures of L-cells were maintained in a reversible, non-growing state for a period of 8 days; during this time the cells remained fully viable.

KJJones

5111. EXAMINATION OF ROLLER-TUBE CULTURES BY E.M. S.Heyner and M.S.Israel: *Exp. Cell Res.*, 1963, 30, 236-238 (Dept. Anat., Royal Coll. Surg. England, London, England) A method is described for embedding roller-tube cultures in Araldite.

KJJones

5112. SIMPLE METHOD FOR SHORT TERM CULTURES FROM SMALL BIOPSIES. P.K.Basrur, V.R.Basrur and J.P.W.Gilman: *Exp. Cell Res.*, 1963, 30, 229-232 (Div. Microscopic Anat., Ontario Vet. Coll., Guelph, Ont., Canada) Two 11 x 35 mm. coverslips were used to hold the fragments of tissue; the advantages of this method are discussed.

KJJones

EMBRYOLOGY

5113. PRE-OVULATORY CHANGES IN THE OOCYTE OF THE ADULT RAT. A.M.Mandb Proc. roy.SocB, 1963, 158, 105-118 (Dept. Anat., Univ., Birmingham, England) The sequence of nuclear changes in adult rat oocytes, especially the pre-ovulatory stages, has been investigated in relation to both natural and artificial diurnal rhythms of light and darkness. An attempt was made to determine the time of diakinesis and the duration of each stage of division up to second metaphase.

G.M.Lewis

5114. RADIOSENSITIVITY OF OOCYTES AT DIFFERENT STAGES OF MATURATION. A.M.Mandt Proc. roy. Soc. B, 1963, 158, 119-141 (Dept. Anat., Univ., Birmingham, England) The viability of the zygote after fertile mating has been used as an index to assess radiosensitivity of oocytes in Graafian follicles at different times before ovulation and at known stages of maturation process. Radiosensitivity increases as the interval between irradiation and ovulation decreases; after fertilisation the radiosensitivity of the zygote progressively decreases. Oocytes in 'medium sized' follicles are highly radioresistant. X-irradiation is followed by superovulation and a decrease in the mean size of corpora lutea.

G.M.Lewis

5115. VITELLINE MEMBRANE OF HEN'S EGG: CHEMICAL AND E.M. STUDY. R.Bellairs, M.Harkness SS, R.D.Harkness: *J. ultrastructure Res.*, 1963, 8, 339-359 (Anat. and EmbryoL Dept., Univ. College, London, England) The inner of the two layered vitelline membrane of the hen's egg has a three dimensional network of fibres and fibrils. The outer layer

consists of fibrils formed into sublayers. A thin membrane is present between the two layers. The outer layer is lost prior to ovulation. Both layers consist of protein, the structure of which is different in the two layers. The types of protein in the vitelline membrane are discussed.

H.B.Waynfirth

5116. E.M. OF CHORIOALLANTOIC PLACENTA OF RABBIT, n. DECIDUA AND MATERNAL VESSELS.

J.F.Larsen: *J. ultrastructure Res.*, 1963, 8, 327-338 (Anat. Dept., Washington Univ. Med. Sch., St. Louis, Mo., U.S.A.)

Decidual cells of the rabbit placenta are formed from perivascular cells about the 8th day of gestation. Their ultrastructure, resembles that of foetal liver cells. Multinucleated cells of unknown origin line the maternal vessels during the latter part of pregnancy. The degeneration of the multi-nucleated giant cells of the 'intermediate zone*' forms the 'separation zone' at parturition.

H. B. Waynfirth

5117. THE MATRIX CELL AND CYTOGENESIS IN THE DEVELOPING C.N.S. S.Fujita: *J. comp. Neurol.*, 1963, 120, 37-42 (Dept. Pathol., Kyoto Fritsu Med.

Coll., Kawaramachi, Kyoto, Japan) By autoradiography of cumulative labelling with ^{3}H -thymidine, it was shown that the matrix cells in the neural tube of the 6-day-old chick embryo become labelled at a linear rate, reaching 100% in about 10 hr. It is suggested that the matrix cells form a functionally homogeneous population and give rise to the nerve cells, neuroglia and ependymal cells.

G.M.Lewis

5118. MITOTIC ACTIVITY IN INDIVIDUAL REGIONS OF THE C.N.S., AS WELL AS IN THE LENS AND THE VESTIBULO-COCHLEAR ORGAN IN THE CHICKEN-EMBRYO; A CONTRIBUTION TO THE QUANTITATIVE EVALUATION OF GROWTH PROCESSES. K.Goerttler and K.Wegener. *Z. Zellforsch.*, 1963, 59, 771-789 (Path. Inst., Univ., Kiel, Germany) Mitotic growth-activity in parts of the c.n.s. as well as the lens and the vestibulo-cochlear organ in the chick embryo has been evaluated; the mitotic index for all the examined sections of the c.n.s. was very high; maxima of the mitotic index curves extend over a comparatively short time and are found during the first days of incubation; the mesencephalon and spinal cord have only one period of max. activity whilst retina and vestibulo-cochlear organ show two max. phases of mitotic activity. The importance of the evaluated findings for the analysis of developmental disturbances is discussed.

(German) J.E.Linder

5119. HUMAN FOETAL KIDNEY. H. PERMEABILITY CHARACTERISTICS OF DEVELOPING GLOMERULUS.

R.L.Venier and A.Birch-Andersen: *J. ultrastructure Res.*, 1963, 8, 66-88 (Biophysics Dept., Statens Serum Institut, Copenhagen, Denmark) Young human foetuses were inj. with C or ferritin and renal biopsies were obtained 2-12 min. later. By E.M. it was shown that the lamina densa of the basement membrane of the glomerular capillaries functions as a filter. Pinocytosis of the inj. particles was observed in the endothelium of the capillaries. It is likely also that free diffusion of particles takes place. The probable mechanism of formation of the basement membrane of renal tubules is described.

H.B.Waynfirth

5120. HORMONAL CONTROL OF THE METABOLISM OF CHOLESTEROL IN THE RABBIT FOETUS. J.G.Bearn

and T.R.E.Pilkingtons *Nature*, Lond., 1963, 198, 1005-1006 (Dept. Anat., Middlesex Hosp. Med. Sch.,

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London, England) Injn. of 100-150 fig. L-thyroxine into rabbit foetuses at the 22nd-23rd day of development prevents the increase in blood cholesterol produced by decapitation. The foetal thyroid is essential for normal regulation of the cholesterol metabolism. G.M.Lewis

5121. EFFECTS OF EXTRA-EPITHELIAL FACTORS ON INCORPORATION THYMIDINE BY EMBRYONIC EPIDERMIS. N.K.Wessells: *Exp. Cell Res.*, 1963, 30, 36-55 (Dept. Biol. Sci., Univ., Stanford, Calif., U.S.A.) Cells in explants of 11-day chick epidermis rapidly lost their ability to incorporate ^{3}H thymidine, and epidermal basal cells lost their columnal shape. Both prop, reappeared if dermis was combined with such epidermis. Thymidine incorporation freq. in epidermis could be influenced by the kind or age of dermis present, or by muscle opposed to dermis. The results are discussed in relation to the hypothesis that cellular incorporation of thymidine is dependent on conditions in the epidermis as a whole. K.Jones

5122. STUDIES ON THE ABILITY OF EMBRYONIC MESONEPHROS EXPLANTS TO FORM CARTILAGE. J.W.Lash: *Develop. Biol.*, 1963, 6, 219-232 (Dept. Anat., Sch. Med., Univ. Pennsylvania, Philadelphia, Pa., U.S.A.) Chondrogenesis in explanted chick mesonephros was restricted to areas adjacent to limb primordia, proceeded independently of neighbouring tissues, and did not appear to affect somite chondrogenesis. When cultured with 2-3 day limb primordia, chondrogenic regions of the mesonephros appeared to enhance limb cartilage formation and it is suggested that cells associated with the mesonephros may participate in development of limb or girdle cartilage. J.W.S.Harris

5123. TERATOGENIC INTERACTION OF INSULIN AND 2-DEOXY-D-GLUCOSE [2-DG] IN CHICK DEVELOPMENT. W.Landauer and E.M.Clark: *J. exp. Zool.*, 1962, 151, 245-248 (Storrs Agric. Expt. Stat., Univ. Connecticut, Storrs, Conn., U.S.A.) Injn. into the yolk sac of 500 pg. or more 2-DG at 96 hr. of incubation and of 100 fig. at 24 hr. was highly toxic to embryos of White Leghorn fowls. 2-DG was not teratogenic at either stage. The toxicity to 2-DG was overcome by supplementary glucose. The teratogenic effects of die administration of one unit insulin at the 96 hr. stage were potentiated by addition of 500 pg. 2-DG. One unit of insulin plus 100 fig. 2-DG at 24 hr. led to a significant rise in the incidence of rumplessness. In addition to this, 2-DG was also responsible for abnormalities of the tibiotarsal joints, the tarsometatarsus and toes. Glucose reduced the toxicity of insulin to embryos at 24 and 96 hr. without affecting its teratogenic activity. The intracellular entry of glucosamine, 0-hydroxybutyric acid, galactose and N-acetylglucosamine is enhanced by insulin but none of these compounds potentiate the teratogenic action of insulin. 2-DG also potentiated the effects of 6-aminonicotinamide and of pilocarpine in a way similar to that of insulin. The synergism of 2-DG and insulin and the teratogenic activity of insulin itself are clearly intracellular events. R.J. Walker

5124. THE INTERACTION IN TERATOGENIC ACTIVITY OF THE TWO NIACIN ANALOGUES 3-ACETYL PYRIDINE [3-AP] AND 6-AMINONICOTINAMIDE [6-AN]. W.Landauer and E.M.Clark: *J. exp. Zool.*, 1962, 151, 253-258 (Storrs Agric. Expt. Stat., Univ. Connecticut, Storrs, Conn., U.S.A.) In this study, the interaction in die teratogenic activity of 3-AP and 6-AN following

simult. injn. into the yolk sac of 96 hr. White Leghorn chick embryos was observed. The dwarfing, micromelia and parrot beak effects with 6-AN are almost completely prevented in the presence of 3-AP. When 2*5-5 fig. of 6-AN were added to the administration of 375 or 500 pg. 3-AP, the teratological effects of the 3-AP were exaggerated. The addition of 10 fig. 6-AN failed to produce a similar effect. The beneficial effects of 3-AP on 6-AN are interpreted in terms of the ability of 3-AP pyridine nucleotide to substitute partially for the metabolic functions of NAD. The responses of maxilla and mandible to combined administration of the 2 nicotinamide analogues differ from those of the long bones and of the musculature. R.J. Walker

5125. ACTION OF THYROXINE ON TERATOGENIC ACTIVITY OF RADIOMIMETIC SUBSTANCE. R.Stoll, M.Bernes-Lasserre and R.Maraud: *C.R. Soc. Biol., Paris*, 1962, 156, 2032-2034 (Lab. Biol., Fac. Méd., Bordeaux, France) 1-10 /ig. di-(n-propoxy)-2,5-di(ethylene-imino)-3,6-benzoquinone-1,4 induced malformations of the limbs in chick embryos. 3 fig. thyroxine increased the toxic and teratogenic action of the ethylene-imine. Mortality at 9th day of incubation increased from 17% to 47% when both compounds were administered. (French) M.A.Price

5126. EXPERIMENTAL PRODUCTION OF MAMMARY MALFORMATIONS IN THE RAT FOETUS BY INJECTION OF OESTRADIOL TO THE MOTHER AT THE 14TH DAY OF GESTATION. P.Delost, C.Jean and C.Jean: *C.R. Soc. Biol., Paris*, 1962, 156, 2048-2052 (Lab. Physiol. animale, Fac. Sci., Clermont-Ferrand, France) Injn. of 10 mg. oestradiol to rats at the 14th day of gestation induced mammary malformations in foeti of both sexes at term. The malformations appeared as suppression of total mammary gland with premature development and hypertrophy of the nipple. (French) M.A.Price

MISCELLANEOUS

5127. A STEREOTAXE ATLAS OF THE BRAIN OF THE GOLDEN HAMSTER (MESOCRICETUS AURATUS). O.A.Smith JUIL and CN.Bodem: *J. comp. Neurol.*, 1963, 120, 53-63 (Dept. Physiol., Univ. Washington Sch. Med., Seattle, Washington, D.C., U.S.A.) G.M.Lewis

5128. THE NUCLEI GEMINI TWO HITHERTO UNDESCRIBED NERVE CELL COLLECTIONS ON THE HYPOTHALAMUS OF THE RABBET. P.O.Lundberg: *J. comp. Neurol.*, 1962, 119, 311-316 (Dept. Anat., Univ., Uppsala, Sweden) Two nerve cell groups in the rabbit hypothalamus have definite cytol., cytoarchitectonic and myeloarchitectonic characteristics and receive communications from regio prepyriformis and tuberculum olfactorium. Central vegetative regulation is ascribed to the nuclei. G.M.Lewis

5129. EFFERENT CORTICO-NUCLEAR PATHWAYS IN THE CEREBELLUM OF THE CAT. R.P.Eagen J. coinP-Neurol., 1963, 120, 81-103 (Dept. Anat., Univ. Pennsylvania Sch. Med., Philadelphia, Pa., U.S.A.) Small, well-defined lesions were placed in the cerebellar

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cortex of cats limited to 1 of 3 longitudinal cortico-nuclear zones. The resulting degenerating axons were stained by a Ag technique and the pattern of cortico-nuclear projections plotted at representative cerebellar levels. The results indicated that concepts of a simple radial projection system from cortex to specific cerebellar nuclei are not valid in all respects. A correlation¹⁵ made between anat. results and recent physiol. investigations.

G.M.Lewis

5130. A STUDY OF THE COCHLEAR NUCLEI AND ASCENDING AUDITORY PATHWAYS OF THE MEDULLA.
J.M.Harrison and W.B.Warn J. comp. NeuroL, 1962, 119, 341-379 (Psychol. Inst., Univ., Boston, Mass., U.S.A.) The synaptic morjihol. and ascending fibre connections of the cochlear nuclei and the sup. olivary complex were examined in the albino rat using the Protargol silver method of Bodian. The results of unilat. damage to the cochlea producing degeneration of the acoustic nerve were studied.

G.M.Lewis

5131. AN AUTONOMIC GANGLION NEURONE IN A SMALL BRANCH OF THE RIGHT SCIATIC NERVE OF THE RAT. T.R.Shanthaveerappa and G.H.Bourne:

Nature, Lond., 1963, 198, 607-608 (Dept. Anat., Emory Univ., Atlanta, Ga., U.S.A.) Two autonomic ganglia were observed in the rat sciatic nerve enclosed within perineural epithelium; their possible significance is discussed.

G.M.Lewis

5132. SOME ANATOMICAL ASPECTS OF APHASIA.
W.R.Ritchie: Lancet, 1963, i, 1173-1183 (Univ. Hosp., Oxford, England) A lecture.

G.H.Bell

5133. MEAN FORMATION TIME OF HUMAN OSTEONS.

H.M.Frost: Canad. J. Biochem., 1963, 41, 1307-1310 (Dept. Orthopaedic Surg., H.Ford Hosp., Detroit, Mich., U.S.A.* With the aid of 19 dôubly tetric cycline-labelled human bones the mean daily linear decrease in the radius of Haversian canals of newly forming osteons was measured. The mean outside diam. of the Haversian canals were measured on a larger no. of human bones. From these measurements the calc. mean time of Haversian system formation in ribs is 46 ± 37 days, at age 7 yr. and 79 ± 63 days at age 43. Compared with those for ribs, the formation times seemed to be longer in the long bones of the appendicular skeleton.

A.M.Gibbins'

ODONTOLOGY

5134. DENTAL OBSERVATIONS ON AUSTRALIAN ABORIGINES: MESIODISTAL CROWN DIAMETERS OF PERMANENT TEETH. MJ.Barrett, T.Brown and M.R. MacDonald: *Aust. dent. J.*, 1963, 8, 150-155 (Dept. Sch., Univ. Adelaide, S. Australia) Mesiodistal crown diam. of permanent teeth were obtained from record casts of 251 Australian aborigines. They are analysed statistically and compared with similar measurements from other populations. **J.H.P.Main**

5135. AUSTRALIAN CHILDREN WITH EXCELLENT OCCLUSION. R.G.Henry: *Aust. dent. J.*, 1963, 8, 123-126 (229 Macquarie St., Sydney, N.S.W., Australia) Plaster casts of the dentitions and cephalometric radiographs of 60 Australian children of 12 yr. with excellent occlusions were studied under the following headings:- (1) Pont's index, (2) occlusal pattern, (3) cephalometric analysis. The results are presented and compared with previous studies. **J.H.P.Main**

5136. EFFECT OF EXTRACTION OF DECIDUOUS MOLARS ON THE ERUPTION OF BICUSPID TEETH. L.M.Carn: *Aust. dent. J.*, 1963, 8, 130-136 (Dept. Health, Canberra, Australia) From a survey of records in the Commonwealth Dept. of Health, the effect of extraction of deciduous molars, either before age 7 yr.; between 7 and 10 yr.; or after 10 yr. of age, on the time of eruption of the premolars was assessed statistically. The results indicate that extraction of mandibular deciduous molars before 7 yr. causes delayed eruption of the succeeding premolars; the extraction of maxillary deciduous molars between 7 and 10 yr. causes earlier eruption of the succeeding premolars. The reasons for this are discussed. **J.H.P.Main**

5137. GROWTH AND FUNCTION OF MANDIBLE. G.Cimasoni: *Schweiz. Mschr. Zahnheilk.*, 1963, 73, 507-513 (Inst. Méd. dent., 30 rue Lombard, Genève, Switzerland) The right upper molars were removed at 40 days of age from 8 normal and 13 hypophysectomised rats. Apart from elongation of the lower molars, there was no significant difference in dimensions between the 2 sides. **C.P.Wallis**

5138. CROWN DEVELOPMENT IN HUMAN DECIDUOUS MOLAR TEETH. E.P.Turner: *Arch. oral Biol.*, 1963, 8, 523-540 (Turner Dent. Sch., Univ., Manchester, England) Reconstructions were prep. from serial sections of the jaws of foetuses ranging in age from 8 weeks to full term. In the upper deciduous molars the cusps developed and calcified in the order of paracone, protocone, metacone and hypocone; in the lower deciduous molars this order was protoconid, metaconid, hypoconid, entoconid and hypoconulid. *

5139. DISTINCTIVE AUTORADIOGRAPHIC PATTERNS OF GLYCINE INCORPORATION IN RAT ENAMEL AND DENTINE MATRICES. R.W. Young and R.C.Greulich: *Arch. oral Biol.*, 1963, 8, 509-521 (Dept. Anat., Univ. of California Med. Center, Los Angeles, Calif., U.S.A.) [3H]Glycine was first localised in odontoblasts and ameloblasts, reflecting intracellular synthesis of the respective matrix proteins, but was rapidly transferred to the adjacent matrices. In dentine matrix, the labelled material appeared as a discrete, intensely reactive band, which did not decrease in intensity with time. Dentine matrix present prior to the time of [³H]glycine administration did not become labelled. Although enamel matrix labelling also appeared initially

as a band, it soon spread through the thickness of the matrix layer, including that which was present prior to treatment. The mechanism by which this redistribution of enamel matrix protein occurs is not known. The resulting diffuse reaction in enamel matrix was maintained during the time when definitive enamel mineralisation begins, i.e. at the same time that an absolute reduction of enamel matrix mass is assumed to occur.

5140. LIFE CYCLE OF GINGIVAL EPITHELIAL CELLS OF MICE AS REVEALED BY AUTORADIOGRAPHY. G.S.Beagrie and M.R.Skougaard: *Acta odont. scand.*, 1962, 20, 15-31 (Sch. Dent. Surg., Univ., Edinburgh, Scotland) Cells of the gingival epithelium were labelled with [3H]thymidine. Labelled cells were first seen in the basal layer, from which they migrated to the surface. This movement was complete in oral epithelium and in downgrowing oral epithelium by 10-12 days and in epithelial attachment by 1-5 days, depending on the distance between the basal and surface layer.

5141. STRUCTURE OF PULP IN UNERUPTED TEETH. K.Zajusz and W.Zaleski: *Czas. stomat.*, 1962, 15, 261-270 (ZaHlad Stomatol Zachowawczej, Slaska Akad. Med., Zabrze, Poland) 20% of unerupted teeth showed normal pulp. In the remaining cases vacuolar degeneration of odontoblasts, reticular atrophy, pulp ischaemia and deposition of Ca salts were observed; no inflammation or fibrous changes were noted. (Polish) **M.Góra**

5142. EFFECT OF LEMON JUICE ON DIFFERENT TYPES OF TOOTH SURFACE. REPLICA STUDY IN VIVO. F.Mannerberg: *Acta odont. scand.*, 1962, 20, 153-164 (Royal Dent. Sch., MalmB S, Sweden) Different types of tooth surfaces, distinguished by shadowed replicas taken in vivo, react differently after exposure to the juice of lemon. *

5143. PAIN THRESHOLD OF NORMAL HUMAN ANTERIOR TEETH. J.M.Mumford: *Arch. oral Biol.*, 1963, 8, 493-501 (Sch. Dent. Surg., Univ., Liverpool England) When the stimulus had a duration of 10 msec, and a freq. of 50 per second the pain threshold values of normal upper anterior teeth were in the range 0.7-4.5 mAmp. The effect on the current reading of different resistances in the external circuit was determined for different stimulus durations and also the effect on the pain threshold of using different areas of electrode contact.

5144. RELATIVE PROPORTIONS OF SODIUM, POTASSIUM AND CALCIUM IN GINGIVAL POCKET FLUID. B.Krasse and J.Egelberg: *Acta odont. scand.*, 1962, 20, 143-152 (Royal Dent. Sch., MalmB, Sweden) In comparison with blood plasma, an increased content of K was found in pocket fluid from clinically healthy gingivae.

5145. GINGIVAL POCKET: OCCURRENCE, COMPOSITION AND EFFECT. N.Brlik: *Acta odont. scand.*, 1962, 20, Suppl. 32, 1-115 (Royal Dent. Coll., Copenhagen, Denmark) Step-serially sectioned material from gingival pockets previously traversed by fluorescein sodium, was obtained from 2 dogs. No ulcerations could be found, although inflammatory changes were always present. It is concluded that fluid can escape through pocket epithelium formed by a complete sheet of contiguous cells. Extensive review. 196 ref. *

- 5146. THE FAILURE OF A HUMAN SALIVARY MUCIN PREPARATION TO ALTER γ -GLOBULIN MOBILITY.** G.T.Raust and H.M.Myers: Arch, oral Biol., 1963, 8, 587-588. Shoft comm. *
- 5147. HUMAN SALIVA WITH NUCLEAR MAGNETIC RESONANCE. I. PROTON LINE WIDTHS AND SPIN-SPIN RELAXATION TIMES.** E.Odeblad and R.S8remark: Acta odont. scand., 1962, 20, 33-42 (Sabbatsberg Sjukhus, Karolinska Inst., Stockholm 60, Sweden) The line-width was proportional to the concn. of solids in saliva, largely due to the mucin Present. *
- 5148. PROTON MAGNETIC RESONANCE OF HUMAN GINGIVAL TISSUE.** G.Forsslund, E.Odeblad and A.Bergstrand: Acta odont. scand., 1962, 20, 121-126 (Sabbatsberg Sjukhus, Karolinska Inst., Stockholm, Sweden) Prelim, report on the nature and strength of water binding in normal and diseased gingiva. *
- 5149. CYTOCHEMISTRY OF HUMAN ORAL MUCOSA DETERMINATION OF PHOSPHOLIPIDS, PROTEIN-BOUND HEXOSES, MUCOPROTEINS, COLLAGENOUS AND NON-COLLAGENOUS PROTEINS.** D.E.Flieden J. dent. Res., 1962, 41, 112-116 (Dept. Pathol., St. Louis Univ. Sch. Dent., St. Louis, Mo., U.S.A.) Analysis of human oral mucosa revealed no significant changes in the ratios of the components with increasing ^{38}Se . Protein-bound hexoses and mucoproteins were Educated in amount with advancing age. *
- 5150. EFFECTS OF PROCaine CONCENTRATION AND DURATION OF CONTACT ON OXYGEN CONSUMPTION IN BOVINE DENTAL PULP.** A.K.Fisher and C.Schwabe: J. dent. Res., 1962, 41, 484-490 (Coll. Dent., State Univ. Iowa, Iowa City, Iowa, U.S.A.) Aspiration was depressed approx. in proportion to the c_2 ncn. of the drug. The continuing decline in respiration throughout the 5 hr. period suggests that procaine can be Δ thal to tissues if sufficient time is allowed for its a^2 ction. *
- 5151. X-RAY DIFFRACTION ANALYSIS OF EFFECT OF FLUORIDE ON HUMAN BONE APATITE.** A.S.Posner, E.D.Eanes, R.A.Harper and L.Zipkin: Arch. oral. Biol., 1963, 8, 549-570 (Nat. Inst. of Dent. Res., Bethesda, Md., U.S.A.) X-ray diffraction studies were performed on a series of human bones containing varying amounts of F^- . A rise in F^- content was accompanied by an increase in bone apatite crystal size and/or a decrease in C_7 stal strain in a direction perpendicular to the \pm -axis, with no changes in the c -axis direction. Details of criticism of the X-ray methods are given and a new Δ uplate X-ray method is described for obtaining an Δ txrnate of crystallinity of oporly cryst. apatite samples. In Δ ence is furnished to show that F^- substitutes for OH^- in bone apatite phase. It is suggested that the movement of crystallinity results from the increased crystal growth rate due to the higher supersatn. resulting from the presence of F^- in the serum and the final cryst. Phase.
- 5152. UPTAKE AND RELEASE OF VANADIUM FROM γ -ACT HUMAN ENAMEL FOLLOWING $^{48}\text{V}_2\text{O}_5$ APPLICATION IN VITRO.** R.S8remark and N.Andersson: &ta odont. scand., 1962, 20, 81-93 (Kungl. Tandstdf *? r^h gskolan, Stockholm, Sweden) Uptake was studied by autoradiography and scintillation counting.

Release was studied by washing in tap water, physiological saline, 0*05, 0*1 and 10 p.p.m. stable V_2O_5 soln. and dil. H_3PO_4 . *

- 5153. FLUORINE RELEASE FROM ENAMEL.** H.V.LotC Helv. odont. Acta, 1962, 6, 10-14 (ZahnSrztliches Inst., Zttrich, Switzerland) Intact enamel was treated with $O^{\prime}NaF$, pH 4. Fluorine release in subsequent demineralisations was greater in pH 6 buffer than in pH 4 buffer, irrespective of the anion used. Fluorine release increased with temp, and was most rapid at the beginning of exposure.

- 5154. ACTIVITY OF ACID PHOSPHATASES IN SALIVA AND CAVIES PROBLEM.** L.Kozlowska and S.Opaiko: Czas. stomat., 1962, 15, 621-626 (I Klinika Chorob Wewnetrznych, Warszawa, Poland) No correlation was found between the occurrence of caries and the activity of acid phosphatase in saliva of 62 individuals 23-26 yr. old. (Polish) M.Gora

- 5155. EVALUATION OF LABORATORY TESTS FOR ESTIMATION OF CAVIES ACTIVITY: CORRELATION WITH SPECIFIC SURFACES.** M.L.Snyder, D.R.Porter, C.K.Claycomb, W.Sims and F.R.Macho: Arch, oral Biol., 1963, 8, 541-547 (Univ. Oregon Dent. Sch., Portland, Ore., U.S.A.) Two groups of children having high and low caries prevalence were studied for up to 4 yr. Paraffin stim. saliva specimens collected monthly during school year. Correlations made between clinical change and laboratory data from salivary lactobacillus count, Snyder test, Rickles test, (X-amylase and acid buffering capacity. No reliable estimation or prediction of new caries for any of the five surfaces recorded by any of these tests possible for individual. * Group significance was frequently obtained for lactobacillus counts and Snyder tests. *

- 5156. DENTAL CAVIES IN GROUP OF WESTERN AUSTRALIAN CHILDREN. II. INCIDENCE OF DENTAL CAVIES IN CHILDREN AGED 2-6 YEARS.** S.E.Halikis: Aust. dent. J., 1963, 8, 114-122 (6 Hale Str., North Beach, Australia) The incidence and distribution of dental caries is described in a group of 361 children who presented for treatment at the Gustafson Dent. Clinic, Fremantle. J.H.P.Main

- 5157. DENTAL CAVIES IN TWINS. I. COMPARISON OF CAVIES EXPERIENCE OF MONOZYGOTIC TWINS, DIZYGOtic TWINS AND UNRELATED CHILDREN.** S.B.Finn and R.C.Caldwell: Arch, oral Biol., 1963, 8, 571-585 (Univ. Alabama Sch. Dent., Ala., U.S.A.) A study of 35 pairs of monozygotic twins, 31 pairs of dizygotic twins and 25 pairs of unrelated children indicates that there is a genetic component which influences the occurrence of dental caries. Dizygotic twin pairs show a greater variance than monozygotic twin pairs. Unrelated children show a greater variance than either the monozygotic or dizygotic twin pairs, but not significantly so when comparing the latter two groups. There is a greater variance between the dizygotic twin pairs than the monozygotic twin pairs in approximal lesions but not in the pit and fissure type, indicating that there may be a greater genetic component involved with the former type of lesions.

- 5158. RECENT MARINE SOILS AND RESISTANCE TO DENTAL CAVIES.** T.G.Ludwig: Aust. dent. J., 1963, 8, 109-113 (Dent. Res. Unit, N.Z. M.R.C., P.O.

ODONTOLOGY

Box 3155, Wellington, New Zealand) An enhanced resistance to dental caries in children resident in Napier, N.Z. is described as compared to adjoining towns Hastings and Palmerston North. It is suggested that the resistance is due to a caries reducing factor in diet, resulting from an increased intake of vegetables grown on recent marine soils.

J.H.P.Main

5159. INHIBITION OF CARIES IN CHILDREN AFTER 51 YEARS USE OF FLUORIDATED TABLE SALT.

T.M.Marthalen and C.Schenardu: *Helv. odont. Acta*, 1962, 6, 1-6 (ZahnSrztliches Inst., Zflrich, Switzerland)

The DMF surfaces were recorded in 918 children who had consumed fluoridated table salt containing 200 mg./kg. NaF. In children 5-7 yr. old consuming fluoridated salt regularly, the DMF surfaces were significantly lower than in controls. The inhibn. was most pronounced in the prox. and bucco-lingual surfaces, while the occlusal surfaces showed only a small effect.

5160. EFFECT OF LYSOZYME ON EXPERIMENTAL CARIES. H.R.MQhlemann and K.G.KOnig: *Helv. odont. Acta*, 1962, 6, 33-37 (ZahnSrztliches Inst., Zflrich, Switzerland)

Lysozyme at 10, 100 or 1000 p.p.m. in a high sucrose diet, and in the same diet mixed with half its wt. of wheat flour or stock diet was without inhibitory effect on the incidental & initial fissure lesions in 2 independent expt. on rats of 15 and 25 days duration.

5161. ANTISEPTIC COMPOUNDS AND THEIR INTEREST TO ODONTOSTOMATOLOGIA. C.Zearo: *Atti. Acad. med. Lombarda*, 1962, 17, 431-440 (Clinica Odontoiatrica, Univ. Milano, Italy)

A survey of chemotherapeutic compounds used in stomatology is given. Expt. results are also given to show that the 'rinse method' of sampling and counting oral bacteria is better than most other methods in current use.

(Italian) G.N.Godson

5162. THE FREQUENCY DISTRIBUTION OF THE P-M-A INDEX OF GINGIVITIS. K.A.Rosenzweig and Y.Molk: *Arch. oral Biol.*, 1963, 8, 487-492 (Hebrew Univ.-Hadassah Sch. of Dent., Jerusalem, Israel)

The freq. distributions of the factors P^f and M^f of the P-M-A index from a survey of various ethnic groups of school children were compared by rank correlation. The significance of the difference between these non-normal distributions was as a rule identical with that between their means. A non-parametric test was applied to compare the distributions of the weighted P-M-A index ($P+2M+3A$) of Jewish and Arab children, with and without mal-occlusion. It is concluded that for distributions deviating very much from normal the application of non-parametric tests is more adequate and facilitates a more refined analysis.

5163. BLOOD SUPPLY OF PERIODONTAL TISSUE IN CHRONIC MARGINAL GINGIVITIS STUDIED WITH ^{24}Na . V.Doktorov and J.Vitek: *Csl. Stomat.*, 1963, 63, 225-229 (Státne sanatorium, Bratislava, Czechoslovakia)

The clearance of ^{24}Na was followed for 25 min. after injn. into the labial marginal gingiva. In 5 subjects with normal gingivae, the half-time of disappearance was 4-22 min.; in 7 subjects with recent gingivitis, 6-30 min. In 3 subjects with gingivitis of over 4 yr. standing the clearance was very slow.

(Slovakian, English summary) C.P.Wallis

5164. HISTOCHEMICAL TESTS FOR ENZYMES IN HYPERTROPHIC GINGIVITIS. J.Zdenek and P.Milan:

Czas. stomat., 1962, 15, 179-184 (Univ. Karola w Hradcu Kralove, Czechoslovakia)

No significant differences were revealed on histochem. examination of various forms of gingival hypertrophy. Inflammation or a generally intensified metabolism is responsible for the observed changes. The activities of alk. phosphomonoesterase and leucine aminopeptidase are increased whereas that of acid phosphomonoesterase was pronounce only in the case of marked proliferation of epithelium. The activity of non-sp. esterases was observed only in the cells.

(Polish)

MGóra

5165. INITIAL CALCULUS FORMATION RATE ON FOB

H.E.Schroeder and T.M.Marthalen: *Helv. odont. ACE*, 1962, 6, 38-41 (ZahnSrztliches Inst., ZOrich, Switzerland)

The formation of calculus deposits was studied with the aid of foils attached to the lower central incisors of 5 students for periods of 4 or 12 days. The mean calculus formation rate was the same in each case. In individuals the rate was both increased and decreased by changing foils every 4 days. Both ash and total P content of dried deposits increased when calculus formation was left undisturbed for 12 days.

5166. EFFECTS OF POTENTIAL INHIBITORS ON EARLY CALCULUS FORMATION. H.E.Schroeder, T.M.

Marthalen and H.R.MQhlemann: *Helv. odont. Acta*, 1962, 6, 6-9 (ZahnSrztliches Inst., Zflrich, Switzerland)

Summary of earlier paper in German (see I.A.B.S., 1962, 27, 2087).

C.P.Wallis

5167. DENTAL CALCULUS IN GERM-FREE RATS.

B.E.Gustafsson and B.Krasse: *Acta odont. scand.*, 1962, 20, 135-142 (Karolinska Inst., Stockholm, Sweden)

Germ-free and conventional rats on a sterilised cake-type diet showed roughly the same amount of calculus-like deposit. Conventional animals on non-sterilised mash-type diet had considerably more deposit*

5168. BIOPHYSICAL STUDIES ON DENTAL CALCULUS FROM GERM-FREE AND CONVENTIONAL RATS.

J.-E.Glas and B.Krasse: *Acta odont. scand.*, 1962, 2, 127-134 (Dept. Med. Physics, Karolinska Inst., Stockholm, Sweden)

Calculi were investigated by light microscopy, microradiography, and X-ray diffraction. Deposits of germ-free origin showed a well-ordered internal structure of thin lamellar sheets of varying mineral content running approx. parallel to the enamel surface. Calculi from conventional rats had essentially the same internal structure, but a less regular appearance. The inorg. fraction was apatite in all cases.

5169. HISTOLOGICAL EFFECTS OF COLLAGEN AND CHONDROITIN SULPHATE AS CAPPING AGENT IN AMPUTATED RAT MOLAR PULPS. B.LJohansson,

L.Persson and P.Manera: *Arch. oral Biol.*, 1963, 8, 503-507 (Forsyth Dent. Infirmary, Boston, Mass., U.S.A.)

Collagen and chondroitin sulphate were tested for their ability to stimulate healing and bridge formation when applied to an exposed rat molar pulp. They produced some retardation in the bridge formation compared to $\text{Ca}(\text{OH})_2$.

5170. CLOSURE OF SECONDARY PALATE. V. TERAT^O GENIC ACTION OF CORTISONE IN MICE.

K.S.Larss^O: *Acta odont. scand.*, 1962, 20, 1-13 (Dept. Anat., Karolinska Inst., Stockholm, Sweden)

Cleft palate without cleft lip was induced in mouse embryos of the A/Jax strain by injecting cortisone into the mothers on

11th-14th days of pregnancy. Methylandrostenediol, given concurrently caused all die embryos to be resorbed. Methylandrostenediol alone resulted in cleft palate of the same type as that produced by cortisone, but in only 5-7% of the embryos judged to have been alive on the 18th embryonic day. Administration of vit. B6 reduced the incidence of resorption but not of cortisone-induced cleft Palate. •

5171. VARIATION OF DEFICIENCY OF TOOTH GERMS.

A.Masztalerz: Czas. stomat., 1962, 15, 855-859
 (Katedra Ortodoncji, Akad. Med., Wroclaw, Polish)
 Examination of 100 neolithic skulls, 147 skulls from XVn-XVm century, 59 Australian skulls, 46 skulls of black and 25 of yellow race did not show any significant difference in the freq. of tooth germ deficiency. Reduction in no. of teeth took place a long time ago and is probably not connected with civilisation process or lipitation in the use of maxilla. (Polish) M.Gora

5172. INTERNAL RESORPTION OF TOOTH ⁵INTERNAL ODONTOLYSIS¹. R.Zofia: Czas. stomat., 1962, 15, 603-611 (Klinika Stomatologii Zachowawczej, Akademia Medyczna, Warszawa, Poland) 10 cases of internal resorption of tooth were revealed on examination of 50000 radiograms. Histopathological examination showed fibrous pulp granuloma in areas of focal resorption. Ossecus or osseous-like tissue was deposited on the

walls of resorption lacunae. The less advanced cases could be cured by the conventional methods. The traumatic aetiology of the process seems to be the most probable. (Polish) M.Gora

5173. MORPHOLOGICAL AND FUNCTIONAL STUDIES OF MUSCLES OF MASTICATION IN VARIOUS MALOCCLUSIONS. G.H. Schumacher: Dtsch. Zahn-, Mund-u. Kieferheilk., 1963, 39, 177-207, 272-297, 360-376, 376-392 (Gertrudenstr. 9, Rostock, Germany) Dissections of the muscles of mastication and temporomandibular joint of 5 subjects of 50-72 yr. and one of 9 yr. with various malocclusions are described. In 10 adults the cross sectional area, length and wt. of each muscle were measured, and the relative contributions to movements of the mandible were estimated.

(German) CP.Wallis

5174. PROSPECTS AND REALITIES IN ANTI-ENZYME THERAPY IN ODONTOSTOMATOLOGIA. CZearo: Atti. Acad. med. Lombarda, 1962, 17, 423-430 (Clinica Odontoiatrica Uiiiv. Milano, Italy)
 Review. 37 ref. (Italian) G.N.Godson

5175. ACETYLCHOLINESTERASE ACTIVITY IN THE MASSETER OF THE RAT. G.Cimasoni, J.W.Smudski, H.M.Myers and G.L.Ellman: Arch. oral Biol., 1963, 8, 467-469 (Dent. Sch., Univ. Geneva, Switzerland)
 Short comm. r ***

BIOCHEMISTRY

CARBOHYDRATES

- 5176. PHOSPHATE COMPOUNDS OF THE CANINE ERYTHROCYTES AS THE INTERMEDIATES AND CO-ENZYMES OF CARBOHYDRATE METABOLISM.** J.Chmiel: Pozn. Towarzy. Przyjac. nauk. Wydz. Iek., 1962, 22, 5-60 (ZaK*ad Chemii Fizjol., Akad. Med., Poznai, Poland) It was found that 2,3-glyceric acid diphosphate constitutes *SQPo* of all phosphate compounds in the dog r.b.c. In high amounts occur also ATP, inorg. phosphates and hexose diphosphates. The adenine nucleotides dominate among free nucleotides. Neither sedoheptulose nor ribose 5-phosphate can be revealed. Comparing with human erythrocytes dog r.b.c. contain less ATP and more NADP; lactic acid could not be detected. The modified Bartlett method was used for chromatographic separation of phosphate compounds on Dowex I using formate buffer. (Polish) T.GJfebicki
- 5177. REOXIDATION OF NADPH₂ IN MUSCLE WITH INCREASED G 6-P-DEHYDROGENASE AND 6 PG-DEHYDROGENASE ACTIVITIES.** F.Rossi, M.Zatti and A.Tartarini: Sperimentale, 1963, 113, 15-23 (Ist. Patol. Gen., Univ. Podova, Italy) It was previously shown that in atrophic muscles (denerveved) there was an increase in glucose 6-phosphate dehydrogenase and 6-phosphogluconate-dehydrogenase. It is now shown that atropic muscles have an increased rate of incorporation of [¹⁴C]acetate into lipid. This suggested a correlation between the activity of the pentose phosphate pathway and the synthesis of fat which stimulates glucose oxidation by way of NADP dependent dehydrogenases, by utilising the reduced NADPH₂*. It was shown that lactic dehydrogenase with pyruvic acid acting as NADPH₂ hydrogen acceptor does not provide the driving force whereby more glucose 6-phosphate can be oxidised. (Italian) G. N. Godson
- 5178. MOVEMENT OF WATER-SOL. MATERIAL IN MAYER'S ALBUMIN AND A SIMPLIFIED DRY-MOUNTING METHOD FOR AUTORADIOGRAPHY.** T.C.Smitherman, A.F.Debons, J.A.Pittman and V.Stephens: Nature, Lond., 1963, 198, 499-500 (V.A.Hosp., Radioisotope Service, Univ. Alabama Med. Center, Birmingham, Ala., U.S.A.) The distribution of sucrose labelled with ¹⁴C in thyroid slices was investigated by an autoradiographic technique involving a mounting procedure without exposure to water or water-miscible material. Sucrose appeared in the extrafollicular spaces. G.M.Lewis
- 5179. SEPARATORY DETERMINATION OF ALDONO-OR URONO-LACTONE AND THE CORRESPONDING ACID IN THEIR MIXTURE.** M.Kawada: J. Biochem., Tokyo, 1963, 53, 323-325 (Dept. Biochem., Fac. Med., Univ. Tokyo, Japan) The difference in the speeds of periodate oxidation of acids and their lactones was used. B.M. Stevens
- 5180. INTERACTION OF CARBOHYDRATES WITH HYDROGEN PEROXIDE AT LOW TEMPERATURE.** G.J.Moody: Nature, Lond., 1963, 198, 781-782 (Dept. Chem., Welsh Coll. Advanced Technol., Cardiff, Wales). G.M.Lewis
- 5181. METABOLISM OF ACETATE AND GLUCOSE BY THE ISOLATED PERFUSED UDDER. II. THE CONTRIBUTION OF ACETATE AND GLUCOSE TO CARBON DIOXIDE AND MILK CONSTITUENTS.** D.CHardwick,

J.L.Linzell and T.B.Mepham: Biochem. J., 1963, 88, 213-220 (A.R.C. Inst. Animal Physiol., Babraham, Cambridge, England) Glucose, acetate and amino acids with [^{U-14}C]glucose or [2-¹⁴C]acetate were infused for 6-9 hr. into four perfused goat udders. Of the expired CO₂, 39% came from added glucose and 14% from acetate. In the milk 77% of lactose, 23% of triglyceride glycerol, 0.5% of triglyceride fatty acids and 41% of citrate came from added glucose, whereas 0.3% of lactose, 2% of glycerol, 48% of fatty acids and 33% of citrate came from added acetate. Milk fat was labelled later than other constituents. The different extent of labelling of citrate and fatty acids from glucose is discussed. *

5182. TIME COURSE OF UTILISATION OF RADIO-GLUCOSE BY TISSUE IN CULTURE. W.Rficker, E.Broda, G.Kellner and J.Frimmel: Exp. Cell. Res., 1963, 29, 17-30 (Inst. Phys. Chem., Univ. Vienna, Austria) The utilisation of glucose/cell and hr. for glycolysis decreased, and for respiration increased, with increasing no. of cells/roller tube and with increasing time, as studied with chick mesenchyma cells and HeLa cells. The amount of free energy available to the single cells of mesenchyma/hr. did not change, while the total supply of free energy to the single HeLa cell fell off with time. A possible explanation is given for the fact that HeLa relies for its energy supply on aerobic glycolysis rather than on respiration to a higher extent.

KJones
5183. FERMENTATION OF LACTOSE BY CELL-FREE EXTRACTS OF BACILLUS ANTHRACIS. B.R.Chatterjee and R.P. Williams: Nature, Lond., 1963, 198, 909-91* (Dept. Microbiol., Baylor Univ. Coll. Med., Houston, Tex., U.S.A.) Cell-free extracts of *B. anthracis* showed α -galactosidase activity when tested against lactose and α -nitrophenyl- β -galactopyramoside, although the intact cells cannot hydrolyse lactose. *Salmonella typhosa* and *Pseudomonas aeruginosa* showed no β -galactosidase activity in cell-free extracts, and presumably do not synthesise the enzyme. G.M.Lewis

5184. METABOLIC INTERRELATIONS OF GLUCOSE AND LACTATE IN SHEEP. E.F.Annison, D.B.Lindsay and R.R. White: Biochem. J., 1963, 88, 243-248 (Sch. Rural Sci., Univ. New England, Armidale, N.S.W., Australia) An isotope-diln. technique was used to measure entry rates of lactate in sheep after the const. infusion of L-(+)-[¹⁴C]lactate. Values were 1.2 ± 0.14 (five animals) mg./min./kg. in sheep starved for 24 hr. and 1.7 ± 0.14 (four animals) mg./min./kg. in the period 2-4 hr. after feeding. There was a significant correlation between entry rate and blood lactate concn. Comparison of the sp. radioactivities of blood lactate and plasma glucose during the infusion of [¹⁴C]glucose or [¹⁴C]lactate indicated that about 6% of glucose was recycled through glucose-lactate interconversion, and this value was supported by a study of the relocation of ¹⁴C during the infusion of [6-¹⁴C]glucose. From the low labelling of liver and muscle glycogen after the infusion of [¹⁴C]-glucose or [¹⁴C]lactate it was suggested that glucose-lactate interconversion was not by the Cori cycle. It is concluded that glucose-lactate interconversion does not affect previous estimates of carbohydrate requirement in sheep, based on the measurement of the entry rate of glucose. *

5185. SOME EXPERIENCE WITH A COLORIMETRIC METHOD FOR THE DETERMINATION OF GLUCOSE &

BIOLOGICAL FLUIDS. J.A.P.Stroes, H.A.Zondag and Pj.H.C.Cornelissen: Clin. chim. Acta, 1963, 8, 152-154 (Clin.<:hem. Lab., St. Elizabeth's Hosp., Haarlem, Netherlands) The phenylhydrazine method for determination of glucose in biol. fluids is recommended for routine analysis because of its rapidity.

K.Brew

5186. HEXOSAMINE CONTAINING COMPOUNDS IN PLANT LEAVES. B.N.Gladyshev: Biokhimiia, 1963, 28, 210-215. Hexosamine containing compounds of Uropolysaccharide type were isolated from the leaves of haricot beans and potato plants. A method was developed for isolation of lipopolysaccharides in higher plants, involving extraction of dry leaves with boiling acidified ^a0% ethanol, pptn. of a composite complex of substances ^bY cooling at 4-6°, and isolation of lipopolysaccharides ^bY treating this complex with a mixture of water and Phenol. (Russian) BJ.Cooper

5187. SEVERAL NEW SUGARS IN THE VINE AND IN WINE. M.J.Carles: C.R. Acad. Sci., Paris, 1962, 255, 4, 761-763 (Lab. Physiol. vegetale, Inst. Catholique, Toulouse, France) Expt. on the vine showed that besides glucose, fructose and sucrose, raffinose and stachyose occurred regularly and in relative Sundance. Expt. with wine showed that besides fructose and glucose, ribose, galactose, xylose, etc. also were Present. (French) J.M.Thomas

5188. NOTE ON SEASONAL OCCURRENCE OF FORBITOL (D-GLUCITOL) IN BUDS AND LEAVES OF MALUS. J-M.Whetter and C.D.Taper: Canad. J. Bot., 1963, 41, 175-177 (Dept. Hort., Macdonald Coll, Quebec, Canada). A.Meany

5189. DETERMINATION OF SORBITOL AS ITS HKA-ACETATE BY GAS LIQUID CHROMATOGRAPHY USING IONISATION DETECTOR. J.A.Hause, J.A. Hubicki and G.G.Hazerc: Analyt. Chem., 1962, 34, 1567-1570 (Process Devel. Labs., Merck Chem. Div., ^ Merck and Co. Inc., Danville, Pa., U.S.A.) This Method is simple and reliable for the determination of ^snitol in mixtures. Mannitol was used as an internal standard which minimised the variable detector response. The error was about 1%. The method could be used for simultaneous determination of mannitol and sorbitol by use of another standard. L.G.Gilnes

5190. BIOSYNTHESIS OF PARAMYLON IN EUGLENA GRACILIS. S.H.Goldemberg and L.R.Marechal: Buchim. biophys. Acta, 1963, 71, 743-744 (Inst. Invest. Bioqufm. Fund. Campomar, Buenos Aires, Argentina) An enzyme extracted from E^{gracj} synthesized paramylon from UDP glucose. Prelim. comm. B.M. Stevens

5191. PAPER CHROMATOGRAPHIC ESTIMATION OF [^]ASCORBIC AND D-ARABOASCORBIC ACIDS. T.Miki, N.Kikuchi and Y.Sahashi: J. Vitaminol., 1962, 8, 279-285 (Dept. Agric. Chem., Fac. Agnc. Kyōto Agric. Univ., Chitose, Tokyo, Japan)

5192. A chromatographic separation (ascending method) at [^]ture of L-ascorbic and D-araboascorbic acids was carried out using papers impregnated with 37° metapnosic acid and water-sat, methyl ethyl ketone as a solvent system. After spraying with indophenol soln. 3-40 min. Per spot of each isomer became clearly distinguishable per spot. of each isomer. Neglecting both acids being ^aed, the difference in Rf values for both acids liquids approx. 0.1. The effects of moisture and partition in the stationary phase were studied, also the

influence of some carbohydrates and their deriv. on the separation of the isomers. After separation, the isomers were estimated using 2:4-dinitrophenyl hydrazine.

E.Parkinson

5192. GLUCOSE TOLERANCE AND SYNTHESIS OF HEPATIC GLYCOGEN FROM GLUCOSE AND [1-14C]-GLYCINE IN TUBERCULOUS GUINEA-PIGS. V.N.Singh, T.A.Venkatasubramanian and R.Viswanathan: Arch. Biochem., 1963, 101, 229-233 (Vallabhbhai Patel Chest Inst., Univ. Delhi, India) Tuberculous animals showed a marked depletion of hepatic glycogen, an appreciable decrease in hepatic glycogenesis and a lowered glucose tolerance. In vivo incorporation of ¹⁴C from [1-14c]glycine into hepatic glycogen tended to be increased. B.M. Stevens

5193. GLYCOGEN SYNTHESISING AND DEGRADING ENZYMES OF GUINEA-PIG LIVER IN EXPERIMENTAL TUBERCULOSIS. V.N.Singh, U.Bhargava, T.A.Venkatasubramanian and R.Viswanathan: Arch. Biochem., 1963, 101, 234-239 (Vallabhbhai Patel Chest Inst., Univ. Delhi, India) UDP-glucose-glycogen transglucosylase, phosphorylase and phosphoglucomutase activities were decreased and glucose 6-phosphatase activity was increased in tuberculous animals. The decrease in UDP-glucose-glycogen transglucosylase activity was sufficiently great to account for the depletion of hepatic glycogen. B.M.Stevens

5194. GLYCOGEN METABOLISM IN EMBRYONIC CHICK AND NEONATAL RAT LIVER. F.J.Ballard and I.T. Oliver: Biochim. biophys. Acta, 1963, 71, 578-588 (Dept. Biochem., Univ. Western Australia, Nedlands, Australia) UDP-glucose [UDPG] a-glucan glucosyl transferase, a-glucan phosphorylase, glucose 1-phosphate uridyl transferase and phosphoglucomutase activities increased throughout the glycogen synthesis period in embryonic chick and foetal rat livers. UDPG a-glucan glucosyl transferase activity in rats appeared when glycogen synthesis began, a-glucan phosphorylase increased 2-fold in the 24 hr. after birth when liver glycogen was utilised. Phosphoenolpyruvate was synthesised from malate in embryonic chick and postnatal rat liver but not in foetal rat liver. Incorporation of [14c]glucose and [¹⁴C]pyruvate into glycogen in liver slices also indicated that rats developed glycogenetic activity only after birth. In chicks, glycogenetic enzymes were present by the eleventh day of incubation.

B.M.Stevens

5195. URIDINE DIPHOSPHATE GLUCOSE [UDPG] MECHANISM OF GLYCOGEN SYNTHESIS IN HUMAN LEUCOCYTES. LF.Seits, LS.Luganova and A.D.Vladimirova: Biokhimiia, 1963, 28, 295-302. UDPG was detected in human w.b.c: up to 0.1 jmol./ml. wet cells. Active UDPG-pyrophosphorylase and UDPG-glycogen transferase were also found in the cells, as were active hexokinase, phosphoglucomutase and glucose 6-phosphate dehydrogenase. Similar results were obtained in the study of human platelets.

(Russian) BJ.Cooper

5196. PARTICIPATION OF SARCOTUBULAR SYSTEM IN GLYCOGEN METABOLISM. E.Andersson-Cedergren and U.Muscatillo: J. ultrastructure Res., 1963, 8, 391-401 (Anat. Dept., Karolinska Inst., Stockholm, Sweden) The fraction of frog skeletal muscle homogenate which was derived from the sarcotubular system contained much protein-bound glycogen. Aggregates of glycogen particles were also found after EDTA treatment of the sarcotubular fraction. This fraction also contained UDPG-glycogen

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synthetase. It was concluded that the sarcotubular system was directly involved in the glycogenogenesis of the muscle cell.

H. B. Waynfirth

5197. PHYSICOCHEMICAL PROPERTIES OF OX-BRAIN GLANGLIOSIDES. D.B.Gammack: Biochem. J., 1963, 88, 373-383 (Dept. Biochem., Inst. Psychiatry, Maudsley Hosp., London, England) Gangliosides isolated from ox-brain grey matter in a high state of purity were separated into 5 components on thin-layer chromatography. They formed micelles in aq. soln. with micellar weights of about 300000 determined from sedimentation, diffusion and viscosity data. In the ultracentrifuge isolated fractions behaved differently from the whole prep. A critical micelle concn. of 0*015% was observed from surface-tension measurements. A minimum mol. wt. of 1500 was estimated from sedimentation in NN-dimethylformamide and an equiv. wt. of 1520 was obtained by titration. Interaction of ganglioside micelles with small ions, dyes and other lipid micelles was observed.

5198. CONTENT OF EXTRACTABLE GLANGLIOSIDES IN RAT BRAIN DURING ETHANOL INTOXICATION.

H.-M.H2kkinen and E.Kulonen: Nature, Lond., 1963, 198, 995 (Res. Lab. the St. Alcohol Monopoly, Helsinki, Finland) The content of extractable N-acetylneuraminic acid in rat brains during ethanol intoxication increased from 0.188 to 0*211 pmoles/100 mg. fresh wt.

G.M.Lewis

5199. OCCURRENCE OF INORGANIC POLYPHOSPHATE HEXOKINASE IN SOME MICRO-ORGANISMS.

M.Szymona and S.Kulesza: Acta microbiol., pol., 1962, 11, 287-300 (Akad. Med., Lublin, Poland) A new type of kinase, phosphorylating glucose at the expense of inorg. phosphate, has been revealed in the following 7 strains of Mycobacterium: tuberculosis, H37Ra[#] BCG, smegmatis, phlei, tTilmrgensis, pelligri_{no}, atypicum 410. Specific activity of the kinase varied from 5 to about 30 $\mu\text{M}/\text{hr.}/\text{mg}$. of protein. Phosphorylation of glucose in the presence of ATP was less effective. The acetone powders and the cell-free extracts from S. cerevisiae, Aspergillus niger, E. coli and Aerobacter aerogenes were inactive towards inorg. polyphosphates.

M.Korbecki

5200. HEXOKINASE IN HEALTHY AND IN DIABETIC RABBITS. M.P.Fomina: Biokhimiia, 1963, 28, 232-237. Approx. 10-15% of the total homogenate hexokinase activity was found in isolated rabbit hepatic mitochondria. The enzyme was mainly localised in the hyaloplasm (85-90%). However, the ratio of hexokinase activity to protein content in isolated mitochondria was about 1*5 times lower than in the fraction of hyaloplasm plus microsomes. Inhibn. of the hexokinase reaction in liver extracts of rabbits with alloxan diabetes was mainly due to inhibn. in the hyaloplasm; its depression in the mitochondria was much less marked. 1 $\frac{1}{2}$ -2 hr. after administration of insulin to the diabetic rabbits there was a slight increase in hexokinase activity in the hyaloplasm, while it was almost completely restored in the mitochondria.

(Russian) B.J.Cooper

5201. COMPARATIVE STUDY OF GLUCOSE 6-PHOSPHATE DEHYDROGENASE IN MAMMALS. B.Ramot and S.Baumingen: Biochim. biophys. Acta, 1963, 73, 186-192 (Dept. HaematoL, Tel-Hashomer Government Hosp., Tel-Hashomer, Israel) Neutralising Ab against human r.b.c. glucose 6-phosphate dehydrogen-

ase were produced in rabbits by 2 immunisation techniques. Differences in amount of cross reaction between these antisera and enzymes from different sources were found. An enzymically inactive glucose 6-phosphate dehydrogenase fraction¹ obtained from r.b.c. of enzyme 'deficient' human subjects absorbed the Ab. Electrophoresis on starch gel indicated differences in glucose 6-phosphate dehydrogenases from different spp. No differences in kinetic prop. were found amongst the various glucose 6-phosphate dehydrogenases.

B.M.Stevens

5202. AN IMPROVED MICROMETHOD FOR DETERMINATION OF GLUCOSE 6-PHOSPHATASE ACTIVITY. T.R.Ricketts: Clin. chim. Acta, 1963, 8, 160-162 (Dept. Chem. Pathol., Leeds Univ., England).

K.Brew

5203. ALTERATION OF FRUCTOSE-t6-DIPHOSPHATASE ACTIVITY IN CALF KIDNEY CELLS IN TISSUE CULTURE. H.Friedrich-Freksa, H.Kneser and P.Bbrner: Z. Naturforsch. B, 1963, 18, 224-228 (Max-Planck-Inst. Virusforsch., Ttlbingen, Germany) The fructose t6-diphosphatase [FDP] activity of calf kidney cells in tissue culture fell by 1/100 during 4-7 days; aldolase activity fell only slightly. The ratio of FDPase activity to aldolase activity was about 1:1 again after 3 months and about 1:2 after 6 months whereas the ratio in mouse fibroblast cells and HeLa was about 1:30.

(German) J.C.Crawhall

5204. ENZYMIC DEPHOSPHORYLATION OF SOME PHOSPHORIC ESTERS. P.Segni: Biochim. appl., 1962, 9, 283-302 (1st. Chim. Biol., Univ. Genoa, Italy) The dephosphorylation of G-I-P, F-I, 6-diP and sedoheptulose-1,7-diPhosphate [S-I, 7-diP] was studied with various enzyme prep. obtained from the rat. G-I-P was converted to G-6-P before dephosphorylation. F-I, 6-diP was first converted to F-6-P. A specific enzyme for conversion of S-I, 7-diP to S-7-P was isolated from yeast and its prop. studied.

(Italian) J.C.Crawhall

5205. ELECTROPHORETIC LOCALISATION OF AMYLASES & BY TWO DIMENSIONAL TECHNIQUES. D.Vincent and G.Segonzac: C.R. Soc. Biol., Paris, 1962, 156, 2133-2135 (Lab. Matière méd., Fac. Méd., Toulouse. France) Amylases were separated by continuous 2 dimensional electrophoresis on paper at pH 8*6, 120-230 V and 5-10 mA. The delivery rate of samples was 0*07 ml./hr. The amylases studied (human serum and saliva, pancreatin and standard amylases) migrated between & -globulins and y-globulins.

(French) M.A.Price

5206. ENZYMIC DIGESTION OF FIBRE IN COCONUT CAKE. K.Ramamurti and D.S.Johan: Nature, Lond., 1963, 198, 481-482 (Central Food Technol. Res. Inst" Mysore, India) The enzymic digestion of fibre in coconut cake through the action of cellulases from Myrothecium verrucaria, Stachybotrys atra and "Takamine cellulase" was studied! About 40% decomposition was the max. attained under the expt. conditions studied.

G.M.Lewis

5207. STUDIES ON GALACTOSIDASES. XI. SIZE AND SHAPE OF 3-GALACTOSIDASE FROM E. COLI.

H.Sund and K.Weber: Biochem. Z.f 1963, 337, 24-34 (Chem. Lab., Univ. Freiburg i.Br., Germany) The mol. wt. of 3-galactosidases from 2 mutants of E. coli were determined. The sedimentation coeff.

$D_0^{(S)} = 201w$ and the diffusion coeff. D_{201w}^0 are 16.14S and 3.13F for the enzyme from the mutant NiL35 ($i^+y^-z^+$) and 15.93jS and 3.12F for the enzyme from the mutant

($i''y+z+$). The mol. wt. of ML35 was calc. to be 521000 and that of ML309 to be 516000. The enzyme from *E. coli* was thought to have an average mol. wt. of 518000 and to possess an oblate shape with an axial ratio of 5²4-5²9.

(German) L.Cohn

5208. DEGRADATION OF COTTON CELLULOSE BY THE EXTRACELLULAR CELLULASE OF MYROTHECIUM VERRUCARIA. II. THE EXISTENCE OF AN 'EXHAUSTIBLE' CELLULASE. K.Selby, C.C.Maitland and K.V.A. Thompson: *Biochem. J.*, 1963, 88, 288-289 (Shirley Inst., Didsbury, Manchester, England) The cellulolytic activity of cell-free culture filtrates from *M. verrucaria* has been measured by their ability to weaken and to solubilise unswollen cotton. A single application of filtrate could only produce a limited loss of strength but repeated applications caused complete loss and substantial (27%) solubilisation. This was shown to be due to the renewal of a cellulase which is necessary for the extensive degradation of unswollen cotton but is lost during attack. Another more stable 'cellulase' could attack cotton but to a very limited extent, its action being otherwise restricted to swollen or sol. cellulosic materials.

5209. POLYSACCHARIDES OF YEAST-LIKE ORGANISMS. N.P.Elinov and G.A.Vitovskia: *Biokhimiia*, 1963, 28, 312-315. The composition of polysaccharides of 15 spp. of yeast-like organisms was studied. The prep. isolated from non-pigmented organisms contained mostly β -mannose and smaller amounts of glucose, while those from pigmented organisms contained galactose, and to a lesser extent glucose and mannose.

(Russian) B.J. Cooper

5210. SLIME POLYSACCHARIDES OF THE ENTEROBACTERIACEAE. E.S.Anderson and A.H.Rogers: *Nature*, Lond., 1963, 198, 714-715 (Enteric Reference Lab., Publ. Hlth. Lab. Serv., Colindale Ave., London, England) Slime polysaccharides were prep. and purified from *Salmonella paratyphi B*, *S. dublin*.

^Jeversoir and *E. coli*. They were similar in composition, consisting of glucose, galactose, fucose and an α -diblouronic acid and were serol. related. Slime production appeared to be stimulated by a high external P_2O_5 and varied inversely with humidity; it may be a protective mechanism.

G.M.Lewis

5211. SYNTHESIS OF CHITIN IN CELL-FREE EXTRACTS OF PRODENIA ERIDANIA. E.Jaworski, L.Wang and G.Marco: *Nature*, Lond., 1963, 198, 790 (Agric. Chem. Div., Monsanto Cem. Co., St. Louis, Mo., U.S.A.) [¹⁴C]Uridine-diphospho-N-acetylglucosamine was incorporated by chitin synthetase in cell-free extracts of *P. eridania* at various stages of development. Peak of activity coinciding with the prepupal stage at which substantial amounts of chitin would be required for the pupal casing.

G.M.Lewis

5212. SOME BIOCHEMICAL CHANGES IN BLOOD AFTER DEXTRAN ADMINISTRATION. L.Triner and M.Mráz: *Physiol. Bohem.*, 1963, 12, 128-135 (Inst. Pharm., Charles Univ., Prague, Czechoslovakia) The blood levels of proteins, neutral lipids, non-esterified fatty acids and Ca in rats, and protein and Ca level in rabbits after i.v. injection of dextran (2.5 ml./100 g. S.). This diminution is accentuated by previous withdrawal of 15 ml. of blood from the expt. animal. The dextran-induced fall of Ca can be prevented by i.v. injn. of Ca^{2+} .

M.S.Laverack

5213. CHARACTERISATION OF CARBOHYDRATE SULPHATES BY ACID HYDROLYSIS. D.A.Rees:

Biochem. J., 1963, 88, 343-345 (Dept. Chem., University, Edinburgh, Scotland) The rates of acid hydrolysis have been compared under standard conditions for a no. of carbohydrate sulphates. A wide range of values is found, suggesting that this rate might be useful for characterisation purposes. It appears that the esters of axial secondary hydroxyl groups are more stable than those derived from equatorial secondary hydroxyl groups, and that the sulphates of primary alcohols are more stable than those of either class of secondary alcohol.

5214. PURIFICATION AND PROPERTIES OF AVIAN NEURAMINIDASE. G.L.Ada: *Biochim. biophys. Acta*, 1963, 73, 276-284 (Hall Inst., Royal Melbourne Hosp., Melbourne, Australia) Washed chorioallantois from 19 day old chick embryos were subjected to mild extraction, heat treatment, $(\text{NH}_4)_2\text{SO}_4$ pptn. and column chromatography on hydracylapatite. The final neuraminidase prep. was approx. 200-fold purer than the starting fluid. The prep. was stable at 0° but not at 37°. j^2 was approx. 3*3. SH reactants inactivated. Optimum pH for activity on sialyl lactose, fetuin and ovine submaxillary gland mucin was between 4 and 5. Km and max. rates of action on these substrates were determined.

B.M.Stevens

5215. STAINING OF SULPHATED POLYSACCHARIDES BY MEANS OF ALCIAN BLUE. K.Yamada: *Nature*, Lond., 1963, 198, 799-800 (Dept. Anat., Nagoya Univ., Nagoya-Shi, Japan) The stainability by Alcian Blue of films of chondroitin sulphate C, heparin, glycogen sulphate, amylose sulphate, cellulose sulphates and glycogen was compared. The degree of staining depended largely on the sulphate groups and was decreased by methylation or acetylation.

G.M.Lewis

5216. N-ACETYLATION OF GLUCOSAMINE 6-PHOSPHATE IN EPIPHYSEAL PLATE HOMOGENATES. V.Pedrini, L.Lenzi and V.Zambotti: *G. Biochim.*, 1962, 11, 287-294 (Inst. Chim. Biol., Univ. Milan, Italy) Acetylation of glucosamine, glucosamine 6-phosphate and galactosamine by extracts of epiphyseal cartilage from new born pigs was studied, and only occurred on addition of acetyl CoA. The extracts acetylated glucosamine 6-phosphate mainly, (which the tissue synthesised from glucose 6-phosphate and glutamine) glucosamine in smaller amounts, and galactosamine was not acetylated in detectable amounts.

B.Payne

5217. EFFECT OF GLUTAMIC AND GLUCOSE 6-PHOSPHATE ON THE INCORPORATION OF $^{35}\text{SO}_4^{2-}$ IN CHONDROITIN SULPHATE. A.A.Castellani, C.Ferrari, S.Ronchi, A.Crespi and V.Zambotti: *G. Biochim.*, 1962, 11, 317-325 (Inst. Chim. Biol., Univ. Pavia, Italy) Homogenates of metaphysis cartilage of new-born pig containing ATP, cysteine and MgCl_2 synthesised chondroitin sulphate, addition of glutamine or glucose 6-phosphate stimulated incorporation of $^{35}\text{SO}_4^{2-}$. Simult. addition of both compounds produced further increase in incorporation. It is concluded that glutamine stim. incorporation of $^{35}\text{SO}_4^{2-}$ by increasing biosynthesis of hexosamine 6-phosphate which in turn increased formation of chondroitin sulphate.

B.Payne

5218. IDENTIFICATION OF URONIC ACIDS IN MUCO-POLYSACCHARIDES. B.Radhakrishnamurthy and G.S. Berenson: *Arch. Biochem.*, 1963, 101, 360-362 (Dept. Med., Louisiana State Univ. Sch. Med., New Orleans, La., U.S.A.) Isolation and identification of uronic acids from acid mucopolysaccharides was achieved

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by hydrolysis with formic acid and chromatography of the hydrolysates. B.M. Stevens

5219. PURIFICATION AND PROPERTIES OF 3-1,3-GLUCANASE FROM THE 'LYTIC ENZYME OF BACILLUS CIRCULANS. K.Horikoshi, H.Koffler and K.Arima: *Biochim. biophys. Acta*, 1963, 73, 268-275 (Dept. Agric. Chem., Univ. Tokyo, Japan)

The enzyme was separated from the culture fluid by column chromatography on CG-50 resin followed by column chromatography on DEAE-cellulose. The optimum pH for laminarin hydrolysis was 5*8. Laminaritriose, laminaritetraose and laminaripentaose were also hydrolysed, but not dimers of glucose and other sugars. Glucose, laminaribiose, laminaritriose and higher oligosaccharides were released on laminarin hydrolysis.

B.M.Stevens

LIPIDS AND STEROIDS

5220. STABILITY AND PROPERTIES OF BIMOLECULAR LIPID LEAFLETS IN AQUEOUS SOLUTIONS. D.A.Haydon and J.Taylor: *J. theor. Biol.*, 1963, 4, 281-296 (Dept. Colloid Sci., Univ. Cambridge, England) Consideration is given to the energetics of bimolecular lipid leaflet formation and stability in terms of the nature of the lipid molecules, ionisation etc., and the effect of lytic substances on the stability of such leaflets is discussed. It is suggested that some proposed mechanisms of protein-lipid interaction in the formation of cell membranes are energetically unfavourable and must be discarded.

G.F.Blane

5221. FIRMLY BOUND LIPIDS OF HUMAN TUBERCLE BACILLUS. II. ISOLATION OF ARABINOSE MYCOLATE AND IDENTIFICATION OF ITS CHEMICAL STRUCTURE. L.Azuma and Y.Yamamura: *J. Biochem.* Tokyo, 1963, 53, 275-281 (Third Dept. Int. Med., Sch. Med., Univ. Osaka, Japan) Arabinose mycolate was isolated from the B fraction of strain Aoyama B after treatment with O'IN HC1 at 37° for 72 hr. Mycolic acid and D-arabinose were obtained by acid or alk. hydrolysis of the glycolipid. Reductive cleavage with LiAlH₄ yielded mycoloyl alcohol. Methylation expt. showed that 1 mol. of mycolic acid and 1 mol. of D-arabinose were joined by an ester linkage at the D-arabinose OH-5.

B.M.Stevens

5222. BROWNIAN MOVEMENT IN COLOUR PHOTO-MICROGRAPHY. H.F.Sassoon and M.H.C.Parsons: *Science*, 1963, 139, 1285-1286 (Dept. Animal Husbandry, Univ. Bristol, Langford, England)

Crystals less than 1 μ and stained fat globules in cows milk in Brownian movement have been photographed in colour. G.M.Lewis

5223. EFFECT OF ASPERGILLOMARASMIN B ON THE FORMATION OF LIPID PEROXIDES IN LIVER HOMOGENATES. M.Robert: *C.R. Soc. Biol.*, Paris, 1963, 157, 103-107 (Serv. Microbiol. du Sol, Inst. Pasteur, Paris, France) 1 μM aspergillomarasin B inhib. the formation of peroxides by 68% during oxidation in the presence of 5 μM ascorbic acid by guinea-pig liver homogenates incubated at 37° and by 75% during irradiation with u.v. light. This inhibn. was equiv. to that given by an equal dose of EDTA. (French) M. A. Price

5224. SOME LIPID CONSTITUENTS OF NORMAL AND QUARTZ-DUSTED GUINEA-PIG LUNGS. P.Baily, T.A.Kilroe-Smith and J.S.Harington: *Nature*, Lond., 1963, 198, 856-861 (Chamber Mines Res. Lab., S.African C.S.I.R., Johannesburg, S. Africa) Lungs from dusted animals contained a higher proportion of lecithin and lysolecithin and a lower proportion of sprung^ myelin and cholesterol than lungs from normal animals. Dusting also caused a decrease in the neutral lipid fraction of lungs. J.R. Sargent

5225. NON-PHOSPHATIDE FATTY ACYL ESTERS OF ALKENYL AND ALKYL ETHERS OF GLYCEROL. J.R.Gilbertson and M.L.Karnovsky: *J. bioL Chem.*, 1963, 238, 893-897 (Dept. Biol. Chem., Harvard Med. Sch., Boston, Mass., U.S.A.) The neutral lipid fraction of lipids from diverticulum of the starfish contains glyceryl alkenyl ether diesters. The previously known glyceryl alkyl ethers actually exist in nature as glyceryl alkyl ether diesters. Lipid extracts of ox brain and bone marrow, calf heart, rat brown fat and adipose tissue, guinea-pig w.b.c., and human chylomicrons contain glyceryl ethers of alkyl and alkenyl types; together these comprise 0*1 to 2*9% of the neutral lipid calc. as fatty acid diesters. The alkenyl ethers form 29-82% of the total glyceryl ethers in the neutral lipids of these mammalian tissues. The lipid from rat epididymal fat pads also contains a glyceryl alkenyl ether mono-ester. , J.N.Ashley

5226. LONG CHAIN FATTY ACID ACYL CoA SYNTHETASE IN BACILLUS MEGATERIUM [AND SOME OF ITS PROPERTIES]. W.J.Lennarz: *Biochim. biophys. Acta*, 1963, 73, 335-337 (Dept. Physiol. Chem., Johns Hopkins Univ. Sch. Med., Baltimore, Md., U.S.A.) Prelim, comm. B.M. Stevens

5227. METABOLISM OF HYDROXY FATTY ACIDS. I. METABOLIC CONVERSION OF RICINOLEIC ACID BY A CERTAIN MICRO-ORGANISM TO 8-D-(+)-HYDROXY TETRADEC-ck-5-ENOIC ACID. S.Okui, M.Uchiyama and M.Mizugaki: *J. Biochim.*, Tokyo, 1963, 53, 265-270 (Inst. Pharmacy, Sch. Med., Tohoku Univ., Sendai, Japan) Some *E. coli* strains and an unidentified Gram-neg. coccus produced 3 metabolites from ricinoleic acid. 60% or more was converted to 8-D-hydroxy tetradec-*cis*-5-enoic acid which was a colourless liquid with an optical rotation of 6 • 82° in ethanol. The p- bromophenacyl ester melted at 47° 5'. The other 2 components were concluded to be 10-hydroxy hexadec-7-enoic acid and 6-hydroxy dodec-3-enoic acid. Silicic acid column chromatography, reversed phase column chromatography and thin layer chromatography were used to isolate the acids. The last with a 70:30:1 hexane:ethyl acetate:acetic acid solvent system was found very useful for the detection of hydroxy acids and dicarboxylic acids. , „ B.M. Stevens

5228. ABSORPTION OF [*I*-14c]LIGNOCERIC ACID IN THE RAT. M.Fields (Gellei) and S.Gatt: *Nature*, Lond., 1963, 198, 994-995 (Dept. Biochem., Hebrew Univ.-Hadassah Med. Sch., Jerusalem, Israel)

[*I*-14c]Lignoceric acid was administered by stomach tub⁶ or intraduodenally to rats. Fractionation of the lymph lipids showed that 85-95% of the radioactivity was in neutral glycerides, 3% in phospholipids and 3-107° in *i**⁶* fatty acid. It is suggested that lignoceric acid is trans* ported to the liver, released from its linkage to glycerol, then either oxidised or again incorporated into the sphinx lipids or glycerides. G.M.Lewi

5229. BIOSYNTHESIS OF BRANCHED CHAIN AMINO ACIDS FROM BRANCHED CHAIN FATTY ACIDS BY RUMEN BACTERIA. M.J.Allison and M.P.Bryant: Arch. Biochem., 1963, 101, 269-277 (Dairy Cattle Res. Branch, Animal Husbandry Res. Div., Beltsville, Md., U.S.A.) When *Ruminococcus flavefaciens* was cultured with isobutyrate, isovalerate, 2-methylbutyrate and 14cO₂, the carboxyl C of valine, leucine and iso-leucine became labelled. Formate C was incorporated into various cellular components but not into branched chain amino acids. 14c from [2-¹⁴C]acetate was incorporated into several amino acids but leucine was not appreciably labelled. When whole rumen contents were incubated with [¹-14c]isovalerate for 2 hr., most of the ¹⁴C in the 'bacterial fraction*' was in leucine. With [¹-14c]isobutyrate most of the 14c was in valine.

B.M.Stevens

5230. SYNTHESIS OF FATTY ACIDS BY TESTICULAR TISSUE IN VITRO. P.F.Hall, E.E.Nishizawa and K.B.Eik-Nes: Canad. J. Biochem., 1963, 41, 1267-1274 (Biol. Chem. Dept., Univ. Utah Coll. Med., Salt Lake City, Utah, U.S.A.) Evidence was obtained for the synthesis of palmitic and stearic acids de novo from Cl-14c3acetate in rabbit testes. ICSH did not simulate such synthesis in vitro, but stim. [14C]testosterone production. Adrenal tissue was shown to contain Palmitic, stearic and oleic acids, but ACTH did not increase incorporation of [1-¹⁴C]acetate into them. It was suggested that fatty acid biosynthesis was not influenced by the mechanisms by which tropic hormones increase steroid formation.

A.M.Gibbins

5231. THE METABOLISM OF ACETIC ACID, PROPIONIC ACID AND BUTYRIC ACID IN SHEEP. E.F.Annison, R.A.Leng, D.B.Lindsay and R.R. White: Biochem. J., 1963, 88, 248-252 (Sch. Rural Sci., Univ. New England, Armidale, N.S.W., Australia) Soln. of ¹⁴C-acetate, [2-14C]acetate, [¹-14C]propionate, [¹-14C]propionate, [¹-14C]butyrate, [2-14C]butyrate, or [¹-14C]butyrate were infused into anaesthetised sheep via Portal vein. Liver and muscle glycogen were only slightly labelled in all cases. Radioactivity of blood glucose was appreciable only after the infusion of [14C]-¹⁴COMonate. The distribution of 14c in glucose and acetate molecules was in all cases in accordance with well-known pathways, and indicated no net synthesis of carbohydrate from acetate and butyrate. B-Hydroxy-¹⁴C-Wrate was labelled heavily after the infusion of [¹-14C]butyrate but only slightly after the infusion of [¹⁴C]-¹⁴Wtate or of [14c]propionate. There was slight labelling innate after the infusion of [14C]acetate, [14C]propionate or [14c]butyrate, but only a trace of labelling of ¹⁴cate after infusion of [14c]propionate or of [14c]-¹⁴Wtate.

5232. LONG CHAIN FATTY-ACIDS FROM THE ORGUEIL METEORITE. B.Nagy and M.C.Bitzi: Arch. Biochem., 1963, 101, 240-248 (Dept. Chem., Fordham Univ., New York, U.S.A.) A series of C14-C30 fatty acids isolated and analysed by vapour phase chromatographic fractions of the urea adducts of methyl esters of the acids obtained by solvent extraction. The relative abundance of even numbered and apparently odd numbered chain acids resembled that of fatty acids in ancient sediments on earth.

B.M. Stevens

5233. LIPOAMINO-ACIDS FROM BACILLUS MEGATERIUM. G.D.Hunter and A.T.James: Nature, Lond., 1963, 198, 789 (A.R.C. Dist. Res. Animal Dis.)

Compton, Newbury, Berks., England) Some lipo-amino-acids extracted from *B. megaterium* appear to be O-amino-acid esters of phosphatidyl glycerol.

G.M.Lewis

5234. FATTY ACID COMPOSITION OF MILK PHOSPHOLIPIDS OF MICE WITH AND WITHOUT THE MAMMARY TUMOUR VIRUS. R.F.McGregor, J.Newland and W.E.Comatzen: Nature, Lond., 1963, 198, 482-483 (Ireland Res. Lab., Dept. Biochem., Univ. North Dakota Med. Sch., Grand Forks, N.Dak., U.S.A.) The free fatty acid and neutral fat fractions of mouse milk analysed by gas liquid chromatographic methods showed the same composition in Ax (without mammary tumour virus) and A strains (with virus). In the phospholipid fraction, however, A strain mice contained linoleic acid and an unidentified acid not found in the Ax strain. This may be due to viral stimn. of phospholipid metabolism in the mammary gland. G.M.Lewis

5235. QUANTITATIVE PREPARATION OF METHYL ESTERS OF FATTY ACIDS FOR GAS CHROMATOGRAPHY. C.W.Gehrke and D.F.Goerlitz: Analyt. Chem., 1963, 35, 76-80 (Dept. Agric. Chem., Univ. Missouri, Columbia, Mo., U.S.A.) Quantitative macro and micro gas chromatographic methods were developed for the determination of carboxylic acids in biological materials. The reaction of iodomethane with the Ag salts of the acids was used in esterification. The main advantage of the method was in quant. ester formation with little or no undesirable side reactions or loss of the more volatile methyl esters. The method was used routinely for the quant. determination of the component fatty acids in milk fat and also for fatty acids in bovine semen and human blood serum.

L.G.Gillies

5236. FATTY-ACID COMPOSITION OF PLASMA, AORTA AND LIVER LIPIDS IN COCKERELS WITH STILBOESTROL- OR CHOLESTEROL-INDUCED HYPERLIPIDAEMIA. R.Bломstrand and S.Christensen: J. Atheroscler. Res., 1963, 3, 142-152 (Dept. Clin. Chem., Karolinska Inst., Serafimerlasarettet, Stockholm, Sweden) Birds were made hyperlipaemic either by the addition of 1% cholesterol plus 3% of peanut oil to the diet, or by s.c. implantation of stilboestrol tablets. Both treatments provoked similar changes in the fatty-acid patterns, the most dramatic of which was a great increase in the % of oleic acid. The suggestion is made that hormonal imbalance provoked by cholesterol feeding may be responsible for the observed changes in fatty-acids.

G.F.Blane

5237. OCCURRENCE OF trans-OCTADEC-16-ENOIC ACID IN SHEEP AND OX PERINEPHRIC FATS. R.P.Hansen: Nature, Lond., 1963, 198, 995 (Fats Res. Lab., D.SLR*, Wellington, New Zealand).

G.M.Lewis

5238. GAS-LIQUID CHROMATOGRAPHY OF FATTY ACIDS OF LIPIDS OF CRYSTALLINE LENS. E.Turchetto, M.Sola and G.Lenaz: Exp. Eye Res., 1963, 2, 160-162 (1st. Chim. Biol., Univ. Bologna, Italy) The fatty acid composition of the cryst. lenses of dogs and rabbits has been studied by means of gas-liquid chromatography. The lipids amounted to 0.52 mg./100 mg. lens in rabbits and 0.403 mg./100 mg. lens in dogs. In both rabbit and dog lenses large amounts of sat. and mono-unsat. fatty acids, and smaller quantities of poly-unsat. acids were found. The spectrum of the fatty acids found in the lens is similar to that of those found in the brain.

J. Whiting

BIOCHEMISTRY

5239. NEUTRAL GLYCOLIPIDS OF HUMAN BLOOD SERUM, SPLEEN AND LIVER. E.Svennerholm and L.Svennerholm: *Nature*, Lond., 1963, 198, 688-689 (Dept. Med. Biochem., Univ. Gothenberg, Sweden)

Four neutral glycolipid fractions have been isolated from human serum, liver and spleen and analysed by thin layer chromatography. They have been tentatively identified as ceramide-monohexosides (cerebrosides), -dihexosides, -trihexosides and -trihexoside-N-acetylhexosamine. The cerebrosides contain glucose, the -dihexosides, lactose, -trihexosides, galactose and lactose. The distribution of the glycolipids from these sources differs. G.M.Lewis

5240. STUDIES ON PHOSPHOLIPIDS. DC. THE COMPOSITION OF RAT-LIVER LECITHINS. F.D.Collins: *Biochem. J.*, 1963, 88, 319-324 (Dept. Biochem., Univ., Melbourne, Australia) The liver lipids were obtained from a rat that had been inj. with inorg. [32p]-phosphate 1 hr. before death. The lipids were dinitrophenylated and by the use of cold acetone and a DEAE-cellulose column were divided into 3 fractions: (1) the triglycerides and other acetone-sol. lipids, (2) the neutral acetone-insol. lipids (lecithins and sphingomyelins), and (3) the acidic lipids retained on the column. The lecithin fraction was subjected to countercurrent distribution in Carbon tetrachloride-methanol-water. The fractions were analysed for phosphorus and radioactivity, and fatty acids were determined by gas-liquid chromatography. A mathematical analysis of the results showed the probable presence of 32*3% of stearoyl arachidonoyl lecithin, 21*0% of palmitoyl arachidonoyl lecithin, 15 • 8% of palmitoyl linoleoyl lecithin, 13*2% of stearoyl linoleoyl lecithin, 9*8% of stearoyl oleoyl lecithin, 8*6% of palmitoyl oleoyl lecithin and 3*7% of stearoyl docosahexaenoyl lecithin. The stearoyl lecithins averaged 81 ± 32 counts/min./fig. atom of P as compared with 756 ± 24 counts/min./jjg. atom of P for the palmitoyl lecithins.

5241. CEREBRAL PHOSPHOLIPID METABOLISM DURING ONTOGENESIS. K.G.Manukian, A.A.Smirnov and E.V.Chirkovskaya: *Biokhimiia*, 1963, 28, 246-252. A study was made of the rate of ^{32}P incorporation into individual phospholipids of various parts of the c.n.s. and the myocardium of rats during ontogenesis. In vivo investigations were made by means of chromatography on silicic acid impregnated paper. The changes during ontogenesis are discussed in relation to the growth and differentiation of nervous tissue and the formation of myelin sheaths. (Russian) B.J.Cooper

5242. METABOLISM OF PHOSPHOLIPIDS. VH. LIPID REQUIREMENT FOR PHOSPHATIDIC ACID PHOSPHATASE ACTIVITY. R.Coleman and G.Hilbschen: *Biochim. biophys. Acta*, 1963, 73, 257-266 (Dept. Med. Biochem. and Pharmacol., Med. Sch., Univ. Birmingham, England) Treatment of phosphatidic acid phosphatase with a variety of org. solvents reduced enzymic activity. Under specified conditions addition of lipid prep, almost completely reactivated. B.M. Stevens

5243. ISOLATION OF NATIVE PLASMALOGENS. O.Renkonen: *Acta chem. scand.*, 1963, 17, 634-640 (Dept. Serol. and Bacteriol., Univ. Helsinki, Finland) A method for the isolation of native plasmalogens from ox tissues is described based on selective deacylation of natural mixtures of the plasmalogens and the corresponding diacyl phosphatides by mild alk. treatment. Fairly

pure choline and ethanolamine plasmalogens from partial alk. hydrolysates of *lecithin^f of heart and 'ethanolamine cephalin' of brain were prep. G.F.Blane

5244. METABOLISM OF BLOOD PHOSPHOLIPIDS. VE. IN VITRO INCORPORATION OF 32p PHOSPHATE INTO RED BLOOD CELL PHOSPHOLIPIDS. M.Paysant, B.Maupin and J.Polonovski: *Bull. Soc. Chim. bioL*, Paris, 1963, 45, 247-252 (Lab. Chim. BioL, Fac. Méd., 45, rue des Sts.-Pères, Paris, France) The incorporation of [32p]phosphate into human r.b.c. in vitro occurred almost exclusively into the phosphatidic acids. The incorporation occurred faster with saline medium than with plasma. No labelled phospholipid passed from die r.b.c. to the plasma. The radioactivity rapidly decreased from the cells on further incubation with unlabelled serum. (French) J.C.Crawhall

5245. INFLUENCE OF MYOCARDIAL PHOSPHATIDE EXTRACT ON THE OXIDATIVE RECOVERY OF ANOXIC CARDIAC MUSCLE. G.Pellegrini: *Biochim. Appl.*, 1962, 9, 276-282 (Lab. Biochim. Appl., 1st. Chim. Biol., Univ. Milano, Italy) With the use of a Warburg microspirometer it was shown that the O₂ uptake of rat cardiac muscle damaged by anoxia could be increased by addition of a myocardial muscle extract. A similar increase was obtained by adding cytochrome c but not by digitalis or strophanthidin.

(Italian) J.C.Crawhall
5246. PHOSPHATIDES IN MYELIN SHEATHS AND REPARTITION OF SPHINGOMYELIN IN THE BRAIN. J.L.Nussbaum, R.Bieth and P.Mandek: *Nature*, Lond., 1963, 198, 586-587 (Inst. Chim. Biol., Faculté de Méd., Strasbourg, France) Adult rat brain was fractionated by ultracentrifugation in sucrose and the distribution of phosphatides determined by chromatographic fractionation. 50% of the phosphatides was found in the myelin sheaths, 29% in mitochondria, 16% in microsomes 2*5% in nuclei and 2-5% in cytoplasmic liquid. Myelin sheaths contain 38% of the sphingomyelin. G.M.Lewis

5247. CONSTITUTION OF CEREBRIN FROM THE YEAST TORULOPHIS UTILIS. N.Z.Stanacev and M. Kates: *Canad. J. Biochem.*, 1963, 41, 1330-1334 (Div. Appl. BioL, Nat. Res. Council, Ottawa, Canada) Cerebrin obtained from *T. utilis* was acid hydrolysed, and the long-chain bases released were oxidised, the aldehydes thus formed being identified as pentadecanal and heptadecanal, in the ratio 5:1, corresponding to Ci8 and C20 phytosphingosine, respectively. 3% of hexadecanal was also detected and probably corresponds to Ci8-dfliydrosphingosine. The major fatty acid component of the cerebrin was shown to be a-hydroxy-hexacosanoic acid? # small amounts of jj-hexacosanoic, a-hydroxytetracosanoic, jQ-tetracosanoic, (X-hydroxy stearic, stearic, and olelic acids were also present. A.M.GibbinS

5248. STUDIES OF THE CATIONIC, AND ACh STIMULATION OF PHOSPHATE INCORPORATION INTO PHOSPHOLIPIDS IN RAT BRAIN CORTEX IN VITRO. M.Brossard and J.H.Quastel: *Canad. J. Biochem. Physiol.*, 1963, 41, 1243-1256 (Biochem. Dept., Univ. of Rochester Sch. Med. and Dent., Rochester, N.Y., U.S.A.) When 0.1M KCl was added to, or Ca²⁺ omitted from, incubation media in which rat brain cortex slices were respiring, there was stimm. of the incorporation of 32p into phospholipids, primarily into phosphatidic acid and phosphoinositide but not into phosphatidyl choline and phosphatidyl ethanolamine. 7-mifl-

hydrolysable nucleotide phosphate labelling was stim., but their levels were decreased. Succinate and *y*-amino^b butyrate inhibited, but ACh stim.. the labelling of phospholipids. ACh *ami* K⁺ stimn. was dependent on Na⁺ and atropine and hyoscine inhibited ACh_f but not K⁺, stimn. It was suggested that stimn. due to ACh was mediated by cationic changes at the nerve cell membrane.

A.M.Gibbins

- ^{5249.} INCORPORATION OF INORGANIC PHOSPHORUS-32 INTO PHOSPHOLIPIDS OF BRAIN SLICES. EFFECT OF CERTAIN TRANQUILLISING DRUGS. W.L.Magee and R.J.Rossiter. *Canad. J. Biochem.*, 1963, 41, 1155-1162 (Biochem. Dept., Univ. Western Ontario, London, Ont., Canada) Four tranquillising drugs at 0.1mM concn., promazine, promethazine, tetrameprazine, and WY 1172, resembled chlorpromazine in stimulating the incorporation of inorg. 32P into the phospholipids of guinea-pig brain slices respiring in a suitable medium. 0.1mM promethazine caused no significant increase in Aspiration, aerobic glycolysis, or phosphocreatine concn., but 0.1mM of all the compounds inhibited phospholipid labelling. Azacyclonol, pipradol, mepazine, and benzhydrol also stimulated labelling only in low concn., and Methylene Blue, meprobamate, and phenaglycodol had little or no effect. Piperidine and benzhydrol did not stimulate phospholipid labelling at the most effective concn. for azocyclonol. A.M.Gibbins

- ^{5250.} HYPERLIPAEMIA ACCCOMPANIED BY LIPOPROTEIN OF HIGH ELECTROPHORETIC MOBILITY IN ROOKS. LLélek, B.L.T5th, J.Nicsovics and A.Pálfy: *J.Atheroscler. Res.*, 1963, 3, 137-141 (State Sanatorium, Sopron, Hungary) Very high serum lipid values were found in the rook, *roryus furileaus*, with no sign of spontaneous atherosclerosis. Details are given from electro-phoretic studies on rook serum, including the cholesterol/Phospholipid ratio which is abnormally low. The possible reasons for absence of atherosclerosis in this species are discussed. G.F.Blane

- ^{5251.} IDENTIFICATION AND SIGNIFICANCE OF DESMESTEROL IN DEVELOPING HUMAN AND ANIMAL BRAIN. R.Fumagalli and R.Paoletti: *Life Sci.*, 1963, No. 5, 291-295 (Inst. Pharmacol., Univ. Milan, Italy) The largest amount of desmosterol in brain was found before the period of myelination in man, pinea-pig, rabbit and rat. During the period of myelin formation desmosterol rapidly disappeared and was absent when myelination was complete. It is suggested that desmosterol has an important role in sterol synthesis and metabolism during development, differentiation and myelination in the c.n.s. K.-J.Jones

- ^{5252.} ISOLATION OF SQUALENE FROM HUMAN BRAIN. M.Proštenik and M.Munk-Weinert: *Biochim. biophys. Acta*, 1963, 71, 732-733 (Dept. Chem., Med. Fac., Univ. Zagreb, Croatia, Yugoslavia). B.M.Stevens

- ^aPURIFICATION OF 3a-HYDROXYSTEROID DEHYDROGENASE OBTAINED FROM THE SOLUBLE FRACTION OF RAT LIVER. S.S.Koide: *Arch. Biochem.*, 1963, 101, 278-285 (Div. Clin. Invest., Sloan-Kettering Inst., New York, U.S.A.) The dehydrogenase was partially purified by centrifugation, (NH4)2SO₄ precipitation, Y-alumina adsorption and hydroxyapatite-dieurylaminoethylcellulose column chromatography. Repeated hydroxyapatite-diethylaminoethylcellulose column chromatography and starch block electrophoresis failed to separate transhydrogenase and dehydrogenase

activities. Attempts at further purification failed owing to the instability of the purified enzyme prep.

B.M.Stevens

- ^{5254.} CHROMATOGRAPHIC SEPARATION OF STEROIDS FROM TOTAL LIPID EXTRACTS. R.Hernandez, jun. and L.R.Axelrod: *Analyt. Chem.*, 1963, 35, 80-83 (Dept. Biochem., Southwest Foundn. Res. Educ, San Antonio, Tex., U.S.A.) The technique consisted of a column chromatographic separation utilising standardised silicic acid and developed with benzene to remove fats, fatty acids, sterols including cholesterol and cholesterol esters, followed by acetone/chloroform (2:1, v/v) to remove steroids and finally absolute alcohol to remove the majority of the phospholipids for further analysis if desired. Recovery of the steroids was measured by using 14C-labelled steroids and micro-organic reactions (spot tests).

L.G. Gillies

5255. ON STEROID CONJUGATES IN PLASMA.

- VH. EXTRACTION OF 17-KETOSTEROID CONJUGATES. G.W.Oertel: *Clin. chim. Acta*, 1963, 8, 154-157 (Dept. Endocrinol., Dept. Hyg. Microbiol., Saarland Univ., Hamburg/Saar, Germany) Methods involving extraction with org. solvents and chromatography on DEAE cellulose for the separation of 17-ketosteroid conjugates are compared.

K.Brew

- ^{5256.} CHROMATOGRAPHIC SEPARATION OF 17-KETO-STEROIDS. T.Seki and K.Matsumoto: *J. Chromatography*, 1963, 10, 400-404 (Dept. Genet., Osaka Univ. Med. Sch., Osaka, Japan) Notes.

P.D.Dawkins

- ^{5257.} A MICROMETHOD FOR LABELLING STEROIDS AND ECDYSON WITH TRITIUM. P.Karlson, R.Maurer and M.Wenzel: *Z. Naturforsch. B*, 1963, 18, 218-222 (Physiol.-Chem. Inst., Univ. München, Germany)

The metamorphosis hormone, ecdyson was labelled with tritium by the Wilzbach technique. Various polyhydroxy-steroids were also labelled as model substances. The substances were absorbed on to activated charcoal and exposed to tritium of high activity in nylon bags at room temp. The products were purified by thin layer chromatography and analysed for radioactivity by a special flow counter whilst on the chromatoplates.

(German) J.C.Crawhall

- ^{5258.} ACTION OF CERTAIN FATS AND OTHER FACTORS ON THE ABSORPTION, TRANSPORT AND DEGRADATION OF CHOLESTEROL. P.Favarger: *Biochim. AppL*, 1963, 10, 1-17 (Inst. Biochim. med., Univ. Genève, Switzerland) Review. 71 ref.

(French) J.C.Crawhall

- ^{5259.} USE OF NUCLEAR INDICATORS IN THE STUDY OF THE ORIGIN OF CHYLE CHOLESTEROL.

F.Chevallier and M.Vyas: *Bull. Soc. Chim. biol.*, Paris, 1963, 45, 253-275 (Dép. Biol., Commissariat à l'Energie Atomique, Saclay(S.-et-O.), France)

Rats with abdominal lymph fistulae were fed oleic acid by gastric tube. They were then submitted to (a) s.c. [14C]cholesterol, (b) perfusion of [14C]acetate or (c) [14C]cholesterol by mouth. It was shown that some cholesterol of the chylomicrons arose from intestinal absorption pathways and some by a peripheral contribution from the serum.

(French) J.C.Crawhall

- ^{5260.} ISOLATION OF A NEW BILE STEROL 30L, 70,120L, 245,26-PENTAHYDROXYBISHOMOCHOLANE FROM BULL FROG BILE. T.Kazuno, T.Masui, T.Nakagawa and K.Okuda: *J. Biochem. Tokyo*, 1963, 53, 331-332 (Dept. Biochem., Hiroshima Univ. Sch. Med.,

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Hiroshima, Japan) 30, 7a, 12a, 24?, 26-pentahydroxybishomocholane was the main component of a TCA hydrolysate of bile; 3a, 7a, 12(X-trihydroxy-A?4-homo-cholene, 3a, 7a, 12a, 26-tetrahydroxy-A?3-bishomo-cholene and 30C,70,12a-trihydroxy-A24-homo-5a-cholene were absent. Prelim, comm. B.M.Stevens

- 5261. STEROBILE ACIDS AND BILE STEROLS.**
XLD_C SYNTHESIS OF 3d,70,12O,26,27-PENTA-HYDROXYCOPROSTANE. T.Hoshita, M.Kouchi and T.Kazuno. **L. METABOLISM OF LITHOCHOLIC ACID IN HOG LIVER.** Y.Kurata: *J. Biochem., Tokyo*, 1963, 53, 291-294, 295-298 (Dept. Biochem., Hiroshima Univ. Sch. Med., Hiroshima, Japan)
 L. [24-14c]Lithocholic acid was incubated with liver homogenate. Radioactive hyodeoxycholic and cheno-deoxycholic acids were isolated from the reaction mixture. B.M. Stevens

AMINO ACIDS, PEPTIDES AND PROTEINS

- 5262. AUTOMATIC COLUMN CHROMATOGRAPHY OF ETHER AND WATER-SOLUBLE DNP-DERIVATIVES OF AMINO ACIDS, PEPTIDES AND AMINES.** L.Kesner, E.Muntwyler, G.E. Griffin and J.Abrams: *Analyt. Chem.*, 1963, 35, 83-89 (Dept. Biochem., State Univ. New York, Downstate Med. Cent., Brooklyn, N.Y., U.S.A.) The separation of over 35 deriv. of D³P was accomplished in one column in 22 hr. A gradient elution system composed of n-heptane, t-amyl alcohol and methyl ethyl ketone was deaerated, sat. with water and pumped through a hydrated silica gel column. The effluent was passed through a flow cell from which the absorbance was continuously recorded. An identifiable peak was obtained with 0.01μM of DNP-amino acid. The technique was adaptable to the fractionation of mixtures of DNP-peptides. L.G.Gillies

- 5263. RAPID ESTIMATION OF AMINO ACIDS.** B.Orchard: *Nature, Lond.*, 1963, 198, 688 (Rothamstead Expt. Sta., Harpenden, Herts., England) The time taken for appearance of the colour reaction with ninhydrin at 100° may be used for a rapid estimate of the concn. of amino acid. This time was linearly related to the product of the concn. of ninhydrin and glycine over an 8-fold range of concn. G.M.Lewis

- 5264. SPECIFIC ENZYMIC DETERMINATION OF SOME α-AMINO ACIDS BY AUTOMATIC SPECTROPHOTOMETRIC REACTION RATE METHOD.** H.V.Malmstadt and T.P.Hadjioannou: *Analyst. Chem.*, 1963, 35, 14-16 (Dept. Chem., Univ. Illinois, Urbana, IL, U.S.A.) An automatic spectrophotometric reaction rate method was described for the selective enzymic determination of about 10⁻⁷ equiv. of some amino acids. The method was based on the coupled enzyme reaction in which oxidative deamination of certain L-α-amino acids was sp. catalysed by L-amino acid oxidase to form H₂O₂ which reacts with o-dianisidine in the presence of horseradish peroxidase to form a coloured product which has its absorption max. at 440 mji. The time required for the reaction to produce a small fixed amount of the coloured product, and therefore for the absorbance to change by

a preselected amount was measured automatically and related directly to the amino acid concn. L.G.Gillies

- 5265. ELUTION BEHAVIOUR OF NATURAL OCCURRING I LIHYDRIN-POSITIVE COMPOUNDS DURING ION EXCHANGE CHROMATOGRAPHY.** R.M.Zacharius and E.A.Talley: *Analyst. Chem.*, 1962, 34, 1551-1556 (East Regional Res. Lab., U.S. Dept. Agric, Philadelphia, Pa., U.S.A.) The elution behaviour of over 90 ninhydrin-reacting compounds, including some geometrical isomers, was studied with the automatic amino acid analyser employing the conditions of Spackman, Moore and Stein. Several compounds overlapped, often forming a sharp, symmetrical peak. Some such peak mixtures were resolved with a change in the temp. of operation. Identification of the components might be possible where sufficient differences occur in the 440-570 mjj absorption ratio of the ninhydrin reaction products L.G. Gillies

- 5266. BINDING OF γ-AMINOBUTYRIC ACID BY MOUSE BRAIN PREPARATIONS.** K.Sano and E.Roberts: *Biochem. Pharmacol.*, 1963, 12, 489-502 (Dept. Biochem., City of Hope Med. Cent., Duarte, Calif., U.S.A.) Procedures were described for the study of the binding of [¹I-14c]GABA in prep. of brain but not of several other tissues. All the non-enzymic binding activity was found in the sedimentable fractions of sucrose homogenates. The pH optimum was about 7.4 and the binding was Na⁺-dependent. Expt. with surface-active materials and with -SH reagents led to the suggestion that the binding capacity was associated with osmotically sensitive macromol. structural elements, among the components of which might be proteins with reactive -SH groups. L.G. Gillies

- 5267. STUDIES OF SUBCELLULAR DISTRIBUTION OF γ-AMINOBUTYRIC ACID AND GLUTAMIC DECARBOXYLASE IN MOUSE BRAIN.** H.Weinstein, E.Roberts and T.Kakefuda: *Biochem. Pharmacol.*, 1963, 12, 503-509 (Dept. Biochem., City of Hope Med. Cent., Duarte, Calif., U.S.A.) A study was made of GABA content and glutamic acid decarboxylase activity of various subcellular fractions prep. from homogenates of mouse brain in a sucrose density gradient. Portions of the fractions studied chem. were also examined morphologic* ally by E.M. The largest proportions which were sedimentable were associated with fractions consisting predominantly of nerve ending fragments. The distribution of the two substances did not coincide among these morphologically heterogeneous fragments. L.G. Gillies

- 5268. METABOLISM OF e-N-METHYL-L-LYSINE BY RAT KIDNEY HOMOGENATE.** S.Kim, L.Benoit and W.K.Paik: *Biochim. biophys. Acta*, 1963, 71, 745-747 (Dept. Biochem., Sch. Med., Univ., Ottawa, Canada) Kidney homogliates made in water or iso* tonic sucrose soln. and incubated with very low ionic strength buffer and e-N-methyl-L-lysine, consumed O₂¹ released lysine and formed formaldehyde stoichiometrically; the enzyme system responsible was in mitochondria and differed from 'demethylase*' and sarcosine oxidase. B.M. Steven

- 5269. DETERMINATION OF ORNITHINE, LYSINE, ARGININE, CITRULLINE, HISTIDINE.** I. Stewart: *J. Chromatography*, 1963, 10, 404-407 (Citrus Exp. Stat., Univ. Florida, Lake Alfred, Fla., U.S.A.) Notes. P.D.Dawktf

5270. TRANSPORT OF HISTIDINE AND METHIONINE IN RAT BRAIN SLICES. R.Nakamura: *J. Biochem. Tokyo*, 1963, 53, 314-322 (Div. Metabolism, Inst. Protein Res., C.Ka Univ., Osaka, Japan) Slices cone. L-histidine and, to a slightly lesser extent, D-histidine from the medium. Urocanic acid was not cone. Active histidine uptake was inhibited by DNP or a glucose free medium. L- and D-methionine inhibited histidine uptake but L-histidine stim. DL-methionine uptake. Slices preincubated with L-histidine released the histidine very rapidly on incubation with DL-methionine, uptake of the latter being stim. Exchange diffusion between L-histidine in slices and DL-methionine in the Medium occurred in a mole to mole ratio. The efflux rate of DL-methionine was much greater than those of & L-histidine. Histidine uptake by rat brain in vivo was stereoselective. **B.M. Stevens**

5271. METABOLIC REGULATIONS OF METHIONINE AND THREONINE BIOSYNTHESIS IN *S. CEREVIAE*. L REPRESSION AND RETROINHIBITION OF ASPARTOKINASE. H.De Robichon-Szulmajster and D.Corrivaux: *Biochim. biophys. Acta*, 1963, 73, 248-256 (Lab. d'Enzymol.. C.N.R.S.. Gif-sur-Yvette. S.-et-O.. France) Threonine repressed aspartokinase formation and inhib. 85-100% of the enzyme formed under different conditions. Homoserine also repressed and inhib. Lysine ^pressed but did not inhibit "normal" enzyme. Methionine also did not inhibit "normal" enzyme but after growth in the presence of methionine or ethionine, ^Partokinase was partly inhib. by methionine and lysine. Sensitivity to homoserine inhibn. was increased by growth in the presence of homoserine and reduced by growth in ^e presence of lysine. The existence of at least 3 aspartokinases, all sensitive to threonine, but with other different ^*tes of inhibn. is postulated. (French) **B.M.Stevens**

5272. DISTRIBUTION OF [3H]METHIONINE AND CETHYL-3HJETHIONINE IN MATERNAL AND FOETAL RAT TISSUES. W.R.Proffit and L.E.Edwards: *J. exp. ZooL*, 1962, 151, 53-59 (Sch. Deat., Univ. Washington, Seattle, Wash.. U.S.A.) Each animal Received either 200 μ ic[3H]methionine or 200 μ ic [ethyl-^ethionine. The highest concn. of methionine in Maternal tissues was in the intestinal glands and oral Pithelium. Ethionine autoradiographs showed little or ^o activity in the gut and oral tissues, having max. activity in renal proximal tubules. In foetal tissues, ^ethionine was cone, in the liver and other developing epithelial structures while the distribution of ethionine ^as random. Administration of 200 mg. ethionine prior ^o methionine did not alter the pattern of distribution of ^e latter in either maternal or foetal tissue. **R.J.Walker**

5273. ION-EXCHANGE CHROMATOGRAPHY OF SULPHUR AMINO ACIDS AND THE SEPARATION OF DIESTEREOISOMERS. G.F.W.Frimpter, S.Ohmon and S.Mizuhara: *J. Chromatography*, 1963, 10, 439-442 (Dept. Med., New York Hosp.-Cornell Univ. Med. Center, N.Y., U.S.A.) The technique of ion-^change chromatography, has been used for the separata of s-amino acids. Double peaking has been taken ^o indicate the separation of diastereoisomers. **P.D.Dawkins**

5274. ADAPTIVE CONTROL OF TRYPTOPHAN AND TYROSINE METABOLISM IN ANIMALS. W.E.Knox: *Trans. N.Y. Acad. Sci.*, 1963, 25, 503-512 (Dept. Biol. Chem., Harvard Med Sch., Boston, Mass., U.S.A.) The adaptations of tryptophan pyrolase and

tyrosine-a-oxoglutarate transaminase of liver are discussed in relation to the two known mechanisms of enzymic adaptation in animal tissues i.e., substrate-type and hormone-type inductions. The complexity of these systems involving endocrine and nervous communication chains is indicated. **R.H.Kimberlin**

5275. L-PHENYLALANINE: AN ORGAN SPECIFIC, STEREOSPECIFIC INHIBITOR OF HUMAN INTESTINAL ALKALINE PHOSPHATASE. W.H.Fishman, S.Green and N.L.Inglis: *Nature*, Lond., 1963, 198, 685-686 (Tufts Univ. Sch. Med., Boston, Mass., U.S.A.) Human alk. phosphatase of intestine, but not of liver, bile, bone, lung, kidney and spleen in 78% inhib. by L-phenylalanine but not by D-phenylalanine (both at 0'005M). **G.M.Lewis**

5276. FLUORESCENCE OF TYROSINE IN ALKALINE SOLUTION. J.L.Cornog, jun. and W.R.Adams: *Biochim. biophys. Acta*, 1963, 66, 356-365 (Dept. Pathol., Yale Univ. Sch. Med., New Haven, Conn., U.S.A.) Tyrosine in 0-12N NaOH had a measurable fluorescence. Determinations of the relative quantum yield of this sp. are given. Tyrosine, insulin and RNase showed a shift in the peak of their fluorescence spectra from 315 mji in water at pH 7 to 345 mji in 0*12 N NaOH. At pH 7 the quantum yield of tyrosine in a protein was less than that of free tyrosine in soln., but this was not the case in 0*12 N NaOH. **B.M.Stevens**

5277. ALKALINE LABILE D-ALANINE IN CELL WALLS. G.D.Shockman: *Nature*, Lond., 1963, 198, 997-998 (Dept. Microbiol., Temple Univ. Sch. Med., Philadelphia, Pa., U.S.A.) The time course of extraction of D-alanine from walls of freeze-dried *Streptococcus faecalis* and *Staphylococcus aureus* by ammonium was followed by a microbiol. assay. The amounts found were in agreement with the total amount of alanine that can be calc. to be present in teichoic acid. **G.M.Lewis**

5278. PURIFICATION AND PROPERTIES OF CERTAIN GLUTAMIC ACID METABOLISING ENZYMES FROM COCKROACH MUSCLE MITOCHONDRIA. R.R.Mills and D.G.Cochran: *Biochim. biophys. Acta*, 1963, 73, 213-221 (Dept. Biochem. and Nutr., Virginia Polytechnic Inst., Blacksburg, Va., U.S.A.) Glutamic dehydrogenase, GOT and glutamic alanine transaminase were partially purified from thoracic muscle mitochondria. The dehydrogenase appeared to be NAD sp. while the 2 transaminases required pyridoxal phosphate. Substrate specificities, pH optima and several other characteristics were determined. **B.M. Stevens**

5279. GLUTAMINE SYNTHETASE ACTIVITY IN RAT BRAIN. Z.S.Gershovich, A.A.Krichevskaja and Ia.Koloushek: *Biokhimiia*, 1963, 28, 303-307. Both O₂ under pressure and methionine sulphoximine had the effect of inhibiting glutamine synthetase activity, both singly and synergistically. (Russian) **BJ.Cooper**

5280. ERYTHROCYTE GLUTATHIONE REDUCTASE. E.Beutler and M.K.Y.Yeh: *Blood*, 1963, 21, 573-585 (Med. Dept., City Hope Med. Centre, Duarte, Calif., U.S.A.) Chromatographic procedures for the purification of glutathione reductase are described. During purification, no change in ratio of activity of enzyme with NAD was found. KCl and NaCl increased the enzyme activity only when NADPH₂ served as a hydrogen donor. The NAD linked system did not result in glutathionine reduction when lactate served as a substrate in intact r.b.c. **H.B.Waynforth**

BIOCHEMISTRY

5281. ISOLATION OF A HOMOLOGUE OF GLUTATHIONE FROM BEAN SEEDLINGS. P.R.Carnegie: Arch. Biochem., 1963, 101, 364-365 (Dept. Biochem., Fac. Med., Univ., Singapore, Malaya) Homoglutathione was observed in 4 day old etiolated Phaseolus aureus seedlings. Prelim, comm. B.M.Stevens
5282. USE OF AZOPHENYL α -DIISOCYANATE IN PEPTIDE ANALYSIS. H.Fasold and F.Turba: Biochem. Z., 1963, 337, 80-87 (Physiologisch-chemisches Inst., Univ., Wurzburg, Germany) Azophenyl ω -diisocyanate, prep, by condensing 4-acetaminonitroso-benzene with acetyl ω -phenylene-diamine, was used to prepare azophenyl ω -diureido amino acids. Starting with leucine or a mixture of benzoyllysine and benzoyllysine-amide the reaction products were isolated by passing diem through a cellulose column and detected by their optical prop, or separated by paper electrophoresis after reduction with dithionite. (German) L.Cohn
5283. DISTINCTION BETWEEN PEPTIDASE ACTIVITY AND PEPTIDE TRANSPORT. D.Kessel and M.Lubin: Biochim. biophys. Acta, 1963, 71, 656-663 (Dept. Pharmacol., Harvard Med. Sch., Boston, Mass., U.S.A.) A mutant of a glycine requiring E. coli strain, which lacked the glycylglycine transport system but possessed the peptidase, grew well in media with high glycylglycine levels but failed to grow at low levels. A second mutant, lacking the peptidase but possessing the transport system, failed to grow on glycylglycine at any level. Intracellular glycylglycine reached levels up to 100 times the extracellular level. Expt. on competition between peptides showed that glycylglycine was carried by a transport system with broad specificity. B.M.Stevens
5284. CHROMATOGRAPHIC SEPARATION OF PEPTIDES ON ION EXCHANGE RESINS. SEPARATION OF PEPTIDES FROM ENZYMIC HYDROLYSATES OF O, 3 AND YCHAINS OF HUMAN HAEMOGLOBINS. W.A.Schroder, R.T.Jones, J.Cormick and K.McCalla: Analyt. Chem., 1962, 34, 1570-1575 (California Inst. Technol., Pasadena, Calif., U.S.A.) Isolation of components in a mixture was most effectively accomplished by great alterations of conditions from step to step in the separation. This was applied to complex mixtures of peptides in protein hydrolysates. Good results were obtained by chromatographing first on the cation-exchanger Dowex-50 and then on the anion-exchanger Dowex-1. Volatile developers were used throughout. The results are presented of the application of the method to human haemoglobins A and F. L.G. Gillies
5285. HAEMAGGLUTININS IN LUPINUS LUTEUS. E.KqIyaj: Acta microbiol., pol., 1962, 11, 335-340 (Uniw. Marii Curie-SKłodowskiej, Lublin, Poland) Haemagglutinins were found in the germinating seeds of yellow lupins, and did not occur in stems, leaves and nodules. Human r.b.c. of O, A and B groups, r.b.c. of rabbit, cells of rabbit, guinea-pig, mo use,frog and hen reacted also with the seed extracts. (Polish) M.Korbecki
5286. EFFECTS OF PHYTOHAEMAGGLUTININ IN VIVO IN RATS. M.W.Elves, S.Roath and M.C.G.Israels: Nature, Lond., 1963, 198, 494 (Dept. Clin. Haematol., Univ. Manchester, England) Phytohaemagglutinin inj. s.c. or i.p. into rats was not toxic, produced no haemolysis or agglutination of r.b.c., and did not produce significant lymphoproliferation. G.M.Lewis

5287. BASIC AND OTHER PROTEINS IN MICROSOMES OF RAT LIVER. P.Cohn and P.Simson: Biochem. J., 1963, 88, 206 (C.Beatty Res. Inst., London, England) Microsomes and various prep, of RNP particles from rat liver were extracted with 0'2N-HCl, and the amino acid compositions of the protein in a dialysed extract and of the HCl-insol. residue were determined by the fluorodinitrobenzene method. The HCl-sol. proteins, which amounted to 40% in purified ribosome prep., contained 24% of basic and 18% of acidic amino acid residues. Alanine, glycine, proline and serine were the principal N-terminal groups found; the basic and HCl-insol. proteins differed in the proportions of alanine and glycine present. •
5288. SEPARATION OF IRON-CONTAINING FERRITIN FROM HORSE SPLEEN INTO THREE DISTINCT FRACTIONS BY STARCH GEL ELECTROPHORESIS. R.Kopp, A.Vogt and G.Maass: Nature, Lond., 1963, 198, 892-893 (Hg. Inst., Univ., Freiburg/Br., Germany) These 3 possibly 4 fractions were not dimers or polymers but were ferritin mol. which were serol. identical though differing in sedimentation coeff. and possibly in iron content. G.M.Lewis
5289. THERMAL ELECTROPHORETIC HOMOGENISATION OF BLOOD SERUM PROTEINS. V.LOkulov and G.V. Troitskii: Biokhimiia, 1963, 28, 277-284. The degree of electrophoretic homogenisation [EH] of bovine serum proteins was assayed at various temp. (60-100°) and exposures to heat (15 sec-10 hr.). The effect on EH of pH, ionic strength of soln., and protein concn. was studied. No connection could be found between aggregation of protein mol. and EH. Individual serum proteins differed in their stability to coagulation and EH in purified prep, and in fractions of the total serum, but protein fractions of a native mixture influenced each other's stability. (Russian) BJ.Cooper
5290. CONTRACTILE PROTEINS IN MUSCLES OF CRAYFISH. V.V.Oppel¹ and T.P.Serebrenikova: Biokhimiia, 1963, 28, 224-231. The contractile muscles of Astacus astacus were studied. The salting-out curves showed a large peak of actomyosin, and minor peaks within the salting-out zones of actin, myosin and tropomyosin. Actomyosin obtained for the claws showed a greater mol. aggregation and less easy disintegration into its components by pyrophosphate than actomyosin from the tail. (Russian) BJ.Cooper
5291. ELECTROPHORETIC STUDIES OF BLOOD AND EGG PROTEINS IN AUSTRALORBIS GLABRATUS (GASTROPODA, PLANORBIDAE). C.A.Wright and G.C.Ross: Ann. trop. med. Parasitol., 1963, 57, 47-51 (Dept. Zool., Brit. Museum (Nat. Hist.), London England) The blood proton pattern alters with the degree of sexual maturity of the snail. Young snails have at least six separate protein fractions in the blood, but in adults there is only one, a single large Hb fraction. The qual. protein pattern of the egg contents remains unchanged during embryonic development. Taxonomic implications of the results are discussed. P.J.Baron
5292. PURIFICATION AND PROPERTIES OF CYTOCHROME b₁ FROM E. COLI. T.Fujita, E.Itagaki and R.Satoh: J. Biochem. Tokyo, 1963, 53, 282-290 (in** for Protein Res., Univ., Osaka, Japan) Cytochrome⁶_{b₁} was solubilised from the particulate fraction using snake venom and deoxycholate and was purified by

(NH₄)₂SO₄ fractionation and hydroxylapatite column chromatography. The prep. was 50-70% pure, being contaminated by a colourless substance which sedimented more slowly on ultracentrifugation. From the JS the mol. wt. of cytochrome b₁ was 600000-800000. From the haem content the molar mol. wt. was approx. 160000. Acid acetone split the cytochrome into protohaem and apoprotein. Recombination was observed spectrophotometrically the recombined product, unlike the native cytochrome, combined with CO. The oxidation-reduction potential of the cytochrome was approx. +20 mV at pH 7.0 and 25°. Spectral prop., reactivity and chemical composition were also examined.

B.M.Stevens

5293. CL2-MACROGLOBULIN. L METHOD FOR THE ISOLATION OF RABBIT (X2-MACROGLOBULIN).

J.J.Picard and J.F.Heremans: *Biochim. biophys. Acta*, 1963, 71, 554-561 (Med. Dept. A, Clin. Univ. St.

Pierre, Louvain, Belgium) A protein fraction was salted out from serum using (NH₄)₂SO₄ at pH 6-8 between 1.9M and 2.4M. The (X2-globulins of this fraction were isolated by preparative electrophoresis in agar gel at pH 8-6. Eluted proteins were ultracentrifuged in a sucrose P gradient. The bottom fraction was shown to be pure 0.2-macroglobulin by electrophoresis on paper, agar gel 2nd starch gel, by analytical ultracentrifugation and by immunol. tests. Recovery was almost quant.

B.M.Stevens

5294. ISOLATION AND CHARACTERISATION OF AN UNUSUAL" PROTEIN FROM THE CELL NUCLEUS.

L.R.Kuehk: *Biochim. biophys. Acta*, 1963, 71, 531-543 (Virus Lab., Univ. California, Berkeley, Calif., U.S.A.) A protein, isolated from chicken r.b.c.

Nuclei, was insol. in water and dil. salt soln. at pH above 6 but sol. at lower pH. The protein was partially purified by chromatography on phosphorylated cellulose. The Protein contained high proportions of both acidic and basic amino acids. The mol. wt. was relatively low. No terminal NH₂ groups were detected by the fluorodinitrobenzene method.

B.M. Stevens

5295. POLYMERISATION-DEPOLYMERISATION OF TMV PROTEIN. I. KINETICS.

A.T.Ansevin and M.A.Lauffen: *Biophys. J.*, 1963, 3, 239 (Dept. Biophys., Univ. Pittsburgh, Pa., U.S.A.)

A reversible endothermic association of TMV protein subunits (A protein) can take place at pH values below the isoelectric point as well as at pH 6.5. The polymerisation occurring below the isoelectric point is more complex than that at pH 6.5 probably because products other than the usual TMV-like rods are formed in addition to those rods and also because side-to-side aggregation of the rods takes place readily. Kinetic studies indicate that polymerisation can be treated as a second-order linear condensation. The rate of polymerisation is a critical function of pH, having a SS value near pH 4.3. This behaviour is at variance with the hypothesis that hydrogen-bonded carboxyl pair jfeka dom pt rate-determining role in the association. The dependence of the rate on pH indicates electrostatic forces between subunits are a significant controlling factor in the polymerisation of TMV protein.

>2. ELECTROPHORESIS OF LIPOPROTEINS; USING STAINED SERUM.

L.P.Ribeiro and H.J.McDonald: *[•]Chromatography*, 1963, 10, 443-449 (Biochem.

Ui's t * «• Oswaldo Cruz, Rio de Janeiro, Brazil) >a S^{P1} ei expensive and time-saving method for Ae fS^r electrophoresis of serum lipoproteins, 1p--'ained IU^f a sat. soln. of Acetylated Sudan Black B in propylene

glycol is described. Macherey and Nagel No. 2214ff filter paper, in veronal buffer, pH 8[#]6, ionic strength of 0.05 and potential gradient of 8V/cm. was used for a 2 hr. period.

P.D.Dawkins

5297. STARCH ELECTROPHORESIS OF SOLUBLE

TUMOUR PROTEINS. E.M.Pantelouris: *Brit. J. Cancer*, 1963, 17, 179-182 (Zool. Dept., Queens Univ.

Belfast, N. Ireland) Electrophoretic comparison was made of extracts obtained by different techniques from tumour and brain tissues with the patterns obtained from blood plasma. C3H mice were used, the tumours being spontaneous mammary ones. No zones were found in extracts not present in plasma though there was a predominance of albumin and haptoglobin zones in tumour patterns. A characteristic foetal plasma fraction, absent from maternal plasma, was observed in 16-day old foetuses.

D.Hamer

5298. HETEROGENEITY OF MEROMYOSIN OF CARP.

A.Stainier-Lambrecht: *Arch. int. Physiol.*, 1962, 70, 682-710 (Lab. Gen. Biol., Fac. Sci., Univ., Liège, Belgium) Controlled trypsin hydrolysis of carp

myosin is more rapid than that of rabbit. Ultracentrifugation and electrophoresis show that the products of hydrolysis are more homogeneous in the rabbit. L-meromyosins of carp and rabbit have been isolated. Carp meromyosin is made up of several constituents which differ in electrochemical prop., aromatic amino acid content and asymmetry. These differences are much less marked in rabbit meromyosin. They may explain the low stability of carp myosin. (French)

M.E.Nutt

5299. TRACE PROTEINS IN CEREBROSPINAL FLUID AND OTHER BIOLOGICAL FLUIDS. I. EFFECT OF VARIOUS FRACTIONATION PROCEDURES ON g-trace AND Vtrace PROTEINS AND METHODS FOR ISOLATION OF BOTH PROTEINS. G.M.Hochwald and G.J.

Thorbecke: *Arch. Biochem.*, 1963, 101, 325-334 (Dept. Pathol., New York Univ. Sch. Med., New York, U.S.A.) Salt fractionation, starch block electro-

phoresis and column chromatography were applied to the P-trace and Y-trace Proteins from cerebrospinal fluid and urine. Results were analysed by immuno-electrophoresis and double diffusion in agar using rabbit antisera to c.s.f. and to human serum. A portion of the 3-trace protein was isolated by a 1 step procedure using DEAE-cellulose. Both proteins were isolated when starch block electrophoresis or diethylaminoethylcellulose chromatography was followed by hydroxyapatite chromatography.

B.M. Stevens

5300. FOETAL-HAEMOGLOBIN-CONTAINING ERYTHROCYTES. I. COUNTS OF CELLS STAINED BY ACID ELUTION METHOD COMPARED WITH ALKALI DENATURATION MEASUREMENTS. K.A.Kiossoglou, I.J.Wolman and M.Garrison jun.: *Blood*, 1963, 21, 553-560 (Children's Hosp., Philadelphia, Pa., U.S.A.)

The results of a comparison between the acid elution method and alkali denaturation technique in a quant. study of peripheral smears for r.b.c. containing foetal Hb gave a correlation of only 0.79. The acid elution method seemed more sensitive in most cases.

H.B.Wayforth

5301. EMBRYONIC HAEMOGLOBIN OF BUFO VULGARIS.

Y.Kurata and W.Arakawa: *Blut*, 1963, 9, 1, 42-43 (Dept. Pathol., Med. Sch., Univ., Kanazawa, Japan)

The difference in prop. from human and foetal Hb appeared to be related to O₂ storage. A.J.Wansbrough

BIOCHEMISTRY

5302. REACTIONS OF CYANAMIDE WITH METHAEMOGLOBIN AND SOME OTHER HAEMATIN COMPOUNDS. J.Keilin: *Biochim. biophys. Acta.* 1963, 71, 621-631 (Sch. Vet. Med., Univ., Cambridge, England)

Cyanamide reacted with methaemoglobin to give a red compound with a characteristic absorption spectrum. Cyanamide also combined with whale metmyoglobin and *Tubifex* metHb. Reaction was best in alk. soln., 1 mol. of cyanamide combining/haematin Fe atom. Cyanamide inhibited cytochrome oxidase but was 300 times less effective than cyanide or N₃⁻. No compound was formed between cyanamide and free haematin, haems or their deriv.

B.M.Stevens

5303. MYOGLOBIN AND THE STRUCTURE OF PROTEINS. J.'c.Kendrew: *Science*, 1963, 139, 1259-1266 (M.R.C. Lab. Mol. Biol., Cambridge, England) Nobel Prize lecture.

G.M.Lewis

5304. DIFFERENTIATION OF MYOGLOBINS AND HAEMOGLOBINS. C.L.Walters and A.McM.Taylor: *Nature*, Lond., 1963, 198, 996-997 (Brit. Food Manufacturing Industries Res. Assocn., Leatherhead, Surrey, England) Oxymyoglobin and oxyHb in pig blood can be differentiated by the ratio of optical densities at 577 mji before and after alk. denaturation.

G.M.Lewis

5305. RATE OF RENEWAL OF PLASMA HAPTOGLOBIN IN THE RABBIT. J.Borel, W.Dobryszycka, J.Moretti and M.-F.Jayle: *Bull. Soc. Chim. biol.*, Paris, 1963, 45, 203-210 (Lab. Biochim., Fac. Méd., 45, rue des Sts.-Pères, Paris, France) Rabbits were inj. with 131I-haptoglobin. The halMife of the labelled circulating protein was 3-4 days compared with 13-14 days in a similar expt. with [131I]albumin.

(French) J.C.Crawhall

5306. COMPARISON OF METHODS OF PREPARATION OF RAT SERUM ALBUMIN AND CHARACTERISATION OF A PURE SAMPLE. P.W.Jungblut and F.Turba: *Biochem. Z.*, 1963, 337, 88-103 (Physiol. Chem. Inst., Univ., Wurzburg, Germany)

A pure sample of albumin from the plasma of <? Wistar rats was prep, by subjecting the fraction V of Cohn to continuous electrophoresis in 0.025M barbitone buffer pH 8*6. If such a sample of albumin was re-cycled under the above conditions in 0.025M citric acid-phosphate buffer pH 4*1 and again in the barbitone buffer the purity of the albumin was shown to be 0*1% by immunoelectrophoresis. A mol. wt. of 64500 was calc from S const, the diffusion const, and the apparent spec. vol. The N-terminal amino acid is glutamic acid. The C-terminal sequence is either ala.alala.ser. or ala.leu.alala.ser., the second sequence is more likely to be correct. A complete amino acid analysis is also given.

(German) L.Cohn

5307. MICROHETEROGENEITY OF ALBUMIN. J.Rejnek, T.Bednarik and J.Kocj: *Clin. chim. Acta*, 1963, 8, 116-126 (Inst. Haematol. and Blood Transfusion, Prague, Czechoslovakia)

Very pure prep, of human serum albumin prep, by electrophoresis or ethanol fractionation were subjected to chromatographic analysis and individual fractions analysed by immunoelectrophoresis or agar gel electrophoresis. Two distinct fractions were separated, the larger of which can probably be further subdivided. An incomplete pptn. reaction was given by some chromatographic fractions. It is concluded that albumin contains molecules with different antigenic structures.

K.Brew

5308. DISTRIBUTION OF FOREIGN SERUM PROTEINS IN SERUM AND LYMPH. L.Varga, R.Backhaus and M.F.Bldi: *Z. Ges. exp. Med.*, 1963, 136, 547-551 (II. Med. Univ. Clin. Szeged and Fortchungsinstiut

"Human", Budapest, Hungary) The distribution of albumin and yglobulin in blood and thoracic lymph of dogs after i.v. injn. of 16-20 ml. cockerel serum was followed by an immunol. gel-diffusion method using rabbit serum. Albumin tended to appear in lymph more readily than globulin.

(German) P.F.Meyer

5309. DISTRIBUTION OF THE SERUM PROTEINS OF SYRIAN HAMSTER AS REVEALED BY STARCH GEL ELECTROPHORESIS. A.Amin and K.D.Shamloo:

Nature, Lond., 1963, 198, 485-486 (Lab. Chim. Biol., Inst. d'Etat des Serum et Vaccins Razi, Hessarek, Iran) Starch gel electrophoretic patterns of hamster sera differ considerably from human sera. The paper electrophoretic pattern appeared to contain bands corresponding to albumin, (X-1), (X-2 and a-3 globulin, @and a y-globulin.

G.M.Lewis

5310. ELECTROPHORETIC ANALYSIS OF THE NON-HAEMOGLOBIN PROTEINS OF HUMAN RED CELLS.

E.Bottini and E.R.Huehns: *Clin. chim. Acta*, 1963, 8, 127-132 (Med. Unit, Univ. Coll. Hosp., London, England) A chromatographic method for the separation of non-haemoglobin proteins from haemoglobin of red cells is reported. The pattern obtained on electrophoresis of this fraction on cellulose acetate, and starch gel is described and a new two dimensional system of starch gel electrophoresis which defines at least 20 different proteins is described.

K.Brew

5311. PAPER ELECTROPHORESIS OF SERUM PROTEINS OF THE GRASS-SNAKE, NATRK NATRK (L.).

A.Seni5w: *Comp. Biochem. Physiol.*, 1963, 9, 137-149 (Lab. Gen. Zool., Zool. Inst., Univ. Wroclaw, Poland) Electrophoretic separation of serum albumin from N. natrix resolves only 2 a fractions (a,j, a,2) on paper, but 3 fractions (<x1, (X2.03) on cellulose acetate. The p-globulins are the largest fraction of proteins separated by electrophoresis, separating into two fraction (3lt 32)- Y~Globulins are subject to considerable seasonal variation.

M.S.Laverack

5312. AMINO ACID COMPOSITIONS OF HUMAN AND RABBIT Y-GLOBULINS AND OF THE FRAGMENTS PRODUCED BY REDUCTION. M.J.Crumpton and J.M. Wilkinson: *Biochem. J.*, 1963, 88, 228-234 (Dept. Immunol., St. Mary's Hosp. Med. Sch., London, England)

Amino acid compositions determined with the Spinco model 120 Amino Acid Analyzer are reported for human and rabbit yglobulins, the chains A and B produced by reduction of some of the disulphide bonds of human and rabbit y-globulins, and for the A and B piece* obtained from piece n formed by papain digestion of rabbit y-globulin. The compositions of the rabbit V-globulin chain B and B piece were not significantly different. Cystine was determined as cysteic acid after oxidation of the proteins with performic acid. Tryptopk*¹ was determined spectrophotometrically. Hydroxylysine could not be detected in either human V"globulin or rabbit y-globulin.

5313. MOLECULAR WEIGHTS OF THE PEPTIDE CHAI[§] OF Y-GLOBULIN. R.H.Pain: *Biochem. J.*, 1963, 88, 234-239 (Dept. Immunol., St. Mary's Hosp. Med. Sch., London, England) Mol. wt. of the component

fragments of Y-globulin have been determined, namely chain A(50300), chain B (19400), piece I (40700) and A piece (21600). The sedimentation equilibrium method was used to detect and eliminate the effect of small amounts of sol. aggregate that caused the Trautman plot of Archibald data to yield spuriously high values. j_s and diffusion (Gouy) coefficients, extrapolated to zero concn., with $V=0.738$, give a mol. wt. of 151000 for horse Y-globulin.

5314. IMMUNOLOGICAL INVESTIGATION OF HUMAN Y-GLOBULIN DEGRADED BY CHYMOTRYPSIN.

C.Cederblad, L.A.Hanson and B.G.Johansson: Clin. chim. Acta, 1963, 8, 78-85 (Dept. Med. Biochem., Univ. Goteborg, Sweden) Separation of chymotryptic digest of human Y-globulin was achieved using Sephadex gels with a low degree of cross-linking (G-75, £-100) and components with pptn. prop. separated. The fragments were studied by immunoelectrophoresis and compared with fragments of y-globulin isolated after "Yptic degradation." K.Brew

5315. ISOLATION OF IMMUNOLOGICALLY ACTIVE FRAGMENTS OF NORMAL HUMAN y-GLOBULIN AFTER TRYPTIC DEGRADATION. L.A.Hanson and B.G.Johansson: Clin. chim. Acta, 1963, 8, 66-78 (Dept. Bacteriology, Univ. Goteborg, Sweden)

Several products with retained pptn. prop. in a tryptic digest of human y-globulin were demonstrated by immunoelectrophoresis. A group separation of these products was obtained by gel filtration and Sephadex p-75. Further purification of 2 fragments was attained by column electrophoresis and ion exchange chromatography. One fragment shows retained Ab activity.

K.Brew

5316. N-TERMINALS OF PORCINE ^GLOBULIN.

G.Colacicco: Nature, Lond., 1963, 198, 784-785 (American-Standard Res. Div., Union, N.J., U.S.A.) Porcine y-globulin appears to contain submolar quantities of N-terminals; the significance of this finding is discussed.

G.M.Lewis

5317. INTERACTIVE POWER OF SOME RED CELLS STRUCTURES AND BASIC PROTEINS. II. INTERACTION BETWEEN SALMIN, LYSOZYME AND THYMUS HISTONE AND BOVINE RED CELL STROMA AND THEIR PROTEIN EXTRACTS. A.Brusca, D.Patrono and A.Ardoino: Sperimentale, 1963, 33, 24-40 (1st. Patol. Gen., Univ., Palermo, Italy)

The effect of protein on suspensions of bovine red cell stroma was studied by measuring the changes in turbidity. Basic proteins, lysozyme (0.03tfo final concn.), calf thymus histone (0.0075%) and salmin (0.0037%) agglutinated a 1:10 su

"Gelatin," serum albumin and ovalbumin did not show the effect. The $(\text{NH}_4)_2\text{SO}_4$ fraction 0.2% did not affect the interaction between salmin and histone. The importance of this interaction in anti-viral activity is discussed. (Italian) G.N.Godson

5318. USE OF SPECIFIC AMINO ACID DECARBOXYLASES FOR THE IDENTIFICATION OF C-TERMINAL GROUPS. M.J.Hill, A.M.James and W.R.Maxted:

Biochim. biophys. Acta, 1963, 71, 740-742 (Dept. Chem., Chelsea Coll. of Sci. and Technol., London, England) A method was developed for detecting C-terminal groups at the surface of bacteria by using bacterial α -carboxypeptidases in which Ca^{2+} with electrophoresis. J.M.Cohill and J.C.Crawhall

5319. PURIFICATION AND ANALYSIS OF LYSOZYME ISOLATED FROM HUMAN PLACENTA. J.-F.Petit, M.Panigel and P.Jolles: Bull. Soc. Chim. biol., Paris, 1963, 45, 211-217 (Lab. Chim. Biol., Fac. Sci., 96, Boulevard Raspail, Paris, France) A lysozyme

was extracted from human placenta and purified by chromatography on Amberlite CG50 and CM-cellulose. The amino acid composition was determined by automatic chromatographic analysis and a min. mol. wt. of 15000 was obtained by calc. (French) J.C.Crawhall

5320. KINETIC STUDY OF A LIMITED PROTEOLYSIS: ACTION OF RENNIN ON K-CASEIN. J.Garnien

Biochim. biophys. Acta, 1963, 66, 366-377 (Stat. Cen. Microbiol. et Rech. Laitières, I.N.R.R., Jouy-en-Josas, S.-et-O., France) K_m in 0.1M NaCl at pH 6.9 did not vary between 25° and 40° and was 3.3 ± 0.3 10-5M being practically equal to the dissociation const. of the rennin-ft-casein complex. The rate const. of decomposition of this complex was $36 \pm 4/\text{sec.}$ at 35°. The change in enthalpy of activation of the complex was $6300 \pm 400 \text{ cal./mol.}$ At 35°, the changes in free energy and entropy of activation of the complex were $15800 \pm 100 \text{ cal./mole}$ and $-31 \pm 1^{\circ}5 \text{ cal./mole}$ respectively. (French) B.M.Stevens

5321. METABOLIC ASPECTS OF THE UPTAKE OF OXYGEN BY Hb IN ERYTHROCYTES. J. A. Sirs:

Biochim. biophys. Acta, 1963, 66, 378-385 (Phys. Dept., St. Mary's Hosp. Med. Sch., Univ. of London, London, England) Spectrophotometric measurements showed that O₂ uptake by Hb in intact human r.b.c. was initially fast but slowed with time, the decay varying with temp., storage and the presence of O₂. No such "decay" occurred in rate of CO uptake unless O₂ was also present. The fast rate of O₂ uptake was inhibited by lowering the pH, but cyanide, N₃⁻, F⁻, iodoacetate and Methylene Blue were ineffective. After decay began, adenosine addition temporarily increased the rate.

B.M. Stevens

5322. COMPARATIVE BIOCHEMICAL STUDIES.

H. AMINO ACID COMPOSITION AND SOME PROPERTIES OF HUMAN CYTOCHROME £. H.Matsubara, R.L.Ochu and K.T.Yasunobu: Arch. Biochem., 1963, 101, 209-214 (Dept. Biochem. and Biophys., Univ. Hawaii, Honolulu, Hawaii, U.S.A.) The cytochrome contained 18 Lys., 3 His., 2 Arg., 1 Try., 8 Asp., 7 Thr., 2 Ser., 10 Glu., 4 Pro., 13 Gly., 6 Ala., 2 (CyS)_t 3 Val., 3 Met., 8 lieu., 6 Leu., 5 Tyr., 3 Hie. and 7 NH₃. Some physicochemical prop. are reported. B.M. Stevens

5323. ACTIVATION OF PLASMINOGEN. I. PREPARATION AND PROPERTIES OF AN INSOLUBLE DERIVATIVE OF STREPTOKINASE. A.Rimon, M.Gutman and S.Rimon: Biochim. biophys. Acta, 1963, 73, 301-310 (Marcus Mem. Blood Inst., Magen David Adom, Tel Aviv, Israel)

The deriv., prep. by coupling streptokinase to a diazotised copolymer of γ -aminophenylalanine and leucine, was functionally identical to sol. streptokinase. Some proteins, especially casein, accelerated the activation of plasminogen by bound streptokinase. Other proteins, such as albumins, had no effect, while tosyl-L-argininemethyl ester inhibited the activation. Using bound streptokinase the activation phase of the plasmin system could be separated from the caseinolytic Phase.

B.M. Stevens

5324. COLUMN CHROMATOGRAPHY OF HUMAN

PLASMINOGEN ON DEAE-CELLULOSE. M.J.Cohill and

BIOCHEMISTRY

S.Shulman: *Biochim. biophys. Acta*, 1963, 73, 293-300 (Dept. Biophys., Univ. Sch. Med., Buffalo, N.Y., U.S.A.) Acid extracted samples chromatographed at 0°-4° using stepwise elution appeared grossly heterogeneous. Quant. analysis indicated complete recovery of total protein but only 60-80% of the caseinolytic units were recovered. When NH₄ acetate buffers containing 0.01M L-lysine were used, 6 peaks were obtained. Proteolytic assays indicated that approx. 40% of the original prep. was plasminogen. If the L-lysine concn. was raised to 0.05M, the chromatogram was changed, the sp. activity being increased 5-10 times in 1 fraction. Chromatography in 6M urea produced 3 peaks with complete recovery of total protein but partial loss of caseinolytic activity.

B.M.Stevens

5325. 14C-LABELLING AND MAKING OF PEPTIDE CHARTS OF THE SH-REGIONS OF ACTOMYOSIN, MYOSIN, ACTIN AND H-MEROMYOSIN. U.Groeschel-Stewart and F.Turba: *Biochem. Z.*, 1963, 337, 104-108 (Physiol.-chem. Inst., Univ., Wurzburg, Germany)

Actomyosin, myosin, actin and H-meromyosin were reacted with N-[¹⁴C]ethylmaleimide in the presence of 2M guanidinium chloride. Tryptic digests were subjected to paper electrophoresis, and spots were located by autoradiography. From the position of the radioactive spots it was concluded that since the fingerprints of the sub-units were additive, characteristic amino acid sequences surrounded each reactive cysteine residue.

(German) L.Cohn

5326. EFFECT OF DENATURING AGENTS OF UREA-GUANIDINIUM CLASS ON SOLUBILITY OF ACETYL-TETRAGLYCINE ETHYL ESTER AND RELATED COMPOUNDS. D.R. Robinson and W.P.Jencks: *J. biol. Chem.*, 1963, 238, PC 1558-1560 (Grad. Dept. Biochem., Brandeis Univ., Waltham, Mass., U.S.A.)

The solubility of N-acetyltetraglycine ethyl ester in water is increased 3.35 and 7.7 times in 8M-urea and 7M-guanidinium chloride, respectively. Formamide and acetamide also increase the solubility of the peptide. These agents exert their effect mainly on the amide chain of the mol., and it is not a simple 'hydrophobic' effect. The bearing of the results on denaturation of proteins is discussed.

J.N.Ashley

5327. THERMAL TRANSITIONS IN COLLAGEN [-SALINE SYSTEMS PARTICULARLY IN THE VICINITY OF 40°]. P.Mason and B.J.Rigby: *Biochim. biophys. Acta*, 1963, 66, 448-450 (Div. Textile Phys., C.S.I.R.O., Wool Res. Lab., Ryde, Sydney, Australia) Prelim. comm.

B.M.Stevens

5328. PHYSICOCHEMICAL STUDIES ON CYTOCHROME b₂*, SOME PROPERTIES OF MODIFIED FORMS OF THE ENZYME AND OF THE DNA COMPONENT.

J.McD.Armstrong, J.H.Coates and R.K.Morton: *Biochem. J.*, 1963, 88, 266-276 (Dept. Agric. Chem., Waite Inst., Univ. Adelaide, S. Australia) Type n cytochrome b₂ was obtained from cryst. Type I cytochrome b₂ by removal of the DNA component of the cryst. enzyme with (NH₄)₂SO₄. Type II cytochrome b₂ sedimented as an apparently single component; $\text{f}_{\text{X}_0}^{\text{w}}$ is 8.56 JS. There is a linear relationship between $\text{j}_{\text{20}}^{\text{w}}$ and protein concn., but the proportional change of $\text{f}_{\text{SgO}_2}^{\text{w}}$ with change of protein concn. is about 33% of that of type I cytochrome b₂. Exposure of Type I cytochrome b₂ to O₂ and to chloromercurobenzene-g-sulphonate caused dissociation of enzyme-bound flavin. In the presence of lactate, exposure to air caused the formation

of aggregates that had sedimentation coefficients of about 10-14 j_{E} , 15-17 j_{E} and 20-22 f . Chloromercurobenzene-g-sulphonate prevented the formation of these aggregates on exposure to air. It was estimated that there are 4-6 thiol groups/haem group in Type I cytochrome b₂; at least one of these appears to be at the active centre of the enzyme. Treatment with urea caused dissociation of flavin and inactivation of the enzyme. No new sedimenting components were observed after treatment of the enzyme with 2.7M- or 5M-urea, before or after removal of the urea by dialysis. The sedimentation coefficient of the DNA isolated from Type I cytochrome b₂ was $5.8 \pm 0.2 \text{ JS}$. The mol. wt. was calc. to be $1.2 \times 10^5 \pm 0.4 \times 10^5$.

5329. SOME FEATURES OF THE ASSOCIATION OF β -CASEIN. T.A.J.Payens and B.W.VanMarkwijk: *Biochim. biophys. Acta*, 1963, 71, 517-530 (Netherlands Inst. Dairy Res., Ede, Netherlands) Ultracentrifugation and viscometry indicated that, at 4°, β -casein was a monomer with a min. mol. wt. of approx. 25000. At 8.5° and 13.5°, thread like polymers were formed which were firmly interlinked. The association rate appeared to be quite low. At 8.5° the degree of polymerisation was approx. 22; at 13.5° it appeared to be considerably higher. The second virial coeff. of the polymers, deduced from Archibald's method, was $7.80 \times 10^{-6}/(\text{g./100 m}_1)$. The pool equilibration of the system is discussed.

B.M.Stevens

5330. STRUCTURE OF POLY-L-PROLINE I. W.Traub and U.Shmueli: *Nature*, Lond., 1963, 198, 1165-1166 (Dept. X-ray Cryst., Weizmann Inst. Sci., Rehovoth, Israel) Structure of form I of poly-L-proline (sp. optical rotation $[\alpha]_{\text{D}}^{25} = +50^\circ$) was studied by X-ray diffraction analysis and model building. The mol. exists as a right-handed helical structure with peptide bonds in the cis configuration. 10 residues of proline exist per unit cell of the astal, these 10 residues comprising 3 helical turns. The helical screw axis has a translation of 1.90A and a rotation of 108°.

J.R. Sargent

5331. CHARACTERISATION OF HUMAN LIVER FERRITIN BY STARCH GEL ELECTROPHORESIS. J.J.Theron, A.O.Hawtrey and V.Schirren: *Clin. chim. Acta*, 1963, 8, 165-167 (Nat. Nutrit. Res. Inst., C.S.I.R., Pretoria S. Africa) Starch gel electrophoretic patterns of purified ferritin from normal and high iron, human liver were shown to be similar.

K.BreW

5332. BOHR EFFECT: ABSENCE IN A MOLLUSCAN HAEMOCYANIN. J.R.Redmond: *Science*, 1963, 139, 1294-1295 (Dept. Zool., Iowa State Univ., Ames, Iowa, U.S.A.) Haemocyanin of *Diodora aspera* shows no Bohr effect within the pH range 6.88 to 7.84. At 10° the pressure of half-satn. is 5 mm. Hg of O₂. A moderately pos. interaction occurs among the oxygen-combin. sites during oxygenation. The heat of oxygenation is approx. -12.6 kcal./mole oxygen. The pH of normal blood is lower than that of other marine molluscs.

G.M.Lewis

5333. ESTIMATION OF SIZE AND SHAPE OF Y-GLOBULIN MOLECULES BY SMALL ANGLE X-RAY ANALYSIS. O.Kratky, L.Pilz, P.J.Schmitz and R.Oberdorfer: *Z. Naturforsch. B*, 1963, 18, 180-188 (Inst. physikal. Chem., Univ., Graz, Austria) The results of small angle X-ray analysis of y-globulin in 5.0-5% soln. extrapolated to zero concn. corresponded to a mol. wt. of 1.59×10^5 with an elliptical shape having half-axes of 10.9 and 25A respectively.

(German) J.C.Crawha^{lt}

5334. UREA CATION IN THE MECHANISM OF DENATURATION OF PROTEINS. G. Colacicco: Nature, Lond., 1963, 198, 583-584 (American-Standard Res. Un., Union, N.J., U.S.A.) The structure of urea and guanidinium is discussed in relation to their denaturation of proteins. From spectroscopic evidence and consideration of physical prop., it is concluded that the urea cation is a zwitterion with a pos. head charge, G.M.Lewis

Q335. DIFFERENCE SPECTRUM OF DHEOPROPYLPHOSPHORYLTRYPSIN [DIPT] VERSUS TRYPSIN. H.L.Oppenheimer and G.P.Hess: Nature, Lond., 1963, 198, 689-690 (Dept. Biochem., Cornell Univ., Ithaca, New York, U.S.A.) The DIPT versus trypsin difference spectrum exhibits a max. at 285-287 m μ , probably due to tyrosyl residues. G.M.Lewis

5336. INTENSIFICATION OF ABSORPTION SPECTRA. W.B.Elliott and G.F.Doeblen: Nature, Lond., 1963, 198, 690 (Dept. Biochem., Sch. Med., State Univ. New York, Buffalo, N.Y., U.S.A.) A 40-fold intensification of the absorption spectrum of cytochrome c may be achieved by freezing the aq. soln. into very small ice pellets by forcing it through a 22 gauge needle into liquid N₂. G.M.Lewis

5337. EFFECT OF DIALYSIS AND FERRICYANIDE ON THE RED&X TITRATIONS OF Hb. K.Abeh: Arch. Biochem., 1963, 101, 286-291 (Chem. Dept., Utah State Univ., L. 5^{an}, Utah, U.S.A.) Dialysis effected the shape of the redox titration curves leading to different terminations. At pH 7.9 the oxidation of ferrohaemoglobin by ferricyanide appeared to proceed through an irreversible stepwise mechanism. B.M.Stevens

5338. PROTEIN DENATURATION BY HIGH PRESSURE MEASUREMENTS OF TURBIDITY OF ISOELECTRIC FVALBUMIN AND HORSE SERUM ALBUMIN UNDER HIGH PRESSURE. K.Suzuki, Y.Miyosawa and C.Suzuki: Arch. Biochem., 1963, 101, 225-228 (Dept. Chem., Fac. Sci. and Engineering, Ritsumeikan Univ., Kyoto, Japan) Turbidity was measured directly in an apparatus with optical windows able to withstand pressure up to 10000 kg./sq. cm. Ovalbumin soln. became turbid when compressed to 4000 kg./sq. cm. and showed no change when pressure was released. The albumin soln. also became turbid when compressed to 4000 kg./sq. cm. and turbidity disappeared when the pressure was released. B.M.Stevens

5339. ULTRAVIOLET FLUORESCENCE OF PROTEINS. * INFLUENCE OF pH AND TEMPERATURE. R.F.Steiner and H.Edelhoch: Biochim. biophys. Acta, 1963, 66, 355 (Naval Med. Res. Inst., Natl. Naval Med. Sch., Bethesda, Md., U.S.A.) In highly purified proteins with structures apparently invariant to pH, pH effects were generally small at values acid to the ionization of tyrosyl groups. At high pH, all proteins show significant quenching, presumed to result from ionization transfer of energy from tryptophanyl to tyrosyl residues. All proteins examined showed reversible fluorescence intensity in pH zones where been demonstrated by various procedures. The influence of temperature on fluorescence in pH zones of thermal stability varied in several proteins. Deviations from a characteristic temp. dependence were observed in pH denatured. B.M.Stevens

5340. FURTHER EVIDENCE ON THE IDENTITY OF CYSTATHIONASE AND CYSTEINE DESULPHYDRASE. B.Mondovi, A.Scioscia-Santoro and D.Cavallini: Arch. Biochem., 1963, 101, 363-364 (Inst. Biol. Chem., Univ., Rome, Italy) The enzyme activities were always associated in the protein fractions obtained by column chromatography and electrophoresis of rat liver extracts. B.M.Stevens

5341. INDUCIBLE ENZYME SYSTEM IN LARVAL CELLS OF DROSOPHILA MELANOGASTER. T.M.Rizki and R.M.Rizki: J. cell Biol., 1963, 17, 87-92 (Dept. Zool., Univ. Michigan, Ann Arbor, Mich., U.S.A.) Tryptophan pyrrolase activity in the fat body is related to the distribution of the autofluorescent kynurenone patterns which spread to the cells beyond the ant. region in tryptophan fed larvae. Cell free extracts of the Ore-R-wild type strain and the unsuppressible vermilion mutant U 38f were treated with phenylthiourea to inhibit trypsinase activity and incubated in Vgo L-tryptophan for 3 hr. and optical density readings between 300-400 mp taken. Tissues incubated for 30 min. were examined with a Zeiss fluorescence microscope. The differentiation of kynurenone cells is controlled by a genetic mechanism operating through the inducible tryptophan pyrrolase system.

P.Barrow

5342. EFFECT OF AMINO ACIDS ON PROTEOLYTIC ACTIVITY OF TRYPSIN AND CHYMOTRYPSIN. M.P.Chernikov: Biokhimiia, 1963, 28, 285-287. A study was made of the effect of amino acids (concen. 0.05M) on the hydrolysis of serum albumin by trypsin and chymotrypsin. Trypsin was inhibited by the following, in decreasing order of efficiency: Try., His., Arg., Lys., Phe., Leu., Isoleu. and Thr. For chymotrypsin: Try., Arg., Leu., Pro., Phe., His., Isoleu., Thre., Cit., Ser., Met. and Asp. Pro., Cit., Ser., Mec, Ala. and Asp. had no effect on the activity of trypsin. Gly., Val., Tyr., Hydrol., Asp. and Glu. acids were ineffective for both enzymes. Cys. activated chymotrypsin and trypsin. (Russian) B.J.Cooper

5343. ACTIVATION OF CHYMOTRYPSINOGEN-A BY A PROTEASE FROM STREPTOMYCES GRISEUS. W.M.Awad, jun. and P.E.Wilcox: Biochim. biophys. Acta, 1963, 73, 285-292 (Dept. Biochem., Univ. Washington, Seattle, Wash., U.S.A.) The rate and extent of the activation were comparable to tryptic activation of the zymogen. Studies of the N-terminal amino acid groups suggested that, during rapid activation, 6-chymotrypsin was the main product. B.M.Stevens

5344. L-AMINO ACID OXIDASE FROM SILKWORM EGGS (BOMBYX MORI L). S.Kotaka: J. gen. Physiol., 1963, 46, 1087-1094 (Air Ion Lab., Dept. Bacteriol., Univ. California, Berkeley, Calif., U.S.A.) An enzyme which catalyses the oxidation of L-amino acids was isolated from silkworm eggs. The activity of the purified enzyme prep. was 1584 times as strong as that of the crude prep. Methods of purification of the enzymes are described and certain physicochem. prop. of the enzyme are reported. K.Jones

5345. D-AMINO ACID OXIDASE ACTIVITY IN HUMAN TISSUES. J.T.Dunn and G.T.Perkoff: Biochim. biophys. Acta, 1963, 73, 327-331 (Dept. Med., Univ. Utah Coll. Med., Salt Lake City, Utah, U.S.A.) Kidney, brain stem and liver contained appreciable levels of the enzyme. B.M.Stevens

BIOCHEMISTRY

5346. ABSENCE OF AMINO ACID DECARBOXYLASE IN CERTAIN STRAINS OF E. COLI DEMONSTRATION BY ELECTROPHORETIC TECHNIQUES. H.Leclerc, R-Osteux and J.Guillaume: Ann. Inst. Pasteur, 1963, 104, 477-487 (Inst. Pasteur, Lille, France)

A method is described for incubation of E. coli cultures followed by extraction and electrophoresis for demonstration of products of amino acid decarboxylation. The technique has shown the absence of amino acid decarboxylase in certain atypical E. coli strains, and it is suggested this should be the criterion for establishing a new strain. (French) B.Payne

5347. ARGINASE IN YOUNG CHICK EMBRYOS.
m. REGULATION OF ARGINASE SYNTHESIS.

E.Eliasson: Exp. Cell Res., 1963, 30, 74-79 (Wenner-Gren Inst. Expt. Biol., Univ., Stockholm, Sweden)

Effect of addition of arginine and urea on the synthesis of arginase in young chick embryo was studied. An increase in arginase activity could be induced by increasing the substrate concn., although the effect was only transient*. The results supported the view that arginase accumulation is regulated by a neg. feedback mechanism. K.Jones

5348. STAPHYLOCOCCAL 5-HAEMOLYSIN. I. PURIFICATION AND CHEMICAL PROPERTIES. A.Yoshida: Biochim. biophys. Acta, 1963, 71, 544-553 (Dept. Pub. Hlth. and Preventive Med., Sch. Med., Univ. of Pennsylvania, Philadelphia, Pa., U.S.A.) The

5-haemolysin was purified by column chromatography on Ca phosphate gel and triethylaminoethylcellulose and cryst. Sedimentation expt. showed a high degree of homogeneity. η_S was $6^{\circ}1$. The intrinsic E was $5^{\circ}5$ ml./g. The toxin contained 74 Asp., 47 Thr., 40 Ser., 42 Glu., 3 Pro., 45 Gly., 39 Ala., 31 Val., 25 Met., 59 lieu., 45 Leu., 7 Tyr., 48 Phe., 10 Try., 88 Lys., 2 His. and 4 Arg. The mol. wt. was 68230. The toxin was heat labile. It was easily digested by trypsin and lost its haemolytic activity as a result. B.M.Stevens

5349. GENERAL METHOD FOR THE DETERMINATION OF TRANSAMINASE ACTIVITY. EFFECTS OF HYPOGLYCIN A. S.J.Patrick: Canad. J. Biochem., 1963, 41, 1163-1167 (Biochem. Dept., Dalhousie Univ., Halifax, Nova Scotia, Canada) After incubating a [14 C]amino acid, a non-radioactive a-keto acid, and the appropriate transaminase together, the radioactivity of the combined, isolated dinitrophenylhydrazones of the a-keto acids was determined, thus giving a measure of the extent of transamination. Hypoglycin A was a competitive inhibitor for various liver transaminases, the greatest inhibn. being found with L-leucine transaminase. A.M.Gibbins

5350. PARTIAL RECOVERY OF GLUTAMIC-CXALOACETIC TRANSAMINASE [GOT] ACTIVITY IN THE INFARCTED AREAS OF THE MYOCARDIUM IN RABBITS DURING STIMULATION OF PROTEIN SYNTHESIS. Yu.W.Bukin: Nature, Lond., 1963, 198, 692-693 (Inst. Cardiovasc Surg., Acad. Med. Sci., Moscow, U.S.S.R.) Cardiac infarction was produced

in rabbits by ligation of the left coronary artery; 5 days later, the GOT activity and protein level in the infarcted area was markedly reduced. Treatment with a mixture of methionine, ATP, vitamins B₆ and Bi_{2t} RNA and DNA inj. s.c. caused intensified protein synthesis and promoted formation of the GOT apo-enzyme, restoring its activity to normal. G.M.Lewis

5351. AN ALTERNATIVE COUPLING REACTION OF MITOCHONDRIA BOUND TRANSAMINASE AND TRICARBOXYLIC ACID CYCLE AND ITS METABOLIC ROLE. N.Katunuma and M.Okada: J. Vitaminol., 1962, 8, 309-314 (Dept. Enzyme Chemistry, Inst. Enzyme Res., Sch. Med., Univ., Tokushima, Japan)

In isolated rat mitochondrial systems stoichiometric interconversion of glutamate and aspartate was found to occur by the coupling reaction between the tricarboxylic acid cycle [TCA] and mitochondrial bound glutamic-oxaloacetic transaminase [GOT]. This GOT cycle for amino acid metabolism is thought to be concerned with the anabolism and catabolism of non-essential amino acids and with the effective pathway through which the amino groups of glutamate may be converted into urea without the liberation of ammonia. The elementary reactions of GOT were found to occur in mitochondria but their physiol. significance is unknown.

E.Parkinson

5352. ORNITHINE TRANSAMINASE IN THE RAT.

I. ASSAY AND SOME GENERAL PROPERTIES.

C.Peraido and H.C.Pitot: Biochim. biophys. Acta, 1963, 73, 222-231 (McArdle Mem. Lab., Med. Sch. Univ. Wisconsin, Madison, Wis., U.S.A.) The

enzyme was assayed by estimating the glutamic semi-aldehyde formed, by reacting it with iD-aminobenzaldehyde to give a product with an absorption max. at 440 m μ . Kidney had most activity of the tissues examined, follow by liver. Heart, spleen and brain had approx. equal activities while skeletal muscle had least. The enzyme was located almost exclusively in the mitochondrial fraction. A 7-fold purification was achieved by subjecting isolate* liver mitochondria to ultrasonic vibration followed by (NH₄)₂SO₄ fractionation. The enzyme was sp. for ornithine and a-ketoglutarate. jg-Chloromercuribenzoat inhibited; mercaptoethanol was required for max. acti* vity. Dialysed enzyme prep, required pyridoxal phospha The pH optimum was approx. 7 $^{\circ}4$. B.M.Stevens

5353. REPRESSION OF TRANSAMINASE A BY TYROSIN

IN E. COLI. D.F.Silbert, S.E.Jorgensen and E.C.C.Lifl: Biochim. biophys. Acta, 1963, 73, 232-240 (Dept. Biol. Chem., Harvard Med. Sch., Boston, Mass., U.S.A.) Transaminase A formation was repressed approx. 5-fold in E. coli K12, B and W by tyrosine, but not by other amino acids. The cells were able to utilise tyrosine as sole N source; the activity of transaminase f was not the rate limiting factor for growth. Various JLSqJyi strains contained another transaminase, tthich acted on phenylalanine but not on tyrosine. This enzy* contributed approx. 20% of the total activity on phenyl* alanine in crude extracts of cells grown on simple gluc* media. Its formation was not repressed by any particular amino acid. • B.M.Stevens

NUCLEIC ACIDS, NUCLEOPROTEINS AND NUCLEOTIDES

5354. EFFECT OF CYTIDINE ON PURINE NUCLEOTH* FORMATION IN ASCITES TUMOUR CELLS IN VITRO. H. Harrington: Biochim. biophys. Acta, 1963, 68, 509-518 (Div. Rad. Biol., Dept. Radiol., Western Reserve Univ., Cleveland, Ohio, U.S.A.) Stimm. of purine nucleotide formation by cytidine and glucose in

Ehrlich cells was apparently due to ribose utilisation. Nucleotide formation from precursors requiring linkage to pentose was stim., but not formation from precursors already linked to pentose. ^{14C} from uniformly labelled cytidine was incorporated into the ribose or deoxyribose moiety of purine nucleotides of acid-sol. RNA and DNA. Incorporation of ^{14C} from uniformly labelled [^{14C}]cytidine into ATP ribose was sufficient to account for the increase in [^{14C}]adenine incorporation into ATP when cytidine was added. On incubation of high speed supernatant from cell homogenates with cytidine and phosphate, uridine, uracil and orcinol reacting, non-pyrimidine linked ribose were produced.

B.M.Stevens

5355. CONVERSION OF GUANINE TO HYPOXANTHINE IN MAMMALIAN R.B.C. A.Hershko, E.Wind, A.Razin and J.Mager: *Biochim. biophys. Acta*, 1963, 71, 609-620 (Dept. Biochem., Hebrew Univ., Jerusalem, Israel) Human and rabbit r.b.c. appeared capable of converting exogenously supplied guanine to hypoxanthine. The system appeared to involve transformation of guanine to guanosine 5'-phosphate, followed by reductive deamination to inosine 5'-phosphate. The enzyme catalysing the reductive deamination specifically required NADPH₂ and also an SH compound.

B.M.Stevens

5356. THYMIDINE DEGRADATION PRODUCTS IN PLANT TISSUES LABELLED WITH [3H] THYMIDINE. S.T.Takats and R.M.S.Smellie: *J. cell Biol.*, 1963, 17, 59-66 (Dept. Biol., Temple Univ., Philadelphia, Pa., U.S.A.) Growing buds of *Lilium longiflorum* were incubated in Bonner's soln. with [3H] thymidine, fixed in ethanol-acetic acid and infiltrated with paraffin. Sections and the fixative were analysed for radioactivity. [3H]ureidoisobutyric acid and 3-aminoisobutyric acid present in the fixative accounted for most of the 3H. A course expt. with *Vicia faba* root-tips grown under similar conditions showed that these products appear rapidly in the tissue and [3H]thymidine was recovered from the incubation medium.

P. Barrow

5357. MINERALISING ACTION OF UTP. I. IN VITRO OSSIFICATION OF NORMAL AND RACHITOGENIC CARTILAGE. A.Lanzetta: *Atti. Acad. med. Lombarda*, 1962, 17, 317-320 (Clinica Ortopedica, Univ., Milano, Italy) The process of mineralisation and ossification of tibial cartilage for normal and rachitogenic rats, was studied in vitro. Rachitogenic cartilage behaved similarly to normal cartilage, except for a greater uptake of orthophosphate, a lower respiration rate and a more labile Ca content. ATP and UTP were essential for ossification and it is suggested that the UTP generates the phosphate for mineralisation while the ATP generates the lost phosphate of the UTP.

(Italian) G.N.Godson

5358. MINERALISING ACTION OF UTP. II. IN VIVO OSTEOGENESIS OF BONE AND CARTILAGE. A.Lanzetta and G.Questa: *Atti. Acad. med. Lombarda*, 1962, 17, 321-331 (Clin. Ortopedica, Univ., Milano, Italy) Osteogenesis was studied by radiographical methods in rabbits treated with 1 mg./day i.v. for 10, 20, 30 and 40 days. UTP stim. osteogenesis i.e., UTP participates in the mechanism of ossification, most probably in the synthesis of mucopolysaccharide.

(Italian) G.N.Godson

5359. SOME OBSERVATIONS ON THE INOTROPIC ACTION OF ATP ON THE HEART OF THE FROG. P.Ottolenghi: *Canad. J. Biochem.*, 1963, 41, 1389-

1397 (Physiol. Dept., Fac. Med., Univ., Ottawa, Ont., Canada) The sites of the initial, short-lived inotropic effect (response I), produced when ATP was added to the perfusion fluid of an isolated frog ventricle, became blocked to further ATP action once the response had been elicited, and they had to be reactivated, by washing, to become available again. Response I was separated from response II, the secondary, more prolonged inotropic action, by using low concn. of ATP to block response I. Expt. suggested that the 6-amino group of the adenine of ATP or ADP was necessary to elicit response I, but not response II.

A.M.Gibbins

5360. ADP AS A POSSIBLE HYDROGEN CARRIER IN THE RESPIRATORY CHAIN. V.P.Skulachev. *Nature*, Lond., 1963, 198, 444-446 (Dept. Animal Biochem., Moscow St. Univ., U.S.S.R.) Pigeon breast muscle mitochondria aged in the presence of glucose, hexokinase and DNP for 30-120 min. lose ability to oxidise succinate and malate, which is restored by addition of ATP or ADP but not GDP, CDP, EDTA or serum albumin. AMP and inorg. phosphate do not restore activity. A difference spectrum for adenine and its nucleotides was obtained by electrochem. reduction in 0.1N perchloric acid. Some features of this spectrum can be identified in the difference spectrum of respiratory particles. J.R. Sargent

5361. ENZYMIC AMINOHYDROLYSIS OF 4-AMINO-PYRIMIDINE DEOXYRIBONUCLEOTIDES. IV. POSSIBILITY OF OCCURRENCE OF ALLOSTERIC SITE ON 2'-DEOXYRIBOSYL 4-AMINOPYRIMID-2-ONE 5'-PHOSPHATE AMINOHYDROLASE; E.Scarano, G.Geraci, A.Polzella and E.Campanile: *J. biol. Chem.*, 1963, 238, PC1556-1557 (Internat. Lab. of Genetics, Naples, Italy) Deoxycytidine triphosphate overcomes die inhibn. of the enzyme caused by deoxycytidine triphosphate and chloromercuribenzoate, but not the inhibn. caused by the rnonophosphate. The results obtained so far suggest that the enzyme has 2 active sites: a catalytic site and an allosteric site. The enzyme may have the allosteric site unoccupied, occupied by deoxycytidine triphosphate, or occupied by compounds such as deoxycytidine triphosphate, chloromercuribenzoate, etc. The deoxycytidine triphosphate complex has a higher affinity for the substrate, whereas the other complexes have an affinity for the substrate which is far less than that of the enzyme alone.

J.N.Ashley

5362. BIOSYNTHESIS OF URIDINE NUCLEOTIDES BY CRISTALLIN. P.Mandel, N.Virmaux and J.Klethi: *C.R. Soc. Biol.*, Paris, 1962, 156, 2123-2126 (Clin. Ophthalmol., Fac. de Méd., Strasbourg, France)

Cristallin of young ox possessed marked enzyme activity for the production of UTP from orotic acid with low production of UDP and UMP. 37.8% of [14C]orotic acid was converted to UTP. 17% of total UTP was converted to UDP-hexoses.

(French) M.A.Price

5363. COMPARATIVE STUDY OF FREE URIDYLIC NUCLEOTIDES IN NORMAL LIVER, REGENERATING LIVER AND ZAJDELA HEPATOMA. M.Wintzerith, N.Klein-Pete and L.Mandel: *C.R. Soc. Biol.*, Paris, 1962, 156, 2114-2118 (Centre de Recherches Nucleates, Strasbourg, France) The free uridyllic nucleotide content of rat liver was lower in regenerating liver than in normal liver or hepatoma. The highest levels were found during hepatoma. The level of UDP-hexoses and UDP-hexosamines was lower in hepatoma cells than normal and regenerating liver.

(French)

M.A.Price

BIOCHEMISTRY

5364. SOLUBLE FACTOR FROM MITOCHONDRIA STIMULATING THE RATE OF THE ENERGY REQUIRING PYRIDINE NUCLEOTIDE REDUCTION. F.A.Hommes: *Biochim. biophys. Acta*, 1963, 71, 595-603 (Johnson Foundn. for Med. Phys., Univ. Pennsylvania. Philadelphia, Pa., U.S.A.) The factor was partially purified from sonic particles from beef heart mitochondria. The factor appeared to make cytochrome *b* more accessible to reducing equiv. when succinate or *ig*-phenylene-diamine were used as electron donors. B.M.Stevens

5365. DETERMINATION OF ADENINE NUCLEOTIDES BY PAPER ELECTROPHORESIS. Z.Stránský: *J. Chromatography*, 1963, 10, 456-462 (Inst. Med. Chem., Med. Fac. of Charles Univ., Hradec Králové, Czechoslovakia) Adenine nucleotides from r.b.c. were separated by low voltage paper electrophoresis, eluted and determined by measuring their u.v. absorption. P.D.Dawkins

5366. CHANGES IN CONTENT OF ADENINE NUCLEOTIDES UPON AEROBIC INCUBATION OF SEA URCHIN SPERMATOZOA. S.Taguchi, I.Yasumasu and H.Mohri: *Expt. Cell Res.*, 1963, 30, 218-223 (Div. Biol., Nat. Inst. Rad. Sci., Chiba, Japan) In *Pseudocentrotus* spermatozoa, the proportion of AMP was highest and that of ATP lowest, while in *Hemicentrotus* spermatozoa, the content of ADP was somewhat higher than that of AMP. When the extensive exhaustion of endogenous substrates was allowed, die content of ADP and ATP decreased on aerobic incubation of sperm suspensions of both spp. However, when the utilisation of endogenous substrates was low, their contents did not show changes even after prolonged incubation. K.Jones

5367. COMPARATIVE INVESTIGATION OF THE FREE NUCLEOTIDES OF AN ASCITIC HEPATOMA AND OF NORMAL OR REGENERATING LIVER. P.Mandel, M.Wintzerith, N.Klein-Pete and L.Mandeb: *Nature*, Lond., 1963, 198, 1000-1001 (Centre Rech. Nucléaires, Strasbourg-Cronenbourg, Strasbourg, France) The amount of AMP, NAD, NADP and UDP-saccharides is lower in rat hepatoma than in normal or regenerating rat liver. Values of the triphosphates of guanosine, uridine and cytidine are significantly higher in hepatoma. It is suggested that in tumour cells, as nucleotides required in RNA synthesis are used more actively, there is lower production of nucleoside diphosphate compounds which play a part in the synthesis of polysaccharides and phosphatides. G.M.Lewis

5368. URIDINE NUCLEOTIDE AND RNA METABOLISM IN THE MORRIS 5123 HEPATOMA. E.Reid and H.P. Morris: *Biochim. biophys. Acta*, 1963, 68, 647-650 (Chester Beatty Res. Inst., Royal Cancer Hosp., London, England). B.M.Stevens

5369. NUCLEOTIDES OF MICRO-ORGANISMS. VH. STEREOCHEMISTRY OF ADENOSINE SUCCINIC ACID. A.Ballio, S.Barcellona and V.Di Vittorio: *Arch. Biochem.*, 1963, 101, 311-315 (1st. Sup. Sanità, Int. Centre Microbiol. Chem., Rome, Italy) Comparison of the optical rotation of adenosinesuccinic acid from *Penicillium chrysogenum* with those of the 2 synthetic diastereoisomers showed that the natural ribotide was N-(9-|3-D-ribofuranosylpurin-6-yl)-L-aspartic acid. B.M.Stevens

5370. NUCLEOTIDE INTERCONVERSIONS. X. DEOXYRIBO- AND REBONUCLEOSIDE 5"-PHOSPHATE

SYNTHESIS VIA A PHOSPHOTRANSFERASE REACTION IN CHICK EMBRYO EXTRACTS. G.F.Maley and F.Maley: *Arch. Biochem.*, 1963, 101, 342-349 (Dil Lab. and Res., New York State Dept. Health, Albany N.Y., U.S.A.) The extracts promoted phosphate transfer from nucleoside 5'-phosphates to nucleoside 5'-hydroxymethyl groups. Pyrimidine ribonucleosides were the preferred acceptors of pyrimidine ribonucleotid phosphate but transfer between pyrimidine deoxyribonucleotides and pyrimidine deoxyribonucleosides appeared to be most efficient. Such deoxyribonucleotide synthesis was more active in vitro than syntheses by ATP kinases. Dialysing the extracts sharply reduced phosphotransferase activity but only affected the distribution of kinase reaction products. Deoxycytidylic acid was primarily formed from thymidylic acid [dTMP] and deoxycytidine whereas reaction of ATP with deoxycytidine gave deoxy uridylic acid [dUMP] and deoxyuridine as major products. Adult chicken liver extracts primarily produced dUMP from deoxycytidine and dTMP. Deoxyuridine was apparently formed first. B.M. Stevens

5371. INFLUENCE OF STRONG SOLUTIONS OF UREA AND POLY ALCOHOLS ON THE SPECTROSCOPIC BEHAVIOUR OF RNA AND NUCLEOTIDES. J.StuctoC: *Biochim. biophys. Acta*, 1963, 68, 535-546 (Lab. Fysiolog. Scheikunde, Rijksuniv., Ghent, Belgium) Cone, urea soln. induced hypochromism around 260 mp and hyperchromism around 300 m/j in mononucleotides in adenosine and possibly other nucleosides, in purines and in pyrimidines in neutral or acid media. Neither Mg²⁺ nor HPO₄²⁻ affected this spectral behaviour. TW chromicity change was additive in nucleotide mixtures*. Glucose, glycerol and sucrose induced analogous although less intense phenomena in nucleotides. B.M.Steven*

5372. SEQUENCE DISTRIBUTION AND NEIGHBOUR EFFECTS OF VARIOUS ORDERS IN POLYNUCLEOTIDES. R.Simha and J.M. Zimmerman: *J. theor. Biol.*, 1** 2, 87-104 (Chem. Dept., S. California Univ., Los Angeles, Calif., U.S.A.) A mathematical frame** is developed for the description and evaluation of prevW described non-random effects in two- and four-compo^ copolymers. In calf thymus comparison is made of ob*^ served and computed pyrimidine sequences, and a sea^ made for inconsistencies in calcn. of pyrimidine runs*. J.A.DW

5373. RNA IN VIRUS-INFECTED SILKWORM. LP.K*^ and LN.Skuratovskaja: *Biokhimiia*, 1963, 28, 258' 264. *Bombyx mori* silkworms were infected with nuclear polyhedrosis virus containing protein and DNA. The phenol method was used for extracting high-polymer RNA from the silkworms and such prep. were infective, being capable of causing the formation of DNA-contaJ¹ virus in silkworms. The prcfj contained less than 0% DNA (in relation to RNA) and traces of protein; their absorption spectrum was characteristic of purified na& RNA. The V₁ of this RNA increased with temp. Under different incubation conditions the infective capacity disappeared much sooner than the temp. effect. (Russian) B.J.Cooper

5374. PSEUDOURIDYLIC ACID IN RNA OF INSECT^A N.A.Gumilevskaja and N.M.Sisakian: *Dokl. Akad. Nauk*, 1962, 144, 223-225. RNA of insects co^{frac} pseudouridyllic acid and its content in the NaCl-sol. fraction was considerably higher than in the NaCl-insol. fraction. (Russian) B.J.Cooper

5375. CHROMATOGRAPHY OF RNA OF HIGH MOLECULAR WEIGHT FROM FL CELLS INFECTED WITH ECHO 7 VIRUS. T. Fukada and Y. Kawade: Virology, 1963, 19, 40S-411 (Virus Res. Inst., Kyoto Univ., Japan) Prelim, comm. J.G.Bennette

5376. FRACTIONATION OF INFECTIOUS RNA ISOLATED FROM TMV. K.I.Miura, T.Miura, C.Hiruki, Z.Hidaka and LWatanabe: Virology, 1963, 19, 140-146 (Biophys. Dept., Univ. Tokyo, Japan)

Purified TMV-RNA extracted by phenol proved to be heterogeneous on ultracentrifugal analysis. Various methods of prep, also gave heterogeneous products. Since the heterogeneity of cellular RNA has been shown by fractional ptn. at high salt concn. in the cold, this method was used. The breakdown of TMV-RNA by heat treatment is also described. J.G.Bennette

5377. IN VITRO TRANSFER OF MACROPHAGE RNA TO LYMPH NODE CELLS. M.Fishman, ^A; ^{TM!116**TM111} and V.P.Bond: Nature, Lond., 1963, 198, 549-551 (Med. Res. Center, Brookhaven Nat. Lab., Upton, New York, U.S.A.) Rabbit macrophages were incubated with [3H]cytidine and their RNA extracted. This labelled RNA was taken up by isolated lymph node cells. Only a relatively low mol wt. RNA was absorbed, a fraction possibly associated with antibody synthesis. The relation of these findings to the observation in immunised animals of 'clones', of lymphocytic cells surrounding a macrophage is discussed. G.M.Lewis

5378. ISOLATION AND ANALYSIS OF THE DNA OF MYCOPLASMA MYCOIDES VAR. CAPRI. A. & Jones and R.T.Walken: Nature, Lond., 1963, 198, 588-589 (Dept. Chem., Univ., Birmingham, England) Pure, highly polymerised DNA was isolated from M.mycoides var. capri. Base analysis showed this material to have a very HgJ adenine and thymine content and pairing typical of a double-stranded DNA. The analytical results do not support the theory that Mffijppjasmataei, e L forms of bacteria. dwUewis

5379. STUDY OF DNA IN ACTINOMYCSES. DNA IN CORYNEBACTERIUM. L.Boutet, J.BwnillMdani G.Michel: Ana Inst. Pasteur, 1963, 104, 488-495 (Ub. deMicrobiol.. Fac. deMed... Toulouse, France) The ratio of adenine + thymine/guanine + cytosine of genus Conmetacterium was studied. Although the total amoffiSSfeaHebNA varied considerably, *k ratio was characteristic of the sp. and has been used as a ratio WJZSSBSfIS3Jff C. parvum and C. equi Group II ratio 0.95 includes C. xerosis, C. cutis communis and C. humiferum. Group III ratio 0.85 to 0.90 includes C. diphtheriae, C. michiganense and C. fascians. Group IV ratio 0.89-0.95 includes C. hoagii, C. aydum, C. anaerobium and C. pseudotuberculosis. Group V ratio 1.02 to 1.08 includes C. acnes and C. D. French. B.Payne

5380. NUCLEIC ACID METABOLISM IN WJgKAL MUCOSA. EL LOSS OF NUCLEIC ACIDS FROM INTESTINAL MUCOSA OF THE RAT DURING INCUBATION IN VITRO. B.E.Stewart and S. ^a ^b f S. em. 1963, 41, 1483-1490 (Canad. J. Biochem., British Columbia, Vancouver 8, B.C., Canada) Rat intestinal mucosal scrapings were incubated with 14C-uridine phosphate buffer, pH 7.8. for 2 hr. Only 25% of the RNA and 5% of the DNA present at zero time remained, there was a

rise in orcinol and diphenylamine pos. material in the acid sol. fraction and supernatant soln. The latter also contained much pos. reacting material not related necessarily to nucleic acids. The removal of Mg²⁺ from the buffer, or presence of O'M arsenate, did not prevent the loss of nucleic acids. The possibility was investigated that this loss was due to physical disruption of the cells.

A.M.Gibbins

5381. NUCLEIC ACID CONTENT OF EQUINE ABORTION VIRUS. R.W.Darlington and C.C.Randall: Virology, 1963, 19, 322-327 (Microbiol. Dept., Mississippi Univ. Med. Sch., Jackson, Miss., U.S.A.) A purification procedure is described that yields virus of high enough purity for the determination of nucleic acid composition. A single visible band was produced in sucrose and tartrate density gradients. E.M. data on dimensions of the infective particles are presented. An estimate of the DNA content is based on particle counts and colorimetric determinations. Chromatograms of hydrolysed viral material showed only the major constitutive bases of DNA. The bases were paired, adenine approx. equal to thymine and guanine to cytosine. The molar dissymmetry ratio of the viral DNA was 0.78 in contrast to the ratio for host cell DNA of 1.40. J.G.Bennette

5382. INFECTIVITY EXPERIMENTS WITH NUCLEIC ACIDS OF SHOPE PAPILLOMA AND DERIVED CARCINOMAS. M.E.Hodes, C.G.Palmer, L.E.Beatty, M.K.Swenson and J.D.Hubbard: J. nat. Cancer Inst., 1963, 30, 1-15 (Pathol. Dept., Indiana Univ. Med. Center, Indianapolis, U.S.A.) Phenol extraction of Shope papilloma extracts gives a product that induces papillomas in wild or domestic rabbits in the absence of DNase. The infective DNA has been partially purified. Its thermostability is quoted. Infectious DNA has been isolated only from tumours yielding virus. It has not been obtained from Vx2 or Vx7 carcinomata.

J.G.Bennette

5383. POSSIBLE ROLE FOR WATER AND INOSITOL IN THE STRUCTURE OF NUCLEOPROTEINS. SJ.Webb: Nature, Lond., 1963, 198, 785-787 (Dept. Bacteriol., Univ. Saskatchewan, Sask., Canada) An aerosol of Rous sarcoma virus showed a rapid increase in sensitivity to u.v. irradiation as the relative humidity was lowered from 70-50%. If the virus was aerosolised from inositol, u.v. had no lethal action at any relative humidity. Inositol appears to be able to replace and act like water mol. when a cell or virus is subject to partial desiccation.

G.M.Lewis

5384. HYDROLYSIS OF CALF THYMUS DEOXYRIBONUCLEATE BY PANCREATIC DEOXYRIBONUCLEASE. H. ISOLATION AND ANALYSIS OF THE MONONUCLEOTIDES AND DINUCLEOTIDES OBTAINED BY ENZYMIC DEGRADATION IN THE PRESENCE OF MANGANOUS IONS. G.C.Becking and R.O.Hurst: Canad. J. Biochem., 1963, 41, 1433-1447 (Biochem. Dept., Queen's Univ., Kingston, Ont., Canada) Mononucleotides and dinucleotides were found to comprise 5 and 49%, respectively, of the total calf thymus DNA phosphorus. The relative amounts of isomeric dinucleotides released enzymically by pancreatic DNase at pH 6.6 differed for Mn²⁺ and Mg²⁺ activation. Results indicated a random attack by the enzyme at multiple points in an endonuclease action with certain linkages being more susceptible than others. It appeared that the pPu-pPu linkage was stable and that increased liberation of purine nucleotides occupying the 5'-terminal phosphate position was due to hydrolysis of pPy-pPu linkages.

A.M.Gibbins

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- 5385. FORMATION OF ARTIFICIAL RNase COMPLEX WITH DNA.** T.N.Kopylova-Sviridova: piokhimiiia, 1963, 28, 353-360. A study was made of the effect of the wt. ratio of the components in the initial mixture, the ionic strength and the pH of the soln. on the formation of an artificial RNase-DNA complex. In the "saturated" complex there was an average of one protein mol. per turn of the helix in the DNA mol.
 (Russian) B.J.Cooper
- 5386. CORN MEAL AS A SOURCE OF RNase.** J.Ingle: Biochim. biophys. Acta, 1963, 73, 331-334 (Dept. Agronomy, Univ. Illinois, Urbana, 111., U.S.A.) Commercial corn meal had a high RNase activity and a prep. of relatively high activity could be produced from it by a very simple procedure. B.M.Stevens
- 5387. EFFECT OF RNase ON THE RNA, ATP AND CATECHOLAMINE CONTENT OF MEDULLARY GRANULES.** A.Phillippu and H.J.Schumann: Nature, Lond., 1963, 198, 795-796 (Dept. Pharmacol., Univ., Frankfurt, Germany) When chromaffin granules from cattle suprarenal medulla are incubated at 37°, RNA, catecholamines and ATP are released spontaneously in equiv. amounts. The rate of release is markedly increased by addition of exogenous RNase. It is suggested that RNA has an important role in the storage of ATP and catecholamines in these granules. G.M.Lewis
- 5388. DISTRIBUTION OF DNase IN ANTI-R PNEUMOCOCCAL SERA AND ITS RELATION TO TRANSFORMATION REACTION.** M.Kohoutová and H.Kopecká: Nature, Lond., 1963, 198, 711-712 (Dept. Microbial Genet., Inst. Microbiol., Czechoslovak Acad. Sci., Prague, Czechoslovakia) The effect of the temp. of inactivation of anti-R pneumococcal sera on the distribution of DNase in the different electrophoretic protein fractions is examined. DNase activity is most resistant to high temp. in the albumin fraction, then the CL-globulin and least in the 3" and Y"globulins. G.M.Lewis
- 5389. INDEPENDENCE FROM PRESENCE OF RELAXING FACTORS OF SUBSTRATE INHIBITION OF MYOFIBRILLAR ATPase.** A.Mffilrad, SJáky and N.A.Biró: Acta physiol. Acad. Sci. hung., 1962, 23, 101-104 (Inst. Phylogenics and Genet., Biochem. Group, Lorand Eotvos Univ., Budapest, Hungary) Substrate inhibn. of myofibrillar ATPase is not influenced by excessive washing of the myofibrils or by treatment with deoxycholate and thymol. Since the latter treatment destroys "relaxing granule" activity the substrate inhibn. must be a prop. of the actomyosin. H.G.Bevan
- 5390. EFFECT OF THIOLS ON ADENOSINE TRIPHOSPHATASE ACTIVITY OF CELLS OF VARIOUS ORIGIN.** S.Akerfeldf. Acta chem. scand., 1963, 17, 769-774 (E.Pennsylvania Psychiatric Inst., Philadelphia, Pa., U.S.A.) Thiol stim. ATPases in human red blood cells, mouse liver, mouse liver mitochondria, ox brain and certain vegetables were studied in vitro. No evidence could be found to support a suggestion that the stimulatory effect of thiols on ATPases might be due to the intermediary formation of S-phosphorylated thiols. G.F.Blane
- 5391. LOCALISATION OF ATPase ACTIVITY AND OF ACTIN BINDING IN SPECIFIC THIOL GROUP OF H-MEROMYOSIN.** U.Groschel-Stewart and F.Turba: Biochem. Z., 1963, 337, 109-114 (Physiol.-chem. Inst., Univ., Wurzburg, Germany) The activities of ATPases dependent on Ca^{2+} and on EDTA were each found

to be associated with distinct cysteine peptides of a tryptic digest of H-meromyosin. Similarly, the ability to bind actin resided in peptides which had reacted with N-[14C]ethylmaleimide. (German) * L.Cobi

BIOSYNTHESIS OF PROTEINS AND NUCLEIC ACIDS

- 5392. BIOCHEMISTRY OF VACCINIA-INFECTED MOUSE FIBROBLASTS (STRAIN L-M).** HI. RADIOAUTOGRAPHIC AND BIOCHEMICAL STUDIES OF [3H]THYMIDINE UPTAKE INTO DNA OF L-M CELLS AND RABBIT CELLS IN PRIMARY CULTURE.
- S.Kit, D.R.Dubbs and T.C.HSIK: Virology, 1963, 19, 13-22 (Tumour Inst., Texas Univ., Houston, Tex., U.S.A.) In uninfected cultures, approx. 1/3 to 1/2 of the L-M cells and about 10% of young rabbit kidney cells were labelled in their nuclei after 1 hr. incubation with [3H]thymidine. After vaccinia infection, thymidine uptake into DNA, measured biochem., was reduced in L-M and young rabbit cell cultures. In older rabbit cell cultures, incorporation was increased at 5-7 hr. post-infection. Radioautographic evidence, however, showed that the freq. of labelled nuclei was not increased in any of the infected cell populations, and under certain conditions was definitely decreased. Thymidine uptake was temporarily inhibited when L-M cells were centrifuged and washed. J.G.Bennette,
- 5393. SYNTHESIS OF DNA IN ISOLATED PERFUSED RAT LIVER. I. INCORPORATION OF [3H]THYMIDINE IN NORMAL LIVER AND IN LIVER AFTER PARTIAL HEPATECTOMY.** G.B.Gerber and J.Remy-Defraigne: Z. Naturforsch. B, 1963, 18, 215-217 (Euratom Dei* Radiologie, Mol-Belgien, Belgium) [3H]Thymidine was added to the perfusate in expt. with isolated normal rat liver after 60% hepatectomy. The highest incorporation occurred 48 hr. after hepatectomy. Under the conditions described only 0-7% of [³H]thymidine was incorporated into the DNA of normal rat liver whereas 13% was incorporated into the DNA of liver after partial hepatectomy. (German) J.C.Crawhall
- 5394. BIOCHEMICAL STUDIES ON ADENOVIRUS MULTIPLICATION, II. REQUIREMENTS FOR DNA SYNTHESIS.** M.Green: Virology, 1962, 18, 601-613 (Microbiol. Dept., St. Louis Univ. Med. Sch., Mo., U.S.A.) T₁² metabolic inhibitor 5-fluorodeoxyuridine was used in a study of the role of DNA synthesis in the multiplication of type 2 adenovirus in suspension cultures of KB cells. DNA synthesis is essential for adenovirus multiplication. The time course of viral DNA synthesis was examined by ^{expt} involving the time addition of the inhibitor after infection, and by the reversal of irinibn. by the addition of thymidine. DNA synthesis is not required for viral development during the first 7 hr. of the eclipse period, synthesis of viral DNA begins at 7 hr. after infection, about 7 hr. of DNA synthesis is required before virus maturation is initiated. J.G.Bennette

- 5395. EFFECTS OF OXIDISED LIPOIC ACID ON THE SYNTHESIS OF DNA IN BATRACIAN AND CHICK EMBRYOS.** V.Pohl and J.Quertien: Biochim. biophys.⁸ Acta, 1963, 68, 651-653 (Lab. Morphol. animale, Fac. Sci., Univ. Libre, Bruxelles, Bruxelles, Belgia) Prelim, comm. (French) B.M.Steve**

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5396. DNA NUCLEOTIDYLTRANSFERASE IN NUCLEI AND CYTOPLASM PREPARED FROM THYMUS TISSUE IN NON-AQUEOUS MEDIA. M.J. Smith and H.M. Kein. *Biochim. biophys. Acta.* 1963, 68, 578-588 (Dept. Biochem., Univ., Glasgow, Scotland)

Rabbit and calf thymus nuclei isolated in non-aqueous media in a high degree of purity contained DNA nucleotidyltransferase as also did corresponding calf thymus cytoplasmic prep. The relationship between nucleotidyltransferase and DNase I activities in nuclear and cytoplasmic fractions is described. The activity of both enzymes with respect to the physical condition of primer and substrate DNA was examined. High nucleotidyltransferase sp. activities were obtained after partial Purification of extracts of calf thymus nuclei.

^{o*}M^s oievens

5397. CHARACTERISTICS OF THE ?NA NDCMOTnjrL-TRANSFERASE ACTIVITY IN NON-AQUEOUS TYPE CALF THYMUS NUCLEI. H.M. Kein and M.J. Snutt. *Biochim. biophys. Acta.* 1963, 68, 589-598 (Dept. Biochem., Univ., Glasgow, Scotland) Nuclear

tracts were fractionated with acid and $<\text{NH}_4\text{SO}_4$ and Fe^{2+} fractions assayed for DNA nucleotidyltransferase activity with and without cysteine and in the presence of 1 S of Fe^{2+} deoxyribonucleoside 5'-triphosphates. Patterns of $\text{P}_2\text{p}^3\text{H}$ thymidylic acid incorporation indicated that nuclei contained both DNA nucleotidyltransferase and a physico-chemical distinct nucleotidyltransferase described by Kracow et al. overall deoxyribonucleotide incorporation catalyzed by the latter was approx. 1/27 of that at $[C]^{32}\text{P}^{32}$ the former. The sum of the total no. of units of DNase I in each fraction was 16 times the total units found in the thymus extract. A non-enzymic incorporation of ^{32}P thymidine 5'-triphosphate into thermally denatured DNA appeared to occur in certain control reaction fixtures.

B.M. Stevens

5398. RNA-PRIMED SYNTHESIS OF RNA FOLLOWING VIRAL INFECTION. R.Eason. M.J. Cune and R.M.S. Smellie. *Nature. Lond.* 1963, 198, $^{479}\text{I}_{\text{e}}^{1}\text{re}^{1}\text{w}^{1}\text{a}^{1}$. *Biochem., Univ., Glasgow, Scotland*) There was no significant difference in the activity of DNA "nucleoadyl transferase" in normal

cells infected with encephalomyocarditis virus, but significant increases in RNA-primed RNA and nucleotidyltransferase were observed in infected cells, beginning at intervals of 1-3 hr. after infection. These increases were more pronounced in enzyme prep. nuclear than cytoplasmic fractions.

from

G.M. Lewis

Virology, 1963, 19, 400-408 (Biol. Dept., Mass. Inst. Technol., Cambridge, Mass., U.S.A.) Evidence is presented indicating that only one type of A. the entire RNA molecule of mature virus particles, made in large amounts in poliovirus-infected cells. Viral RNA is expressed at the time of onset whereas cellular protein synthesis is interrupted earlier.

J.G. Bennette

5400. INFLUENCE OF FOUOVIRUS INFECTION ON RNA SYNTHESIS IN MAMMALIAN CELLS. M.L. Fenwick. *Virology*, 1963, 19, 241-249 (Virus Res. Unit, M.R.C. Lab., Carshalton, Surrey, England) Sucrose density gradient centrifugation was used to study the effect of fowlpoxvirus on the incorporation of ^{32}P phosphate into high mol. wt. RNA in ERK cells. Background

of normal cell RNA was reduced by treatment with Mitomycin C or u.v. irradiation. No increase in infective RNA was found during the 2 hr. immediately after infection. By 4 hr. post-infection, RNA with a sedimentation const. of 33-35 S, the same as that of purified virus RNA, appeared. 20 S and 7 S labelled RNA components, observable in uninfected cells, remained depressed at this stage. When the incubation temp. was raised to 40°, infected cells died without producing infective progeny. At 40° cell RNA synthesis was depressed soon after infection, but was not followed by synthesis of 33-35 S RNA.

J.G. Bennette

5401. NUCLEOPROTEINS IN REGENERATING RAT LIVER.

I. INCORPORATION OF $[32\text{p}]$ INORGANIC PHOSPHATE $[32\text{p}_f]$ INTO THE RNA OF LIVER DURING THE EARLY STAGES OF REGENERATION. A.H. McArdle and E.H. Creaser. *H. RAPIDLY LABELLED RNA.* A.H. McArdle: *Biochim. biophys. Acta.* 1963, 68, 561-568. 569-577 (McGill-Montreal Gen. Hosp. Res. Inst., Montreal, Canada)

I. Nucleoproteins were reproducibly separated by differential centrifugation of homogenates followed by chromatography on ECTEOLA cellulose. The fractions differed in $^{32}\text{P}_f$ incorporation into RNA over the first 12 hr. of regeneration. However, all fractions showed incorporation during 0-4 and 8-12 hr. Between hr. 4 and 8 a loss of radioactivity occurred.

II. A highly metabolically active RNA appeared to be synthesised first in 1 of the nuclear fractions. This appeared to be rapidly transferred to the cytoplasm where it appeared first in the deoxycholate sol. fraction of microsomes and was apparently later transferred to the supernatant. In short term expt. the bulk of the ^{32}p incorporated into ribosomes is suggested to be derived from the supernatant.

B.M. Stevens

5402. DNase SENSITIVITY OF RNA SYNTHESISING SYSTEM FROM TOBACCO LEAVES. J.G. Shaw: *Science.* 1963, 139, 924-925 (Plant Res. Inst., Res. Branch, Canada Dept. of Agric. Ottawa, Canada)

A fraction from tobacco leaf cells, containing nuclei and capable of synthesising RNA in the presence of the 4 ribonucleoside triphosphates, was inactivated by incubation with DNase, even when less than half the DNA was removed. A requirement for DNA in RNA synthesis is thus demonstrated.

G.M. Lewis

5403. NEW HYPOTHESIS FOR NUCLEIC ACID REPLICATION. A.L. Dounce: *J. theor. Biol.*, 1962, 2, 152-158 (Biochem. Dept., Rochester Univ., New York, U.S.A.)

It is proposed that the mechanism of replication of DNA involves the exact copying of one strand of the DNA double helix followed by complementary replication of this exact copy to form a new mol. of double-stranded DNA.

T.A. Dawson

5404. BIOSYNTHESIS OF NUCLEIC ACIDS IN BACILLUS MEGATERIUM. H. THE FORMATION OF RIBONUCLEIC ACID BY NUCLEAR MATERIAL IN VITRO. G.C. Barr and J.A.V. Butler: *Biochem. J.* 1963, 88, 252-259 (C. Beatty Res. Inst., Fulham Rd., London, England)

RNA synthesis has been investigated in isolated cell fractions of *B. megaterium* by incubation in vitro with ribonucleoside triphosphates. The conditions in which synthesis occurs have been investigated and it was shown that RNA synthesis occurred only in the nuclear fraction, which was shown to contain a DNA-dependent RNA polymerase. The RNA formed was transferred from nuclear material to the nuclear ribosomes in vitro. The nature of the RNA formed by the enzyme has been investigated.

BIOCHEMISTRY

5405. BIOSYNTHESIS OF NUCLEIC ACIDS IN BACILLUS MEGATERIUM. IE- BIOSYNTHESIS OF RNA IN VIVO. G.N.Godson and J.A.V.Butler: Biochem. J. 1963, 88, 259-266 (C.Beatty Res. Inst., Fulham Rd., London, England) When protoplasts of B. megaterium are incubated with a medium containing [³H]uridine for short times the RNA of the nuclear fraction has the highest sp. radioactivity. Both components of this fraction, namely DNA-containing material and nuclear ribosomes, become highly labelled within about 1 min. The cytoplasmic ribosomal RNA is labelled more slowly and approx. linearly with time, and this RNA may have an independent origin. Considerable conversion of uridine into cytidine takes place in the cell, and some terminal labelling, mainly as cytidine, occurs in all RNA fractions, but the amount falls with time. CsCl-gradient analysis of the nuclear material shows that most of its radioactivity is associated with the DNA band. After 'starvation' of the protoplasts, addition of inactive precursor causes a displacement of radioactivity from the nuclear material. *

5406. BREAKDOWN OF RNA IN THE CELL NUCLEUS. H. Harris: Proc. roy. Soc. B, 1963, 158, 79-87 (Dept. Cell Biol., J.Innes Inst., Bayfordbury, Hertford, Herts., England) The enzyme responsible for the breakdown of rapidly labelled RNA in HeLa cell nuclei has the properties characteristic of a polynucleotide phosphorylase and produces nucleoside-5'-diphosphates. The release of radioactivity from nuclear RNA in the intact cell and the degradation of rapidly labelled RNA by the polynucleotide phosphorylase in isolated nuclei have the same unusual temp. profile. Both RNA and enzyme are attached to the chr. It is suggested that during interphase, RNA is continuously synthesised and degraded on the chr. itself. G.M.Lewis

5407. NUCLEAR RNA FROM RAT KIDNEY. M.Revel, M.Delemen and P.Mandeb: Biochim. biophys. Acta, 1963, 68, 547-553 (Inst. de Chim. Biol. de la Fac. de Méd., Strasbourg, France) Several types of nuclear RNA were separated by chromatography on methylated albumin columns. Sol. RNA 20 S ribosomal RNA and an RNA rapidly labelled after ³²P administration were found. The last was a nucleolar RNA which could be extracted by the phenol method only if Na dodecyl sulphate was added. It corresponded in chromatographic behaviour to the cytoplasmic 30 S ribosomal RNA. It represented no more than 5% of the total nuclear RNA and appeared to be synthesised independently from ribosomal RNA. Its possible identity with messenger RNA was examined. (French) B.M.Stevens

5408. PRESENCE OF RNA OF LOW MOLECULAR WEIGHT IN THE RIBOSOMES OF E. COLI [ML308]. R.Rosset and R.Monien: Biochim. biophys. Acta, 1963, 68, 653-656 (Inst. Chim. Biol., Fac. des Sci., Marseille, France) Detailed study of the RNA extracted with phenol from ribosomes and washed with a medium containing 0.01M Mg²⁺ showed that about half the low mol. wt. RNA associated with ribosomes under these conditions had prop. clearly distinct from those of transfer RNA. Prelim, comm. (French) B.M.Stevens

5409. LACK OF MESSENGER RNA IN RETICULOCYTE CELL-SAP. AJ.Munro and A.Kornen: Nature, Lond., 1963, 198, 891-892 (Dept. Biochem., Univ., Cambridge, England) Expt. on the incorporation of [¹-¹⁴C]leucine into Hb by ribosomes and cell sap of rat

liver and reticulocytes do not provide evidence for messenger RNA in the cell sap. G.M.Lewis

5410. DISSOCIATION OF YEAST RIBOSOMES BY PAPAIN. R.S.Morgan, C.Greenspan and B.Cunningham: Biochim. biophys. Acta, 1963, 68, 642-644 (Grad. Dept. Biochem., Brandeis Univ., Waltham, Mass., U.S.A.) The bonds cleaved by papain united 60 S to 40 S ribosomes. B.M. Stevens

5411. POSSIBLE NATURE OF 85 S RIBOSOMES OF BACTERIA. R.E.Ecker and M.Schaechten: Biochim. biophys. Acta, 1963, 68, 645-647 (Dept. Microbiol., Coll. Med., Univ. Florida, Gainesville, Fla., U.S.A.) B.M.Stevens

5412. PREPARATION AND PROPERTIES OF GOAT BRAIN CORTEX RIBOSOMES. R.K.Datta and J.J.Ghosh: J. Neurochem., 1963, 10, 363-372* (Dept. Biochem., Univ. Coll. Sch. Technol., Calcutta, India) Ribosomes were prep. by homogenising tissue at <F in a Mg-cacodylate buffered sucrose soln. The microsome-containing supernatant was made to 0.5% with deoxycholate and spun at 80000 jg for 2 hr. Composition of the pellet was 30% RNA and 70% protein free of lipid, hexose or DNA. Evidence is presented for this prep, being pure RNP. R.Woodman

5413. LIPIDS IN PROTEIN BIOSYNTHESIS. N.'M.Sisalda* E.N.Bezinger, A.S.Marchukaitis, M.L.Molchanov, V.& Chigirev and A.P.Kotovskaya: Biokhimia, 1963, 28, 326-333. Certain lipids from isolated chloroplasts of haricot bean leaves were found to actively incorporate labelled amino acids. (Russian) B.J.Cooper

5414. GLYCYL-RNA SYNTHETASE OF RAT LIVER: PARTIAL PURIFICATION AND EFFECTS OF SOME METAL IONS ON ITS ACTIVITY. M.J.Frasen: Canad. J. Biochem., 1963, 41, 1123-1133 (Biochem. Dept., Univ. of Manitoba Med. Sch., Winnipeg, Manitoba, Canada) Glycyl-RNA synthetase was purified 40-fold from a 105000 JJ supernatant of an homogenate of rat liver by successive pptn. at pH 5.0, heat treatment at 55° for 3.0 min. in the presence of 1.0mM ATP, and (NH₄)₂SO₄ fractionation. The purified fractions catalyzed glycine-dependent ATP-32P exchange. The effect of some metal ions on glycine activation was studied. Activation occurred in the presence of either Mg²⁺ or Mn²⁺. The apparent stimn. of glycine activation by Co²⁺ was found to be an artefact. A.M.Gibb*¹

5415. INCORPORATION OF [¹⁴C]GLYCINE AND [¹⁴C]LEUCINE INTO THE SOLUBLE RNA OF THE POSTERIOR SILKGLAND. K.Matsuzakfc: J. Biochem-t Tokyo, 1963, 53, 326-327 (Dept. Chem., Sericul. Expt. Stn., Sugihama, Tokyo, Japan) Prelim. comm. B.M. Stevens

5416. INCORPORATION OF [¹⁴C]LEUCINE INTO NUCLEAR PH 5 FRACTION AND ITS TRANSFER TO NUCLEAR RIBOSOMES. T.-Y.Wangs: Biochim. biophys. Acta, 1963, 68, 633-639 (H.Shaw Sch. Botany, Washington Univ., St. Louis, Mo., U.S.A.) & g*f¹ ² ³ ⁴ ⁵ ⁶ ⁷ ⁸ ⁹ ¹⁰ ¹¹ ¹² ¹³ ¹⁴ ¹⁵ ¹⁶ ¹⁷ ¹⁸ ¹⁹ ²⁰ ²¹ ²² ²³ ²⁴ ²⁵ ²⁶ ²⁷ ²⁸ ²⁹ ³⁰ ³¹ ³² ³³ ³⁴ ³⁵ ³⁶ ³⁷ ³⁸ ³⁹ ⁴⁰ ⁴¹ ⁴² ⁴³ ⁴⁴ ⁴⁵ ⁴⁶ ⁴⁷ ⁴⁸ ⁴⁹ ⁵⁰ ⁵¹ ⁵² ⁵³ ⁵⁴ ⁵⁵ ⁵⁶ ⁵⁷ ⁵⁸ ⁵⁹ ⁶⁰ ⁶¹ ⁶² ⁶³ ⁶⁴ ⁶⁵ ⁶⁶ ⁶⁷ ⁶⁸ ⁶⁹ ⁷⁰ ⁷¹ ⁷² ⁷³ ⁷⁴ ⁷⁵ ⁷⁶ ⁷⁷ ⁷⁸ ⁷⁹ ⁸⁰ ⁸¹ ⁸² ⁸³ ⁸⁴ ⁸⁵ ⁸⁶ ⁸⁷ ⁸⁸ ⁸⁹ ⁹⁰ ⁹¹ ⁹² ⁹³ ⁹⁴ ⁹⁵ ⁹⁶ ⁹⁷ ⁹⁸ ⁹⁹ ¹⁰⁰ ¹⁰¹ ¹⁰² ¹⁰³ ¹⁰⁴ ¹⁰⁵ ¹⁰⁶ ¹⁰⁷ ¹⁰⁸ ¹⁰⁹ ¹¹⁰ ¹¹¹ ¹¹² ¹¹³ ¹¹⁴ ¹¹⁵ ¹¹⁶ ¹¹⁷ ¹¹⁸ ¹¹⁹ ¹²⁰ ¹²¹ ¹²² ¹²³ ¹²⁴ ¹²⁵ ¹²⁶ ¹²⁷ ¹²⁸ ¹²⁹ ¹³⁰ ¹³¹ ¹³² ¹³³ ¹³⁴ ¹³⁵ ¹³⁶ ¹³⁷ ¹³⁸ ¹³⁹ ¹⁴⁰ ¹⁴¹ ¹⁴² ¹⁴³ ¹⁴⁴ ¹⁴⁵ ¹⁴⁶ ¹⁴⁷ ¹⁴⁸ ¹⁴⁹ ¹⁵⁰ ¹⁵¹ ¹⁵² ¹⁵³ ¹⁵⁴ ¹⁵⁵ ¹⁵⁶ ¹⁵⁷ ¹⁵⁸ ¹⁵⁹ ¹⁶⁰ ¹⁶¹ ¹⁶² ¹⁶³ ¹⁶⁴ ¹⁶⁵ ¹⁶⁶ ¹⁶⁷ ¹⁶⁸ ¹⁶⁹ ¹⁷⁰ ¹⁷¹ ¹⁷² ¹⁷³ ¹⁷⁴ ¹⁷⁵ ¹⁷⁶ ¹⁷⁷ ¹⁷⁸ ¹⁷⁹ ¹⁸⁰ ¹⁸¹ ¹⁸² ¹⁸³ ¹⁸⁴ ¹⁸⁵ ¹⁸⁶ ¹⁸⁷ ¹⁸⁸ ¹⁸⁹ ¹⁹⁰ ¹⁹¹ ¹⁹² ¹⁹³ ¹⁹⁴ ¹⁹⁵ ¹⁹⁶ ¹⁹⁷ ¹⁹⁸ ¹⁹⁹ ²⁰⁰ ²⁰¹ ²⁰² ²⁰³ ²⁰⁴ ²⁰⁵ ²⁰⁶ ²⁰⁷ ²⁰⁸ ²⁰⁹ ²¹⁰ ²¹¹ ²¹² ²¹³ ²¹⁴ ²¹⁵ ²¹⁶ ²¹⁷ ²¹⁸ ²¹⁹ ²²⁰ ²²¹ ²²² ²²³ ²²⁴ ²²⁵ ²²⁶ ²²⁷ ²²⁸ ²²⁹ ²³⁰ ²³¹ ²³² ²³³ ²³⁴ ²³⁵ ²³⁶ ²³⁷ ²³⁸ ²³⁹ ²⁴⁰ ²⁴¹ ²⁴² ²⁴³ ²⁴⁴ ²⁴⁵ ²⁴⁶ ²⁴⁷ ²⁴⁸ ²⁴⁹ ²⁵⁰ ²⁵¹ ²⁵² ²⁵³ ²⁵⁴ ²⁵⁵ ²⁵⁶ ²⁵⁷ ²⁵⁸ ²⁵⁹ ²⁶⁰ ²⁶¹ ²⁶² ²⁶³ ²⁶⁴ ²⁶⁵ ²⁶⁶ ²⁶⁷ ²⁶⁸ ²⁶⁹ ²⁷⁰ ²⁷¹ ²⁷² ²⁷³ ²⁷⁴ ²⁷⁵ ²⁷⁶ ²⁷⁷ ²⁷⁸ ²⁷⁹ ²⁸⁰ ²⁸¹ ²⁸² ²⁸³ ²⁸⁴ ²⁸⁵ ²⁸⁶ ²⁸⁷ ²⁸⁸ ²⁸⁹ ²⁹⁰ ²⁹¹ ²⁹² ²⁹³ ²⁹⁴ ²⁹⁵ ²⁹⁶ ²⁹⁷ ²⁹⁸ ²⁹⁹ ³⁰⁰ ³⁰¹ ³⁰² ³⁰³ ³⁰⁴ ³⁰⁵ ³⁰⁶ ³⁰⁷ ³⁰⁸ ³⁰⁹ ³¹⁰ ³¹¹ ³¹² ³¹³ ³¹⁴ ³¹⁵ ³¹⁶ ³¹⁷ ³¹⁸ ³¹⁹ ³²⁰ ³²¹ ³²² ³²³ ³²⁴ ³²⁵ ³²⁶ ³²⁷ ³²⁸ ³²⁹ ³³⁰ ³³¹ ³³² ³³³ ³³⁴ ³³⁵ ³³⁶ ³³⁷ ³³⁸ ³³⁹ ³⁴⁰ ³⁴¹ ³⁴² ³⁴³ ³⁴⁴ ³⁴⁵ ³⁴⁶ ³⁴⁷ ³⁴⁸ ³⁴⁹ ³⁵⁰ ³⁵¹ ³⁵² ³⁵³ ³⁵⁴ ³⁵⁵ ³⁵⁶ ³⁵⁷ ³⁵⁸ ³⁵⁹ ³⁶⁰ ³⁶¹ ³⁶² ³⁶³ ³⁶⁴ ³⁶⁵ ³⁶⁶ ³⁶⁷ ³⁶⁸ ³⁶⁹ ³⁷⁰ ³⁷¹ ³⁷² ³⁷³ ³⁷⁴ ³⁷⁵ ³⁷⁶ ³⁷⁷ ³⁷⁸ ³⁷⁹ ³⁸⁰ ³⁸¹ ³⁸² ³⁸³ ³⁸⁴ ³⁸⁵ ³⁸⁶ ³⁸⁷ ³⁸⁸ ³⁸⁹ ³⁹⁰ ³⁹¹ ³⁹² ³⁹³ ³⁹⁴ ³⁹⁵ ³⁹⁶ ³⁹⁷ ³⁹⁸ ³⁹⁹ ⁴⁰⁰ ⁴⁰¹ ⁴⁰² ⁴⁰³ ⁴⁰⁴ ⁴⁰⁵ ⁴⁰⁶ ⁴⁰⁷ ⁴⁰⁸ ⁴⁰⁹ ⁴¹⁰ ⁴¹¹ ⁴¹² ⁴¹³ ⁴¹⁴ ⁴¹⁵ ⁴¹⁶ ⁴¹⁷ ⁴¹⁸ ⁴¹⁹ ⁴²⁰ ⁴²¹ ⁴²² ⁴²³ ⁴²⁴ ⁴²⁵ ⁴²⁶ ⁴²⁷ ⁴²⁸ ⁴²⁹ ⁴³⁰ ⁴³¹ ⁴³² ⁴³³ ⁴³⁴ ⁴³⁵ ⁴³⁶ ⁴³⁷ ⁴³⁸ ⁴³⁹ ⁴⁴⁰ ⁴⁴¹ ⁴⁴² ⁴⁴³ ⁴⁴⁴ ⁴⁴⁵ ⁴⁴⁶ ⁴⁴⁷ ⁴⁴⁸ ⁴⁴⁹ ⁴⁵⁰ ⁴⁵¹ ⁴⁵² ⁴⁵³ ⁴⁵⁴ ⁴⁵⁵ ⁴⁵⁶ ⁴⁵⁷ ⁴⁵⁸ ⁴⁵⁹ ⁴⁶⁰ ⁴⁶¹ ⁴⁶² ⁴⁶³ ⁴⁶⁴ ⁴⁶⁵ ⁴⁶⁶ ⁴⁶⁷ ⁴⁶⁸ ⁴⁶⁹ ⁴⁷⁰ ⁴⁷¹ ⁴⁷² ⁴⁷³ ⁴⁷⁴ ⁴⁷⁵ ⁴⁷⁶ ⁴⁷⁷ ⁴⁷⁸ ⁴⁷⁹ ⁴⁸⁰ ⁴⁸¹ ⁴⁸² ⁴⁸³ ⁴⁸⁴ ⁴⁸⁵ ⁴⁸⁶ ⁴⁸⁷ ⁴⁸⁸ ⁴⁸⁹ ⁴⁹⁰ ⁴⁹¹ ⁴⁹² ⁴⁹³ ⁴⁹⁴ ⁴⁹⁵ ⁴⁹⁶ ⁴⁹⁷ ⁴⁹⁸ ⁴⁹⁹ ⁵⁰⁰ ⁵⁰¹ ⁵⁰² ⁵⁰³ ⁵⁰⁴ ⁵⁰⁵ ⁵⁰⁶ ⁵⁰⁷ ⁵⁰⁸ ⁵⁰⁹ ⁵¹⁰ ⁵¹¹ ⁵¹² ⁵¹³ ⁵¹⁴ ⁵¹⁵ ⁵¹⁶ ⁵¹⁷ ⁵¹⁸ ⁵¹⁹ ⁵²⁰ ⁵²¹ ⁵²² ⁵²³ ⁵²⁴ ⁵²⁵ ⁵²⁶ ⁵²⁷ ⁵²⁸ ⁵²⁹ ⁵³⁰ ⁵³¹ ⁵³² ⁵³³ ⁵³⁴ ⁵³⁵ ⁵³⁶ ⁵³⁷ ⁵³⁸ ⁵³⁹ ⁵⁴⁰ ⁵⁴¹ ⁵⁴² ⁵⁴³ ⁵⁴⁴ ⁵⁴⁵ ⁵⁴⁶ ⁵⁴⁷ ⁵⁴⁸ ⁵⁴⁹ ⁵⁵⁰ ⁵⁵¹ ⁵⁵² ⁵⁵³ ⁵⁵⁴ ⁵⁵⁵ ⁵⁵⁶ ⁵⁵⁷ ⁵⁵⁸ ⁵⁵⁹ ⁵⁶⁰ ⁵⁶¹ ⁵⁶² ⁵⁶³ ⁵⁶⁴ ⁵⁶⁵ ⁵⁶⁶ ⁵⁶⁷ ⁵⁶⁸ ⁵⁶⁹ ⁵⁷⁰ ⁵⁷¹ ⁵⁷² ⁵⁷³ ⁵⁷⁴ ⁵⁷⁵ ⁵⁷⁶ ⁵⁷⁷ ⁵⁷⁸ ⁵⁷⁹ ⁵⁸⁰ ⁵⁸¹ ⁵⁸² ⁵⁸³ ⁵⁸⁴ ⁵⁸⁵ ⁵⁸⁶ ⁵⁸⁷ ⁵⁸⁸ ⁵⁸⁹ ⁵⁹⁰ ⁵⁹¹ ⁵⁹² ⁵⁹³ ⁵⁹⁴ ⁵⁹⁵ ⁵⁹⁶ ⁵⁹⁷ ⁵⁹⁸ ⁵⁹⁹ ⁶⁰⁰ ⁶⁰¹ ⁶⁰² ⁶⁰³ ⁶⁰⁴ ⁶⁰⁵ ⁶⁰⁶ ⁶⁰⁷ ⁶⁰⁸ ⁶⁰⁹ ⁶¹⁰ ⁶¹¹ ⁶¹² ⁶¹³ ⁶¹⁴ ⁶¹⁵ ⁶¹⁶ ⁶¹⁷ ⁶¹⁸ ⁶¹⁹ ⁶²⁰ ⁶²¹ ⁶²² ⁶²³ ⁶²⁴ ⁶²⁵ ⁶²⁶ ⁶²⁷ ⁶²⁸ ⁶²⁹ ⁶³⁰ ⁶³¹ ⁶³² ⁶³³ ⁶³⁴ ⁶³⁵ ⁶³⁶ ⁶³⁷ ⁶³⁸ ⁶³⁹ ⁶⁴⁰ ⁶⁴¹ ⁶⁴² ⁶⁴³ ⁶⁴⁴ ⁶⁴⁵ ⁶⁴⁶ ⁶⁴⁷ ⁶⁴⁸ ⁶⁴⁹ ⁶⁵⁰ ⁶⁵¹ ⁶⁵² ⁶⁵³ ⁶⁵⁴ ⁶⁵⁵ ⁶⁵⁶ ⁶⁵⁷ ⁶⁵⁸ ⁶⁵⁹ ⁶⁶⁰ ⁶⁶¹ ⁶⁶² ⁶⁶³ ⁶⁶⁴ ⁶⁶⁵ ⁶⁶⁶ ⁶⁶⁷ ⁶⁶⁸ ⁶⁶⁹ ⁶⁷⁰ ⁶⁷¹ ⁶⁷² ⁶⁷³ ⁶⁷⁴ ⁶⁷⁵ ⁶⁷⁶ ⁶⁷⁷ ⁶⁷⁸ ⁶⁷⁹ ⁶⁸⁰ ⁶⁸¹ ⁶⁸² ⁶⁸³ ⁶⁸⁴ ⁶⁸⁵ ⁶⁸⁶ ⁶⁸⁷ ⁶⁸⁸ ⁶⁸⁹ ⁶⁹⁰ ⁶⁹¹ ⁶⁹² ⁶⁹³ ⁶⁹⁴ ⁶⁹⁵ ⁶⁹⁶ ⁶⁹⁷ ⁶⁹⁸ ⁶⁹⁹ ⁷⁰⁰ ⁷⁰¹ ⁷⁰² ⁷⁰³ ⁷⁰⁴ ⁷⁰⁵ ⁷⁰⁶ ⁷⁰⁷ ⁷⁰⁸ ⁷⁰⁹ ⁷¹⁰ ⁷¹¹ ⁷¹² ⁷¹³ ⁷¹⁴ ⁷¹⁵ ⁷¹⁶ ⁷¹⁷ ⁷¹⁸ ⁷¹⁹ ⁷²⁰ ⁷²¹ ⁷²² ⁷²³ ⁷²⁴ ⁷²⁵ ⁷²⁶ ⁷²⁷ ⁷²⁸ ⁷²⁹ ⁷³⁰ ⁷³¹ ⁷³² ⁷³³ ⁷³⁴ ⁷³⁵ ⁷³⁶ ⁷³⁷ ⁷³⁸ ⁷³⁹ ⁷⁴⁰ ⁷⁴¹ ⁷⁴² ⁷⁴³ ⁷⁴⁴ ⁷⁴⁵ ⁷⁴⁶ ⁷⁴⁷ ⁷⁴⁸ ⁷⁴⁹ ⁷⁵⁰ ⁷⁵¹ ⁷⁵² ⁷⁵³ ⁷⁵⁴ ⁷⁵⁵ ⁷⁵⁶ ⁷⁵⁷ ⁷⁵⁸ ⁷⁵⁹ ⁷⁶⁰ ⁷⁶¹ ⁷⁶² ⁷⁶³ ⁷⁶⁴ ⁷⁶⁵ ⁷⁶⁶ ⁷⁶⁷ ⁷⁶⁸ ⁷⁶⁹ ⁷⁷⁰ ⁷⁷¹ ⁷⁷² ⁷⁷³ ⁷⁷⁴ ⁷⁷⁵ ⁷⁷⁶ ⁷⁷⁷ ⁷⁷⁸ ⁷⁷⁹ ⁷⁸⁰ ⁷⁸¹ ⁷⁸² ⁷⁸³ ⁷⁸⁴ ⁷⁸⁵ ⁷⁸⁶ ⁷⁸⁷ ⁷⁸⁸ ⁷⁸⁹ ⁷⁹⁰ ⁷⁹¹ ⁷⁹² ⁷⁹³ ⁷⁹⁴ ⁷⁹⁵ ⁷⁹⁶ ⁷⁹⁷ ⁷⁹⁸ ⁷⁹⁹ ⁸⁰⁰ ⁸⁰¹ ⁸⁰² ⁸⁰³ ⁸⁰⁴ ⁸⁰⁵ ⁸⁰⁶ ⁸⁰⁷ ⁸⁰⁸ ⁸⁰⁹ ⁸¹⁰ ⁸¹¹ ⁸¹² ⁸¹³ ⁸¹⁴ ⁸¹⁵ ⁸¹⁶ ⁸¹⁷ ⁸¹⁸ ⁸¹⁹ ⁸²⁰ ⁸²¹ ⁸²² ⁸²³ ⁸²⁴ ⁸²⁵ ⁸²⁶ ⁸²⁷ ⁸²⁸ ⁸²⁹ ⁸³⁰ ⁸³¹ ⁸³² ⁸³³ ⁸³⁴ ⁸³⁵ ⁸³⁶ ⁸³⁷ ⁸³⁸ ⁸³⁹ ⁸⁴⁰ ⁸⁴¹ ⁸⁴² ⁸⁴³ ⁸⁴⁴ ⁸⁴⁵ ⁸⁴⁶ ⁸⁴⁷ ⁸⁴⁸ ⁸⁴⁹ ⁸⁵⁰ ⁸⁵¹ ⁸⁵² ⁸⁵³ ⁸⁵⁴ ⁸⁵⁵ ⁸⁵⁶ ⁸⁵⁷ ⁸⁵⁸ ⁸⁵⁹ ⁸⁶⁰ ⁸⁶¹ ⁸⁶² ⁸⁶³ ⁸⁶⁴ ⁸⁶⁵ ⁸⁶⁶ ⁸⁶⁷ ⁸⁶⁸ ⁸⁶⁹ ⁸⁷⁰ ⁸⁷¹ ⁸⁷² ⁸⁷³ ⁸⁷⁴ ⁸⁷⁵ ⁸⁷⁶ ⁸⁷⁷ ⁸⁷⁸ ⁸⁷⁹ ⁸⁸⁰ ⁸⁸¹ ⁸⁸² ⁸⁸³ ⁸⁸⁴ ⁸⁸⁵ ⁸⁸⁶ ⁸⁸⁷ ⁸⁸⁸ ⁸⁸⁹ ⁸⁹⁰ ⁸⁹¹ ⁸⁹² ⁸⁹³ ⁸⁹⁴ ⁸⁹⁵ ⁸⁹⁶ ⁸⁹⁷ ⁸⁹⁸ ⁸⁹⁹ ⁹⁰⁰ ⁹⁰¹ ⁹⁰² ⁹⁰³ ⁹⁰⁴ ⁹⁰⁵ ⁹⁰⁶ ⁹⁰⁷ ⁹⁰⁸ ⁹⁰⁹ ⁹¹⁰ ⁹¹¹ ⁹¹² ⁹¹³ ⁹¹⁴ ⁹¹⁵ ⁹¹⁶ ⁹¹⁷ ⁹¹⁸ ⁹¹⁹ ⁹²⁰ ⁹²¹ ⁹²² ⁹²³ ⁹²⁴ ⁹²⁵ ⁹²⁶ ⁹²⁷ ⁹²⁸ ⁹²⁹ ⁹³⁰ ⁹³¹ ⁹³² ⁹³³ ⁹³⁴ ⁹³⁵ ⁹³⁶ ⁹³⁷ ⁹³⁸ ⁹³⁹ ⁹⁴⁰ ⁹⁴¹ ⁹⁴² ⁹⁴³ ⁹⁴⁴ ⁹⁴⁵ ⁹⁴⁶ ⁹⁴⁷ ⁹⁴⁸ ⁹⁴⁹ ⁹⁵⁰ ⁹⁵¹ ⁹⁵² ⁹⁵³ ⁹⁵⁴ ⁹⁵⁵ ⁹⁵⁶ ⁹⁵⁷ ⁹⁵⁸ ⁹⁵⁹ ⁹⁶⁰ ⁹⁶¹ ⁹⁶² ⁹⁶³ ⁹⁶⁴ ⁹⁶⁵ ⁹⁶⁶ ⁹⁶⁷ ⁹⁶⁸ ⁹⁶⁹ ⁹⁷⁰ ⁹⁷¹ ⁹⁷² ⁹⁷³ ⁹⁷⁴ ⁹⁷⁵ ⁹⁷⁶ ⁹⁷⁷ ⁹⁷⁸ ⁹⁷⁹ ⁹⁸⁰ ⁹⁸¹ ⁹⁸² ⁹⁸³ ⁹⁸⁴ ⁹⁸⁵ ⁹⁸⁶ ⁹⁸⁷ ⁹⁸⁸ ⁹⁸⁹ ⁹⁹⁰ ⁹⁹¹ ⁹⁹² ⁹⁹³ ⁹⁹⁴ ⁹⁹⁵ ⁹⁹⁶ ⁹⁹⁷ ⁹⁹⁸

5417. ACTIVATION OF GLUTAMIC ACID AND GLUTAMINE IN MAMMALIAN TISSUES. M.A.Alford.

M.Brotman, M.A.Chudy and MJ.Frasen Canad. J. Biochem., 1963, 41, 1135-1145 (Biochem. Dept.. Univ. Manitoba Vied. Sch.. Winnipeg. Manitoba.

Canada) Measurements of a-glutamyl-RNA synthetase and glutaminyl-RNA synthetase activities have been made in fractions derived from 105000 & supernatant of homogenates of rat liver and mouse Ehrlich ascites carcinoma cells. It was indicated that each amino acid was activated by a sp. enzyme, I^{Kin}-enzymes catalysed amino acid dependent ATP-WR exchange. The a-glutamyl-RNA synthetase * » £ ». 42-fold from rat liver 105000 & supernatant was free of tufutamine synthetase.

A.M.Gibbins

5418. SYNTHESIS OF Y-GLOBULINI IN THE NEW-BORN RABBIT. A.Wainer, J.Robbins, ^{ff} and R.T. Smiths Nature, Lond., 1963, 198, 4» / «JB

(Dept. Biochem., Univ. of Florida Coll. Mea.. Gainesville, Flat. U.S.A.) Examination of sera of new-born rabbits by immunoelectrophoresis after i.p. injn. of [35S]methionine showed that Y-globulins » synthesised by the new-born animals although in much smaller amounts than other serum proteins.

G.M.Lewis

541fc PROTEIN SYNTHESIS IN FROG EGGS. I. AMINO ACID INCORPORATION BY A CRUDE SYSTEM.

M.J.Burr and F.J.Finamore. II. AMINO ACTOACTIVATION

V.

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Biophys. Acta, 1963, 68, 608-617, 618-620:
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dale. S. S A T I-CTMdel5000_fsupematanj
fro" ovarian Rana Dipiens eggs to ^S³⁵ into acid insol. proteins. Incorporation was rtTM*? dependent on Mg concn. although there was no abs. Mg reAremate. RNase, gluathione and £-Aiororne<un³noate inhibited, but chloramrAencol and heat Jenaturation had Utte effect. ¹⁴C « a * ^ ^ 3 S i r aviated with peptides derived from the egg Ig g f-
Structures morphologically and chem. ^ nucal with nucleoU activated amino acids and incorporated labelled amino acids into protein. The aco^vaing enzymes were similar to those of cytoplasm and nuclei. Optimal activity » J~J ^ amn Acid concn. ana the presence of Mg²⁺ and ATP. Leucine and methionine activating enzymes to be conc. in nucleoli; cysteine, ic acid activating enzymes to acid incorporation did not require additional enzyme fracion. Mg²⁺, ATP or GTP. B.M.Stevens

****%0, SILKWORM BIOCHEMISTRY S ^ ^ S S**

D-[1-¹⁴C]glucose, D-[2-¹⁴C]glucose and L-¹⁴C glucose by injn. into the haemocoel. From 15 to 33% of inj. activit and glutamic

Quently ^thesised. Tyrosine of Hbiwn had no activity. Findings a*ree w^h the view that the silk glandI can - synthesise the above amino acids, with the excepaoon or tyrosine, from Pyruvate or ^ 1 0 6 8 g living rise to Pyruvate. MAMW (Freh.)

5421. PLASMA PROTEIN SYNTHESIS IN THE LIVER: METHOD FOR MEASUREMENT OF ALBUMIN FORMATION IN VIVO. E.B.Reeve, J.R.Pearson and D.C. Marts Science, 1963, 139, 914-916 (Dept. Med.. Univ. Colorado Med. Center, Denver, Colo., U.S.A.)

L-Arginine labelled with 14C in the guanido group was inj. into neomycin-treated rabbits, and the ratio of the rates of entry of radioactivity into protein and urea determined. This ratio, multiplied by the rate of arginine utilisation in urea synthesis and by the ratio of protein to protein arginine wt. gives the rate of protein synthesis. The method applies to albumin and should apply to any plasma protein synthesised in those liver cells which also synthesise urea.

G.M.Lewis

5422. SERUM PROTEIN SYNTHESIS BY THE FOETAL RAT. P.C.Kellener, CD.Kenyon and C.A.Villee:

Science, 1963, 139, 839-840 (Dept. Biol. Chem., Harvard Med. Sch., Boston, Mass., U.S.A.) When [14C]methionine or [14C]leucine were inj. i.p. into rat foetuses in utero at 20-22 days gestation, significantly greater labelling of foetal serum proteins occurs than when the amino acids are inj. into die maternal circulation. Maternal partial hepatectomy had little effect on the synthesis of foetal serum proteins.

G.M.Lewis

5423. PROTEIN CRYPTOGRAM: I. NON-RANDOM OCCURRENCE OF AMINO ACID 'ALLELES'. R-V.Eck:

J. theor. Biol., 1962, 2, 139-151 (Biol. Lab., Nat. Cancer Inst., N.L.H., Bethesda, Md., U.S.A.) Some complications of the 'overlapping' hypothesis of nucleic acid-protein coding are discussed, and a procedure outlined for elucidating such a code. The first result of such an approach shows that the reported 'alleles' do not occur at random.

J.A.Dawson

5424. SIGNIFICANCE OF ENDOPLASMIC RETICULUM MEMBRANES FOR PROTEIN BIOSYNTHESIS IN RAT LIVER AND YOSHIDA HEPATOMA ASCITES CELLS.

G.P.Barbieri and A.di Marco: Exp. Cell Res., 1963, 30, 193-199 (Farmitalia Lab. Richerche Microbiol.

Chemoterap., Milano, Italy) The amino acid incorporation activity of several microsomal fractions from rat liver and rat hepatoma ascites cells, was determined. The light portion from each microsomal fraction showed a higher content of lipid P and the heavy portion presented a higher content of RNA. In liver the light microsomes always incorporated amino acids into proteins more actively than the heavy ones, while in hepatoma, the light ones presented a lower amino acid incorporation activity.

K.Jones

5425. AMINO ACID INCORPORATION BY IN VITRO TUMOUR AND LIVER SYSTEMS AND THEIR RESPONSE TO EXOGENOUS RNA. M.A.O'Neal and A.C. Griffin: Cancer Res., 1963, 23, 628-633 (Dept.

Biochem., Univ. Texas M.D.Anderson Hosp., Houston, Tex., U.S.A.) A procedure for isolating amino acid incorporating systems from Novikoff ascites tumour and rat liver is described. The tumour system incorporated approx. 30-70 umoles of amino acid/mg. ribosomal protein when [14C]valine, [14C]phenylalanine or [14C]lysine was supplied. Addition of RNA prep. from tumour and liver nuclei, tumour ribosomes or TMV to the tumour system increased incorporation by 16-45%. Addition of polyuridylic acid to the tumour system with [14C]phenylalanine caused a 7-10-fold increase in incorporation.

B.M.Stevens

BIOCHEMISTRY

5426. PROTEIN SYNTHESIS AND METABOLISM OF TUMOUR AND EMBRYO CELLS.

T.Terranova, F.Feo, L.Gabriel and E.Gravela: Sperimentale, 1962, 112, 429-438 (Ist. di Patologia Gen., Univ., Torino, Italy) The aerobic respiration, aerobic and anaerobic glycolysis and the rate of incorporation of [¹⁴C]glycine into TCA precipitable protein, of 10 day old chick embryo cells and hepatic ascites cells (Yoshida) was studied at the same time, under the same conditions. During anaerobiosis in tumour cells, the glycolytic reactions were very active and the rate of protein synthesis very high. In chick embryo cells the rate of protein synthesis is high only during aerobiosis and very low during anaerobiosis. The relatively high efficiency of the energetic metabolism of tumour cells under anaerobic conditions suggested a 'facultative anaerobiosis'. (Italian) G.N.Godson

5427. STRUCTURAL ALTERATIONS OF PHAGE PROTEINS SYNTHESISED IN PRESENCE OF PANCREATIC RIBONUCLEASE. R.Jenner and G.Vansanten: Virology, 1963, 19, 169-178 (Animal Physiol. Lab., Univ., Brussels, Belgium)

The addition of pancreatic RNase to a lysogenic culture of *B. megaterium*, induced by u.v. irradiation, leads to the formation of non-infectious phage particles of normal DNA content. The stability of the tail structure is sharply decreased, and head proteins fail to react with the sp. Ab of control phage. Abnormal chromatographic and electrophoretic patterns are produced from tryptic digests. It is suggested that RNase acts by modifying the specificity of the ribonucleic acids involved in the ordering of amino acids along the genetic messenger. J.G. Bennette

5428. FORMATION OF TRYPTOPHAN SYNTHETASE ENZYME BY CELL-FREE EXTRACTS OF MYCELIUM OF NEUROSPORA CRASSA. S.D.Wainwright: Canad. J. Biochem., 1963, 41, 1327-1329 (Biochem. Dept., Dalhousie Univ., Halifax, Nova Scotia, Canada) ATP (for which hexose diphosphate could not serve as a source) and polyvinyl acetate were required in the medium to induce increased tryptophan synthetase activity with cell-free extracts of *N. crassa*? mycelium. Reduction in amino acid concn., Mg²⁺*, or omission of NAD markedly reduced activity, and no stimm. of enzyme formation was obtained by adding 30 fig./ml. of 'messenger RNA'. 10 " 3M ethionine, £-fluorophenylalanine, or 3-2-thienylalanine inhibited activity increase, as did 20 fig./ml. chloramphenicol or cryst. DNase and 1 rng./ml. pancreatic RNase. There was no correlation between increase in tryptophan synthetase activity and net synthesis of protein* A.M.Gibbins

5429. INCORPORATION OF [¹⁴C]LEUCINE INTO THE PROTEIN OF RAT HEART SARCOSOMES: INVESTIGATION OF OPTIMAL CONDITIONS. G.F.Kalfc: Arch. Biochem., 1963, 101, 350-359 (Dept. Biochem., Seton Hall Coll. Med., Med. Center, Jersey City, N.J., U.S.A.) Incorporation was dependent on ATP generated within the sarcosome by oxidative phosphorylation. Puromycin and chloramphenicol suppressed incorporation almost completely. RNase, DNase and the sol. fraction of the cell had little effect. Leucine incorporation appeared to be a property of the mitochondria per se and not a result of microsomal or bacterial contamination. Treatment of labelled protein with 1-fluoro-2,4-dinitrobenzene indicated that the [¹⁴C]leucine was probably incorporated into the interior of the peptide chain. B.M.Stevens

MINERAL METABOLISM

5430. EFFECTS OF VITAMIN D AND PARATHYROID HORMONE ON CALCIUM AND PHOSPHORUS METABOLISM OF BONE IN VITRO. G.Nichols, jun., S.Schartum and G.M.Vaes: Acta physiol. scand., 1963, 57, 51-60 (Med. Dept., Harvard Med. Sch., Boston, Mass., U.S.A.) Bone from mice was incubated in vitro until an equilibrium for Ca and P ions between the bone and the medium was reached simulating the situation in vivo. Bone from animals pretreated with vitamins had a greater concn. of these ions in the medium than bones from vit. D-deficient controls. Vit. D also increased the passive solubility of the bone mineral and lactate production by bone cells. Parathyroid hormone had the same action as did vit. D in the absence of the latter. H. Wayforth

5431. CALCIUM RETENTION FROM THE COMMONLY USED SALTS: LACTATE, GLUCONATE, DIBASIC PHOSPHATE AND CARBONATE. M.Rakowska: Roczn. Panst. Zatyl. Hig., 1962, 13, 399-407 (Państwowy Zakład Higieny, Warszawa, Poland) No significant changes were observed in the utilisation of Ca or mineralisation of bones when Ca-gluconate, Ca-phosphate or Ca carbonate were alternatively administered to young rats by means of a stomach tube in 10-20 mg. doses of Ca. (Polish) T.Qfebicki

5432. SENSITIVE METHODS FOR TITRIMETRIC MICRODETERMINATION OF BIOLOGICAL CALCIUM AND MAGNESIUM. R.N.Beale and J.O.Bostrom: J. clin. Path., 1963, 16, 252-255 (Inst. Clin. Path., Public Health Dept., Sydney, Australia) Reagents containing high concn. of urea were used in microtitrations of Ca and Mg in serum and urine, with EDTA as titrant and Corinth Ca as indicator. Mg concn. was calculated by subtracting the Ca from the Ca plus Mg concn. The sensitivity of the methods was investigated by recovery expt., and the mean values obtained on 39 normal subjects were compared with published values based on flame emission or flame absorption spectrophotometry, or on 2 other titrimetric methods. J.B.Derbyshire

5433. CRYSTALLINE STRUCTURE OF CALCIUM CARBONATE IN AVIAN EGG SHELL. E.M. STUDY. A.N.J.Heyn: J. ultrastructure Res., 1963, 8, 176-188 (Physics Dept., Auburn Univ., Auburn, Ala., U.S.A.) The shell of the bird, as studied by E.M. of surface replicas consists of very large crystals of closely-packed calcite. Their transverse fracture structure shows a controlled cleavage pattern similar to that found in some metal alloys. At the inside of the shell randomly orientated microcrystals of calcite occur forming the protruding knobs of the mammilla layer. H.B. Wayforth

5434. IN VITRO BINDING OF TETRACYCLINE S TO CALCIUM. G.A.M.Finerman and R.A.Milclu: Nature, Lond., 1963, 198, 486-487 (Divn. Orthopaedic Surg., Dept. Surg., Johns Hopkins Univ., Baltimore, Md., U.S.A.) Sheep or cattle cortical bone powders adsorbed tetracyclines; this adsorption was increased by removal of org. material by treatment with ethylene diamine. Treatment with EDTA to remove Ca²⁺ prevented adsorption of tetracycline. Tetracycline mol. interact primarily if not only with Ca ions in at least hydroxyapatite seeded nucleation sites on collagen fibrils. G.M.Lewis

5435. CHELATION OF CALCIUM BY LACTOSE: ITS ROLE IN TRANSPORT MECHANISMS. P.Charley and P.Saltman: *Science*, 1963, 139, 1205-1206 (Dept. Biochem., Univ⁸ S.California, Los Angeles, Calif., U.S.A.) An uncharged complex between lactose and ⁴⁵Ca was demonstrated by paper electrophoretic techniques. Such a complex may account for the known enhancement of intestinal absorption of Ca by lactose. G.M.Lewis

5436. STRUCTURE AND CALCIFICATION IN AVIAN EGG SHELL. A.R.Terepka: *Exp. Cell Res.*, 1963, 30, 171-182 (Dept. Rad. Biol., Univ. Rochester Sch. Med. Dent., Rochester, N.Y., U.S.A.) The hen's egg shell was a highly ordered structure throughout its entire thickness, as studied optically and radiographically. There was a fibrous ring within the calcified tip of each shell mammilla, and these rings are suggested to serve as initial nucleation centres during egg shell formation. While X-ray microdiffraction showed that the mineral component of the shell was calcite, the presence of keratin in shell membrane could not be ascertained. K.Jones

5437. ORGANIC-INORGANIC INTERRELATIONSHIPS IN AVIAN EGG SHELL. A.R.Terepka: *Exp. Cell Res.*, 1963, 30, 183-192 (Dept. Rad. Biol., Univ. Rochester, Sch. Med. Dent., Rochester, N.Y., U.S.A.) An orderly arranged shell matrix found throughout the entire egg shell was correlated with the distribution of shell mineral, suggesting a close association of matrix and mineral deposition. Concn. of matrix material present at the tips of the shell mammillae appeared to serve to facilitate diffusion of a physiol. decalcifying agent elaborated during embryonic development of the chick. It is suggested that the easily decalcified mineral core is of different cryst. size and/or composition from the remainder of the shell mammilla. K.Jones

5438. CALCIUM DETERMINATION IN SERUM. ni. MICROMETHOD SUITABLE FOR SERUM CONTAINING EDTA. H.Pfordte and W.Ponsold: *Z. Ges. exp. Med.*, 1963, 136, 543-546 (Pharmac. Inst., M.Luther Univ., Halle-Wirtenberg, Germany) A micromethod for Ca determination in 0*1-0*2 ml. serum is described. Ca is ppt. as Ca chloranilate, with subsequent soln. of the ppt. in 5% EDTA and spectro-Dhotometric analysis. (German) P.F.Meyer

5439. SYNTHETIC HYDROXY APATITE CRYSTALS. II. AGEING AND Sr INCORPORATION. W.F.Neuman, R.Bjomerstedt and BJ.Mulryan: *Arch. Biochem.*, 1963, 101, 215-224 (Dept. Rad. Biol., Univ. Rochester, N.Y., U.S.A.) Ageing involved both a successive transport of Ca to fill out vacancies in the crystal interior and a decrease in sp. surface area probably due to recryst. The Ca/P ratio rose from 1 to 1.66 over approx. 2 days. The hydration decreased 20% in 2 days and continued to decrease somewhat further. It was shown that Sr uptake could be preferentially limited to column positions and that Ca discriminated against Sr in this process. Ageing was shown to decrease the amount of exchangeable Sr and to increase Ca/Sr discrimination. B.M.Stevens

5440. EFFECT OF AZIDE AND Ca ION ON REVERSIBLE CHANGES OF PROTEIN CONFIGURATION IN STIMULATED NERVES. M.Luxoro, E.Rojas and E.Wittig: *J. gen. Physiol.*, 1963, 46, 1109-1121 (Dept. Biophys., Sch. Chem. and Pharmacy, Univ. Chile, Santiago, Chile) Ungar's finding that nerve proteins undergo a reversible denaturation concomitant with a

train of nerve impulses, was substantiated in sciatic nerves from *Calyptocephalella gavi*. 0<3mM Na azide impaired the reversibility of those changes, and 10 mequiv./l. of Ca applied to extracts of resting nerves induced configurational rearrangements in the proteins similar to those produced during stimn. It is tentatively concluded that the configurational changes are a consequence of the extra influx of Ca due to nerve impulse propagation. K.Jones

5441. INHIBITION OF MITOCHONDRIAL ADENOSINE TRIPHOSPHATASE. EFFECTS OF ALKALI-METAL IONS. F.Ulrich: *Biochem. J.*, 1963, 88, 193-206 (Dept. Physiol., Yale Univ. Sch. Med., New Haven, Conn., U.S.A.) The alkali-metal ions Na, K, Li, Rb, Cs and NH₄ inhibited the ATPase in membrane suspensions from deoxycholate-disrupted rat-liver mitochondria. Concn. of Na⁺ and K⁺ as low as 10mM were effective. NO₃⁻ caused a greater inhibn. than Cl⁻, but both inhibited more than did SO₄²⁻. Despite large differences in ATPase activity in the absence of alkali-metal ions, the inhibn. of ATPase was similar (a) over the pH range 5-10, (b) with ATP, UTP, GTP, or ITP as substrates and (c) with various activating divalent cations. Activation of the enzyme by DNP was diminished by alkali-metal ions. *

5442. EFFECT OF ALKALI METALS ON GROWTH OF STAPHYLOCOCCUS PYOGENES. H.V.Wyatt: *Exp. Cell Res.*, 1963, 30, 56-73 (Dept. Biol. Sci., Bradford Inst. Technol., Bradford, England) Li was unable to replace K for the growth of *S. pyogenes*, while Rb could replace K with an efficiency of 20 to less than 3% depending on the concn. of the 2 cations. Higher concn. of Rb inhibited growth and glucose uptake. When K was present, Cs had an efficiency of about 0*1%. K.Jones

5443. UPTAKE OF K AND Rb BY STAPHYLOCOCCUS PYOGENES. H.V.Wyatt: *Exp. Cell Res.*, 1963, 30, 62-73 (Dept. Biol. Sci., Bradford Inst. Technol., Bradford, England) The uptake of K and Rb by *S. pyogenes* was logarithmic during log. growth, the 2 metals competing for both entry and efflux. In the presence of Rb, there was biphasic log. growth. The uptake of Rb was dependent on its external concn., and was in excess of K normally taken up. A model is proposed for the flux of Rb and K. K.Jones

5444. SELENIUM CONCENTRATION IN KIDNEYS OF NORMAL PIGS AND PIGS AFFECTED WITH NUTRITIONAL MUSCULAR DYSTROPHY AND LIVER DYSTROPHY (HEPATOSIS DIAETETICA). P.Lindberg and M.Siren: *Life Sci.*, 1963, No. 5, 326-330 (Dept. Med., Royal Vet. Coll., Stockholm, Sweden) The Se content of normal pigs was 10*978 ± 0*568 p.p.m. of dry wt., while pigs affected with muscular dystrophy showed 3*397 ± 0*290 p.p.m. Pigs affected with liver dystrophy showed a value of 3*325 ± 0*567 p.p.m. K.Jones

5445. PARATHYROID HORMONE AND MAGNESIUM HOMOEOSTASIS. LMacIntyre, S.Boss and V.A. Troughton: *Nature*, Lond., 1963, 198, 1058-1060 (Postgrad. Med. Sch., London, England) Results are presented which support the hypothesis that a rise in plasma Mg inhibits secretion of parathyroid hormone resulting in increased excretion of Mg²⁺ in urine and a return of Mg levels in plasma to normal. A fall in plasma Mg stimulates production of parathyroid hormone resulting in increased renal conservation of Mg. J.R.Sargent

BIOCHEMISTRY

5446. ROLE OF MOLYBDENUM IN NITRATE ASSIMILATION BY AGROBACTERIUM TUMEFACIENS.

C.K.R.Kurup and C.S.Vaidyanathan: Biochem. J., 1963, 88, 239-242 (Dept. Biochem., Indian Inst. Sci., Bangalore, India) WO₄ is inhibitory to the growth of the crown-gall-initiating plant pathogen *A. tumefaciens* when grown in a synthetic medium with NO₃⁻ as the sole source of N. With NH₃ as the source of N this inhibitory effect was not apparent. The effect of WO₄ was completely reversed by the simult. presence of M064 in the culture medium. When the medium was purified and made deficient in M004 the growth of the organism was depressed. Nitrate-reductase activity of the cells also was depressed by the deficiency. The activity of the preformed enzyme was not increased by the addition of M004.

5447. EFFECTS OF COBALT ON MITOCHONDRIAL RESPIRATION. E.H.Strickland and C.R.Gouchen Nature, Lond., 1963, 198, 790-791 (U.S. Army Med. Res. Lab., Fort Knox, Kans., U.S.A.) Addition of Cobalt (II) A DP to rat liver mitochondria stim. succinate oxidation; EDTA stim. it further, but this stimn. was reversed by Co. G.M.Lewis

5448. INFLUENCE OF AMINO ACIDS ON IRON ABSORPTION. D.Kroe, T.D.Kinney, N.Kaufman and J.V. Klavins Blood, 1963, 21, 546-552 (Path. Dept., Duke Univ. Med. Center, Durham, N.C., U.S.A.) It was shown by introducing amino acids plus ⁵⁹Fe into isolated intestinal loops and measuring the label in the serum and in the liver, that all the amino acids increased the serum Fe and Fe deposition in the liver.

H.B.Waynfirth

5449. CHEMICAL CONSTITUTION OF HAEMIN. M.Grassl, G.Augsburg, V.Coy and F.Lyneic Biochem. Z., 1963, 337, 35-47 (M.Planck-Inst. fur Zellchemie, MQnchen, Germany) It is postulated that haemin prep, from ox heart is derived from protohaemin by changing the side groups on rings A and C. According to this scheme die vinyl group in position 2 of the porphyrin ring is alkylated by farnesyl pyrophosphate while the methyl group in position 8 is oxidised to an aldehyde. It was shown by oxidative degradation of hydrogenated or unchanged haemin that rings B and C had remained unchanged. (German) L.Cohn

5450. A GEL FILTRATION METHOD FOR STUDIES ON PROTEIN IRON-BINDING. A.A.Barber, C.Demiuwer and N.G.Anderson: Clin. chim. Acta, 1963, 8, 143-145 (Dept. Zool., Univ. California, Los Angeles, Calif., U.S.A.) Gel filtration on Sephadex G-50 and ⁵⁹Fe are used for rapid determination of protein-iron binding in complex mixtures. K.Brew

5451. IRON, PORPHYRINS AND CHLOROPHYLL. E.F.Karali and C.A.Price: Nature, Lond., 1963, 198, 708 (Dept. Plant Physiol., Rutgers, State Univ., New Brunswick, N.J., U.S.A.) *Euglena gracilis* incubated with porphobilinogen showed decreased rates of coproporphyrinogen formation with decreasing levels of cell Fe. Fe-deficient cells, though deficient in their capacity to form chlorophyll, produced protoporphyrin at rates equal to or greater than the iron-sufficient controls. Theories of chlorophyll synthesis are discussed. G.M.Lewis

5452. MECHANISM OF HYDROGEN TRANSFER BY PYRIDINE NUCLEOTIDES. XII. N-TERMINAL GROUPS AND ZINC CONTENT OF ALCOHOL DEHYDROGENASE

FROM YEAST. A.Arens, H.Sund and K.Wallenfels: Biochem. Z., 1963, 337, 1-23 (Chem. Lab., Univ., Freiburg, L Br., Germany) Pure cryst. alcohol dehydrogenase from bakers' yeast was recryst. in the presence of EDTA by adding (NH₄)₂SO₄ to a final satn. of 0⁰36. After the second recrystn. 13*24 mole. N-terminal amino acids, determined as their DNP deriv. were found for each mol. of protein, after the 19th recrystn. this value had dropped to 1*86. The Zn content of once cryst. enzyme was 5[#]2 atoms/mole enzyme, after the 19th recrystn. it had decreased to 3*2. It was concluded that the enzyme protein possessed no N-terminal groups but that Zn was essential for its bioL activity. (German) L.Cohn

5453. DISTRIBUTION OF RADIozINC IN RAT PLASMA. J.P.Okunewick, O.A.Schjeide, E.N.Carlsen and T.G. Hennessy: Nature, Lond., 1963, 198, 966-968 (Lab. Nuclear Med., Sch. Med*, Univ. California, Los

Angeles, Calif., U.S.A.) Loosely bound Zn is distributed among all proteins of rat plasma strictly on a per wt. basis. InjL of individual protein fractions labelled with Zn resulted in the same clearance pattern for Zn as that of the whole plasma, further indicating that none of the inj. fractions shows a greater affinity for Zn than any other fraction or whole plasma. J.R. Sargent

5454. FLUORIMETRIC MICRODETERMINATION OF THALLIUM [Th] WITH RHODAMINE B[Rh]. W.Kisser. Arch. Toxicol., 1963, 20, (2), 108-113 (Inst. Med. Univ., Vienna, Austria) The method can be applied to both org. and inorg. materials. After soln. in acid the Rh-Th complex is extracted and its absorption measured at 590 mji. 0¹ fig. is die lower limit and the error for 5 jig. is 5% (relative). (German) LCornish

5455. DISTRIBUTION AND EXCRETION OF RADIOACTIVE RARE EARTH COMPOUNDS IN MICE. B.Rosoff, E.Siegel, G.L.Williams and H.Spencer. Int. J. appl. Radiat., 1963, 14, 129-135 (Montefiore Hosp., New York, U.S.A.) The distribution and excretion of radioactive rare-earth Sc, Y, La, Sm injn. i.v. in ionic or chelated form was studied. The strong rare earth chelates were well excreted and little was retained, the weaker chelates were largely deposited in liver and spleen, and intermediate chelates were found in bone. B.Payne

OTHER BODY CONSTITUENTS

5456. MOLECULAR VIBRATION AND INSECT SEX ATTRACTANTS. R.H.Wright: Nature, Lond., 1963, 198, 455-459 (Brit. Columbia Res. Council, Vancouver, Canada) Study of the chem. structure of a variety of insect sex attractants, revealed the wide chem. diversity of these attractants. A feature of the attractants was die presence in each mol. of characteristic low-frequency vibrational movements. The results are consistent with the theory that odour is due to these vibrational movements. J.R.Sargent

5467. ATTRACTIVE SUBSTANCE OF THE COTTON WORM (PRODENIA LITURA F). S.M.A.D.Zayed, T.M.Hussein and L.M.LFakhn Z. Naturforsch. B, 1963, 18, 264 (Nat. Res. Centre Dokki, Cairo, U.A.R.) Note* (German) J.C.Crawhall

5458. METABOLISM OF INDOLE-3-CARBOXYLIC ACID BY THE RAT. R.M.Acheson and L.J.King: *Biochim. biophys. Acta*, 1963, 71, 643-649 (Dept. Biochem., Univ., Oxford, England) Extracts of urine, after indole-3-carboxylic acid had been fed or inj. i.p. confined approx. 20% of the original acid, the corresponding glucuronide and 6-hydroxyindole-3-carboxylic acid. N-(indole-3-carbonyl)glycine was synthesised and was shown to be absent from urine extracts. Oxidation of indole-3-carboxylic acid by Udenfriend's method gave the 5- and 6-OH deriv., indole, anthranilic acid and N-formylanthranilic acid. B.M. Stevens

5459. O-METHYLATION IN THE CONVERSION OF TYROSINE TO MELANIN. J.Axelrod and A.B.Lerner: *Biochim. biophys. Acta*, 1963, 71, 650-655 (Nat. Inst. Mental Hlth., Bethesda, Md., U.S.A.) Catechol-O-methyl transferase catalysed methylation of ⁵-dihydroxyindole and 5,6-dihydrodihydroxyindole. Primarily at *C*⁶. Hydroxyindole-O-methyl transferase catalysed methylation of 5,6-dihydroxyindole mainly at ⁵; 5,6-dihydrodihydroxyindole was not methylated. B.M.Stevens

5460. RHODOPSIN: AN ENZYME. D.G McConnell and D.G.Scarpelli: *Science*, 1963, 139, 848 (Inst. Res. Vision, Ohio State Univ., Columbus, Ohio, U.S.A.) Digitonin extracts of frog rhodopsin show ATPase activity; the activity is greatest in light of the wavelength ^{2*} at which rhodopsin shows max. absorption. Hydroxylamine inhibits the enzyme by removing retinine, which is essential for activity. G.M.Lewis

5461. EYE PIGMENT OF COCKROACH. JJ.Wolken and I.J.Scheer. *Exp. Eye Res.*, 1963, 2, 182-188 (Biophys. Res. Lab., Eye and Ear Hosp., Univ. Pittsburgh Sch. Med., Pittsburgh, Pa., U.S.A.) The visual cells from the eye of the cockroach (*Blatta orientalis*) were separated by grinding the heads in 45% sucrose-phosphate buffer soln. followed by differential and high-speed centrifugation. The rhabdomere fraction was thus eluted and extracted with 1.8% aq. digitonin. This suited in a photo-sensitive pigment complex with absorption max. at approx. 500 mp, typical of rhodopsin. The bleaching and difference spectra indicate that ¹retinene is part of the complex. The reaction rate const. for bleaching the complex was 6.1×10^{-5} sec.⁻¹ at 25°. ²* Etone extraction of the heads followed by chromatography on alumina columns eluted a fraction identified spectroscopically as retinene. J. Whiting

5462. ULTRAVIOLET SPECTRAL DISPLACEMENTS OF CATTLE RHODOPSIN. M.Takagi: *Biochim. biophys. Acta*, 1963, 66, 328-340 (Dept. Biol. Fac. Sci., Univ. Osaka, Japan) On illumination the absorption max. at 231, 278, 286-5 and 292 mji shifted towards shorter ¹ by approx. 1 mji. Changes in pH between 4-7 and 9-7, in ionic strength between 0 and 5, in digitonin concn. between 0.1 and 2flo₉, in glycerol concn. between 80% w/v and in age of prep, did not affect the displacements. Displacements were reduced to 10% of control values in cone, sucrose soln. and increased to 160% in urea. Rhodopsin in rod outer segments showed similar spectral changes to rhodopsin in soln. Results of SP* on low temp, illumination indicated that the displacements occurred in the change from metarhodopsin to indicator yellow, but not earlier in the rhodopsin cycle. B.M.Stevens

5463. SHUNT BILIRUBIN: EVIDENCE FOR TWO COMPLEXES. L.G.Israels, T.Yamamoto, J.Skanderbeg and A.Zipursky: *Science*, 1963, 139, 1054-1055 (Med. Coll., Univ. Manitoba, Winnipeg, Manitoba, Canada) Studies with ¹⁴C-labelled glycine and 6-aminolaevulinic acid as haem-bilirubin precursors in man indicate that the early labelled or shunt bilirubin consists of 2 fractions. One requires 1-24 hr. for max. synthesis, is not dependent on marrow erythropoietic haem synthesis, and is possibly of anabolic origin (formed by a direct pathway from haem precursors). The other fraction requires 3-4 days for max. production, is dependent on haem synthesis, and probably has its origin in the bone marrow as a degradation product of red cell haem. G.M.Lewis

5464. INVESTIGATIONS ON THE INFLUENCE OF HAEMIN AND HAEMIN DERIVATIVES ON THE NUCLEAR MAGNETIC RESONANCE OF WATER PROTONS. W.Schelen: *Biochim. biophys. Acta*, 1963, 66, 424-433 (Ftiaermakol. Inst. der E.M.Arndt-Univ., Greifswald, Germany) Effectiveness in influencing the relaxation increased in the order neutral ferricytochrome *c*, horse methaemoglobin, horse metmyoglobin, *Cheirognomus* metahaemoglobin, acidic ferricytochrome *c* and haematin. Haematin effectiveness was decreased by adsorptive bonding to polyvinylpyrrolidone. Influence on relaxation had magnetic and steric components, the latter being suggested to be a relative measure of accessibility of prosthetic groups in haemin deriv. Haemin groups in cytochrome *c* and *Cheirognomus* methaemoglobin were shown to be nearer the surface than those of horse methaemoglobin or metmyoglobin. By bonding ligands, especially F⁻, to horse methaemoglobin the influence of the Fe on relaxation was shown to depend on both magnetic moment and steric arrangement.

(German) B.M. Stevens
5465. SYNTHESIS OF UREA IN HUMAN FOETAL LIVER. G.La Torretta, D.Di Martino, C.Del Bianco, F.Colucci and V.Capano: *Biochim. appl.*, 1962, 9, 344-348 (Ist. Chim. Biol., Univ., Napoli, Italy) Human foetal liver at 7 months was able to synthesise urea from (a) carbamyl phosphate +ornithine +aspartic acid, (b) citrulline and aspartic acid and (c) carbamyl-aspartic acid and ornithine. (Italian) J.C.Crawhall

5466. OPHIDINE AND CARNOSINE ISOLATED FROM WHALE MUSCLE. K.Horisaka and A.Musashi: *J. Biochem.*, Tokyo, 1963, 53, 271-274 (Pharmacol. Inst., Schowa Med. Sch., Tokyo, Japan) 1.4 g. of cryst. carnosine and 4.4 g. of cryst. ophidine were prep, from 10 kg. of whale muscle. These substances were identified by means of salt formation, analysis and paper chromatography. The paper chromatogram showed that lysine, glutamic acid, aspartic acid, glycine, serine, threonine, proline, valine, alanine, 0-alanine, phenylalanine, leucine and creatine occurred in the free form.

(German) B.M.Stevens

ENZYMES

5467. COMPARISON OF NON-ENZYMIC AND ENZYMIC REACTION VELOCITIES. D.E.Koshland: *J. theor. Biol.*, 1962, 2, 75-86 (Brookhaven Nat. Lab., Upton, N.Y., U.S.A.) It is assumed that the

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function of a hypothetical enzyme is to bring together substrates and catalysts. Equations are derived and applied to measured values in sp. cases. If the function of an enzyme were an oriented juxtaposition of 2 substrate mol. only a small acceleration would occur. But if 2 substrates plus 3 catalysts are brought together, the ratio of enzymic to non-enzymic velocity is 10^{18} . J.A.Dawson

5468. QUANTITATIVE POTENTIALITIES IN ENZYME CYTOCHEMISTRY. MODIFIED MICHAELIS-MENTEN RATE LAW APPLICABLE WHEN A SUBSTRATE DIFFUSES SLOWLY INTO AN ENZYME SITE. D.G.O'Sullivan
J. theor. Biol., 1962, 2, 117-128 (Courtauld Inst. Biochem., Middx. Hosp. Med. Sch., London, England)

The theoretical possibility is discussed of eliciting information on kinetics of artificial substrate enzyme reactions *in situ*. Instruments enable accurate physical measurements of rates to be made. A process which rapidly attains a steady state can give quant. information. By modifying the Michaelis-Menten rate law, a slow penetration reaction with homogeneous distribution of enzyme, can also give information. J.A.Dawson

5469. LOCALISATION OF ENZYME ACTIVITY IN ELECTRIC ORGAN OF ELECTROPHORUS ELECTRICUS (L). A.G.E.Pearse and D.F.de Almeida: Exp. Cell Res., 1963, 30, 1-7 (Dept. Pathol., Postgrad. Med.

Sch., London, England) The main oxidative enzyme activities in the Sachs organ were cone, in the post, portion of the electroplate, and phosphorylase was present only in the ant. portion. It is suggested that the neutral polysaccharide (glycogen) in the ant. portion of the electroplate acts as the main source of energy for maintenance of electrical potential in the membrane, its breakdown product diffusing from the ant. portion across the electroplate to be utilised at the active post, membrane. K.Jones

5470. COMPUTER PROGRAMMES FOR PROCESSING ENZYME KINETIC DATA. W.W.Cleland: Nature, Lond., 1963, 198, 463-465 (Dept. Biochem., Univ. Wisconsin, Madison, Wis., U.S.A.) Enzyme kinetic data were analysed by the method of least square fits using a computer whose programmes were written in Fortran language to make least square fits to enzymic equations. Brief descriptions of the various programmes and their uses are presented. The method yields max. velocity values and K_m with standard errors of about 5-10% of the values themselves. Standard errors of inhibitor const. tend to be up to 20% of the const. values. J.R.Sargent

5471. PARAMAGNETIC RESONANCE OF FLAVO-ENZYMES. H.Kubo, T.Shiga, M.Uozumi and A.Isomoto: Bull. Soc. Chim. biol. Paris, 1963, 45, 219-231 (Lab. Physiol. physico-chim., Fac. Méd., Univ., Osaka, Japan) The electron spin resonance [ESR] of the flavo-enzymes D-amino acid oxidase and xanthine oxidase were determined. The ESR signal of flavins and flavo-enzymes was derived from the unpaired electrons of the isoalloxazine nucleus. Various synthetic model isoalloxazines were studied. Photochemical reduction of D-amino acid oxidase yielded a free radical. Reduction of xanthine oxidase gave rise to ESR signals from FAD free radical, Mo and Fe. The oxidation level of Mo was not altered during the oxidation of hypoxanthine. (French) j.C.Crawhall

5472. PREVALENCE AND SIGNIFICANCE OF THE PRODUCT INHIBITION OF ENZYMES. E.Frieden and

C.Walter. Nature, Lond., 1963, 198, 834-837 (Dept. Chem. and Inst. of Mol. Biophys., Florida State Univ., Tallahassee, Fla., U.S.A.) The frequency and importance of product inhibn. of numerous enzymes is emphasised. Product inhibn. was found to be usually of a non-competitive nature, a result which was predictable from kinetic analysis of the reactions involved. Non-competitive nature of product inhibn. causes an exaggerated quant. effect of products on enzyme reactions.

J.R.Sargent

5473. D-GLYCERALDEHYDE 3-PHOSPHATE DEHYDROGENASE. XDC. EFFECT OF SODIUM DODECYL SULPHATE [NaDS] ON ENZYME ACTIVITY AND STRUCTURAL PROPERTIES OF DEHYDROGENASES. P.ElBdi, G.Jécsai and P.Tóth: Acta physiol. Acad. Sci. hung., 1963, 23, 87-99 (Inst. Biochem., Hungarian Acad. of Sci., Budapest, Hungary)

NaDS inhibits both phosphoglyceraldehyde dehydrogenase and lactic dehydrogenase of muscle. NaDS inhibits the denaturing effects of urea and heat on the enzymes as measured by change in optical rotation. Absorption spectrum measurements at 220-245 my reveal that NaDS causes disorganisation of the protein structures with £ indicating an increase of vol. and hydration of the proteins. The role of hydrophobic factors in the maintenance of the native structure and biol. activity of the enzymes is discussed.

H. G. Bevan

5474. MULTIPLE MOLECULAR FORMS OF MALATE DEHYDROGENASES IN ECHINODERM EMBRYOS.

R.O.Moore and C.A.Villee: Comp. Biochem. Physiol., 1963, 9, 81-94 (Dept. Biol. Chem., Harvard Med. Sch., Boston, Mass., U.S.A.) The eggs of *Arbacia punctulata*, and the ovaries of *Asterias forbesi* or Teleophoretic analysis show 5 separate protein components differing in mobilities but all with 1-malic dehydrogenase activity. Further differences between these proteins are found to exist in their rates of reaction with pyridine analogues, with d- and 1-malate, in sensitivity to heat and in solubility in $(NH_4)_2SO_4$. After fertilisation 2 of these enzymes disappear, but one reappears after 12 hr. development. Malic dehydrogenase activity is also shown by other proteins with regard to d-malate but not 1-malate utilising the analogues of NAD, but not NAD alone.

M.S.Laverack

5475. STARCH GEL ELECTROPHORESIS OF MALATE DEHYDROGENASE. C.J.R.Thome, L.I.Grossman and N.O.Kaplan: Biochim. biophys. Acta, 1963, 73, 193-203 (Grad. Dept. Biochem., Brandeis Univ., Waltham, Mass., U.S.A.) Purified prep. of mitochondrial enzyme existed in up to 6 forms separable by electrophoresis at pH 7.0. The distribution pattern was unaffected by the age of the tissue of origin, the purification procedures and a no. of degradative treatments. Treatment with methyl iodide and urea did have some effect. After elution the components were shown to be relatively similar by catalytic criteria, but all differed from the pig heart supernatant¹ enzyme.

B.M.Stevens

5476. SUCCINOXIDASE SYSTEM OF BEGONIA LEAVES.

K. Sasaki: Bot. Mag. Tokyo, 1962, 75, 428-435 (Dept. Bot. Fac. Sci., Hokkaido Univ., Sapporo, Japan) The oxidising capacities of various fractions of leaf homo* genate of *Begonia sempervirens* on succinate, fumarate, malate and (X-ketoglutarate were investigated. An optimum pH for oxidation of these substances was 5.0. Succinoxidase activity in the paniculate fractions increased on ageing and was stim. by cytochrome c but strongly inhibited by azide and cyanide. Solubilisation

and activation of succinoxidase in the chloroplast fraction was effected by lipase treatment. Enzyme activity in the sol. fraction was less sensitive to the effects of azide and cyanide* N.J.Pinfield

5477. SUCCINATE TETRAZOLIUM REDUCTASE ACTIVITY IN DEVELOPING RAT THYMUS. A.L.Kahri, M.Hannuksela and E.O.Karharju: *Acta endocr. Kbh.*, 1963, 42, 564-570 (Anat. Dept., Univ., Helsinki, Finland) No change in the succinate tetrazolium reductase activity measured by optical density and histo-chem. methods was observed in the thymus of rats up to the 294th day after birth. H.B.Wayforth

5478. CYTOCHROME c-CYTOCHROME OXIDASE IN BIOLUMINESCENT FUNGI. E.A.Botan: *Nature, Lond.*, 1963, 198, 479 (AVCO Res. Divn., Med. Sci. Dept., Wilmington, Mass., U.S.A.) A pos. G-Nadi reaction for cytochrome oxidase is given by cultures of the bioluminescent fungi, *Panus stipticus*, *Armillaria mellea*, *A. fusipes*, *Mycena polygramma*, *ggocySe illudens* and *Collybia velutipes*. The reaction was inhibited by KCN or by heating the fungi to 60° for 15 min. G.M.Lewis

5479. SUCCINOXIDASE ACTIVITIES AND CYTO-CHROME OXIDASE OF EXTRACTS OF ASCARIS EGGS. E.Kmetec, P.C.Beaver and E.Bueding: *Comp. Biochem. Physiol.*, 1963, 9, 115-120 (Dept. Pediatrics, Western Res. Univ., Cleveland, Ohio, U.S.A.) Extracts were prepared from *A. lumbricoides* eggs homogenised in 0.1N H₂SO₄ after aerobic incubation for up to 120 days, or after anaerobic incubation in N₂ for up to 64 days. These extracts oxidised reduced cytochrome $\frac{1}{2}$ by a cyanide-sensitive pathway. In the presence of succinate these extracts also catalysed the reduction of added cytochrome $\frac{1}{2}$. The concn. of enzymes in extracts is sufficiently high to account for the rate of O₂ uptake in intact eggs. M.S.Laverack

5480. VALIDITY OF ELECTROPHORETIC DETERMINATION OF LACTIC DEHYDROGENASE ISOZYMES. N.Ressler, J.L.Schulz and R.R.Joseph: *Nature, Lond.*, 1963, 198, 888-889 (Dept. Med., Wayne County Gen. Hosp., Eloise, Mich., U.S.A.) Starch gel electrophoresis of kidney and liver homogenates was studied in buffers of different ionic strengths. Interactions between lactic dehydrogenase isoenzymes produced distorted patterns unless sufficiently concentrated, buffers were used. G.M.Lewis

^{81.} **AGAR-GEL EVIDENCE FOR ISOENZYMES OF DEHYDROGENASES USING NAD AND NADP.** G. Broun and S.Avrameas: *Bull. Soc. Chim. biol.*, Paris, 1963, 45, 233-245 (Inst. Rech. Sci. sur le Cancer, Villejuif (Seine), France) Dehydrogenase activity was determined by coupling the substrate reaction with NAD or $\frac{1}{2}$ ADP followed by the formation of formazans. Separation of the coenzymes was carried out by electrophoresis on agar gel. Various human plasma lactic dehydrogenases were demonstrated. Isoenzymes of lactic, malic, $\frac{1}{2}$ ocitric and p-hydroxybutyric acids were demonstrated in rat liver and the variation of pattern after hepatectomy and with hepatomas was studied. (French) J.C.Crawhall

^{82.} **ANAEROBIC REDUCTION OF BOVINE MILK XANTHINE OXIDASE.** D.A.Gilbert: *Nature, Lond.*, 1963, 198, 1175-1177 (Chester Beatty Res. Inst., Royal Cancer Hosp., London, England) Anaerobic reduction of milk xanthine oxidase depends on (1) the enzyme sample, (2) the enzyme concn., (3) the presence

of inhibitors such as ascorbate, sulphite, 8-hydroxy-quinoline, cyanide, (4) pH, (5) substrate concn. The finding that the anaerobic reduction of xanthine oxidase takes place in 2 stages is considered to reflect different reactivities of the 2 FAD groups in the enzyme, rather than the presence of active and inactive forms of the enzyme. J. R. Sargent

5483. [PURIFICATION AND SOME PROPERTIES OF] HYPOXANTHINE OXIDASE FROM BOVINE SMALL INTESTINE. G.G.Roussos: *Biochim. biophys. Acta*, 1963, 73, 338-340 (Res. Dept., V.A. Hosp., Kansas City, Mo., U.S.A.) Prelim, comm. B.M.Stevens

5484. OXIDATION OF ETHANOL BY A PEROXIDASE SYSTEM IN HOMOGENATES OF LIVER FROM RATS RECEIVING I.P. INJECTION OF ETHANOL. G.Griffaton and R.Lowy: *C.R. Soc. Biol.*, Paris, 1962, 156, 1982-1987 (Inst. Nat. d'Hyg., Hôp. Bichat, Paris, France) Rats received 1^{1/2}, 3 and 4^{1/2} g. ethanol/kg. 15 min. before killing. Ethanol and O₂ consumption of liver homogenate was measured for 1 hr. at 37° and pH 7^{1/2}. In rats receiving ethanol there was an increase in O₂ consumption compared with normal animals. 10mM AMP activated the system while 1mM CN⁻ inhibited it. (French) M.A.Price

5485. DENATURATION AND INACTIVATION OF ENZYME PROTEINS. XIII. KINETIC STUDIES ON THE HEAT DENATURATION OF BACTERIAL PROTEINASE N* AND ITS COMPLEX WITH DFP. L.Fuke: *J. Biochem.* Tokyo, 1963, 53, 304-313 (Dept. Biol., Fac Sci., Univ., Osaka, Japan) The heat denaturations did not follow simple first order kinetics. Expt. on the effects of NaCl soln, ionic strength on the denaturation indicated that the ionic process was an ion-ion reaction of ions with opposite signs*. Effects of ionic strength of phosphate soln. indicated that phosphate had a sp. effect as well as the ordinary ionic reaction. During denaturation the change in the heat of activation was small and the change in the entropy of activation quite large. B.M.Stevens

5486. CATALYTICALLY ACTIVE CENTRE OF LYSOZYME. N.A.Kravchenko, G.V.Kleopina and E.D. Kaverzneva: *Dokl. Akad. Nauk*, 1962, 144, 118-121. Lysozyme was extracted from the white of hens' eggs by direct crystn. It seemed certain that histidine does not enter into the content of the catalytically active centre of lysozyme. The mechanism of the action of 3-glucosidase, to which lysozyme is related, was found to differ from that of ribonuclease and enzymes of the protease and esterase type. (Russian) B.J.Cooper

5487. ACID HYDROLASES OF BEEF HEART MUSCLE, m. INTRACELLULAR DISTRIBUTION OF β -GLUCURONIDASE AND CATHEPSIN. N.Stagni, D.Romeo, G.L.Sottocasa and M.C.Pugliarello. IV. β -GALACOSIDASE ACTIVITY ASSOCIATED WITH BEEF HEART SARCOMAS. D.Romeo, N.Stagni, G.L.Sottocasa and B.De Bernard. V. CATHEPSIN, (3-GALACTOSIDASE AND 3-GLUCURONIDASE DISTRIBUTION IN SUBCELLULAR FRACTIONS SEPARATED BY CENTRIFUGATION OF HEART HOMOGENATES. G.L.Sottocasa, N.Stagni, D.Romeo and B.De Bernard: *G. Biochim. Biol.*, Univ., Trieste, Italy) m. The distribution of β -glucuronidase and cathepsin in nuclear, mitochondrial and supernatant fractions of beef heart homogenates was studied. The highest sp. activity for both enzymes was

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found in mitochondrial fractions, but expressed as a % of total enzymic activity, there was more (3-glucuronidase in nuclear fraction and more cathepsin in mitochondrial fraction. The enzymic activity of both nuclear and mitochondrial fractions was sensitive to Triton X-100, but in contrast the supernatant activity was not modified by addition of Triton X-100.

IV- 3^{Galactosidase} was present in beef heart homogenates and mitochondrial suspensions although the catalytic activity was partially masked, and was liberated by addition of Triton X-100. The enzyme was more sensitive to Triton X-100 than p-glucuronidase or cathepsin.

V. The sp. activity of 0-galactosidase was higher in mitochondrial suspensions than in the original homogenate. The distribution of these enzymes in nuclear and mitochondrial fractions after differential centrifugation showed a distribution pattern characteristic of each enzyme and distinct from succinoxidase a typical mitochondrial enzyme. It was concluded that the particles to which cathepsin, (3-galactosidase and g-glucuronidase were linked were distinct from mitochondria and probably their population was not homogeneous. B.Payne

5488. HISTOCHEMICAL STUDY OF HYDROLASES AND OXIDATIVE ENZYMES IN THE DEVELOPING RAT LIVER. W.Rossowski: Pozn. Towarz. Przyjaci. nauk, Wydz. lek., 1962, 22, 191-232 (Zatfad Histol. Prawitfowej i Embriologii Akad. Med., Poznań, Poland)

Lactic dehydrogenase [fl.succinic dehydrogenase [ID] and diaphorase [IE] were found in the liver mitochondria of the 12-14 day old rat foetus; at the same time acid phosphatase [IV] and non-sp. esterase [V] were revealed in the cytoplasmic granules. After the J.4th day of pregnancy the activity of ATPase [VI] and alk. phosphatase [VE] gradually increase with simult. increase in concn. of PAS-pos. compounds. Differential distribution of enzymes took place in the liver lobule 2-3 weeks after birth. The highest activity of H, IV, VI and VII was observed in the peripheral parts of the lobule. The cells close to the central vein were rich in I, III and V. (Polish) T.Qtebicki

5489. WHEAT LEAF PHOSPHATASES. VI SOME PROPERTIES OF THE ENZYME SYSTEM HYDROLYSING ADENOSINE 5'-PHOSPHATE AND PHENOLPHTHALEIN DIPHOSPHATE IN CRUDE JUICE PREPARATIONS.

D.W.A.Roberts: Canad. J. Biochem., 1963, 41, 1275-1281 (Plant Pathol. Section, Canada Agric. Res. Stn., Lethbridge, Alberta, Canada) In wheat leaf juice, an enzyme was demonstrated that hydrolysed p-glycerophosphate, together with another [E] that hydrolysed phenolphthalein diphosphate and AMP liberating orthophosphate. E was inhibited by 0.005M adenosine but not by 0.02M phosphate, and its inhibition by F" was smaller than the F" irihbn. of g-glycerophosphatase. E transferred phosphate from phenolphthalein diphosphate to adenosine to form AMP, and expt. indicated that there may have been more than one enzyme with different pH optima acting on these 2 substrates. A.M.Gibbins

5490. ENZYMIC HYDROLYSIS OF SODIUM PHENYL-PHOSPHATE. N.LRzhekhina: Biokhimia, 1963, 28, 321-325. Kinetics of Na phenylphosphate hydrolysis by alk. phosphatase from dog intestinal mucosa at 3 pH values (8.8, 9.4, 10.0) showed that a decrease in the pH of the reaction mixture was accompanied by a drastic decrease in the substrate concn. corresponding to the max. rate of hydrolysis. The expt. data were subjected to mathematical treatment, and kinetic equations were obtained. (Russian) B.J.Cooper

5491. EFFECT OF UNDERCUTTING ON THE AChase AND CHOLINE ACETYLTRANSFERASE ACTIVITY IN THE CAT *S CEREBRAL CORTEX. CO.Hebb, K.Krnjević and A.Silver: Nature, Lond., 1963, 198, 692 (A.R.C. Inst. Animal Physiol, Babraham, Cambridge, England) Slabs of cat cerebral cortex in the suprasylvian and pericruciate areas was undercut in such a way that the blood supply was not abolished. After 1-5 weeks, AChase and choline acetyltransferase activity of the fibres in the isolated area was markedly reduced, indicating that cholinergic fibres innervate cortical cells and probably travel from deep nuclei or cortical regions. G.M.Lewis

5492. ACETYLCHOLINESTERASE ACTIVITY OF MICE BRAIN TISSUE IN VITRO. E.Moerman: Arch. int. Pharmacodyn., 1963, 143, 287-297 (J.F. and C.Hermans Inst. Pharmacol., Univ. Ghent, Belgium) An automated potentiometric titration method is employed and described in detail. Enzyme inactivation by parathion deriv. is dependent on temp, and incubation time. S.E.Smith

5493. SPECIFIC ACh ACYL-HYDROLASES OF SHEEP BRAIN. K.Got and J.B.Polya: Nature, Lond., 1963, 198, 884-885 (Dept. Chem., Univ. Tasmania, Hobart, Australia) A procedure for the partial purification of cholinesterases from sheep brain is described*. The activity towards ACh, acetyl-3-methyl choline and benzoyl choline was in the ratio 1>0.04:0.01. After adsorption on diethylamine-cellulose ion exchange column* 2 active protein fractions were observed. Ultracentrifugation indicated a heterogeneous material. G.M.Lewis

5494. ENZYMIC PRODUCTION OF (+)-YTHREO-9,10-DIHYDROXYOCTADECANOIC ACID IN THE SPORES OF PLANT RUSTS. A.P.Tulloch: Canad. J. Biochem., 1963, 41, 1115-1121 (Nat. Res. Council Canada, Prairie Regional Laboratory, Saskatoon, Sask., Canada) An epoxide-hydrolysing enzyme system is present in the uredospores of Puccinia graminis Pers. f. sp. tritici Erikss. and Henn. race 15B and in the teliospores of Gymnosporangium clavigeriforme (Pers.) DC. Incubation of the spores results in a partial conversion of cis-9,10-epoxy octadecanoic acid, which is present in the spore oil as a glyceride, to (+)-threo-9,10-dihydroxyoctadecanoic acid*. A.M.Gibbons

5495. SOME PHYSICO-CHEMICAL PROPERTIES OF SULPHITE MODIFIED UREASE. L.W.Nichol and J.M.Creeth: Biochim. biophys. Acta, 1963, 71, 509-516 (Dept. of Phys. and Inorg. Chem., Univ. Adelaide, S. Australia) Urease in buffered SO₃²⁻ soln. sedimented as 1 boundary on ultracentrifugation. Analysis of die boundary shape showed the material to be essentially homogeneous in terms of S distribution. On electrophoresis, marked heterogeneity was apparent, -SSO₃²⁻ groups apparently being introduced on to the monomer. Unsymmetrical scission of S-S bonds. A cyclic mechanism was also indicated, whereby urease in SO₃²⁻ could be converted to an electrophoretically homogeneous modified form with a high mobility. Additional sedimentation velocity expt. confirmed the function of dissolved O₂ in this respect and in polymer formation in SO₃²⁻-free soln. B.M.Stevens

5496. INCREASED PLASMA ISOMERASE AND TRANSMINASE ACTIVITY IN MICE INFECTED WITH LA^ATIC DEHYDROGENASE-ELEVATING VIRUS. B.W.J.Mahy, C.W.Parr and K.E.K.ROWSOK: Nature, Lond., 1963, 198, 885 (Dep. Cancer Res., London Hosp. Med. Coll., London, England) Mice infected

with Riley virus showed a marked increase in plasma lactic dehydrogenase and phosphoglucose isomerase, a smaller increase in SGOT and SGPT, and no elevation in alk.-phenyl phosphatase or Hb.

G.M.Lewis

5497. SYNTHESIS AND DEGRADATION OF NATURALLY OCCURRING AMINES BY ENZYMIC TRANSAMINATION. K.Hasse and G.Schmid: Biochem. Z., 1963. 337, 69-79 (Inst. fur Organische Chem., Technische Hochschule, Karlsruhe, Germany) An enzyme prep. having a transaminase activity was obtained from peas, lupins, cauliflower, *tobacco* and *Neurospora crassa* by extracting homogenised plant tissues or freeze dried cells with phosphate buffer (pH 7-7.8). In enzyme assays *a*-ketoglutarate or pyruvate acted as acceptor of the amino group from a variety of mono- and polyamines. Effective donors of the amino group were glutamate and alanine. * (German) L.Cohn

5498. FORMAMIDINE GROUP TRANSFER IN EXTRACTS OF HUMAN PANCREAS, LIVER AND KIDNEY. J.B. Walker: Biochim. biophys. Acta, 1963. 73, 241-247 (Dept. Biochem., Baylor Univ. Coll. Med., Houston, Tex., U.S.A.) Activity in transferring formamidine to hydroxylamine was approx. equal in liver and kidney; pancreas was 5 times as active. Extracts of rat, rabbit and dog livers showed no activity; monkey liver had *bH* of the activity of human liver. Arginine, guanidinoacetate, 4-guanidinobutyrate and 3-guanidino-Propionate donated formamidine in descending order of activity. L-2-Amino-4-guanidinobutyrate and L-2-amino-3-guanidinopropionate had no donor activity. Ornithine, glycine and norvaline inhibited in descending order of effectiveness. Most of the reactions are suggested to be catalysed by L-arginine: glycine amidotransferase. Several methods of assaying amidotransferase in the presence of high levels of arginase are described. Two models are suggested to explain the observed "ibn".

B.M. Stevens

5499. SEPARATION OF BOVINE LENS CARBONIC ANHYDRASE INTO TWO COMPONENTS. M.Sen. S.M.Drance and V.R.Woodford: Canad. J. Biochem., 1963, 41, 1236-1241 (Biochem. Dept., Univ. Saskatchewan, Saskatoon, Sask., Canada) Two components of carbonic anhydrase were separated m. Partially purified forms from the sol. proteins of bovine lens. During the chromatographic separation on diethylaminoethyl cellulose columns, the total carbonic anhydrase increased, on an average, 9-fold. The bovine lens carbonic anhydrase may exist in the form of 2 iso-enzymes and there may be a naturally occurring inhibitory mechanism in vivo regulating the activity of bovine lens carbonic anhydrase in situ. A.M.Gibbins

5500. PURIFICATION AND SOME PROPERTIES OF LACCASE FROM *LYCOPRUS VERSICOLOR*. R-Mosbach: Biochir. biophys. Acta, 1963. 7* 204-212 (Enzyme Chem Group Inst. Biochem., Univ., Uppsala, Sweden) Two forms, A and B, were purified from the culture medium, after induction with 2.5-xylose, by (NH₄)₂SO₄ PPtN, chromatography on hydroxylapatite to remove contaminating pigments and *z*-one electrophoresis which separated the 2 forms. The 2 forms could also be separated by chromatography on diethylaminoethylcellulose. The A form gave a single symmetrical peak on free electrophoresis and both forms gave single symmetrical peaks on ultracentrifugation. The mol. wt. of laccase > was approx. 60000. It contained 14% carbohydrates and 0.44% Cu, corresponding to

4 atoms Cu/mol. The absorption spectra of the 2 forms were almost identical but laccase B had a lower sp. activity than laccase A.

B.M.Stevens

5501. DENITRIFICATION. VII. FURTHER PURIFICATION AND PROPERTIES OF DENITRIFYING ENZYME. H.Iwasaki, S.Shidara, H.Suzuki and T.Mori: J. Biochem. Tokyo, 1963, 53, 299-303 (Biol. Inst., Fac. Sci., Univ., Nagoya, Japan) An ultracentrifugally homogeneous prep. was obtained from cells of a strain of denitrifying bacterium by (NH₄)₂SO₄ fractionation and column chromatography on Amberlite CG-50 and CMcellulose. The prep. had absorption max. at 280 and 594 mp with a shoulder at approx. 290 nm and plateaux at approx. 750-780 and 460-480 mji in the oxidised state. There was no visible absorption in the reduced state. *J₂* was 6.46 and the diffusion coeff. 4.00 x 10⁻⁷ sq. cm./sec. giving a mol. wt. of 149000. Cu seemed to be the metal constituent. B.M. Stevens

5502. VARIATION OF ENZYME ACTIVITIES IN ERYTHROCYTES AT DIFFERENT AGES. RELATION BETWEEN ENZYME ACTIVITY AND ENERGY BALANCE. G.Budillon, A.Di Simone and A.Castellana: Biochim. AppL, 1962, 9, 323-327 (Ist. Patol. Spec. Med. e Metodol. Clin., Univ. Napoli, Italy) The enzyme levels of glyceraldehyde-3-P_O dehydrogenase [GAPDfl, 3-phosphoglycerokinase [3PGAK], pyruvate kinase [PK] and creatine phosphokinase [CPK] were studied in the r.b.c. of rabbits rendered anaemic by acetylphenylhydrazine. PK and CPK were increased during reticulocytosis whilst GAPDH and 3PGAK remained unchanged. (Italian) J.C.Crawhall

NUTRITION

5503. NUTRITIONAL REQUIREMENT OF YEASTS *SCHIZOSACCHAROMYCES ACIDODEVORATUS* DECOMPOSING 1-MALIC ACID. S.Bujak and W.Dabkowski: Acta microbiol. poL, 1962, 11, 373-382 (Wyzsza Szkoła Rolnicza, Lublin, Poland) *S. acidodevoratus* decomposed malic acid in the presence of amino acids, adenine, guanine or uracil as sole N-source provided pantothenic acid was added. d-Malic acid was decomposed to a slight extent.

(Polish) M.Korbecki

5504. COMPOUND MOUSE DIETS. W.Lane-Petter and G.Porten: Nature, Lond., 1963, 198, 1013-1014 (Lab. Animals Centre, M.R.C.Lab., Carshalton, Surrey, England) Four commercially available mouse diets were assessed in CBA mice observed through 5 gestation periods. It was concluded that there is as yet no ideal standardised and efficient mouse diet. G.M.Lewis

5505. EFFECT OF ALACREATINE ON THE RAT. C.Fitch and J.S.Dinning: Nature, Lond., 1963, 198, 1003 (Dept. Biochem., Univ. Arkansas Sch. Med., Little Rock, Ark., U.S.A.) A weakness which developed in rats fed alacreatine is due to an impurity, possibly an isothiourea or guanidine deriv. G.M.Lewis

5506. CALORIFIC NUTRITIONAL STATUS OF CHILDREN AND OLDER PUPILS IN CATANIA. M.Proja and D.Marletta: Quad. Nutr., 1*63, 22, 119-126 (Clinica Pediatrica, Univ., Catania, Italy) The use of

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measuring the skin-fold thickness of the right subscapular and right tricipital area with Harpenden calipers, as a measure of calorific nutrition, was evaluated using 2259 children of both sexes between 6-11 yr. old, and comparing the results with these published in the literature. The results compared well. (Italian) G.N.Godson

5507. NUTRITIONAL STATUS OF ITALIAN SCHOOL CHILDREN. IV. NUTRITIONAL STATUS OF PUPILS FROM TWO RURAL COMMUNITIES IN CENTRAL ITALY. G.Ferro-Luzzi and M.Proja: Quad- Nutr., 1963, 22, 114-118 (Ministers della Sanitos, Serv. Nutr., Rome, Italy) 589 children, 6-11 yr. old, living in 2 agricultural centres in Central Italy, were examined for their nutritional status using clinical examination and anthropometric measurement of skin thickness. The results of the anthropometric method agreed well with the clinical evaluation. The nutritional status of the communities was satisfactory. (Italian) G.N.Godson

5508. NUTRITIONAL STATE OF ITALIAN SCHOOL COMMUNITIES, m. NUTRITIONAL STATE OF CHILDREN BOARDING IN THREE PERMANENT ROMAN SCHOOLS. A.Ferro-Luzzi: Quad. Nutr., 1963, 22, 106-113 (1st. Nazionale della Nutrizione, Rome, Italy) The nutritional status and health of 596 children between 3-14 yr. old boarding in at a school in Rome was examined. Their nutritional status was satisfactory, but when compared with boarding out schools in Rome corresponded to the nutritional status of children from a group between the high and medium economic levels. Caries and cheilosis was present in a % of cases, 31% and 12% respectively of the children. Obesity was present in only 2P/o. (Italian) G.N.Godson

5509. FOOD INPUT AND ENERGY EXTRACTION EFFICIENCY IN CARASSIUS AURATUS. P.M.C.Davies: Nature, Lond., 3963, 198, 707 (Dept. Zool., Trinity Coll., Dublin, Ireland) In goldfish under controlled conditions, a pos. correlation was observed between food input and extraction efficiency, within the limits of 1-5 mg. dried worm/g./fish/day. G.M.Lewis

5510. EFFECTS OF FEEDING QXYTETRACYCLINE TO PIGS AND WHITE RATS. P.J.S.Pieterse: S. Afr. J. agric. Sci., 1963, 6, 47-53 (Agric. Res. Inst. Highveld Region, Potchefstroom, S. Africa). I.A.B.S.

5511. CHEMICAL COMPOSITION OF MACKEREL (RASTRELLIGER CANAGURTA) AND CHANGES IN THE NUTRITIVE VALUE DURING STORAGE. DJ.Nazir and N.G.Magan Indian J. Technol., 1963, 1, 247-249 (Dept. Biochem., Inst. Sci., Bombay, India). I.A.B.S.

5512. CENTRAL NERVOUS EFFECT OF CARDIOPATHOGENIC DIET. LDési, L.Nikolits and J.Sós: Acta physiol. Acad. Sci. hung., 1963, 23, 205-210 (Inst. Pathophysiol. Med. Univ., Budapest, Hungary)
Rats fed on a diet containing cholesterol, protein, vit. D2# Na, Cl, Ca and P in excess but with little K or Mg died of myocardial infarction in 5-6 weeks. From the first week on the diet the e.e.g. showed increased spontaneous and electrically evoked excitatory activity. Cond. refl. began to diminish in spite of daily reinforcements. H.G.Bevan

5513. CARBOHYDRASE ACTIVITY OF RUMEN ENTDINUM SP. FROM SHEEP ON A STARCH-FREE DIET. R.W.Bailey and R.T.J.Clarke: Nature, Lond., 1963, 198, 787 (Plant Chem. Divn., D.S.I.R., Palmerston

North, New Zealand) E.ovinum* E.lip inflatum, E.indicum, E.biconcavum and E.bicarinatum together made up 80% of the rumen protozoa in a sheep grazing rye grass. Extracts of the Entodinium hydrolysed amylose and amylopectin, xylan and arabinoxylan, laminarin and cellobextrins, maltose, laminaribiose and sucrose, but not cellobiose, g-glucosides, a- and 3-galactosides, pectin and native cellulose. G.M.Lewis

5514. INFLUENCE OF MOLASSES AND MAIZE MEAL AS SOURCES OF CARBOHYDRATE ON UTILISATION OF UREA BY BOVINES. P.J.S.Pieterse and S.A.OosthuizeB S. Afr. J. agric. Sci., 1963, 6, 149-154 (Landbouwvarsings-inst., Hoeveldstreek, Potchefstroom, S. Africa). I.A.B.S.

5515. ACTION OF HERBS AND ROOTS OF ARTICHOKE (CYNARA SCOLYMUS L.) AND CARDOONS (CYNARA CARDUNCULUS L.), ON THE DEVELOPMENT OF EXPERIMENTAL ATHEROSCLEROSIS IN WHITE RATS. L.Samochowiec: Dissert, pharm., 1962, 14, 113-122 (ZaHId Farmakologii, Słaska Akademia Medyczna, Zabrze-Rokitnica, Poland) The addition of powdered dried artichokes and cardoons to both basic and sclerogenic diets in rats decreased the serum levels of cholesterol, lipid-P, glycoproteins and 3 -globulin. The results were confirmed by the histopathological examination and post-mortem analysis. The anti-atherosclerotic action of artichokes and cardoons is probably due to the presence of cynarin. (Polish) J.Baraińska

5516. INFLUENCE OF ATHEROGENIC DIET AND ARTICHOKE (CYNARA SCOLYMUS L.) AND CARDOONS (CYNARA CARDUNCULUS L.) ON THE HISTOPATHOLOGY OF CORONARY ARTERIES AND MYOCARDIUM IN WHITE RATS. L.Samochowiec, D.Habczyńska and Cz.Wazna-Boguńska: Patol. pol., 1962, 13, 337-348 (Zaltfad Farmakologii, Słaska Akad. Med., Zabrze-Rokitnica, Poland). M.Korbecki

5517. EGG YOLK AND SERUM CHOLESTEROL LEVELS-IMPORTANCE OF DIETARY CHOLESTEROL INTAKE. V.M. Wells and B.Bronte-Stewart: Brit. med. J., 1963, i, 577-581 (Dept. Med., Univ., Capetown, S. Africa) Consumption of egg yolk lipid, which has a relatively high I2 value and polyunsat. fatty acid content, results in rapid rise of serum cholesterol in man. Activity resides in the acetone fraction, but neither the unsaponifiable nor the saponifiable fraction cause the rise when fed separately only when given together. A delay of 6 hr. between feeding the fractions much decreases their effect. The effects of the unsaponifiable fraction can be reproduced by cholesterol and that of the saponifiable fraction by fat of similar iodine value to that of egg yolk. Giving oils of high iodine value with cholesterol has no effect. The range of intake of cholesterol required to produce the effect was 40-500 mg. daily, which is below the normal intake per day in non-vegetarian diets. M.E.Nutt

5518. INFLUENCE OF INOSITOL HEXANICOTINIC ESTER ON HEPATIC NAD, IN CHOLESTEROL STEATOSIS OF THE LIVER. F.Melani, P.Chiarini and L.Donnini: Sperimentale, 1963, 113, 54-60 (1st. de Semeiotica Med., Univ., Firenze, Italy) When 1 g/day of cholesterol was added to the diet of rabbits, there was a decrease in concn. of liver NAD and NADH2- After 15 days the NAD and NADH2 had fallen by 16.6 and 8.8% respectively with no signs of "steatosis". After 90 days they had fallen by 62.2 and 50.4% respectively and signs

of steatosis had appeared. Oral administration of 1 g./day of inositol hexanicotinic ester at the same time as cholesterol feeding protected the liver from NAD and NADH₂ depletion.. This protection was complete at 15 days, but after 90 days the loss was 30% and 29*5% respectively and some signs of steatosis had appeared in the liver.

(Italian) G.N.Godson

5519. SERUM HEXOSAMINE AND HYDROXYPROLINE IN PULLETS FED AN ATHEROGENIC DIET.

K.Kowalewskfc Arch. int. Physiol., 1962, 70_f, 631-635 (Surgical-Medical Res. Inst., Univ. of Alberta, Edmonton, Alberta, Canada) Pullets aged 10 days were fed an atherogenic diet containing 2% cholesterol and 5% olive oil. Serum hexosamine increased in all birds, in comparison with controls, within 20-100 days. The hydroxyproline content of serum was lower in birds in the atherogenic diet than in controls during the first half of the 100 day expt., but later rose to a normal value. The hexosamine¹hydroxyproline ratio was elevated in all birds on the diet. Results agree with those reported on atherosclerosis in mammals.

M.E.Nutt

5520. VARIATIONS OF LIPID FRACTIONS IN THE PLASMA AND R.B.C. OF HYPERCHOLESTEROLAEMIC ANIMALS. D.Gianieri: Biochim. appl., 1962, 9, 261-267 (1st. Chim. Biol. Univ., Roma, Italy)

Rabbits fed cholesterol and Tween 80 showed an increase of total lipids and free and combined cholesterol in Plasma. R.b.c. cholesterol did not rise.

(Italian) J.C.Crawhall

5521. UPTAKE OF PHOSPHORUS-32 BY BRAIN MICROSOMAL PHOSPHATIC ACID IN RATS DEFICIENT IN ESSENTIAL FATTY ACIDS. G.G.de Pur and F.D.Collins: Nature, Lond., 1963, 198, 788-789 (Russell Grimwade Sch. Biochem., Unjy. Melbourne, Australia) ACh stim. the uptake of ³²P into phosphatidic acid in normal rat brain microsomes but not in those from rats deficient in essential fatty acids, whose rate of uptake without ACh was of the same order as that by normal microsomes with ACh. This could be due to weakening of the lipoprotein microsomal membrane in deficient animals.

G.M.Lewis

5522. ANALYSIS OF EDIBLE OILS CONTAMINATED WITH SYNTHETIC ESTER LUBRICANTS. G.B.Crumpe Analyst, 1963, 88, 456-465 (Shell Res. Ltd., Thornton Res. Cen., P.O.Box 1, Chester, England).

I.A.B.S.

5523. SKELETAL MODIFICATION IN RATS FED WITH UNBALANCED PROTEIN DIETS. E.Turolia, C.Bertazzoli and T.Chieli: Sperimentale, 1962, 112, 467-484 (Lab. di Richerche di Microbiol. and Chemothropia, 'Farmitalia', Milan, Italy) Young rats were fed on an unbalanced protein diet, either hypo-proteinic (6-7% protein or less), or hyperproteinic and hyper-slycidic (25-8% protein). The body and bone growth rate, histoenzymology, histology and the Ca and P content of the skeleton, were similar in both groups of rats, but in the hypoproteinic group there was an inhibn. of growth cartilage proliferation and endochondral and periosteal osteogenesis and a reduction in bone-turnover. These Riost probably result from a reduced protein synthesis, other than a primary endocrine change.

(Italian) G.N.Godson

5524. PROTEIN SUPPLEMENTATION OF RYE FLOURS WITH SOME OTHER FOOD PRODUCTS. W.Szktffedz-iowa: Roczn. Państ. ZaW. Hig., 1962, 13, 415-425 (ZaWad Higieny Zywienia PZH, Warszawa, Poland)

Addition of meat or milk increased satisfactorily the nutritive value of rye flour, in white rats. No such results were observed upon the addition of vegetables. The results of the growth test were confirmed by the chem. determination of amino acid composition of the diets, performed after Block and Mitchell.

(Polish) T.Qlewicki

5525. INHIBITION OF ERYTHROPOIESIS AFTER DEPRIVING MALE RATS OF VARIOUS ESSENTIAL AMINO ACIDS. A.Aschkenasy: OR. Soc. Biol., Paris, 1962, 156, 1971-1976 (H6p. de la Pitie, Paris, France)

Rats deprived of essential amino acids for 7 days showed a reduction in erythropoiesis as shown by a comparative study of blood reticulocytosis and ⁵⁹Fe incorporation into r.b.c. Deprivation of isoleucine and S amino acids produced the greatest reduction. During amino acid deficiency there was a retention of ⁵⁹Fe in bone marrow. Accumulation of ⁵⁹Fe in liver was marked during methionine and cystine deficiency.

(French) M.A.Price

5526. CHANGES IN THE FIBROUS COMPONENT OF COLLAGEN AND DEVELOPMENT OF MACROPHAGE GRANULOMA IN RATS FED ON A RESTRICTED OR HYPOPROTEIN DIET. F.Farabolini and G.G.Tedeschi: Quad. Nutr., 1963, 22, 127-134 (1st. Fisiol. Gen. e Clin. Biologica, Univ. Camerino, Italy) After 27

days, the body wt. of rats maintained on a low protein diet, was 78% less than that of control animals fed on an unrestricted semisynthetic diet. Animals kept on a restricted diet (1/3 normal diet) had lost 25% of their initial body wt. after 27 days. However, granulomata had developed in all groups of animals but this was greatest in the hypoproteic group and affected particularly the collagenic fibrous component.

(Italian) G.N.Godson

5527. NITROGEN METABOLISM IN COLD-EXPOSED RATS. J.R.Beatore Canad. J. Biochem., 1963, 41, 1169-1179 (Defense Res. Med. Lab., Box 62, Station K, Toronto, Ontario, Canada) Exposure of c? albino rats to cold (2-3°) for a 7-day period increased amino acid catabolism, and consequently reduced protein synthesis in the period 1-5 days inclusive, despite a marked increase in food intake. Cold exposure was without effect on protein absorption but after 24 hr. in the cold the amount of N appearing in the urine increased from 55% (at 22°) to about 76% of that absorbed. N retention was not affected during the first 24 hr. of cold exposure, but its subsequent reduction appeared to bear a relationship to liver enzyme activity changes, particularly to increased activities of liver transaminases and arginase.

A.M.Gibbins

VITAMINS

5528. DETERMINATION OF VITAMIN A IN WHOLE BLOOD. V.A.Karpacheva: Biokhimiia, 1963, 28, 204-209.

A new method was devised for carotene and vit. A assay in whole blood. Saponification is followed by pptn. of sterols by digitonin at pH 1⁴, ensuring direct spectrophotometry of vit. A and carotene by extraction of these alone. Hb does not interfere with the spectrophotometry.

(Russian) BJ.Cooper

5529. EFFECT OF EXCESS VITAMIN A ON THE OXYGEN CONSUMPTION OF YOUNG FEMALE RATS.

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M.M.Sampson, E.Carpenter and R. Wight: J. exp. Zool., 1962, 151, 279-285 (Dept. ZooL, Smith Coll., Northampton, Mass., U.S.A.) Hypervitaminotic-A rats receiving not more than 200 LU./g. body wt. consumed less O₂ than litter mate controls. Rats receiving from 300-525 LU./g. body wt. consumed more O₂ than litter mate controls. The increased O₂ consumption on high vit. A diet supports the histol. evidence of an increase in thyroid activity. R.J.Walker

5530. METABOLIC ACTIVITIES OF VITAMIN A AND RELATED COMPOUNDS IN ANIMALS- I ROLE OF VITAMIN A IN INTESTINAL MUSCULAR CONTRACTION. F.Fujita, Y.Sahashi, T.Suzuki, K.Heno and H.Sone: J. Vitaminol., 1962, 8, 268-274 (Lab. Vet. Physiol., Azabu Vet. Univ., Sagamihara, Fuchinobe, Kanagawa-ken, Japan) Isolated segments of rat small intestine were perfused with Tyrode's soln. and the action of vit. A and related compounds was tested using a kymograph. Free vit. A alcohol and vit. A aldehyde both increased the rate of intestinal movement but the acetate had little effect. Vit. A acid was inhibitory. No activity was observed with β -carotene but vit. A alcohol derived from β -carotene showed activity. It is suggested that free vit. A alcohol may be linked to the intermediate source of H transfer for muscular work in intestinal tissue. E.Parkinson

5531. MODE OF ACTION OF EXCESS VITAMIN A. Vn. CHANGES IN FINE STRUCTURE OF ERYTHROCYTES DURING HAEMOLYSIS BY VITAMIN A. A.M.Glauert, M.R.Daniel, J.A.Lucy and J.T.Dingle: J. cell Biol., 1963, 17, 111-121 (Strangeways Res. Lab., Cambridge, England) Suspensions of rabbit r.b.c. in NaCl were treated with an ethanolic soln. of vit. A and studied by phase control, or fixed in OsO₄ for E.M. study. Within 1 min. the surface of the r.b.c. is greatly increased and large indentations appear from which vacuoles are formed by a micro-pinocytosis like process. Hb is lost through breaks in the cell membrane and cell ghosts are produced containing numerous vacuoles. The effect of vit. A on the lipoprotein membrane is discussed. P-Barrow

5532. INFLUENCE OF VITAMIN A ON VARIOUS ENZYME ACTIVITIES. N.Sozio and A.Patimo: Biochim. appl., 1962, 9, 328-332 (Ist. Patol. Med. e Metodol. Clin., Univ., Bari, Italy) Rabbits were inj. daily with vit. A (100000 I.U.) serum GOT increased 5-fold from the 15-30th days. A lesser increase was observed in serum GPT levels. (Italian) J.C.Crawhall

5533. THIAMINE CONTENT IN AUTOLYSATES OF WINE- AND BEER-SEDIMENT-YEASTS. J.Jakubowska and D.Kusewicz: Acta Microbiol. pol., 1962, 11, 363-372 (Katedra Mikrobiol. Technicznej, Politechnika Szczecinska, Poland) The max. amount of thiamine i.e. 0.68 mg. of dry wt. was reached in the brewery yeast autolysate after 24 hr., whereas in the wine yeast autolysate max. concn. i.e. 0.21 mg./g. of dry wt. was attained after 20 hr. (Polish) M.Korbecki

5534. HYDROLYSIS OF THIAMINE PHOSPHATE ESTERS. F.Riva, D.Giarnieri and L.Hammady: G. Biochim., 1962, 11, 346-351 (Ist. Chim. Biol., Univ., Rome, Italy) Hydrolysis of the phosphate esters of thiamine was studied at varying pH and at temp. of 100°. The triphosphate ester was the most labile especially at low pH values, and the monophosphate was relatively stable. After prolonged incubation and at pH values greater than

9, the thiamine heterocyclic nucleus was broken down. The data is of interest in assessing optimum conditions for extraction of biol. materials for analysis. B.Payne

5535. ACTION OF PHOSPHATE ESTERS OF THIAMINE ON THE α -CARBOXYLASE OF WHEAT GERM. D.Giarnieri and R. Strom: G. Biochim., 1962, 11, 341-345 (Ist. Chim. Biol., Univ., Rome, Italy) Thiamine diphosphate is the coenzyme of purified α -carboxylase obtained from wheat germ. The mono and triphosphate esters of thiamine did not exert any co-enzymic or inhibiting action on α -carboxylase. B.Payne

5536. BIOSYNTHESIS OF THIAMINE. IV. INHIBITION BY VITAMIN B₆ COMPOUNDS. L.M.Lewin and G.M. Brown: Arch. Biochem., 1963, 101, 197-203 (Div. Biochem., Dept. Biol., Massachusetts Inst. Technol., Cambridge, Mass., U.S.A.) A novel method for the synthesis of the mono- and pyrophosphate esters of 2-methyl-4-amino-5-hydroxymethylpyrimidine is described. Inhibn. by BQ compounds due primarily to inhibn. by pyridoxal phosphate of the enzymic reaction in which thiamine monophosphate is formed from the monophosphate ester of 4-methyl-5-(2-hydroxyethyl)thiazole and the pyrophosphate ester of 2-methyl-4-amino-5-hydroxymethylpyrimidine. Kinetic expt. indicated that the inhibn. was a mixture of non-competitive inhibn. and a partially competitive inhibn., the pyridoxal phosphate competing with the pyrophosphate of 2-methyl-4-amino-5-hydroxymethylpyrimidine. B.M. Stevens

5537. POSSIBLE INVOLVEMENT OF AN AMINO DE-CARBOXYLASE IN THE STIMULATION OF THE PERICARDIAL CELLS OF PERIPLANETA. K.G.Davey: J. exp. Biol., 1963, 40, 343-350 (Zool. Lab., Univ., Cambridge, England) Semicarbazide and INH, which are both inhibitors of phosphopyridoxal-dependent systems, inhibit the increase in rate in isolated hearts which is brought about by breis of corpora cardiaca. This inhibn. is partially reversed by phosphopyridoxal. The increase in rate brought about by dopa is mediated by the pericardial cells and inhibited by semicarbazide. The hormone from the corpus cardiacum probably stimulates the pericardial cells to produce an amine from an amino acid by bringing into play the appropriate decarboxylase. A.J.Martin

5538. ISOLATION OF CARBON-14 LABELED PYRIDOX-AMINE FROM CANDIDA UTILIS ATCC 9950. K.D.Lunan and C.A.Wests Arch. Biochem., 1963, 101, 261-268 (Dept. Chem., Univ. California, Los Angeles, Calif., U.S.A.) The entire cellular pyridoxamine content was isolated by ion exchange chromatography. Pyridoxamine was isolated and identified by comparison of chem., physical and biol. prop. with authentic pyridoxamine. Pyridoxamine and pyridoxal were the only substances found in *C. utilis* extracts which promoted growth of a vit. BQ requiring *Streptococcus faecalis* mutant. When *C. utilis* was grown with sucrose as C source in the presence of [3-14C]serine, [1-14C]alanine, [1-14C]acetate or [2-14C]acetate, [14C]pyridoxamine was isolated and recrystallised to const. sp. activity after addition of carrier pyridoxamine. Amounts of 14C incorporated were low. B.M.Stevens

5539. BIOCHEMICAL FUNCTION OF BIOTIN. V. FURTHER STUDIES ON g-METHYLCROTONYL-CoA CARBOXYLASE. R.H.Himes, D.L.Young, E.Ringel-Mann and F.Lynen: Biochem* Z., 1963, 337, 48-61 (Max Planck-Inst. fdr Zellchemie, Mtlnchen,

Germany) 0-Methylcrotonyl-CoA carboxylase was isolated from Achromobacter by repeated pptn. with $(\text{NH}_4)_2\text{SO}_4$ and chromatography on DEAE cellulose. This enzyme showed one boundary in the analytical ultracentrifuge, contained one mol. biotin/184000 g. protein and was inactivated by iodoacetamide, N-ethylmaleimide and p-chloromercuribenzoate. Incubation of the enzyme with ³²ATP, KHCO_3 and MgCl_2 produced a carboxylated enzyme which could be isolated by elution from Sephadex G-50. Transfer of the 'active' CO_2 to P-methylcrotonyl-CoA occurred in the absence of ATP and MgCl_2 . L.Cohn

5540. NIACINOPEN-HYDROLYSING ENZYME IN EXTRACTS FROM RICE SEEDLINGS. H.P.Ghosh, P.K. Sarkar and (the late) B.C.Guha: *Nature*, Lond., 1963, 198, 484-485 (Dept. Appl. Chem., Univ., Calcutta, India) An enzyme in phosphate buffer extracts of rice seedlings, partially purified by pptn. with $(\text{NH}_4)_2\text{SO}_4$ and protamine, catalyses the release of nicotinic acid from niacinogen. The optimum pH was 5.5 and substrate concn. greater than 1M inhibited the enzyme, which was also inhibited by Fe^{2+} and Zn^{2+} , Hg^{2+} and Cu^{2+} ions, p-chloromercuribenzoate, and NaF. It was present in both microsomal and supernatant fractions and caused the synthesis of labelled NAD when incubated with [14C]-nicotinic acid, 5-phosphoryl-ribose-1-pyrophosphate, ATP, Mg, glutamine and glutathione. G.M.Lewis

5541. INFLUENCE OF SOME 4-AMINO ANALOGUES OF TETRAHYDROFOLATE COENZYMES ON PURINE BIOSYNTHESIS. V.Slavíková and K.Slavík: *Biochim. biophys. Acta*, 1963, 71, 604-608 (Inst. Haematol. and Blood Transfusion, Charles Univ., Prague, Czechoslovakia) Aminopterin and other 4-amino folic acid coenzyme analogues did not appreciably inhibit inosinate biosynthesis in pigeon liver. Tetrahydroaminopterin and some of its deriv. substituted for the tetrahydrofolate coenzymes in both transformylation fractions of purine biosynthesis. The deamination of tetrahydroaminopterin and its deriv. to tetrahydrofolate impounds could not be established. B.M. Stevens

5542. CATALYSIS OF THE AUTO-OXIDATION OF 2-MERCAPTOETHANOL AND OTHER THIOLS BY VITAMIN B12 DERIVATIVES: POLAROGRAPHIC AND OTHER INVESTIGATIONS. J.L.Peel: *Biochem. J.*, 1963, 88, 296 (Agric. Res. Council Unit Microbiol., Univ. Sheffield, England) At pH 7, 13 vit. B12 deriv. at concn. of 10 μM or less catalysed the auto-oxidation of 2-mercaptoethanol to the disulphide form, the kinetics of the reaction have been examined with a Polarographic method suitable for following O_2 uptakes of a few min. duration. Catalytic activities of vit. B12 deriv. cover a 12000-fold range from dimethylbenzyl-Udazolylcobamide coenzyme (least active) to Factor B (most active). The reactiori's completely inhibited by ImM-KCN but is unaffected by ImM-EDTA . Catalysis was observed with 7 thiols; dihydro-6-thioctic acid was the most active. Implications and applications of these fractions are discussed.

5543. INFLUENCE OF VITAMIN B12 ON THE CONTENT OF GLYCOGEN IN LIVER AND MUSCLES OF MICE. ty.Krashile 'pozn' Towarzy. Przyjac nauk, Wydz. lek., 1962, 23, 169-199 (II. Klin. Chorób Wewngtrznych, Akad. Med., Poznań, Poland) In mice the s.c. administration of 5 mg vit. B12 twice a week had no effect upon the level and distribution of glycogen in

muscles and liver. Vit. B12 prevented the decrease in glycogen level under anaerobic conditions and after 1 hr. swimming. (Polish) T.Qlebicki

5544. SOME REACTIONS OF VITAMIN B12 COENZYME. A.W.Johnson and N.Shaw: *J. chem. Soc.*, 1962, 4608-4614 (Dept. Chem., Univ., Nottingham, England) Several reactions of the vit. B12 coenzyme were described and interpreted in the light of the structure determined recently by X-ray crystallography. The novel Co-C linkage was easily broken by the action of CN^- , dil. mineral acids or light, and in the latter case it was suggested that a nucleoside free radical was obtained which underwent intramolecular cyclisation. L.G. Gillies

5545. ASCORBIC ACID IN CHLOROPLASTS. B.J.Constable: *Nature*, Lond., 1963, 198, 483-484 (Dunn Nutr. Lab., Univ., Cambridge, England) Chloroplasts were prep. from Iris leaves by differential centrifugation of a homogenate in liquid paraffin. The concn. of ascorbic acid in the chloroplasts was similar to that in the cell sap; it was freely diffusible across the chloroplast membrane when chloroplasts were washed with NaCl. G.M.Lewis

5546. STUDIES IN ASCORBIGEN. I. SURVEY OF OCCURRENCE AND DISTRIBUTION OF ASCORBIGEN IN PLANTS. S.Bose and B.C.Guha: *Ann. Biochem.*, 1963, 23, 149-158 (Dept. Chem., Argonne Nat. Lab., Illinois, U.S.A.) L.Barnes

5547. INCREASE OF ASCORBIC ACID IN CAULIFLOWER DURING BLANCHING. M.C.Malakan: *Nature*, Lond., 1963, 198, 994 (Dept. Appl. Chem., Univ. Coll. Sci. and Technol., Calcutta, India) Blanching cauliflower for 4 min. at 82° with 5 vol. water increased the ascorbic acid content by between 50-60%. G.M.Lewis

5548. REDUCTION OF ADRENOCHROME BY ASCORBIC ACID. G.L.Mattock and R.A.Heacock: *Nature*, Lond., 1963, 198, 993-994 (Psychiatric Res. Unit, Univ. Hosp., Saskatoon, Sask., Canada) The products of reduction of adrenochrome by ascorbic acid were examined by paper chromatography. The unstable 'leuco-adrenochrome' spontaneously dehydrates to form 5,6-dihydroxy-N-methylindole, which reacts slowly with dehydroascorbic acid to form a secondary product as yet unidentified; further unidentified products were formed at neutral and slightly alk. pH. G.M.Lewis

5549. COMPOSITION OF EPIPHYSEAL CARTILAGE. IV. EFFECT OF VITAMIN D₃ ON ENZYMIC ACTIVITIES IN EPIPHYSEAL AND ARTICULAR CARTILAGE OF RACHITIC CHICKS. J.D.Cipera and J.S.Willmen: *Canad. J. Biochem.*, 1963, 41, 1490-1493 (Animal Res. Inst., Res. Branch, Canada Dept. of Agric., Ottawa, Canada) Vit. D₃ was administered in 2 oral doses of 1500 or 2000 I.U. to rachitic chicks, 48 and 24 hr. before the birds were killed at 3 weeks of age. When compared with controls, treated rachitic chicks had increased activities of alk. phosphatase, hexosamine synthetase, and of pyrophosphatase in epiphyseal cartilage, but not in articular cartilage. Phosphorylase and ATPase activities in both types of cartilage appeared to be unaffected by vit. D₃. Vit. D-dosed chicks exhibited lower serum alk. phosphatase activities than controls (28 ± 1.26 and 44.5 ± 3.69 /jmoles Jj-nitrophenol/rnl. serum/hr. incubation, respectively). A.M.Cibbins

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5550. TRANSAMINATION IN MUSCULAR DYSTROPHY AND THE EFFECT OF EXOGENOUS GLUTAMATE: A STUDY ON VITAMIN E DEFICIENT RABBITS, AND MICE WITH HEREDITARY DYSTROPHY. R.O.Laferte, H.Rosenkrantz and L.Berlinguet: *Canad. J. Biochem.*, 1963, 41, 1423-1432 (Biochem. Dept., Fac. Med., Laval Univ., Quebec, Canada) The levels of glutamic-oxaloacetic and glutamic-pyruvate transaminases were determined in the tissues from rabbits deficient in vit. E and mice with inherited dystrophy. Important variations between the 2 types of dystrophy, and between the levels of the enzymes in blood and liver of dystrophic rabbits, were noted. Exogenous glutajnic acid was inj. into vit. E deprived rabbits, thus postponing body wt. losses and the onset of the terminal stage of the disease. A discussion is presented of the possible role of glutamic acid in muscular dystrophy of vit. E deprived rabbits.

A.M.Gibbins

5551. METABOLISM OF COENZYME Q IN CHICK EMBRYO. J.Jayaraman and T.Ramasarma: *Biochem. J.*, 1963, 88, 362-368 (Dept. Biochem., Indian Inst. Sci., Bangalore, India) Coenzyme Qio [ubiquinone-50] was isolated in nearly pure form from hen's-egg yolks: the average quantity per yolk was about 0.134 pinole. In the initial stages of development the coenzyme Q content of embryos increased and that of the yolk residue decreased. [¹⁴C]Coenzyme Q, inj. into embryonate eggs, was absorbed by the embryo at the three stages of development tested: 5th, 10th and 15th days. Both in vitro and in vivo [²⁻¹⁴C]mevalonic acid was incorporated into coenzyme Q by embryos at about the 10th day of development, but not at the 5th day. Sterol synthesis by chick embryos was demonstrated as early as the 4th day of development.

5552. SOME ASPECTS OF THE METABOLISM OF COENZYME Q IN THE RAT. J.Jayaraman, V.C.Joshi and T.Ramasarma: *Biochem. J.*, 1963, 88, 369-373 (Dept. Biochem., Indian Inst. Sci., Bangalore, India) Administration of [¹⁴C]coenzyme Qio [ubiquinone-50] by oral or intracardial routes to rats resulted in its exclusive incorporation into liver and spleen. Although the radioactivity decreased rapidly it was not transferred to other tissues even after 48 hr. Most of the radioactivity in the unsaponifiable lipids of liver was in the form of unconverted coenzyme Qio, even after 24 hr. Under these conditions, administered [¹⁴C]coenzyme Qio was not converted into its cyclic isomer, ubichromenol. The coenzyme Q content of rat foetuses increased during development. Blood coenzyme Q is capable of passing through the placenta and being incorporated into the foetuses. Inj. [¹⁴C]coenzyme Qio is rapidly removed from the blood. Dietary coenzyme Q appears to be the source of blood coenzyme Q and therefore assumes an indirect importance in embryonic development. Several rat tissues are capable of synthesising coenzyme Q from [²⁻¹⁴C]mevalonic acid.

5553. COENZYME Q. XXXII. COENZYME Q AND THE MAINTENANCE OF SPERM CELLS IN VITRO.

A.C.Page, jun., M.C.Smith, P.H.Gale, D.Polin and K.Folkers. **XXXK. BIOSYNTHESIS OF COENZYME QIO-** A.F.Wagner, A.Lusi and K.Folkers: *Arch. Biochem.*, 1963, 101, 204-208, 316-318 (Merck Sharp and Dohme Res. Lab. Div., Merck and Co., Inc., Rahway, N.J., U.S.A.) **XXXIL** At least 20% of the cells remained motile for 5-7 days with 1 µg./ml. of coenzyme Q₂, the 6-chromanols of coenzyme Q_j, coenzyme Q₂ of hexahydrocoenzyme Q₄, the 6-chromenols

of the latter 2 or diphenyl-p-phenylenediamine, 10 or 30 µg./ml. of the 6-chromanol of coenzyme Q_i, the 6-chromanol and 6-chromenol of coenzyme Q_{2#} diphenyl-p-phenylenediamine or 'butylated hydroxyanisole*' gave Z3-62fJ_o motility. Similar levels of a-tocopherol, a-tocopherylquinone and 2,3,5-trimethyl-6-phytylbenzoquinone were less effective; vit. K compounds showed sporadic, low activity. With the 6-chromanol of hexahydrocoenzyme Q₄ or a-tocopherol, cells were motile for more than 2 weeks. Water sol. vitamins and related compounds were essentially inactive.

XXXIX. Reaction of ³H and coenzyme Qio by the Wilzbach technique gave a product with over 99% of the ³H in the 6-position. Coenzyme Q_o, fumigatin and 2,3-dihydroxy-5-methyl-1,4-benzohydroquinone were labelled with ³H in the 5-methyl position. None of these products was utilised by *Pseudomonas denitrificans* for coenzyme Q_{1Q} biosynthesis. * B.M.Stevens

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5554. MOBILISATION OF FAT BODY GLYCOGEN BY AN EXTRACT OF CORPUS CARDIACUM. W.S.Bowers and S.Friedman: *Nature*, Lond., 1963, 198, 685 (Dept. Entomol., Purdue Univ., West Lafayette, Ind., U.S.A.) Injn. of an extract of the corpus cardiacum of *Blaberus discoidalis* (Serville) into the intact cockroach caused a rise in blood glucose and trehalose and a fall in fat body glycogen. Extracts of the corpus allatum were without effect. Corpus cardiacum extracts exerted a direct effect, being active even when the head was tied off.

G.M.Lewis

5555. EFFECT OF INSULIN ON CARBOHYDRATE METABOLISM OF SMOOTH MUSCLE. L.Lundholm and E.Mohure-Lundholm: *Acta physiol. scand.*, 1963, 57, 130-134 (Pharm. Dept., Univ., Goteborg, Sweden) Insulin stim. the synthesis of glycogen in isolated stomach muscle of rabbits and in bovine mesenteric arteries. There was no effect on the lactic acid production.

H.B.Waynfirth

5556. ACTIVITIES OF GLUCOSE 6-PHOSPHATE DEHYDROGENASE AND OF 6-PHOSPHOGLUCONATE DEHYDROGENASE IN RETINA FROM ALLOXAN-DIABETIC RATS. H.Heath, A.C.Rutter and T.C.Fletcher: *Vision Res.*, 1963, 3, 95-100 (Dept. Chem. Pathol., Univ. Coll. Hosp. Med. Sch., London, England) The method, based on the increase in u.v. absorption at 340 m μ due to the reduction of NADP, enables both estimations to be carried out on the retinae from one rat. No significant change in the activities was found in diabetes. These results are discussed in relation to the previously reported lowered level of NADPH₂ in the retinae from alloxan-diabetic rats. J. Whiting

5557. INFLUENCE OF ENZYMIC ACTIVITIES ON SUBSTRATE OXIDATIONS IN NORMAL AND DIABETIC RAT LIVER AND IN MAMMARY GLAND HOMOGENATE FRACTIONS. K.J.Matthes, S.Abraham and LL.Chaikoff: *Biochim. biophys. Acta*, 1963, 71, 568-577 (Dept. Physiol., Univ. California, Berkeley, Calif., U.S.A.) Decreases in glucose 6-PO₄ [G6P] and gluconic acid 6-phosphate dehydrogenases in diabetic Hver supernatants were not accompanied by a decrease in the G6P oxidation

rate. The inhibitory effect of citrate on the oxidation of G6P and malate in normal and diabetic liver, when the availability of NADP was limited, was principally due to high isocitrate dehydrogenase activity. G6P inhibits of citrate and malate oxidation by lactating gland fractions was similarly mediated. Malic enzyme activity in diabetic liver supernatant was 25% of normal. Weaning decreased G6P oxidising and malic enzyme activities in mammary gland supernatants. Further evidence for conversion of NAD to NADP in liver and lactating gland with ATP is presented.

B.M.Stevens

5558. ACTION OF INSULIN AND OF NADP ON THE IN VIVO METABOLISM OF RAT EPIDIDYMAL ADIPOSE TISSUE. G.Pozza, A.Ghiromi and C.Basilico: G. Biochim., 1962, 11, 326-340 (1st. Clin. Med. Univ., Milan, Italy) Insulin produced an increase in RQ and CO₂ production of rat epididymal adipose tissue incubated in vivo, which may be due to increased activity of hexosemonooiphosphate metabolic pathway. Addition of NADP as stimulant of hexosemonophosphate pathway led to similar increase of RQ but this increase was also observed in absence of glucose provided tissue came from fed rats; when it was obtained from fasted rats, glucose or fructose was required in medium for a similar result.

B.Payne

5559. ISOLATION OF RAT PITUITARY GRANULES AND STUDY OF THEIR BIOCHEMICAL PROPERTIES AND HORMONAL ACTIVITIES. W.C.Hymen and W.H.N.^ap-Shan: J. cell Biol., 1963, 17, 67-86 (Dept. Zool., Univ. Wisconsin, Madison, Wis., U.S.A.) An homogenate of ant. pituitary gland was centrifuged at 275 £ and the supernatant passed through a column of celite no. 545. The granules and microsomes were collected and fractionated by discontinuous density sucrose gradient centrifugation. The acidophilic and basophilic granules were separated as confirmed by electron micrographs and ^bY enzyme, fatty acid and RNA analysis. TSH and Somatotrophin were found in the basophilic granules and growth and lactogenic hormones in the acidophilic. ACTH was localised in the microsomal fraction.

P.Barlow

5560. ADMINISTRATION OF ANTERIOR PITUITARY GROWTH HORMONE TO RATS DURING COLD EXPOSURE. J.R.Beatson: Canad. J. Biochem., 1963, 41, 1449-1453 (Defense Res. Med. Lab., Toronto, Ont., Canada) Male rats were inj. daily with ant. Pituitary [GH] growth hormone (3 mg./100 g. body wt.) and fed ad libitum for 7 days at environmental temp. of 21° and 2-3°. Cold exposure retarded body wt. gain, decreased N retention, and increased the activities of liver arginase, alanine-glutamic transaminase, and phosphate activated glutaminase, none of these effects being stimulated by GH. At 22°, GH decreased the activities of liver arginase, alanine-ptyramic transaminase, and liver glutamic acid dehydrogenase, although cold exposure eliminated the effect on the latter.

A.M.Gibbins

5561. EFFECTS OF GROWTH HORMONE [GH] ON METABOLISM OF N FROM SEVERAL AMINO ACIDS AND AMMONIA. T.G.Vitti and O.H.Gaebelen: Arch. Biochem., 1963, 101, 292-298 (Dept. Biochem., E.B.Ford Inst. for Med. Res., H.Ford Hosp., Detroit, Mich., U.S.A.) GH increased 15N incorporation ^a in i.p. inj. NH₄ citrate into hypophysectomised rat ^b heart, muscle, kidney and spleen. 15N distribution amongst 9 liver protein amino acids indicated that ^cProved NH₃" N utilisation was due to transfer to amino

acids directly involved in urea formation and transamination and increased utilisation of these for protein synthesis. 15N incorporation from i.p. inj^d glycine, L-alanine, L-aspartate and L-glutamate into hypophysectomised rat liver protein was much greater than into muscle protein. GH further increased both. GH increased 15N from all 5 sources appearing in liver or muscle as arginine. Without GH, 15N transfer patterns from alanine and glutamate were similar. Distribution from NH₄ citrate to amino acids other than serine resembled that from glycine.

B,

M.Stevens

5562. IN VIVO STIMULATION BY ACTH OF RAT ADRENALS IN RELATION TO DIETARY FAT.

L.Skovsted, J.P.Funch and H.Dam: J. Endocr., 1963, 26, 457-461 (Danish Fat Res. Inst., Copenhagen, Denmark) Exogenous ACTH did not change the amount or pattern of polyunsat. fatty acids in the adrenals of rats given a fat-free diet, or diets containing hydrogenated or unhydrogenated peanut oil. There was a significant reduction in the corticosterone levels in plasma following ACTH administration in rats fed the fat-free diet.

G.F.Blane

5563. EFFECT OF PIG PITUITARY ACTH FRACTIONS ON DIFFERENT PARAMETERS OF ADRENOCORTICAL ACTIVITY.

E.de Jager, J.D.H.Homan and D.De Wied: Canad. J. Biochem., 1963, 41, 1455-1467 (Res. Lab., Organon Oss, Netherlands)

Purified uhydrolysed ACTH was separated into 5 fractions by chromatography on a column of CM cellulose, using pyridine-acetic acid as buffer. In comparing the extent to which the potencies according to the Sayers adrenal ascorbic acid depletion test corresponded with those obtained from the assay involving plasma corticosterone levels in hypophysectomised rats, a fair agreement was observed for the major fractions, which showed electrophoretic relationship. The minor fractions showed significant differences. These data are discussed together with results of classical assay methods.

A.M.Gibbins

5564. PURIFICATION OF HUMAN TSH.

P.G.Condliffe: Endocrinology, 1963, 72, 893-896 (Nat. Inst. Arthritis and Metabolic Dis., N.L.H., Bethesda, Md., U.S.A.) Steps taken in the purification of human TSH are described. It is concluded that it is more acidic than bovine TSH but has the same mol. wt.

H.C.Jones

5565. MOLE RATIOS OF THE NEUROHYPOPHYSIAL HORMONES IN THE VERTEBRATE NEURAL LOBE.

B.K.Follett: Nature, Lond., 1963, 198, 693-694 (Dept. Pharmacol., Univ., Bristol, England)

In neurohypophysial extracts of all the major classes of vertebrates, the mole ratio of oxytocic to pressor-anti-diuretic principle was estimated and the storage of neural lobe hormone relative to body wt. determined.

G.M.Lewis

5566. STUDIES ON INTRACELLULAR DISTRIBUTION OF VASOPRESSIN.

H.Sachs: J. Neurochem., 1963, 10, 289-297 (Dept. Physiol., Western Reserve Univ. Med. Sch., Cleveland, Ohio, U.S.A.) Homogenates of dog hypothalamo-median eminence [HME] were centrifuged to remove nuclei and cell debris. The 70000 £ pellet from this supernatant contained 40-50% of the vasopressin activity and was rich in neurosecretory particles [NSP]. The NSP fraction from HME contained only 20% of the vasopressin content of neural lobe NSP fraction. Vasopressin in NSP could be cone. 5-fold by centrifugation in a sucrose gradient. Subcellular distribution of protein.

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nucleic acid, cytochrome oxidase and (3-glucuronidase were also studied but no correlation could be made with vasopressin distribution. R. Woodman

5567. VASOPRESSIN BIOSYNTHESIS. II. INCORPORATION OF [35S]CYSTEINE INTO VASOPRESSIN AND PROTEIN ASSOCIATED WITH CELL FRACTIONS. H. Sachs: *J. Neurochem.*, 1963, 10, 299-311 (Dept. Physiol., Western Reserve Univ. Med. Sch., Cleveland, Ohio, U.S.A.) After infusing 3 x 10⁹ counts/min. of [35S]cysteine over 3-6 hr. into the 3rd ventricle of dog brain, less than 20 μ g. radioactive vasopressin was isolated from subcellular fractions of the hypothalamus homogenate. Greatest vasopressin incorporation was in the nuclear (600 \pm 15 min.) and crude mitochondrial (10500 \pm 15 min.) fractions. If the latter were treated with deoxycholate most of the radioactivity passed into the supernatant containing membranous structures. Neurosecretory particles showed much lower [35S]incorporation into vasopressin but highest incorporation into other proteins whether [35S]- or [³H]leucine was employed. R. Woodman

5568. UNIVERSALLY APPLICABLE METHOD FOR ASSAYING THYROID FUNCTION IN VERTEBRATES. C.C.Lushbaugh: *Nature*, Lond., 1963, 198, 862-864 (Los Alamos Sci. Lab., Univ. California, Los Alamos, N. Mex., U.S.A.) Binding of 131I by thyroid can be determined by a whole-body assay of radioactivity. The method thus obviates collection of sera and excreta and is independent of body size and shape of localisation of thyroid tissue. J.R.Sargent

5569. DONOR ACTIVITY FOR PEROXIDASE AND EFFECT ON THYROID GLAND OF CERTAIN TYROSINE DERIVATIVES. J.Ljunggren and B.S8rbo: *Acta chem. scand.*, 1963, 17, 563-566 (Biochem. Dept., Nobel Med. Inst., Stockholm, Sweden) Tyrosine and some deriv. were tested as donors for myeloperoxidase by an amperometric technique. Esterification or decarboxylation was found to increase the efficiency of tyrosine in this test but the most potent deriv. were devoid of antithyroid activity in a test *in vivo*. G.F.Blane

5570. RATE OF RETURN OF RADIOIODINE UPTAKE BY NORMAL THYROID AFTER SUPPRESSION BY PHARMACOLOGICAL DOSES OF STABLE IODIDE. A.E.Johnson: *Health Physics*, 1963, 9, 537-538 (M.R.C. Dept. Clin. Res., Univ. Coll. Hosp. Med. Sch., London, England) Thyroid uptake of 132I (50 μ g) was followed by profile counting, and the effect of a large dose (200 mg. I⁻) on uptake was noted. Initial suppression of thyroid uptake occurs after I⁻ treatment, but recovers to 50% of control rate by 3 days, more than 50% by 4 days and returns to normal level at about 8 days. M.S. Lavee rack

5571. PARTIAL INHIBITION OF FIRST PHASES OF BIOGENESIS OF THYROID HORMONES. V. Stole: *Physiol. Bohem.*, 1963, 12, 93-99 (CSAV, Inst. Endocrin., Slovak Acad. Sci., Bratislava, Czechoslovakia) Methylthiouracil (0.775 mg./kg.) given orally to rats decreases the iodination of thyroglobulin in the thyroid to about 50% of normal values. KCNS (10 mg./kg.) releases accumulated I⁻ from the gland. M.S.Laverack

5572. OXIDATION OF 3,5-DIIODOTYROSINE BY PEROXIDASE AND HYDROGEN PEROXIDE. J.Ljunggren: *Acta chem. scand.*, 1963, 17, 567-572 (Biochem. Dept., Nobel Med. Inst., Stockholm, Sweden)

The reaction between 3,5-diiodotyrosine and hydrogen peroxide in the presence of peroxidase resulted in the formation of 4-hydroxy-3,5-diiodophenylpyruvic acid, 4-hydroxy-3,5-diiodobenzaldehyde, and 3,5-diiodo-benzoquinone. G. F. Blane

5573. RECOVERY OF THYROXINE FROM THYROID PROTEIN HYDROLYSED WITH PANCREATIC AND BACTERIAL PROTEASES. W.Tong, E.Raghupathy and I.L.Chaikoff: *Endocrinology*, 1963, 72, 931-935 (Physiol. Dept., California Univ., Berkeley, Calif., U.S.A.) A bacterial protease prep, released iodo-tyrosines and thyroxine from thyroprotein more rapidly than did a pancreatic protease prep. The bacterial protease was also more active in deiodinating thyroxine. H.C.Jones

5574. STEADY STATE OXIDATION OF GLUCOSE IN THE HYPOTHYROID DIABETIC RAT: A ROLE FOR THE ADRENAL CORTEX IN GLUCOSE OXIDATION. D.S.Dow and C.E.Allen: *Canad. J. Biochem.*, 1963, 41, 1293-1305 (Animal Res. Inst., Res. Branch, Canada Dept. Agric. Ottawa, Ont., Canada) Rates of oxidation of [1-14C]- and [6-14C]glucose were measured during the steady state maintained between the sp. activities of blood glucose and expired CO₂ in the hypothyroid diabetic rat following a single i.p. injn. of the sugars. Glucose oxidation by way of glycolysis and the tricarboxylic acid cycle paralleled the decrease in expired CO₂, but that by way of the hexose monophosphate pathway was completely suppressed. This suppression may have been due to the maintenance of NADH₂ as the result of goitrogen inhibn. of steroid catalysed transhydrogenation. Steroid concn. was suggested to be a critical factor in glucose oxidation via the hexose monophosphate pathway. A.M.Gibbins

5575. STORAGE OF TISSUE THIAMINE AND ITS INTESTINAL SYNTHESIS IN HYPO- AND HYPERTHYROID RATS. S.K.Meghal and M.C.Nath: *Ann. Biochem.*, 1963, 23, 169-172 (Dept. Biochem., Nagpur Univ., India) It was shown that, contrary to previous findings faecal thiamine excretion was reduced in hyperthyroid rats irrespective of whether a low thiamine or a thiamine supplemented diet was supplied. L.A.Barnes

5576. DEMONSTRATION OF KININS IN INTESTINAL OBSTRUCTION IN DOGS. W.L.Weipers and J.Sanford: *Nature*, Lond., 1963, 198, 813 (Univ. Vet. Hosp., Bearsden, Glasgow, Scotland) In dogs with isolated intestinal loops, the loop content and i.p. fluid contained a substance causing contraction of guinea-pig ileum; incubation with dog pseudoglobulin released a kinin. G.M.Lewis

5577. EFFECT OF pH AND CHLORIDE IONS ON PLASMA KININASE ACTIVITY. P.N.Aarsen and A.Kemp: *Nature*, Lond., 1963, 198, P87-688 (Dept. Pharmacotherapeutics, Univ., Amsterdam, Netherlands) From expt. on the effect of pH and Cl⁻ on the bradykinin-destroying activity of a guinea-pig serum kininase, it was concluded that estimation of kininase activity should be carried out at pH 8 in the presence of at least 0.02M NaCl. G.M.Lewis

5578. ISOLATION AND ESTIMATION OF ACTIVE POLYPEPTIDE KININS IN BIOLOGICAL FLUIDS AND ANIMAL TISSUES. P.Melchiorrk: *Biochim. appl.*, 1962, 9, 309-322 (1st. Farm., Univ., Roma, Italy) Human blood, urine, cs.f., ascitic and syaovial fluids and various animal tissues were examined for kinin activity. An

i β fraction was obtained by chromatography on 3 Mc cellulose. This was converted to the 131i pipsyl aerw. and separation of kallidin from bradykinin was obtained on a silip gel column. The amino acid composition was obtained by chromatography on Dowex 50.

ccrm (Italian) J.C.Crawhall

*579. INFLUENCE OF NEUROAMINES ON THE OXIDATION OF GLUCOSE BY THE ANTERIOR PITUITARY, n. EFFECT ON NADPH₂ OXIDATION. S.H.Barondes and J.B.Field: Biochim. biophys. Acta, 1963, 73, 324-327 (Clin. Endocrinol. Branch, Nat. Inst. Arthritis and Metabolic Dis., Bethesda, Md., U.S.A.)

NADPH₂ oxidation was stim. An alcohol dehydrogenase Much could react with NADP and which may mediate the effect was demonstrated. B.M.Stevens

5580. RELATION BETWEEN THE OESTROUS CYCLE AND THE BINDING OF CATECHOLAMINES IN THE RAT UTERUS. R.J.Wurtman, E.W.Chu and J.Axelrod: Nature, Lond., 1963, 198, 547-548 (Lab. Clin. Sci., Natl. Inst. of Mental Hlth., Bethesda, Md., U.S.A.)

The capacity of the rat uterus to bind [3H]adrenaline increased continuously as oestrous approached then fell again to a min. at dioestrous. Endogenous adrenaline also showed a max. at oestrous. Binding of 3H-noradrenaline Δ s not concomitantly increased during oestrous.

ceo., G.M.Lewis

*581. DEMETHYLATION OF ADRENALINE TO NOR-ADRENALINE IN THE CAT. W.G.Verly, G.Koch and G.Hunebelle: Arch. int. Physiol., 1962, 70, 624-630 (Inst. L.Fredericq, Univ., Liege, Belgium) [3 - 3 H > Adrenaline (575 μ g) was inj. i.v. during 5 min., via a femoral vein in the cat. Plasma from blood samples collected during the succeeding 5 min. had 13% of their activity in the form of noradrenaline.

(French) M.E.Nutt

&582. REPAIR PROCESSES IN ARTERIAL TISSUE. BIO-CHEMICAL ALTERATIONS IN RABBIT AORTA INDUCED BY NORADRENALINE. L.Lorenzen: Circulat. Res., 1963, 12, 449-454 (Rigshosp., Dept. H., Univ., Copenhagen, Denmark) Male albino rabbits were inj. i.v. with 1-noradrenaline daily for 15 days. The aortic acid mucopolysaccharides were increased in quantity, were qual. altered and were radioactive after Previous injn. of 35 so₄²⁻ into the animal, R.E.Moore

5583. SOME EFFECTS OF 5HT AND RELATED COMPOUNDS ON HUMAN COLLAGEN. T.C.Highton and M.H.Garrett: Lancet, 1963, i, 1234-1236 (Rheumatism Res. Lab., Wellcome Res. Inst., Univ. Otago, Dunedin, New Zealand) The shrinkage temp. of human tendon collagen was estimated after the collagen Δ s been immersed in various compounds. Only 5HT compounds, 5-methoxytryptamine, tryptamine, 5HTP and 5-HIAA affected the shrinkage temp. Histamine, Jtoradrenaline, and other compounds had no effect. 5HT imaleinate in 0-32M concn, reduced the shrinkage temp. Δ s over 30° in some instances. 5HTP and 5-HIAA raised Δ e shrinkage temp. The E.M. appearances of specimens Δ s collagen affected by 5HT show progressive disorganisa-

G.H.Bell

5584. SULPHYDRYL GROUPS AND HISTAMINE RELEASE IN VIVO. W.G.Spector, D.A.Willoughby and J.Frears: Nature, Lond., 1963, 198, 595-596 (Dept. Pathol., St. Bartholomew's Hosp., London, England) When Δ s were inj. with alloxan prior to intra-pleural injn. of Δ fPentine, the increase in vascular permeability in the «eura due to histamine release was blocked. The effect

of alloxan was reversed by administration of cysteinamine. It is concluded that histamine release after injury depends on the integrity of SH groups, perhaps part of an enzyme mol. n-Ethylmaleimide did not block the action of turpentine, nor did cysteine have any protective effect, but these neg. results might be due to failure of penetration.

G.M.Lewis

5585. RELAXING FACTOR IN EXTRACTS OF BLOOD PLATELETS AND ITS FUNCTION IN THE CELLS.

K.Grette: Nature, Lond., 1963, 198, 488-489 (Nat. Inst. of Publ. Hlth., Oslo, Norway) An extract of pig blood platelets incubated with contractile protein from the platelets and ATP caused its complete soln. The reaction was inhibited by Ca²⁺. It is concluded that a relaxing factor is present in platelets similar to that in striated muscle. The mechanism of the 'release reaction' of platelets is discussed in the light of these findings.

G.M.Lewis

5586. ACTIVITY OF 'TOXOHORMONE' IN NORMAL AND PATHOLOGICAL TISSUES. E.Mascitelli-Coriandoli and F.Di Re: Atti. Acad. med. Lombarda,

1962, 17, 272-274 (Lab. Ric. Farmavigor S.p.A., Sesto S.Giovanni, Milan, Italy) 12 hr. after the i.p. injn. of 1 mg. /animal of a material extracted from Walker carcinoma 256 into rats, the plasma Fe content had fallen to 80% of the normal control level. Injn. of a similar extract from normal and pathol. tissues from the rat, and also rat embryos and some protein prep. (ovalbumin, casein) produced a 10-15% decrease in plasma Fe content. (Italian) G.N.Godson

5587. MITOCHONDRIAL LOCALISATION OF THE 'TOXOHORMONE' ACTIVITY. F.Di Re and E.Mascitelli-Coriandoli: Atti. Acad. med. Lombarda, 1962, 17, 275-278 (Lab. Ric. Farmavigor S.p.A., Sesto S.Giovanni, Milan, Italy) The toxohormone

extractable from neoplastic tissue that induces a fall in the plasma Fe content of rats, is mainly localised in the mitochondrial fraction of the tumour homogenate. The active extract from mitochondria had an activity greater than the extract from the total tumour and was followed in order of decreasing activity by extracts from Flexner-Jobling carcinoma, primary hepatoma and Jensen's sarcoma. (Italian) G.N.Godson

5588. EFFECT OF TOXOHORMONE ON THE CYTOCHROME $\frac{1}{2}$ OF VARIOUS RAT TISSUES. F.Di Ri and E.Mascitelli-Coriandoli: Atti. Acad. med. Lombarda, 1962, 17, 453-456 (Lab. Richerche Farmavigor S.p.A., Sesto S.Giovanni, Milan, Italy) Toxohormone, an extract from neoplastic tissue, when inj. i.p. into rats (50 mg./animal), produced a significant decrease in the cytochrome $\frac{1}{2}$ content of the liver and kidney, but not in the heart and skeletal muscles. In hyperthyroid rats, the toxohormone had no effect on the kidney cytochrome $\frac{1}{2}$ level, but did lower the liver cytochrome $\frac{1}{2}$ concn.

(Italian) G.N.Godson

5589. CHANGES IN Δ -30-HYDROXYSTEROID DEHYDROGENASE ACTIVITY IN OVARIES OF MATURING RATS. B.L.Rubin, H.W.Deane, J.A.Hamilton and E.L.Driks: Endocrinology, 1963, 72, 924-930 (Dept. Obstet. and Gynecol., A.Einstein Med. Coll., Yeshiva Univ., Bronx, N.Y., U.S.A.)

A5-3g-Hydroxysteroid dehydrogenase activity in the ovaries of rats was found to be low at the period of initial ovulation and to increase and reach a peak at 9-10 weeks of age. H.C.Jones

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**5590. IN VITRO BIOSYNTHESIS OF 18-HYDROXY-
 Fe^{14}C CORTICOSTERONE BY SLICES OF ZONA
GLOMERULOSA OF BEEF ADRENALS AND BY HUMAN
ADRENALS.** T.Sando and A.Lanthier. *Acta endocr.
Kbh.*, 1963, 42, 355-363 (Endocrin. Lab., Med.
Dept., Notre-Dame Hosp., Montreal Univ., Montreal
Canada) The zona glomerulosa of beef and human
adrenals was incubated in a Krebs-Ringer-bicarbonate
medium containing glucose, [4^{14}C]progesterone and
[$4-14\text{C}$]corticosterone as precursors. The identity of the
14c transformation product produced, was investigated
and found to be 18-hydroxycorticosterone. A greater
yield was obtained by beef tissue from corticosterone
than from progesterone. H.B.Waynforth

**5591. INFLUENCE OF ADRENAL STEROIDS ON RADIO-
CALCIUM METABOLISM IN YOUNG BEAGLE DOGS.**
E.J.Collins, A.S.Carpenter and V.F.Baken *Acta
endocr. Kbh.*, 1963, 42, 348-354 (Upjohn Co.,
Kalamazoo, Mich., U.S.A.) Increased elimination
of 47Ca in the faeces and urine of beagle dogs was die
main effect of therapy with several adrenal steroids.
Inhibn. of utilisation of ^{47}Ca was more marked after
treatment with 9a-fluoro, 16a-methylprednisolone than
with 6a-fluoro- t_1 and 6a-methyl-prednisolone.
H.B.Waynforth

**5592. STUDIES ON LYSOSOMES. II. THE EFFECT OF
CORTISONE ON THE RELEASE OF ACID HYDROLASE
FROM A LARGE GRANULE FRACTION OF RABBIR
LIVER INDUCED BY AN EXCESS OF VITAMIN A.**
G.Weissmann and L.Thomas: *J. clin. Invest.*, 1963,
42, 661-670 (Dept. Med., New York Univ. Sch.
Med., New York, U.S.A.) Previous studies have
suggested that vit. A in vivo and in vitro causes release
of acid hydrolases from lysosomes: this work on hyper-
vitaminotic rabbits supports the hypothesis, an excess of
vit. A increasing acid hydrolase activity in both liver
homogenates and cartilage matrix. When, however, the
animals were given cortisone with the vitamin the effect
was diminished, while hydrocortisone added to rabbit
liver homogenates partially antagonised the effect of
excess vit. A administered during life. These findings
agree with the hypothesis that one action of cortisol and
its analogues is the stabilisation of lysosomes against the
effects of excess vit. A. M.J.Bell

**5593. ACTION OF CORTICOSTEROID DERIVATIVES ON
THE ALCOHOL DEHYDROGENASE [ALD] ACTIVITY
OF THE LIVER.** LGy.Fazekas: *Arch. Toxicol.*, 1962,
19, 388-395 (Inst. Med., Univ., Szeged, Hungary)
Administration of cortisone deriv. to rat liver homogenates
had a profound effect on ALD activity. It is suggested
that in humans the adrenal cortex stimulates ALD activity
facilitating the oxidation of alcohol in the liver. Possible
treatment for chronic alcoholism or alcohol poisoning is
discussed. (German) LComish

**5594. COMPARISON OF PROTEIN-BINDING OF CORTISOL
AS MEASURED BY EQUILIBRIUM DIALYSIS AND GEL
FILTRATION.** R.V.Quincey and CH.Grey: *J. Endocr.*,
1963, 26, 509-516 (Dept. Chem. Path., King's Coll
Hosp. Med. Sch., Denmark Hill, London, England)
With undiluted plasma at room temp, the % binding of
cortisol was 97% by equilibrium dialysis and only 60% by
gel filtration. However, the rate of dissociation of the
cortisol-transcortin complex during gel filtration was so
rapid that the 37% difference between the 2 methods
could not be reliably attributed to albumin binding.
G.F.Blane

**5595. INFLUENCE OF CORTISOL ON FOOD INTAKE
AND GLUCOSE METABOLISM IN SHEEP.** J.M.BassetU
J. Endocr., 1963, 26, 539-553 (C.S.I.R.O., Div.
Animal Physiol., I.C.Ross Animal Res. Lab., Prospect,
N.S.W., Australia) Low doses of cortisol (25 mg./
day) stim. the food intake of ewes while doses above
150 mg./day resulted in a decline in food intake. N
excretion was uniformly increased in animals receiving
cortisol while blood glucose levels rose progressively
with increase of cortisol dose level. At the same time
glucose tolerance was progressively impaired. Since there
was no parallelism between increased glucose levels and
the N output it is concluded that increased protein cata-
bolism is not responsible for the rise in plasma glucose
but rather that there is an impairment of glucose utilisa-
tion relative to the blood glucose level. G.F.Blane

**5596. PREPARATION OF [3H]CORTISOL METABOLITES
OF HIGH SPECIFIC ACTIVITY.** D.A.Shaw and R.V.
Quincey: *J. Endocr.*, 1963, 26, 575-576 (Dept.
Chem. Path., King's Coll. Hosp. Med. Sch., Denmark
Hill, London, England) Methods are described for
the prep. of metabolites from [$7-3\text{H}$]cortisol. The com-
pounds prep. chem. include cortisone, tetrahydrocortisone
and tetrahydrocortisol, allotetrahydrocortisol, and a no. of
17-oxosteroids. The labelled 63-hydroxycortisol
metabolite was extracted from the urine of guinea-pigs
following injn. of [3H]cortisol. G.F.Blane

**5597. INFLUENCE OF THYROXINE AND PREDNISOLONE
ON THE OXIDATIVE METABOLISM OF THE MYO-
CARDIUM.** G.Giordano, G.Nigro, LD*Alessandro
and H.Eposito: *Biochim. appl.*, 1963, 10, 18-23
(1st. Patol. Speciale Med. e Metodol. Clin., Univ.,
Napoli, Italy) Rabbits treated with thyroxine
(0*25 mg./kg.) showed a 20% increase of myocardial
cytochrome f on the 4th day, but this fell to a value
below normal on the 8th day. Treatment with prednisolon*
(3 mg./kg.) showed a 50% decrease of myocardial cyto-
chrome f on the 4th and 8th days. A combination of both
these drugs slightly decreased myocardial cytochrome f .
(Italian) J.C.Crawhall

**5598. CoA AND THE BIOSYNTHESIS OF ADRENAL
CORTICOIDS IN RATS WITH HEPATOMAS.**
E.Mascitelli-Coriandoli, F.Di Re and P.Lanzani:
Biochim. appl., 1962, 9, 268-275 (Lab. ricerche
Farmavigor S.p.A., Sesto S.Giovanni, Milan, Italy)
Rats affected by hepatomas induced by 2-acetylaminofluorene
showed hypertrophy of the adrenal glands. These glands
showed a reduced content of CoA and pantothenic
acid and a reduced corticosteroid response to ACTH.
The glands of animals fed additional pantothenic acid did
not show a reduced response to ACTH.
(Italian) J.C.Crawhall

**5599. METABOLISM OF PROGESTERONE IN MAN.
EXTRACTION AND SEPARATION BY COUNTER-
CURRENT DISTRIBUTION OF THE METABOLITES IN
URINE.** R.A.Harkness and K.F other by: *Biochem. J.*,
1963, 88, 308-314 (Postgrad. Med. Sch., Ducane Rd.,
London, England) After i.v. administration of
[$4-14\text{C}$]progesterone to adrenalectomised ovariectomised
women 47-68% of the radioactivity was excreted in die
urine within 4 days and small amounts during the sub-
sequent 7 days. Various methods for extracting the radio-
activity from urine were investigated. Countercurrent
distribution of die urine extracts showed that pregnanediol
and its isomers were the main metabolites. In the freely
extractable and enzyme-hydrolysed- extracts 12-'5% of the
radioactivity was associated with metabolites more polar

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than pregnanediol, whereas in the acid-hydrolysed extract 50% of the radioactivity was associated with the more polar compounds.

5600. ENZYMIC SYNTHESIS OF THE SULPHATE ESTERS OF OESTRADIOL-17 β AND DIETHYLSTILBOESTEROL. A.H. Payne and M. Mason. *Biochim. biophys. Acta.* 1963, 71, 1^ ^K f. ^{ext. Biol. Chem., Univ. Mich., U}

Michigan. Ann Arbor, sulphate and oestradiol 3,17 β -sulphate, oestradiol I, monosulphate esters and the diethylstilboestrol were formed by disulphate ester of 3,17 β -sulphate. The esters were separated by paper chromatography with a K pho: te buffer solvent and detected by radioautography w: 35S. B.M. Stevens

5601. REDUCTION IN VITRO OF 16-KETO-[16-14C]-OESTRADIOL-17 β BY MAMMALIAN BLOOD. D.Trachewsky and R.Hobirk. *Biochim. biophys. Acta.* 1963, 71, 748-749 (McGill Univ. Med. Clinic, Montreal Gen. Hosp., Montreal, Canada) Thin layer chromatography showed 2 radioactive products with mobilities corresponding to oestriol and 16-epi-oestriol. When cat blood was used and the former predominated, when rat blood was used, the latter predominated. Prelim. comm. B.M. Stevens

5602. REGULATION OF ADRENAL FUNCTION BY CORTICOCENS AND OTHER HORMONES. K.W.McKenna. *Cancer Res.* 1963, 23, 710-718 (Dept.

Obst and Gynecol., I.H.-Mi¹ ^ ^{rate of} Gainesville. P. ¹ t diolesterol in adrenal corticoid synthesis from pregnenolone primarily by the rate of NADP reduction by glucose 6-PO₄ [G6P] dehydrogenase. Oestrogens and several other hormones competitively inhibited NADP binding to NADP sp. cytoplasmic dehydrogenases. Competitive inhibition by oestrogens of the rate of NADP reduction by G6P dehydrogenase was correlated with the competitive inhibition of the rate of corticoidogenesis. Inhibition was non-competitive with regard to NADP. Oestrogens also non-competitively activate mw AD sp. cytoplasmic lactic dehydrogenase. Km for the activation by oestradiol with excess lactate was 2.7 \times 10⁻⁹M. Inhibition and activation by oestrogens also occurred with ant. pituitary enzymes. B.M. Stevens

5603. DISPOSITION OF INTRA-AMNIOTICALLY ADMINISTERED [6-14C]OESTRIOL AND [6-14C]-OESTRONE SULPHATE BY WOMEN. E.Diczfalusy, K.G.Tillinger, N.Wigquist, M.Levitz, G.P.Condon and J.Daniel. *J. clin. Endocr.* 1963, 23, 503 (Hormone Lab., Dept. Women's Diseases, Karolinska Sjukhuset, Stockholm, Sweden) An average of 6.6% of the radioactivity administered as oestriol appeared in the maternal urine within 72 hr. as compared with 0.6% following injn. of the conjugated oestrone. The foetal tissues contained approx. 10 times more radioactivity when oestriol was administered than when Na oestrone sulphate was given; in both cases the steroids being inj. 50 min. before the surgical interruption of pregnancy. Details are given of the distribution of the hormone in foetal tissues. G.F.Blane

5604. ISOLATION AND IDENTIFICATION OF 3 α ,17 α ,21-TRIHYDROXY-5 α -PREGNAN-20-ONE (ALLO-OXPREGN-5-EN-20-ONE)(17 α ,21-dihydroxy-5 α -pregnolone). J.R.Pasqualini and M.-F.Jayi¹. *Biochem. J.* 1963, 88,

315-318 (Lab. Chim. Biol., Fac M6d., 45, Rue des Saints Peres, Paris, France) 3d, 170L, 21-Trihydroxy-5 α -Pregn-20-one (allo-tetrahydro-compound S) was isolated and identified in human urine after the administration of 33,17 α ,21-trihydroxypregn-5-en-20-one (17 α , 21-dihydroxypregnolone) to a normal subject. Its identification was established on the basis of chromatography in 5 different systems and in 2 systems after acetylation. Its oxidation product was proved to be androsterone before and after acetylation. Of this steroid 60% was found in the least-polar ester sulphate fraction and 40% in the glucuronide fraction.

5605. CONVERSION OF ANDROST-4-EN-3,17-DIONE INTO TESTOLOLACTONE AND OTHER SUBSTANCES BY INCUBATION IN BOVINE BLOOD. H.Levy, T.Saito¹, S.Takeyama and A.P.Merrill. *Biochim. biophys. Acta.* 1963, 71, 749-751 (Univ. Shrewsbury, Mass., U.S.A.) Prelim. for Expt. Biol., Shrewsbury, Mass., U.S.A.) Prelim. comm. B.M. Stevens

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fi, i S ^ t s ^ (Publ. Meath Res. Inst. City of New York, U.S.A.) 25-50 mg./kg. body wt. of 17 α -methyltestosterone suppressed the formation of bilary stones in rabbits fed 0.5% dihydrocholesterol. It is suggested that this is due to reduced absorption of dihydrocholesterol from the gut. R.Mitchell

5607. INHIBITION OF CALCIPHYLAXIS BY METHYL-TESTOSTERONE. G.Gabbiani. *Sperimentale.* 1962, 112, 457-466 (Ist. di M Chir. Sperimentale, Univ. Montreal, Canada) Daily s.c. administration of methyltestosterone (1 mg./animal) to rats, inhibits the non-sp. calcification of the heart, kidney, aorta, salivary glands, skin and lips, that normally follows dehydro-tachysterol intoxication. The selective calcification due to calciphyaxis is prevented by methyltestosterone. (Italian) G.N.Godson

5608. GAS CHROMATOGRAPHIC ANALYSIS OF 17-HYDROXYCORTICOSTEROIDS BY MEANS OF THEIR BISMETHYLENEDIOXY DERIVATIVES. M.A.Kirschner and H.M.Fales. *Analyt. Chem.*, 1962, 34, 1548-1551 (Dept. Hlth. Ed. and Welfare, N.H., Bethesda, Md., U.S.A.) The bismethylenedioxy deriv. of cortisone conferred stability to the 20,21-side chain and rendered it suitable for gas liquid chromatographic analysis. The deriv. was formed by reaction of the 17-OHCS with formaldehyde in the presence of acid. The specificity of this reaction for the dihydroxyacetone moiety provided a means of selecting cortisone from a complex mixture. Formation of this deriv. and other hydroxylated analogues resulted in a complex, but useful, chromatogram. The method had several advantages over analysis of cortisone by its acetate or pyrolysis product. L.G.Gillies

METABOLIC INHIBITORS AND CARCINOGENS

5609. EFFECTS OF SALICYLATE ON GLUTAMATE DEHYDROGENASE AND GLUTAMATE DECARBOXYLASE.

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BJ.Gould, A.K.Huggins and M.J.H.Smith: Biochem. J., 1963, 88, 346-349 (Empire Rheumatism Council Res. Unit, King's College Hoip. Med. Sch., London, England) Salicylate inhib. ox-liver glutamate-dehydrogenase and *E. coli* glutamate-decarboxylase activities in vitro. The mechanism of inhibn. of the glutamate dehydrogenase is reversible but does not involve competition with either glutamate or NAD. Salicylate causes an irreversible inhibn. of the glutamate decarboxylase but this is decreased by preincubation of the enzyme with pyridoxal phosphate. These inhibitory actions of salicylate may contribute to the increased incorporation of ^{14}C from [3- ^{14}C]pyruvate into glutamate that occurs in prep. of isolated rat tissues.

5610. INHIBITION OF BACTERIOCHLOROPHYLL BIO-SYNTHESIS IN RHODOPSEUDOMONAS SPHEROIDES BY 8-HYDROXYQUINOLINE. O.T. G.Jones: Biochem. J., 1963, 88, 335-343 (CS.I.R.O. Div. Plant Industry, Canberra, Australia) When *R. sphaeroides* was grown anaerobically in the light the addition of 8-hydroxyquinoline to the medium decreased the intracellular concn. of bacteriochlorophyll but not that of either the total haem pigments or carotenoids. At the same time a no. of tetrapyrrolic pigments was secreted into the medium. These pigments were purified by chromatography and resembled known p-otochlorophylls and chlorophylls in spectroscopic prop. It is possible that they are intermediates or related to intermediates in bacteriochlorophyll biosynthesis. In addition a Cu phaeophorbide was isolated. Cu^{2+} was essential for 8-hydroxyquinoline to produce this effect.

5611. INHIBITION OF GLUCOSE UPTAKE OF EMBRYONIC CHICK HEARTS BY 2-DEOXY-D-GLUCOSE AND 3-O-METHYLGLUCOSE. R.Litta-Modignani and P.P.Foa: Atti. Acad. med., Lombarda, 1962, 17, 286-289 (Clin. Med. Gen., Univ., Milano, Italy) $4 \times 10^{-6}\text{M}$ 2-deoxy-D⁺lucose [2-DG] inhibits the uptake of glucose ($8-16 \times 10^{-6}\text{M}$) in vitro by hearts of 5-9 day old chick embryos and $2-4 \times 10^{-6}\text{M}$ 3-O-methyl glucose [3-MG] inhibits the glucose uptake of hearts of 9 day old embryos but not 5 day old embryos. Insulin reverses the 3-MG inhibn. but not the 2-DG inhibn. This is compatible with the idea that 2-DG inhibits intracellular phosphorylation of glucose and 3-MG, the glucose transport. (Italian) G.N. Godson

5612. EFFECT OF DISULPHIDE BOND REAGENTS ON CYTOCHROME OXIDASE. S.J.Cooperstein: Biochim. biophys. Acta, 1963, 73, 343-346 (Dept. Anat., Western Reserve Univ., Cleveland, Ohio, U.S.A.) Prelim, comm. B.M.Stevens

5613. INHIBITION OF INORGANIC PHOSPHATE LIBERATION BY] A SODIUM AND POTASSIUM ION STIMULATED [RABBIT BRAIN] ATPase BY OLIGOMYCIN. F.F.J.Basis and H.J.Vreman: Biochim. biophys. Acta, 1963, 73, 346-348 (Johnson Foundn., Univ. of Pennsylvania, Philadelphia, Pa., U.S.A.) Prelim. comm. * B.M.Stevens

5614. INHIBITION OF ALCOHOL DEHYDROGENASE. I. KINETIC STUDIES. L.B.Khouw, T.N.Burbridge and V.C.Sutherland: Biochim. biophys. Acta, 1963, 73, 173-185 (Dept. Pharmacol., Univ. California, San Francisco, Calif., U.S.A.) Chlorpromazine was a potent inhibitor of horse and rabbit liver alcohol dehydrogenases but the yeast enzyme was only slightly inhibited.

Inhibn. was instantaneous, partial and reversible. Neither the SH nor the Zn of the enzyme mol. interacted with chlorpromazine. B.M. Stevens

5615. EFFECT OF SODIUM FLUORIDE ON THE RIBO-FLAVIN PRODUCTION OF EREMOTHECIUM ASHBYI: F.Kaprálek: Biochim. biophys. Acta, 1963, 71, 725-727 (Dept. Microbiol., Charles Univ., Viničná, Prague, Czechoslovakia) Only NaF of the various inhibitors tested, showed different effects on growing cells and on producing mycelium. B.M.Stevens

5616. SEPARATION OF FERTILISATION MEMBRANE [FM] IN URECHIS AND SEA URCHIN EGGS AS PHENOMENON CAUSED BY BREAKAGE OF H BONDS. I. ACTION OF MERCAPTIDE-FORMING, ALKYLATING OXIDISING AND PROTEIN-DENATURING AGENTS. II. ACTION OF CARBOXYLIC ACIDS. S.Isaka and T.Aikawa: Exp. Cell Res., 1963, 30, 139-149, 150-159 (Biol. Inst., Univ., Chiba, Japan) I. Janus

Green dyes were effective in elevating the blisters in the sea urchin eggs without jelly layer. Alkylating, oxidising* mercaptide-forming agents, and protein denaturants were also effective in causing separation of FM in *Urechis* and sea urchin eggs, when properly employed. A possible connection of vitelline and plasma membrane by means of H bonding is proposed.

II. Some aliphatic and aromatic carboxylic acids were investigated for their potency in causing the separation of the FM in sea urchin eggs. The results agreed with the supposition that the acids penetrate the membrane mojt easily in the non-ionised form, but exhibit the membrane elevating potency when ionised and endowed with activity to compete with H bonds between the vitelline and plasm¹ membranes, and that the carboxylate anions should be the site of the activity. K.Jones

5617. INHIBITION ANALYSIS AND INHIBITOR-RESISTANT ENZYMES. J.N.Aronsore: Nature, Lond., 1963, 198, 992-993 (Dept. Chem., Arizona St. Univ., Tempe, Ariz., U.S.A.) A *Bacillus cereus* system is described which is thought to illustrate antihibfl analysis investigation of the enzyme synthesising methionine (probably the final methylation step) with mutant enzymes comprising a resistant homologous series. G.M.Lewis

5618. TOXICITY OF GUANIDINE IN RELATION TO POSSIBLE CHANGES IN CREATININE METABOLISM. G.G.Tedeschi, F.Petrelli and D.Amici: Quad. Nutr., 1963, 22, 135-144 (1st. di Fisiol. Gen. e Chim. Biol. # Univ. di Cameño, Italy) In order to substantiate the hypothesis that toxic guanidines might originate from creatine in the animal body, guanidine, methylguanidine and dimethylguanidine (20 mg./animal) was inj. into rats and rabbits, daily for up to 2 months and the effects on the body wt., histology of the heart, liver, skeletal musd* and kidney, and en the e.c.g. and gestation examined. No pos. effects were observed in any of the measurements* The compound had no general toxic action. (Italian) G.N.GodsoU

5619. HISTOCHEMICAL VARIATION IN SOME DEHYDROGENASE ACTIVITIES OF THE RAT THYROID GLAND AFTER ADMINISTRATION OF THIOCYANATE AND OF METHYL THIOURACIL. F.Melani and P.Gentilini: Sperimentale, 1962, 112, 496-506 (1st. Semeiotica Med., Univ., Firenze, Italy) The activity of succinic- [S], citric- [C], 6-phosphogluconate-[6-PG] and glyceraldehyde-3-phQspheate. [G-3-P] dehydro* genases, of the thyroid gland after rats had been treated

with CNS (20 mg./animal) daily for 20 or 40 days was stim. whereas, the glucose 6-PO₄ dehydrogenase activity remained the same for 20 days and then increased. When the rats were treated with methyl thiouracil (10 mg./animal) daily for 20 and 40 days, all these dehydrogenase enzymes in the thyroid gland were considerably higher in activity than in the CNS-treated animals. It is suggested that the CNS inhibits the uptake of I₂ and reduces % thyronine synthesis, whereas methyl-thiouracil completely blocks the synthesis of thyronine.

(Italian) G. N. Godson

5620. SEARCH FOR BIOTIN ANTAGONISTS AND ISOLATION OF v-BIOTIN. A.B.Ajansen and PJ.Stokes: J. chem. Soc., 1962, 4909-4914 (Res. Lab., J.Wyeth and Brother Ltd., New Lane, Havant, Hants., England) Some N-substituted deriv. of biotin were synthesised in the hope that, because they could not form allophanate ions of the type which are probably essential for normal biochemical function, they might act as antimetabolites. None of the deriv. showed either bactericidal or bacteriostatic activity. A new member of the biotin group, designated v-biotin, was isolated and formulated as N-Phenylbiotin. L.G.Gillies

5S21. METHYLATION OF GUANOSINE AND RELATED COMPOUNDS WITH DIAZOMETHANE. J.A.Haines, C.B.Reese and A.Todd: J. chem. Soc., 1962, 5281-5288 (Uttiv. Chem. Lab., Cambridge, England)

Guanosine, deoxyguanosine and their deriv. were methylated by diazomethane at position 7. The chemistry of 7-methylguanosine was investigated. The decomposition ¹f deriv. of deoxy-7-methylguanosine in aq. soln. proceeded with glycosidic fission at low pH and with cleavage ¹f the imidazole ring at high pH. The relevance of this to mutagenic action was considered. L.G.Gillies

5622. DETERMINATION OF CHOLINESTERASE INHIBITION WITH THE USE OF A CHOLINE-DEPENDENT STRAIN OF NEUROSPORA CRASSA. G.Schatzberg-Porath, J.Zahavy and S.GitteR: Nature, Lond., 1963, 198, 686-687 (Israel Inst. Biol. Res., Ness-Ziona,

Israel) Quant. determination of organophosphorus cholinesterase inhibitors can be made using a cholineless mutant of *N. crassa*. The growth of this organism in a medium containing ACh and cholinesterase is measured in the presence of inhibitor. Application of the method to determination of diisopropyl fluorophosphate is shown. G.M.Lewis

5623. CORRELATION BETWEEN SOME CHEMICAL AND BIOLOGICAL REACTIONS OF ETHYL METHANE-SULPHONATE. E.E.Froese-Gertzen, C.F.Konzak, R.Foster and R.A.Nilan: Nature, Lond., 1963, 198, 447-448 (Dept. Agronomy, Washington State Univ., Pullman, D.C., U.S.A.) The biol. activity of the ¹*utagen ethyl methanesulphonate as measured by its inhibitory effects on the growth of barley seeds, can be correlated with the chemical reactivity of the mutagen as measured by its rate of hydrolysis under various conditions of temp. and pH. It is inferred that biol. effects of ethyl methanesulphonate are closely related to its activity as an alkylating agent. J.R. Sargent

5624. DIETHYL ETHER AND LACTATE DEHYDROGENASE ACTIVITY IN VITRO. N.M.Greene and E.L. Spencer, jun.: Anaesthesiology, 1963, 24, 23-28 (Sect. Anaesthesiol., Yale Univ. Sch. Med., New Haven, Conn., U.S.A.) High concn. of diethyl ether result in an inhibn. of beef heart lactate dehydrogenase as determined by spectrophotometric measurement of the

rate of consumption of NADH₂ in buffered soln. containing only Na pyruvate, lactate dehydrogenase, and NADH₂. While such inhibn. is statistically significant, it is of little or no biochem. significance. A.A.Zimmerman

5625. INTERACTIONS OF ARSENATE WITH PHOSPHATE-TRANSPORTING SYSTEM OF YEAST. A.Rothstein: J. gen. Physiol., 1963, 46, 1075-1085 (Sch. Med. Dent., Univ., Rochester, New York, U.S.A.)

Arsenate competed with phosphate for transport into the yeast cell, their affinity for the transport system being about equal. But in mixtures, the phosphate was taken up about twice as fast as arsenate. Arsenate caused a continuous and irreversible inactivation of the transport system that could be characterised by first order kinetics. This inactivation was slower in the presence of phosphate, and was not the result of an inhibn. of metabolism.

K.Jones

5626. COMPARISON OF SELENITE AND TELLURITE TOXICITY IN E. COLI J.Scala and H.T.Williams: Arch. Biochem., 1963, 101, 319-324 (Dept. Biochem., Cornell Univ., Ithaca, N.Y., U.S.A.) L-, but not D-, methionine enhanced the toxicity of TeO₃²⁻ and SeO₃²⁻ in wild type and the methionine requiring mutant ATCC 9663. Enhancement of TeO₃²⁻ toxicity was produced by S compounds which were complete or partial S sources for *E.coli* and by those that were not metabolised, but all effective compounds contained S as S²⁻. SeO₃²⁻ toxicity was not similarly affected. B.M. Stevens

5627. INTERACTION OF CYCLOCERINE WITH ASPARTATE-GLUTAMATE TRANSAMINASE. M.Ia.Karpeiskii, Iu.N.Breusov, R.M.Khomutov, E.S.Severin and O.L. Polianovskii: Biokhimia, 1963, 28, 345-352.

Cycloserine reacts with the pyridoxylidene form but not at all with the pyridaxamine form of the enzyme. The effects of pH and of time of incubation were also examined. The inhibn. caused by cycloserine develops with time and is irreversible. The product of interaction between cycloserine and aspartate-glutamate transaminase was isolated. (Russian) B.J.Cooper

5628. EFFECT OF SULPHONAMIDES ON FERRICYANIDE REDUCTION BY ILLUMINATED SPINACH CHLOROPLASTS. B.K.Stern: Biochim. biophys. Acta, 1963, 71, 727-729 (Dept. Biochem., Univ. of Chicago, Chicago, Ill., U.S.A.) These sulphonamides which inhibited animal carbonic anhydrase strongly, markedly inhibited the Hill reaction with ferricyanide as electron acceptor. B.M. Stevens

5629. EFFECTS OF ACTINOMYCIN D ON ACETATE STARVED AND LOGARITHMICALLY GROWING EUGLENA GRACILIS. J.J.Blum and D.E.Buetow: Biochim. biophys. Acta, 1963, 68, 625-632 (Gerontol. Branch, Nat. Heart Inst., Bethesda, Md., U.S.A.) On replacement of acetate, starved cells resumed logarithmic growth after a lag in which RNA and protein utilised during starvation were resynthesised. If actinomycin D was added with acetate, growth after the lag was slow, the rate depending on actinomycin D concn. and the time of starvation. During the lag the cells resynthesised a normal amount of protein and almost the normal amount of RNA. After growth resumed, protein, but not RNA, accumulated and DNA was synthesised. Addition of actinomycin D to logarithmically growing cells inhibited rates of growth and RNA synthesis.

B.M.Stevens

5630. RNA SYNTHESIS IN PROTOPLASTS OF E. COLI INHIBITION BY ACTINOMYCIN D. B.Mach and

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E.L.Tatum: *Science*, 1963, 139, 1051-1052 (Rockefeller Inst., New York, U.S.A.) Actinomycin D inhibits the DNA-dependent RNA synthesis in protoplasts prep, from *E. coli* K13 by treatment with lysozyme and EDTA; although intact cells are resistant to the drug.

G.M.Lewis

5631. EFFECT OF ISONICOTINIC ACID HYDRAZIDE [INH] AND CYCLOSERINE ON THE GLUTAMIC - OXALOACETIC TRANSAMINASE ACTIVITY OF THE RAT LIVER. M.R.Alioto: *Biochim. appl.*, 1962, 9, 333-343 (Ist. Chim. Biol., Univ., Napoli, Italy)

Inhibitn. of enzyme occurred with much smaller levels of INH and cycloserine than in vitro. 2&Jo inhibn. of activity required 2000 times higher concn. of INH in vitro than in vivo and 68 times higher concn. of cycloserine.

(Italian) J.C.Crawhall

5632. MOLECULAR WEIGHTS OF INTERFERONS FROM DIFFERENT ANIMAL SPECIES. Z.Rotem and P.A. Charlwoob: *Nature*, Lond., 1963, 198, 1066-1038 (Nat. Inst. Med. Res., London, England)

Mol. wt. were determined by density gradient centrifugation in sucrose using radioactive proteins of known mol. wt. as markers. Chick, mouse and monkey interferons have very similar mol. wt. (min. value 13000 - max. value 20000-25000) the sedimentation const. for these interferons being 1.95. J. R. Sargent

5633. PRESENCE IN MAMMALIAN LIVER AND BLOOD OF SUBSTANCES WHICH INHIBIT THE MITOTIC ACTIVITY OF HUMAN CELLS GROWN IN VITRO.

R.Oftebro, P.Laland, J.Dedichen, S.Laland and N.Thorsdal: *Brit. J. Cancer*, 1963, 17, 183-193 (Norsk Hydro's Inst. Cancer Res., Oslo, Norway)

Various fractions were obtained by pptn. from ox blood and ox liver extracts. The effect of these fractions on the mitotic activity in vitro of HeLa cells and Chang-strain liver cells, was determined. Two liver fractions arrested completely mitotic activity in HeLa cells and one was also effective on Chang cells. The fractions were believed to exert their effect on the cell during the interphase period. D.Hamer

5634. ACTION OF ARGINASE AND CATALASE ON GROWTH OF CARCINOMA OF GUERIN. J.Biraben and G.Delmon: *CR* Soc. Biol.*, Paris, 1962, 156, 2011-2013 (Lab. d'Anat. pathol. expt., Fac. M&L,

Bordeaux, France) The albumin/globulin [A/G] ratio of serum was estimated in rats with an implant of carcinoma of Guerin (Ts) after injn. of 1 mg. arginase and 1 mg. catalase per day for 20 days. The serum protein level of normal rats was 6.0 g./100 ml. and the A/G ratio was 1.7. In rats with tumour implants the serum protein level was 7.0 g./100 ml. and the A/G ratio was 1. In rats treated with enzymes the serum protein content decreased to normal and the A/G ratio increased to 1.56. (French) M. A. Price

5635. SOMÉ POTENTIAL AMINO ACID ANTAGONISTS AND RELATED COMPOUNDS. T.A.Connors, A.B.

Mauger, M.A.Peutherer and W.C.J.Ross: *J. chem. Soc.*, 1962, 4601-4607 (Chester Beatty Res. Inst., Fulham Rd, London, England)

In an attempt to produce a tumour inhibitor 2-chloroethionine, glycylethionine, ethionylglycine, glycylethionylglycine and some dipeptides containing the tumour-growth-inhibitor, 1-amino-cyclopentanecarbonyl residue with sarcosine, leucine and tyrosine were prep. Unsuccessful attempts were made to prepare a-fluoroglycine and 3-fluoroaspartic acid. Preliminary tests indicated that S-2-chloroethylhomocysteine caused 40% inhibn. of transplanted Walker rat

carcinoma with one dose i.p. of 25 mg./kg. None of the other compounds had any effect on this tumour.

L.G.Gillies

5636. SELECTIVE INHIBITION OF NUCLEIC ACID

SYNTHESIS IN MYCOBACTERIUM TUBERCULOSIS BY

ISONIAZID. P.R.J.Gangadharam, F.M.Harold and

W.B.Schaefen: *Nature*, Lond., 1963, 198, 712-714

(Dept. Expt. Microbiol. Divn. Res., Natl. Jewish

Hosp., Denver, Colo., U.S.A.) Addition of 1 fig./

ml. isoniazid to growing cultures of the BCG strain of

M. tuberculosis caused a steep reduction in viable count.

Protein synthesis continued for 24 hr. while accumulatio

of RNA and DNA was inhibited. Isoniazid had no effect

on the incorporation of 32p into acid-insol. inorg. poly-

phosphate or incorporation of [¹⁴C]alanine into cell wall

mucopeptide; incorporation of 32p into ethanol-sol.

phospholipid was somewhat affected.

G.M.Lewis

5637. EFFECTS OF THIOACETAMIDE ON INCORPORATION OF [2-14C]OROTIC ACID INTO RNA FRACTIO1

IN LIVER. H.R.Adams and H.Busch: *Cancer Res.*,

1963, 23, 576-582 (Depc. Pharmacol., Baylor Univ.

Coll. Med., Houston, Tex., U.S.A.) 50 mg./kg./

day for 9 days increased the amounts of RNA released by

paeol into the aq. phase [p-RNA] and of RNA remaining

in the phenol [r-RNA] 2-3-fold in rat liver nuclei. In

nucleoli p-RNA was increased 2-fold and r-RNA 3[#]5-fold

Amounts of mitochondrial and microsomal RNA were

correspondingly decreased but the supernatant fraction

p-RNA was increased. Incorporation of [2-14C]orotic

acid into nuclear p-RNA and r-RNA was suppressed. As

measured by sp. activity, labelling of nucleolar p-RNA

was unchanged. Labelling of nucleolar r-RNA was

decreased by 30% at early time points after orotic acid

B.M.Stevens

5638. 5-AZAOROTIC ACID AND RELATED INHIBITOR! OF THE SYNTHESIS DE NOVO OF PYRIMIDINE

NUCLEOTIDES. R.E.Handschumachen: *Cancer Res.*,

1963, 23, 634-639 (Dept. Pharmacol., Yale Univ.

Sch. Med., New Haven, Conn., U.S.A.) 6 x 10⁻⁷N

5-azaorotic acid or 2 x 10⁻⁴M 5-azauracil produced approx. 50% inhibn. of orotic acid metabolism in cell free extracts of mouse liver or L5178Y leukaemia cells. Seven other compounds of the 42 tested also produced at least 50% inhibn. at concn. less than 2 x 10⁻³M. The primary site of action of the 2 symmetrical triazine deri

appeared to be orotidylic acid pyrophosphorylase.

5-Azaorotate was much more effective at inhibiting exogenous orotic acid utilisation by liver slices than by leukaemia cells. 5-Azauracil was nearly inactive in liver slices but effective in leukaemia cells. I.p. injn. of 0.3 pmole 5-azaorotate/g. into mice produced an 80% inhibn. of orotic acid utilisation but did not affect incorporation of uridine into liver.

B.M.Stevens

5639. RESISTANCE TO 6-MERCAPTOPURINE.

H1. DELETION OF A 5'-NUCLEOTIDASE IN A

6-MERCAPTOPURINE-RESISTANT SUBLINE OF THE

EHRLICH ASCITES CARCINOMA. A.R.P.Paterson and

A.Horne Canad. J. Bio. chem., 1963, 41, 1339-1348

(Biochem. Dept., Univ. British Columbia, Vancouver

B.C., Canada) Nuclei prep, from cells of a 6-mercaptopurine-resistant subline of the Ehrlich ascites

carcinoma differed from nuclei isolated from the parent

line of cells in being markedly deficient in 5'-nucleo-

tidase. This deficiency was apparently not related to th<

resistance to 6-mercaptopurine. The nucleotidase activi

ty of Ehrlich cell homogenates was characterised as

being localised primarily in the nuclear fraction, specific for 5'-nucleotides, and inhibited by Zn^{2+}

A.M.Gibbins

5640. SUCCINIC DEHYDROGENASE LEVELS IN LIVERS OF RATS DURING EARLY FEEDING OF 4-DIMETHYLAMINOAZOBENZENE, A REINTERPRETATION OF BIOCHEMICAL DATA. G.kNJones: Brit. J.Cancer, 1963, 17, 153-161 (Roy- Coll. of Surgeons. London. England)

August strain rats on a low protein diet were fed 4-dimethylaminoazobenzene and succinic dehydrogenase activity was subsequently determined on Uver samples by the anaerobic Methylene Blue technique. There was a fall in enzyme activity but this could be accounted for by a change in the proportion of cell types rather than by a biochem. change within the cells themselves.

D.Hamer

5641. UPTAKE OF ARSENIC-74 LABELLED ARSONOAZOPROTEINS IN TISSUES OF TUMOUR BEARING MICE. J.L.Mego and J.D.McQueen: Cancer Res., 1963, 23, 523-530 (Lab. of Radioisotope Res., Div. Neural. Surgery, Baltimore City Hosp., Baltimore, Md., U.S.A.) The uptake of ^{74}As into tumour from i.v. inj. $[^{74}As]arsonoazoalbomin$ approached the uptake from $[^{74}As]arsanilate$ with protein containing 30 moles arsanilate/mole. Clearance of $[^{74}As]arsanilate$ was virtually complete in approx. 24 hr. but 25-50% of the initial concn. remained in tumour for 8 days after $[^{74}As]arsonoazoalbomin$ injn. Large persistent accumulations of $(^{74}As)arsonoazoalbomin$ were found in liver and kidney after injn. of protein with only 1-2 moles arsanilate/mole. Uptake in kidney and rate of disappearance from blood varied directly with the amount of arsanilate bound to protein within the range 2-30 moles/mole protein. Correlation was poor for liver and tumour and neg. for muscle.

B.M.Stevens

5642. CARCINOGENICITY OF 2-NAPHTHYLHYDROXYL AMINE AND 2-NAPHTHYLAMINE. E.Boyland, C.E. Dukes and P.L.Grover: Brit. J. Cancer, 1963, 17, 79-84 (Chester Beatty Res. Inst., London, England) Carcinogenic prop. of 2-naphthylhydroxylamine and 2-naphthylamine were compared by i.p. injn. into groups of albino rats at a dosage of 50 mg./kg. twice weekly, for 3 months. The hydroxylamine deriv. induced tumours in 9/15 rats while the amino produced 2/14. "The results were consistent with the hypothesis that the carcinogenic aromatic amines are active via conversion to hydroxylamines.

D.Hamer

5643. CARCINOGENIC AND GROWTH INHIBITORY ACTIVITY OF LACTONES AND RELATED SUBSTANCES. F.Dickens and H.E.H.Jones: Brit. J. Cancer, 1963, 17, 100-108 (Middlesex Hosp. Med. Sch., London, England) (3-Propiolactone had previously been shown to be carcinogenic in rats. Further tests confirmed that Penicillin G was carcinogenic, so also was pp-dimethyl-tri*-methylene oxide and (+)-parasorbic acid.) D.Hamer

5644. NEW TEST FOR CARCINOGENICITY. IE. NON-CARCINOGENIC AND WEAK CARCINOGENIC HYDROCARBONS. E.Arffmann: Acta Path. microbiol., scand., 1963, 57, 375-394 (Dept. Path. Finsen Inst., Copenhagen, Denmark) Some non-carcinogenic and weak carcinogenic hydrocarbons have been tested on $XO12Q$ Sustatus. Phenanthrene and, with a few exceptions, $^{a}ntRracene$ and triphenylene gave no epithelial response, $^{v}M1_e$ chrysene and beng(a)anthracene induced a pos. re-action, estimated as weak or moderate. Contrary to

reviewed results in mammals reaction to 1,2,4-tri-methylphenanthrene was neg. but pos. to $3',6'$ -dimethyl benz(a)-anthracene. It is preliminarily concluded that the newt test has shown sufficient specificity to be used as a quick-test for carcinogenicity, at least of polycyclic hydrocarbons.

L.Friedmann

5645. EFFECT OF CARCINOGENIC POLYNUCLEAR HYDROCARBONS ON THE METABOLISM OF OESTROGENS. P.H.Jellinck and L.Irwin: Nature, Lond., 1963, 198, 787-788 (Cancer Res. Centre, Univ. of British Columbia, Vancouver, B.C., Canada)

The liver microsomes of rats fed 7,12-dimethylbenz(a)-anthracene or 3-methylcholanthrene had a greatly enhanced ability to convert oestrone a^* oestradiol to unidentified water-sol. products which were biol. inactive*. BenzQ $_Q$ anthracene, dibenzQ $_Q$ anthracene and benzCa $_Q$ pyrene had a similar effect but phenanthrene was inactive. Ethionine inj. 2 hr. before dosing with carcinogen abolished this effect, indicating that enzyme induction may be involved. The significance of these results in relation to effect of hormones on induction of mammary cancer is discussed.

G.M.Lewis

5646. ACETONITRILE AS A CONSTITUENT OF CIGARETTE SMOKE. J.K.Campbell, J.W.Rhoades and A.L.Gross: Nature, Lond., 1963, 198, 991-992 (Dept. Chem., Southwest Res. Inst., San Antonio, Tex., U.S.A.) Using gas chromatography and mass spectrometry, acetonitrile was identified in cigarette smoke at concn. approx. 1 mg./cigarette. None was present in unsmoked tobacco and cigarette papers, showing that it must be a combustion product.

G.M.Lewis

5647. OC-PARTICLE ACTIVITY AND FREE RADICALS FROM TOBACCO. E.Marsden and M.A.Collins: Nature, Lond., 1963, 198, 962-964 (Dominion Physical Lab., Lower Hutt, New Zealand)

Considerations of the levels of a-particle emitters (^{222}Rn , ^{226}Ra , ^{210}Po and ^{210}pb) present in tobacco smoke and leaf suggests that the role of these in carcinogenesis should not be neglected. The variation in stable free radicals in tobacco follows directly the variation in a-emitting activity. A large no. of very unstable free radicals are present in smoke condensates.

J.R.Sargent

5648. FILTRATION OF PHENOLS FROM CIGARETTE SMOKE. D.Hoffmann and E.L.Wynden J. nat. Cancer Inst., 1963, 30, 67-84 (Preventive Med. Div., Sloan-Kettering Inst., New York, U.S.A.) The adsorption capacity of various filter materials for phenols have been tested.

It is possible to reduce the phenol in cigarette smoke up to 90% with selected filter fibres and plasticisers. From a comparative study of the adsorption by various materials, suggestions are made in terms of fibre structure and die use of plasticisers that could lead to further improvement of filters for phenol removal.

J.G.Bennette

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5649. CLINICAL APPLICATION OF THE EFFECT OF ACETONE ON SERUM LACTATE DEHYDROGENASE.

A.L.Latner and D.M.Turner: Lancet, 1963, i, 1293-1294 (Dept. Clin. Chem., King's Coll., Newcastle

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upon Tyne, England) The lactate dehydrogenase activity remaining after treatment of serum with acetone is an indication of the presence of one of the isoenzymes found in cardiac muscle. This finding has diagnostic significance in relation to myocardial infarction, although pos. results are also obtained in sera from patients with untreated pernicious anaemia and malignant disease.

G.H.Bell

5650. MULTIPLE MYELOMA: IMMUNOCHEMICAL ANALYSIS OF SERUM PROTEINS. G.Pontieri and O.J.Plescia: Sperimentale, 1963, 113, 1-14 (Inst. Microbiol., Rutgers Univ., New Brunswick, N.J., U.S.A.) In multiple myeloma there is a considerable increase in the serum globular protein. This protein was separated into 2 components by zone electrophoresis on cellulose acetate columns and quant., immunochem. analysis by the p-incipitin method and gel diffusion demonstrated the presence of several Ag in these components and also different Ag in the different components. These fractions precipitated about 50% of the total Ab of normal serum fraction. Thus, myeloma proteins are made up of several electrophoretically and antigenically distinct proteins which differ from the normal serum proteins.

(Italian) G.N. Godson

5651. INVESTIGATIONS OF THE INFLUENCE OF SERA FROM PREGNANT WOMEN ON THE GROWTH OF CELL CULTURES IN CONJUNCTION WITH THE OCCURRENCE OF ABNORMAL CTI-LIPOPROTEIN. J.Rejnek, T.Bednářík, E.ReYaoková and A.Doležal: Clin.chim. Acta, 1963, 8, 108-115 (Inst. Haematol. and Blood Transfusion, 2nd. Gynaecol. and Obstet. Clinic, Prague, Czechoslovakia) The influence of sera from different stages of pregnancy on the proliferation of HeLa cells in vitro is reported. The effect was correlated with the occurrence of an abnormal immunoelectrophoretic picture of trilipoprotein. K.Brew

5652. PHYSICAL-CHEMICAL AND IMMUNOLOGICAL STUDIES OF PATHOLOGICAL SERUM MACROGLOBULINS. P.Ratcliff, J.F.Soothill and D.R.Stanworth: Clin. chim. Acta, 1963, 8, 91-108 (Dept. Expt. Pathol., Univ., Birmingham, England) A study is presented of the physico-chem. and quant., gel diffusion precipitin prop. of 14 sera containing pathol. macroglobulins.

K.Brew

5653. DETERMINATION OF TOTAL CHOLESTEROL AND CHOLESTEROL IN a- AND g-LIPOPROTEINS OF SERUM. G.Vanzetti and E.Gatti: Biochim. appl., 1963, 10, 34-50 (Lab. Biochim., Ospedale Maggiore, Milano, Italy) The cholesterol content of human serum in the a- and g-fractions of the lipoproteins was determined by a chem. procedure and by ultracentrifugal analysis which was sensitive to the presence of bilirubin. In a large series of normal patients the total cholesterol was found to be in the range 160-240 mg./100 ml. with lipoprotein cholesterol 45-50 mg./100 ml.

(Italian) J.C.Crawhall

5654. DISTINCTION OF MYELOMA PARAPROTEIN FROM MACROGLOBULINS. M.Mancini, P.Oriente, M.Cuzzupoli and R.Cerqua: Biochim. appl., 1962, 9, 351-382 (1st. Patol. Speciale Med. e Metodol. Clin., Univ., Napoli, Italy) The sera of patients with myeloma and macroglobulinaemia respectively were studied bV starch gel electrophoresis and immunoelectrophoresis. The proteins could be distinguished without the use of ultracentrifugal analysis. The electrophoretic pattern of macroglobulins but not myeloma proteins was

altered by addition of mercaptoethanol to the starch gel. Specific immunophoretic interaction with anti-macroglobulin Ab could be demonstrated.

(Italian)

J.C.Crawhall

5655. IMMUNOHISTOLOGICAL LOCALISATION OF Y-1-MACROGLOBULINS, (32A-MYELOMA PROTEINS, 6-0-S Y-MYELOMA PROTEINS AND BENCE-JONES PROTEINS. A.Solomon, J.L.Fahey and R.A.Malmgren: Blood, 1963, 21, 403-423 (Nat. Cancer Inst., Nat. Inst. Hlth., Bethesda, Md., U.S.A.) Each type of protein was identified by sp. immunofluorescence in a variety of morphol. forms of malignant cells in patients with multiple myeloma or macroglobulinaemia. The Y-, 32A "# YIM" ^{aik*} Bence Jones proteins were not found exclusively in a particular form of malignant cell. In patients with anomalous proteins, all of the malignant cells contained the sp. anomalous protein. Only one class of globulin was found in individual cells.

H.B.Waynforth

5656. NEW FLUORIMETRIC TECHNIQUE FOR MEASURING SERUM HIGH- AND LOW-DENSITY LIPOPROTEINS. R.L.Searcy, J.L.Korotzer and L.M. Bergquist: Clin. chim. Acta, 1963, 8, 148-151 (Dept. Pathol., Los Angeles County General Hosp., Los Angeles, Calif., U.S.A.)

K.Brew

5657. PLASMA FREE 5HT. N.Crawford: Clin. chim. Acta, 1963, 8, 39-45 (Dept. Surg., Clin. Res. Dept., Queen Elizabeth Hosp., Birmingham, England) Evidence is presented indicating that normal plasma contains free 5HT. This fraction, unassociated with the platelets was quant. determined in humans using a spectro-photofluorimetric method. A range of values from 0.003 to 0.045 μ g./ml., mean 0.019 pg./ml., was found.

K.Brew

5658. ROUTINE METHOD FOR DETERMINATION^a PHOSPHOGLUCOSE ISOMERASE ACTIVITY IN BODY FLUID. J.E.Horrocks, J.Ward and J.King: J. clin. Path., 1963, 16, 248-251 (N.Lonsdale Hosp., Barrow-in-Furness, Lancs., England) Phosphoglucose isomerase activity was measured in normal serum and c.s.f. by colorimetrically using the determination of fructose by a colour reagent containing resorcinol-thiourea.

J.B.Derbyshire

5659. HISTAMINE IN HUMAN BLOOD [DETERMINED BX SPECTROFLUORIMETRY]. H.Zachariae: Scand. J. clin. Lab. Invest., 1963, 15, 173-178 (Dept. Skin and Venereal Dis. and Clin. Chem., Rigshospitalet, Univ., Copenhagen, Denmark) The method was evaluated using standard soln. of histamine, and the fluorescence intensity found to be proportional to the concn. of histamine within the range studied. In 32 adults the values ranged from 0.04 to 0.14 μ g./ml. of histamine. The recovery of histamine ranged from 86 to 97.5%. The method was considered to offer a simple, sp. time-saving and accurate assay of blood histamine.

E.Parkinson

5660. DISTRIBUTION OF ORAMINO NITROGEN BETWEEN ERYTHROCYTES AND PLASMA IN FOETAL AND MATERNAL BLOOD. K.B.Björnesjö: Scand. J. clin. Lab. Invest., 1963, 15, 198-201 (Dept. Clin. Chem., Central Hosp., Karlstad, Sweden) a-Amino N analyses using the ninhydrin reagent were performed on plasma and r.b.c. from foetal and maternal blood. Corresponding values were obtained from healthy pregnant and non-pregnant. Foetal plasma had a significantly higher level of amino-N than maternal plasma. Maternal r.b.c. showed an increase in amino-N during pregnancy but a decrease in plasma values. The results suggest that

the decrease in plasma amino-N during pregnancy is caused part by active transport of amino acids across the Placenta, and part by a change in the distribution of amino acids between the intracellular and extracellular fluid.

* E.Parkinson

5661. DETERMINATION OF AMMONIUM IN BLOOD AND TISSUE EXTRACTS BY THE PHENOL-HYPO-CHLORITE REACTION. K.Koritzer and S.Voigt: Clin. chim. Acta. 1963, 8, 5-11 (Deut. Akad. der Wissenschaften zu Berlin, Inst. for Komko-Viszeale Pathologic and Therapie, Berlin-Buch, Germany)

The method has the following advantages (1) no complicated apparatus is needed and the method is time saving, (2) microdiffusion is avoided as a source of errors. (3) the method has a greater reliability than those using Nessler's reagent. (German) K.Brew

5662. DETERMINATION OF Ca^{++} IN SERUM. G.A.Lumb: Clin. chim. Acta. 1963, 8, 33-38 (Dept. Med., Royal Infirmary. Manchester. England)

A direct method for measuring Ca^{++} concn. in serum is described which requires half the amount of leramto compared with other methods and is more rapid. The esU's of Ca^{++} - level in normal and pathol. sera are in good agreement with those of another method. Cf. total Ca was independent of total Ca concn. K.Brew

5663. REDUCTION OF METHAEMOGLOBIN IN ERYTHROCYTES OF PATIENTS WITH CONGENITAL MET-HAEMOGLOBINAEMIA. SUBJECTS WITH ERYTHROCYTE GLUCOSE 6-PHOSPHATE DEHYDROGENASE tG 6-PD DEFICIENCY AND NORMAL IND Δ UALS. F.RJaffe: Blood. 1963, 21, 361-372 (Med. Dept. A.Einstein Med. Coll., New York, U.S.A.) Reduction of met-Hb did not occur in the r.b.c. of the patients with methaemoglobinaemia upon incubation with glucose and inosine. The NADH2-utilising diaphorase-like system was normal in G 6-PD-deficient r.b.c. but was deficient in the case of methaemoglobinaemia. The NADPH2 utilising met-Hb reductase system was only abnormal in the G 6-PD deficient r.b.c. Pathways for reduction of met-Hb to Hb are suggested. H.B.Waynforth

5664. CONCENTRATION OF PHOSPHATE ESTERS AND

Patol. Med., Univ.. Milano. Italy) R.b.c. of newborn infants have a lower nicotinic nucleotide and 2,3-diphosphoglyceric acid content than adult r.b.c. The "Jicotinic nucleotide content of the newborn r.b.c. was 42-&7% lower than the adult, the 2,3-diphosphoglyceric acid content was 33% lower and the ATP content 4% higher. (Italian) G.N.Godson

5665. EFFECT OF INCUBATION WITH GLUCOSE OR ADENOSINE ON THE ORGANIC PHOSPHATE ESTER d S K Δ A Δ O N Δ F RED CELLS FROM NEWBORN INFANTS AND ADULT SUBJECTS. F.M.Quarto di Palo and L.Mombelli: Amf. Acad. med. Lombarda. 1962, 17, 398-401 (1st. di patol. medica. Univ.. Milano. Italy) R.b.c. from newborn infants and young children were incubated at 37° for 2 or 6 hr. in an isotonic medium containing 30 /imole/mL of glucose or 30 /imole/ml. of adenosine and the changes in intracellular ATP and 2,3-diphosphoglyceric acid [DPGA] measured. During the incubation in glucose both the ATP and DPGA

content decreased. This decrease was greater in newborn than in adult r.b.c. Adenosine prevented this decrease in adult, but not in newborn r.b.c. (Italian) G.N.Godson

5666. GLYCOLYSIS OF R.B.C FROM NEWBORN INFANTS AND THE DIFFERENCES WITH RESPECT TO ADULT RED CELLS. F.M.Quarto di Palo and H.R.Spinnen

Atti. Acad. med. Lombarda, 1962, 17, 392-394 (1st. Patol. Med., Univ., Milano, Italy) R.b.c. from newborn infants and adults were incubated in an isotonic medium containing 6 jimole/ml. of adenosine or 30 jimole/ml. of glucose at 37° for 2 or 6 hr. and the effect on glycolysis measured. Incubation in glucose induced a greater production of lactic and pyruvic acid than incubation in adenosine, in both types of cells. Adult r.b.c. produced 50% more lactic acid than infant r.b.c., but the infant cells produced 20-100 times more pyruvic acid than the adult r.b.c.

(Italian) G.N.Godson

5667. DIFFERENTIATING BETWEEN VITAMIN B12 DEFICIENT AND FOLIC ACID DEFICIENT MEGALOBLASTIC ANAEMIAS WITH [14C]HISTIDINE.

M.B.Fish, M.Pollycore and T.V.Feichtimer: Blood, 1963, 21, 447-461 (Clin. Lab., San Francisco Gen. Hosp., San Francisco, Calif., U.S.A.) The intermediary metabolism of the Ci pool and histidine in patients with megaloblastic anaemia was studied by measurement of pulmonary excretion of $^{14}\text{CO}_2$ and urinary excretion of ^{14}c after injn. of L-[2-14c]histidine. Simult. measurements of the cumulative 1 hr. pulmonary ^{14}C excretion, and the time of occurrence of max. $^{14}\text{CO}_2$ sp. activity permits rapid differentiation between folic acid and vit. B12 deficient megaloblastic anaemia. Measurement characteristic of the 2 types of deficiencies are given.

H.B.Waynforth"

5668. CHROMATOGRAPHY OF HUMAN Hb. FACTORS INFLUENCING CHROMATOGRAPHY AND DIFFERENTIATION OF SIMILAR Hb. R.T.Jones and W.A. Schroeden J. Chromatography, 1962, 10, 421-431 (Div. Chem. and Chem. Eng., California Inst. Technol., Pasadena, Calif., U.S.A.) A modified procedure for the chromatography of human Hb on Amberlite IRC-50 columns is described. Important factors which influence the separation of these Hb are stressed and a radioactive tracer technique using R^{35} -labelled Hb is presented in which compounds with similar chromatographic prop. may be compared.

P.D.Dawkins

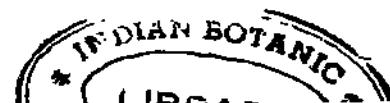
5669. ELECTROPHORESIS OF C.S.F. PROTEINS IN CERTAIN NEUROLOGICAL DISEASES. J.Goa and L.Tveten: Scand. J. clin. Lab. Invest., 1963, 15, 152-158 (Central Lab. Hosp. Norrkoping, Sweden)

Electrophoresis of c.s.f. proteins was carried out after concn. by means of pervaporation or by dialysis against dextran. The 2 techniques gave similar results. Only in a few diseases of the c.n.s. could characteristic changes in the c.s.f. protein pattern be demonstrated. Variation in the yglobulin values were found to give the best information especially in multiple sclerosis and in infectious diseases, within the c.n.s. E.Parkinson

5670. HYDROLYSIS OF CONJUGATED 17-KS.

J.C.De Paoli, E.Nishizama and K.B.Eik-Nes: J. clin. Endocrin., 1963, 23, 81-89 (Dept. Biol. Chem., Univ. Utah Coll. Med., Salt Lake City, Utah, U.S.A.)

Data are presented which indicate that the following hydrolytic procedures are adequate when working with conjugated urinary 17-KS: (a) β -glucuronidase for 17-KS



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glucuronosides; (b) ethyl acetate-sulphuric acid solvolysis for 17-KS sulphates; (c) ethyl acetate-perchloric acid solvolysis for 17-KS glucuronosides and sulphates.

G.F.Blane

5671. CONTRIBUTION TO THE STUDY OF PATHOLOGICAL URINARY AMINO ACIDS. M.E.S.A.Relvas: Clin. chim. Acta, 1963, 8, 12-18 (Service de Biochemie, Lab. Natl. de Recherches Veterinaires, Lisbon, Portugal) Urinary elimination of amino acids was studied and the results compared with those from various diseases including leukaemia, diabetes, Hodgkin's, Wilson's and Farconi's diseases. The changed pattern of excretion in some diseases is described.

(French)

K.Brew

5672. URINARY EXCRETION OF ORALLY ADMINISTERED TRITIUM-LABELLED FOLIC ACID AS TEST OF FOLIC ACID ABSORPTION. F.A.Klipstein: Blood, 1963, 21, 626-639 (Med. Dept., Coll. Physn. and Surg., Columbia Univ., Columbia, U.S.A.) Results from the urinary excretion of orally administered [³H]folic acid [3HFA] were compared with those from subjects with folic acid deficiency as detected with a variety of tests available for evaluation of intestinal absorption. The excretion of 3HFA in patients with intestinal malabsorption was about 70% less than in normal subjects. Folic acid deficiency was studied in 12 patients and its incidence shown to be related to the severity of impairment of folic acid absorption.

H.B.Waynfirth

5673. ESTIMATION OF 0-AMINO-ISOBUTYRIC ACID [BAIB] IN HUMAN URINE. D.Bawden: J. clin. Path., 1963, 16, 284-287 (Roy. Marsden Hosp. Path. Dept., London, England) In recovery expt. with a chromatographic method for the estimation of BAIB in human urine, % recovery was 80-100. The mean daily output of BAIB in the urine of 12 normal cT was 86 mg.

J.B.Derbyshire

5674. • NEW COLORIMETRIC METHOD FOR DIAGNOSIS OF PHAEochromocytoma. P.Lanucara, U.Marini and F.F.Gilardi: Atti. Acad. med. Lombarda, 1962, 17, 366-368 (1st. Patol. spec. med., Univ. Milano, Italy) A new colorimetric method for semi-quant. evaluation of urinary 3-methoxy-4-hydroxy mandelic acid (vanillylmandelic acid) [VMA], an important metabolite of adrenaline, was reported. A sample of urine was extracted with ethyl acetate, jj-amino diazoalanine reagent added and the colour measured at 450 and 550 mfi. From the 2 values the amount of VMA was calc. This method is far more rapid than the normal chromatographic technique and is accurate enough for clinical use.

(Italian) G.R. Godson

5675. DETERMINATION BY THIN-LAYER CHROMATOGRAPHY OF URINARY HOMOVANILLIC ACID IN NORMAL AND DISEASE STATES. L.Sankoff and T.L. Sourkes: Canad. J. Biochem., 1963, 41, 1381-1388 (Allan Mem. Inst. Psychiatry, McGill Univ., Montreal, Quebec, Canada) Ethyl acetate extracts of urine were chromatographed on glass plates coated with silica gel, using the org. phase of benzene: acetic acid: H₂O (2:3:1) mixture as solvent. Eluted homovanilllic acid was treated with Folin's phenol reagent and absorbance was measured at 750 m/i. Amounts in normal human urine were found to be 8*23 ± 2*96 mg./24 hr. or 6*42 ± 2*28 mg./g. creatinine. Higher values were obtained in cases of ganglioneuroma and neuroblastoma, in a case of pheochromocytoma, and in one of two cases of Wilson's disease. Values were normal for 3 cases of Huntington's chorea.

A.M.Gibbins

5676. QUANTITATIVE DETERMINATION OF PROTEIN IN URINE. B.Tidstrjftn: Scand. J. din. Lab. Invest., 1963, 15, 167-172 (Protein Lab., Inst. Gen. Pathol., Copenhagen, Denmark) A previously described

micro-method for protein determination was employed on 58 normal subjects to investigate the excretion of protein in urine. The excretion varied slightly from one 24 hr. period to another, but a significantly higher excretion per hr. was found during the day than during the night. Intensive physical exercise caused an appreciable rise in the protein excretion. From these results the upper normal limit of protein excretion was set as 2*5 mg./hr.

E. Parkinson

5677. SERUM CONTENT OF TSH IN HUMAN THYROIDITIS: LOW TSH LEVELS WITH HIGH RADIOIODINE UPTAKE IN MILD AUTOIMMUNE THYROIDITIS. D.J.E1 Kabir, D.Donach and R.Turner-Warwick: J. clin. Endocr., 1963, 23, 510-520 (M.R.C. Neuroendocr., Res. Unit, Dept. Human Anat., Univ., Oxford, England) Serum TSH values were measured

in 24 patients with auto-immune thyroiditis and in 5 other patients with other thyroid disorders by an *in vitro* bio-assay. These data were correlated with histol. examination of biopsies from the glands and other indices of thyroid function. In mild thyroiditis with good colloid stores TSH secretion is partly suppressed by the release of iodinated proteins from injured acini, and the excessive I uptake in some cases of thyroiditis is due either to an intense acinar regeneration or to a metabolic stimulus imparted to the thyroid cells by the inflammatory process itself.

G.F.Blane

5678. EFFECT OF PREDNISOLONE AND TRIIODOTHYRONINE ON THYROID FUNCTION IN HYPERTHYROIDISM. G.Wikholm and J.Einhorn: J. clin. Endocr., 1963, 23, 76-80 (Radiumhemmet, Karolinska Sjukhuset, Stockholm, Sweden) After 7 days of prednisolone treatment there was significant depression of the uptake of radioactive I by the thyroid gland and a fall in serum PBI in hyperthyroid patients. By supplying TSH a thyroid response could still be elicited in die presence of a high level of adrenal steroids. No significant depression of the radio-I uptake or of the level of PBI was observed with the same methods when triiodothyronine was given.

G.F.Blane

5679. ALTERATIONS IN FREE FATTY ACID [FFA] METABOLISM IN ENDOCRINE DISORDERS. I. EFFECT OF THYROID HORMONE. II. SEQUENTIAL STUDIES AND EFFECT OF 2-DEOXY-D-GLUCOSE [2-DG]. W.R.Harla J.Laszlo, M.D.Bogdonoff and E.H.Estes: J. clin. Endocr., 1963, 23, 33-40, 41-49 (Dept. Med., Duke Univ. Med. Sch., Durham, N.C., U.S.A.)

I. The fasting levels of FFA and die response to adrenaline and noradrenaline infusions were studied in euthyroid subjects and in patients with thyroid disorders. In hyperthyroidism there was significant elevation of resting levels of FFA and an enhanced mobilisation of FFA after catecholamine infusion. Although there was wide variation in resting FFA among hypothyroid subjects it appeared that mobilisation after the amine infusions was decreased. It is suggested that the thyroid hormone has an effect on utilisation as well as mobilisation of fatty acids.

II. On the basis of studies using the inhibitor of glucose metabolism 2-DG the thesis is advanced that relative availability of lipid or carbohydrate as energy substrate may be regulated by a balance of cortisone and thyroid hormones.

G.F.Blane

5680. IODINE REPLETION AFTER IODINE DEFICIENCY. R.H.Parker and W.H.Beierwaltes: *J. clin. Endocr.*, 1963, 23, 568-573 (Dept. Int. Med., Univ. Michigan, Ann Arbor, Mich., U.S.A.) 20 subjects from a non-goitrous, euthyroid, I-deficient population were treated with iodized salt. Some of these subjects received a supplement of desiccated thyroid and others KI. Metabolic studies before and after treatment revealed that the rather large difference between PBI and butanol-extract-^{a,b}Ie iodine in the untreated subjects could be attributed to the presence of a non-metabolically active iodoprotein released from the thyroid gland under increased TSH stimn. associated with the I deficient state. G.F.Blane

5681. THYROID FUNCTION IN ENDEMIC GOITRE. I. IMPAIRMENT OF HORMONE SYNTHESIS AND SECRETION IN GOITROUS GLANDS. A.M.Ermans, J.E.Dumont and P/A.Bastenie. II. NON-HORMONAL IODINE ESCAPE FROM GOITROUS GLAND. A.M.Ermans, J.E.Dumont and P.A.Bastenie: *J. clin. Endocr.*, 1963, 23, 539-549, 550-560 (Dept. Radioactive Isotopes, Lab. Exp. Med., Sch. Med., Univ., Brussels, Belgium) I. A detailed study is described of thyroid metabolism in 12 untreated and iodine-treated objects from the Uele in Central Africa. It is concluded that the adaptation mechanism to iodine-deficient conditions is associated with a modification of the normal Pattern of org. iodine metabolism within the gland. II. Radio-iodine studies in 9 goitrous subjects from the Uele area are reported. Since the results were not in keeping with the generally accepted dynamic pattern ^cthesis is put forward that there is, in this group, ^ escape of non-hormonal-I from the goitrous gland. G.F.Blane

5682. THIOCYANATE-LEVEL IN THE SERUM AND THYROID OF COWS FROM AREAS WITH DIFFERENT INTENSITIES OF GOITRE IN HUMAN BEINGS. S.Bobek and A.Pelczarska: *Nature*, Lond., 1963, 198, 1002 (Dept. Animal Physiol, Coll. Agric., Cracow, Poland) In cattle from areas of endemic human goitre, the CNS content of extracts of the thyroid glands was correlated with the incidence of thyroid cysts. It is suggested that CNS- in vegetables have a goitrogenic effect in cattle. G.M.Lewis

5683. LOCALISATION OF IODOAMINO ACIDS ON PLASMA PROTEINS OF SUBJECTS WITH THYROID CANCER. N.Etling: *C.R. Soc Biol.*, Paris, 1963, 157, 100-103 (Group Hospitalier Necker-Enfants Malades, Paris, France) Plasma from normal subjects and those with thyroid cancer was incubated with ^{V*}I thyroxine and 3,5,3-triiodothyronine. 50% of thyroxine was localised on the prealbumin fraction of plasma from normal subjects while 10% was localised on ^{m*}S fraction from cancerous plasma. No radioactivity was associated with the (X2-fraction of S globulin. (French) M.A.Price

5684. OVARIAN DWARFISM WITH PITUITARY TUMOUR. L.W.Kelly: *J. clin. Endocr.*, 1963, 23, 50-53 (Nalle Clinic, Charlotte, N.C., U.S.A.) Enlargement of sella turcica and elevated urinary gonadotrophin secretion were found in a patient with ovarian dwarfism. Gonadotrophin production could be suppressed by exogenous oestrogen. It is suggested that the prolonged ovarian deficiency may have led to the development of a pituitary tumour. G.F. Blane

5685. STEROID HORMONE METABOLITES BEFORE AND AFTER ORCHIDECTOMY FOR PROSTATIC CANCER.

T.F.Gallagher, W.F.Whitmore, B.Zumoffand L.Hellmare *J. clin. Endocr.*, 1963, 23, 523-532 (Sloan-Kettering Inst. Cancer Res., New York, U.S.A.) No correlation could be found between the initial or post-operative levels of androgens or hydrocortisone metabolites in the urine, and the degree of remission of the disease. The changes in adrenal function which did occur appeared to reflect the psychological state of the patients rather than the primary disease. G.F.Blane

5686. PERCHLORIC ACID SOLUBLE BASIC AND ACIDIC PROTEINS OF THE CYTOPLASM: VARIATION IN CANCER. D.Burston, M.P.Tombs, M.E.Apsey and N.F.Maclagan: *Brit. J. Cancer*, 1963, 17, 162-178 (Westminster Med. Sch., London, England) Perchloric acid extracts of various human tissues and tumours were examined by chromatographic and electrophoretic techniques. Particular attention was paid to the ai-globulin and glycoprotein fractions. A component E, was common to all extracts and was similar to serum 3*5 S glycoprotein in composition and immunol. prop. It was considerably elevated in cancer cases. Another component (A) behaved similarly to RNase but had no enzyme activity. The level of this component in liver was depressed in cancer cases. Parallel estimations were also made on Wistar rats. D.Hamer

5687. HISTAMINURIA IN MASTOCYTOSIS. D.J.Demis and J.G.Zimmen *Arch. intern. Med.*, 1963, 111, 309-314 (Dept. Dermatol., W.Reed Army Inst. Res., Washington, D.C., U.S.A.) (X-Methyl-dopa has no effect on histidine decarboxylase, although it inhibits other decarboxylases, and thus has no effect on the urinary excretion of histamine in patients with mastocytosis. E.E.Hobbiger

5688. PERIODIC FEVER ASSOCIATED WITH INCREASED PLASMA UNCONJUGATED AETIOCHOLANOLONE AND GRANULOMATOUS LIVER DISEASE: CASE REPORT AND STUDIES IN AETIOCHOLANOLONE AND CORTISOL CONJUGATION. S.Schenker, H.Wilson and A.Spickard: *J. clin. Endocr.*, 1963, 23, 95-106 (Lab. Clin. Invest., Endocrinol. Branch, N.I.H., Bethesda, Md., U.S.A.) The patient's ability to conjugate and excrete aetiocholanolone, menthol and cortisol were investigated when both asymptomatic and febrile. It was concluded that there was no evidence of an abnormal conjugating mechanism for aetiocholanolone in this patient. G.F.Blane

5689. TESTIS IN MYOTONIC MUSCULAR DYSTROPHY: A CLINICAL AND PATHOLOGIC STUDY WITH COMPARISON WITH KLINEFELTER SYNDROME. W.D.Drucker, W.A.Blanc, L.P.Rowland, M.M.Grumbach and N.P.Christy: *J. clin. Endocr.*, 1963, 23, 59 (Dept. Med., Coll. Physn. and Surgn., Columbia Univ., New York, U.S.A.) A description is given of the clinical picture and the histol. findings in 18 patients with testicular lesions in myotonic dystrophy. The evidence supports the primary nature of the lesion as distinct from any failure of the pituitary stimulus and emphasises the differences between this condition and the seminiferous tubule dysgenesis of Klinefelter's syndrome. Since urinary gonadotrophin levels were generally normal in the presence of degenerating Sertoli cells it is concluded that these, cells do not normally produce a hormone that inhibits pituitary gonadotrophin. G.F.Blane

5690. BIOSYNTHESIS OF DEHYDROISOANDROSTERONE SULPHATE BY HUMAN ADRENOCORTICAL TISSUE.

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E.Z. Wallace and S.Lieberman: *J. din. Endocr.*, 1963, 23, 90-94 (Coll. Phys. and Surg., Columbia Univ., New York, U.S.A.) The conversion of [7-3H]dehydroandrosterone to its sulphate ester by homogenates of an adrenocortical carcinoma is described. Details of the methods of analysis and identification of the sulphate product are given.
G.F.Blane

5691. ABSENCE OF ANDROGENS IN HUMAN EJACULATE
J.Raboch, L.Gregorová and K.Kežábek: *J. clin. Endocr.*, 1963, 23, 521-522 (Sexological Inst., Charles Univ., Prague, Czechoslovakia) A chromatographic examination of semen collected from subjects with Sertoli cells only and from normals revealed the absence of testosterone, androsterone, dehydroepiandrosterone, androstenedione, 11β-3-hydroxyaetiocholanolone and 11-ketoaetiocholanolone.
G.F.Blane

5692. SEPARATION OF HUMAN BRAIN GANGLIOSIDES.
S.R.Korey and J.Gonatas: *Life Sci.*, 1963, No. 5, 296-302 (Albert Einstein Coll. Med., New York, U.S.A.) The major spp. of gangliosides were separated by descending thin layer chromatography. The eluted gangliosides included 1 monosialo, 3 disialo and 1 trisialo forms, the gangliosides being distinct from those previously described.
K.Jones

5693. ACID MUCOPOLYSACCHARIDE FROM A SPLEEN OF PRIMARY AMYLOIDOSIS. T.Okuyama and K.Turams: *Clin. chim. Acta*, 1963, 8, 140-142 (Dept. Biochem., Fukushima Med. Coll., Fukushima, Japan).
K.Brew

5(394. PROBLEM OF SPECIFICITY IN SEROLOGICAL DETERMINATION OF HUMAN CHORIONIC GONADOTROPHIN. S.Brody and G.Carlstrom: *Acta endocr. Kbh.*, 1963, 42, 485-497 (Obstet. and Gynaec. Dept., Karolinska sjufchuset, Stockholm, Sweden) Gel diffusion and complement fixation techniques were used to ascertain the heterogeneity of a rabbit antiserum to a purified prep. of chorionic gonadotrophin. The non-sp. Ag and methods to eliminate them were examined.
H.B.Wayforth

5695. ORIGIN OF THE LIPID COMPONENTS OF XANTHOMATA. J.D.Wilson: *Circulat. Res.*, 1963, 13, 472-478 (Dept. Intn. Med., Univ. Texas, Southwestern Med. Sch., Dallas, Tex., U.S.A.) Rabbits were fed 2% fr cholesterol and 1QP/o lard, and finally [4-14C]cholesterol. Most of the cholesterol in xanthomata was derived from the blood stream, but these structures in both rabbits and human patients were able to synthesise phospholipids and fatty acids.
R.E.Moore

5696. CHROMATOGRAPHIC OBSERVATIONS OF HUMAN GASTRIC MUCOPOLYSACCHARIDES. J.Schragec Roy. A.Edward Infirmary, Wigan, England) Gastric mucopolysaccharides were examined by paper chromatography after hydrolysis. Uronic acid did not appear. Glucose, mannose, fucose and galactose were present, fucose and galactose being the predominant sugars in normal secretions. In patients with gastric carcinoma, glucose was greatly increased and galactose decreased.
G.M.Lewis

5697. HISTOCHEMICAL OBSERVATIONS ON LOCALISATION AND ORIGIN OF SPHINGOMYELIN, CEREBROSIDE AND CHOLESTEROL IN NORMAL AND ATHEROSCLEROTIC HUMAN ARTERY. C.W.M.Adams and O.B.Bayliss *J. Path. Bact.*, 1963, 85, 113-119

(Path. Dept., Guy's Hops. Med. Sch., London, England) Methods are described to identify the lipids in aortas and coronary arteries taken at necropsy from subjects aged 2 months to 80 yr*. Sphingomyelin alone is identified in the infant artery. In young adults, cholesterol is often found in intimal macrophages and in the phospholipid pool at the base of atheromatous plaques and in the inner half of media of atherosclerotic vessels*. The phospholipid pool at the base of atheromatous plaque contains mainly sphingomyelin but also cerebroside.
D.MurraJ

5698. EFFECT OF HEAVY CIGARETTE SMOKING ON POST-PRANDIAL TRIGLYCERIDES, FREE FATTY ACYL AND CHOLESTEROL. A.Konttinen and M.Rajasalmi: *Brit. med. J.*, 1963, i, 850-852 (Wihuri Res. Inst., Helsinki, Finland) Post-prandial rise in serum triglycerides after a fat meal was less in 20 young d who were heavy smokers than in a comparable group of 20 non-smokers, probably due to decreased intestinal absorption in smokers. At 6 hr. after the meal triglyceridaemia was similar in the 2 groups. Rise in free fatty acids of plasma was insignificantly greater in smokers than in non-smokers. Serum cholesterol levels were not affected by smoking.
M.E.Nutl

5699. DIET AND PLASMA CHOLESTEROL IN 99 BANK MEN. J.N.Morris, J.W.Marr, J.A.Heady, P.L.Mills and T.R.E.Pilkington: *Brit. med. J.*, 1963, i, 571-576 (MRC Social Med. Res. Unit, London Hospital, London, England) Total fat consumption of 99 British bank men, aged 40-55 yr. was 84-189 g./day, and animal fat 55-173 g./day. Casual plasma cholesterol level was 154-324 mg./100 ml. The distribution of values showed that all had a high fat consumption and a high plasma cholesterol level relative to the 180 mg./100 ml. postulated as the upper level in health. There was little correlation between fat intake and plasma cholesterol level and other causes for the high level must be sought.
M.E.Nutt

5700. STATURE AND NUTRITION IN CYSTINURIA AND HARTNUP DISEASE. J.E.Colliss, A.J.Levi and M.D. Milne: *Brit. med. J.*, 1963, i, 590-592 (Westminster Hosp. Med. Sch., London, England) The mean height of 44 patients with cystinuria was 2*5 cm. less than that for normal subjects, and 5*3 cm. less in 15 with Hartnup disease. This may result from undernutrition in childhood due to loss of essential amino acids in urine and their less efficient absorption from the gut. The relevance of findings to clinical management of die disease is discussed.
M.E.Nutl

5701. CLINICAL TRIAL OF Fe FORTIFIED BREAD. P.C.Elwood: *Brit. med. J.*, 1963, i, 224-227 (Dept. Social and Preventive Med., Queen's Univ., Belfast, N.Ireland) Two groups of 53 and 55 mental hospital patients were given bread made from flour fortified with 60 mg. ferrum redactum/100 g., for 6 months. (Equivalent to approx. 80 mg. Fe per day)* One group was given 50 mg. ascorbic acid twice daily during the last 2 months of the trial. A third group of 5* patients was given 80 mg. Fe daily as ferrous gluconate and a fourth group of 99 had no Fe therapy. Age and H& level of all groups was similar when the trial began*. There was no significant increase in mean Hb of either group given fortified bread, but there was a significant increase in the group given ferrous gluconate. In the group given bread, but no vit. C those having initial Hb < 12*5 g./100 ml. showed a significant increase in Hb level during the trial, but there was a similar incre*st

in comparable patients in the control group. Incomparable patients given ferrous & *cawv^Hbw* increased significantly by 1.60 ± 0.03 g./100 ml. during the 6 months, an increase significantly greater than in all other comparable patients. The value of the present level of Fe fortification of bread in this country u doubtful and additional fortification of no value. M.E.Nutt

5702: SORBITOL DEHYDROGENASE AND HEPATOCELLULAR INJURY: AN EXPERIMENTAL AND CLINICAL STUDY. M.Asada and J-T-GaJTM Gastroenterology, 1963, 44, 578-587 (Dept. Med., Emory Univ. Med. Sch., Atlanta, Ga., U.S.A.)

Studies on liver and serum enzymes such as so/bitol dehydrogenase and glutamic-oxaloacetic "an.aminase" of rats treated with CCl₄ have shown that * < » a * *nes are increased following hepatocellular inj'ry in proportion to the dosage of CO*. Studies on otheen E?? such as ducose 6-bosphatase made inhuman patients 3£ or S u t 'pa&onditions of the ^vershowf that an elevated sorbitol dehydrogenase in PaTM" 1 * "" associated with hepatocellular TM"functions i. many cases. D.N.Wheatley

5703. MUNOELECTROPHORESIS OF PROTEUS OF CORNEAL EPITHELIUM. ^' a " ^ * ^ ; TM , * ^ ; nic. Eyn. FwRes., 1963, 2, 196-202 (Op.ithalmol.CU, uSy^Ghem Belgium) The proteins of die corneal epiSu'm epSted into a greater Jjoffawgn^A by high-tension agar electrophoresis than by paper elec trophoresis. The distribution of the fractions "greatly influenced by the ionic strength of the b << ^ o in : , f great similarity is seen between the paneTM obuined from Paper electrophoresis and from agar electrciphoresii, at relat s confi st 8 different ppt. lines corresponding to different tissue proteins. The fraction present in highest concn. is found in h mals. It appears specificity. that tt has poor stability in soln. and **&*? te* electro I or 3 components which are separated dung slightly. Phoresis in agar. where their mobilities differ J.Whiting

5704. CHARACTER OF THE TECTORIAL MEMBRANE. iST^K^PSS and A.Stephens: Lancet, e's Hosp., Lincoln, England) entified topically, hydrolysed. and analysed for amino acids. f a m i n e , sulphate and sulphydryl groups. G.H.Bell

5705. BEDSIDE BIOCHEMISTRY IN SURGICAL CARE. C.nUngworth: Lancet. 1963. ^ I S ; 1278 (Dept. Surg., Univ.. Glasgow. Scotland) A lecture. G.H.Bell

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(See also Microbiology)

W08. SIGNIFICANCE OF PROTEIN COAT IN HOST-
S P E C S Y OF PLANT VIRUSES. E'Sande; and
G.Schramm: Z. Naturforsch. B, 1963,,18, 198-201
(Max-Planck-Inst. Virusforschung. Tifflungen.

Germany) The infectivity of whole virus and the corresponding free RNA was determined for TMV and turnip yellow mosaic virus. The protein coat of the complete virus enhanced the infectivity of the virus in comparison with the free RNA only in the host to which the virus was adapted. (German) J.C.Crawhall

5707. REACTION DIFFERENCES BETWEEN TOBACCO MOSAIC VIRUS AND ITS FREE RNA WITH NITROUS ACID. H.Schuster and R.C.Wilhelm: Biochim. biophys. Acta, 1963, 68, 554-560 (Max-Planck-Inst. Virusforschung, Ttibingen, Germany) When TMV RNA was treated with HNO₂ at pH 4[#]2 or 5[#]0 adenine, guanine and cytosine reacted with similar velocities. Not all the guanine attacked produced xanthine. When intact TMV was treated with HNO₂, adenine and cytosine were deaminated but guanine was not attacked. B.M.Stevens

5708. MULTIPLICATION AND PROPERTIES OF LACTIC DEHYDROGENASE [LDH] AGENT. A.L.Notkins and S.J.Shochac J. exp. Med., 1963, 117, 735-747 (Microbiol. Lab., Nat. Inst. Dental Res., N.I.H., Bethesda, Md., U.S.A.) Multiplication of LDH agent in mice began within 6 hr. of infection and reached a max. titre in the plasma within 24 hr. The titre decreased over the next 72 hr. but viraemia persisted with high titres for at least 16 months. LDH activity increased in the plasma about 24 hr. after the first sign of increase of LDH agent. The LDH agent is inactivated by ether but not by lyophilisation and freezing and thawing. Centrifugation and filtration studies suggest that the upper size of the agent is about 55 maf. There was little transmission of infection between mice caged together or from mothers to their offspring. H.E.Jones

5709. CYTOPATHOGENIC EFFECTS OF ADENOVIRUS TYPE 5. V. QUANTITATIVE STUDY. Y.Chardonnet, M.Prunieras and R.Sohier Ann. Inst. Pasteur, 1963, 104, 433-449 (Lab. d'Hyg?ene Fac. de Med., Lyon, France) Quant, extraction methods for DNA, RNA and protein from HeLa cells infected with adenovirus type 5 are reported. Significant increases in DNA and protein levels were found 48 hr. after infection. The RNA curve showed a significant peak after 24 hr. (French)

5710. BIOPHYSICAL STUDIES ON NATURE OF SIMIAN PAPOVA VIRUS PARTICLE (VACUOLATING VIRUS SV 40). H.D.Mayor, R.M.Jamison and L.E.Jordan: Virology, 1963, 19, 359-366 (Virol. Dept., Baylor Univ. Med. Coll., Houston, Tex., U.S.A.) The 45 mp diam. virus particle has a buoyant density of 1*30 in CsCl. The complete virion has a mol. wt. of 4*4 x 10⁷, of which &jo is double-stranded DNA. Icpahedral cubic symmetry (5:3:2) is shown and the capsid has 42 protein capsomeres. It is estimated that there are 240 chem. subunits, each with an approx. mol. wt. of 167000. The mature virion is susceptible to photodynamic inactivation with Acridine Orange. J.G.Bennette

5711. VIRUS-INDUCED ACQUISITION OF METABOLIC FUNCTION. VI. DIHYDROFOLATE REDUCTASE, NEW PHAGE-INDUCED ENZYME. C.K.Mathews and S.S. Cohen: J. biol. Chem., 1963, 238, 853-855 (Dept. Biochem., Univ. Pennsylvania Sch. Med., Philadelphia, Pa., U.S.A.) When *E. coli* is infected with T6 phage the dihydrofolate reductase activity is increased to a level approx. 10 times that of thymidylate synthetase. The overall increase in sp. activity of the reductase compared with the level before infection is approx. 20-fold. This

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induced enzyme reduces dihydrofolate with NADH₂, an activity that is absent from the uninfected cell.

J.N.Ashley

5712. AUTORADIOGRAPHIC STUDIES OF BEHAVIOUR OF DNA IN HERPES VIRUS INFECTED CELLS. K.Munk and G.Sauen Z. Naturforsch. B, 1963, 18, 210-214 (Inst. Virusforschung, Heidelberg, Germany) Autoradiographs were prep. of HeLa cells infected with herpes simplex virus in which the DNA was labelled with ³H-thymidine. Before infection with virus ³H-thymidine was incorporated only into the peripheral nuclear zone whereas after infection the inner nuclear zone was labelled and the periphery remained clear.

(German) J.C.Crawhall

5713. ATPase ACTIVITY AT SURFACE OF MATURE EXTRACELLULAR HERPES VIRUS. M.A.Epstein and S.J.Holt: Nature, Lond., 1963, 198, 509-510 (Bland-Sutton Inst. Pathol., Middlesex Hosp., London, England) In HeLa cell cultures heavily infected with the HFEM strain of herpes virus, E.M. studies showed that mature virus carries ATPase activity with it when released through the cell membranes which possess this function.

G.M.Lewis

5714. LOCALISATION OF ADENOSINE TRIPHOSPHATASE ACTIVITY IN T2 PHAGE. A.S.Tikhonenko and B.F. Poglazov: Biokhimiia, 1963, 28, 340-344.

A method was devised for separating the T2 phage into various structural elements (head, sheath, tail core), based on successive destruction of phage particles at continuously increasing pH. The highest ATPase activity was found in the tail sheath fraction.

(Russian) B.J.Cooper

5715. DNA METABOLISM IN T5-INFECTED E. COLI BIOCHEMICAL FUNCTION OF PRESUMPTIVE GENETIC FRAGMENT OF PHAGE. Y.T.Lanni and D.J.McCorquodale: Virology, 1963, 19, 72-80 (Microbiol. Dept., Emory Univ., Atlanta, Ga., U.S.A.)

Mechanical shearing (in the Waring blender) of complexes of T5 st and *E. coli* F, after first-step transfer of phage material, interrupts the passage of phage DNA to the host cell and that the transferred fragments control the degradation of host DNA. The results are consistent with the hypothesis that the first-step transfer material is a phage DNA fragment and one of its functions is to induce the degradation of host DNA.

J.G.Bennette

5716. CHARACTERISATION OF POOLS OF PROTEIN IN CELLS OF SHIGELLA FLEXNERI F6S INFECTED WITH PHAGE H-Sh. M.P.Beumer-Jochmans: Nature, Lond., 1963, 198, 506-507 (Inst. Pasteur Brabant, Brussels, Belgium) The effect of infection with H-Sh phage on the DNA and RNA of cells of *S. flexneri* F6S has been followed, by staining with coriphosphine, and the effects of fluorescent anti-bacterial and anti-phage rabbit sera investigated.

G.M.Lewis

5717. PHAGE CONCENTRATION ON ANION EXCHANGE RESIN. I.V.Cherniakhovskaya: Biokhimiia, 1963, 28, 253*257. The chromatographic behaviour of T2 *E. coli* phage on AB-17 anion exchange resin was studied. After dialysis of bacterial phage lysate the resin adsorbed the phage, protein and DNA. Elution with 0.2M NaCl desorbed 93% of the phage with more than 100-fold concn. Appreciable purification of T2 phage was effected by ion-exchange adsorption and differential centrifugation.

(Russian) B.J.Cooper

5718. OXIDATIVE METABOLISM IN RICKETTSIAL-INFECTED MICE. L.P.Zubok: Biokhimiia, 1963, 28, 265-271. Examination of striated muscle homo-

genates obtained from mice infected with rickettsia showed that there was impairment of the oxidation of some intermediate substances in the tricarboxylic acid cycle. (Russian)

B.J.Cooper

5719. HYDRODYNAMIC STUDY OF MOTILITY OF FLAGELLATED BACTERIA. M.E.J.Holwill and R.E. Burge: Arch. Biochem., 1963, 101, 249-260 (M.R.C. Biophys. Res. Unit, King's Coll., London, England) Expressions are derived following Gray and Hancock's method for the velocity of propulsion assuming propulsion by active helical movements of flagella and assuming propulsion by active movements of the body. Energy expenditure necessary to maintain helical displacement waves is compared with energy associated with sinusoidal waves. Size and shape of the bacterial body, the different no. of flagella found and the nature of flagella as shown by E.M. are taken into account. The observed velocities of up to 50 fi/sec. are shown to be possible only if flagella are active motor organs. Most of the flagellar energy is expended in maintaining the helical motion.

B.M.Stevens

5720. ULTRACENTRIFUGAL STUDIES ON EXTRACTS FROM PROLIFERATING YEAST CELLS. S.Chatterjee and N.D.Gupta: Exp. Cell Res., 1963, 30, 224-228 (Biophys. Div., Saha Inst. Nuclear Phys., Calcutta, India) Some ultracentrifugal patterns obtained with the crude extracts of proliferating yeast cells from different phases of the growth cycle are presented.

K.Jones

5721. METABOLISM OF METHYL SUCCINATE IN PSEUDOMONAS FLUORESCENS GROWN ON ITACONATE. H.Katsuki, J.Nagai, A.Wada, LFukuma and S.Tanaka: J. Biochem., Tokyo, 1963, 53, 328-330 (Dept. Chem., Fac. Sci., Kyoto Univ., Kyoto, Japan)* B.M.Stevens

5722. OXIDATION OF SUCCINATE IN BACTERIA.

M.A.Lukoianova, N.S.Gel'man and A.L.Oparin:

Biokhimiia, 1963, 28, 334-339. Succinic oxidase activity in *Micrococcus lysodeikticus* was related to the integrity of the protoplast or the cytoplasmic membrane. This required a definite concn. of phosphate buffer or the addition of Mg²⁺ when the concn. of the buffer was reduced. When these stabilising factors were present, a slight additional secondary protective effect of high polymer DNA in the cell lysate was demonstrated.

(Russian) B.J.Cooper

5723. DIRECT EVIDENCE FOR TRYPTOPHAN ANTHRANILIC ACID CYCLE IN NEUROSPORA. W.H.Matchett and J.A.Demoss: Biochim. biophys. Acta, 1963, 71, 632-642 (Dept. Biol., Univ. California, San Diego, La Jolla, Calif., U.S.A.) Protein tryptophan isolated from wild type and 2 auxotrophs, 1 blocked in the conversion of anthranilic acid to indole glycerol phosphate, after growth with [14C]tryptophan labelled randomly in the benzene ring, had the sainje sp. activity as the tryptophan supplied. With L-[2-¹⁴C]tryptophan, no isotopic diln. was found in the auxotrophi blocjed in the conversion of anthranilic acid to tryptophan but extensive diln. was observed in the other 2 strains. Radioactive anthranilic acid and formylanthranilic acid accumulated in the growth filtrate of the blocked mutant. The sp. radioactivity of these compounds indicated their exclusive derivation from exogenous tryptophan until this was exhausted when the anthranilic acid sp. activity fell abruptly.

B.M.Stevens

5724. METABOLISM OF 6-METHYLAMINOPURINE IN SALMONELLA TYPHIMURIUM. - D.E.Duggan, M.G. Weigert, W.E.Grieb and E.O.Titus: Biochim. biophys-

Acta, 1963, 68, 519-525 (Lab. of Chem. Pharmacol., Nat. Heart Inst., Bethesda, Md., U.S.A.) 6-Methylaminopurine was efficiently utilised by growing cultures of various mutants for polynucleotide purine biosynthesis. In the "purineless" mutant Ade-11 it competed favourably with adenine, guanine and hypoxanthine and in 2 sp. adenine dependent mutants it effected a unique growth increment beyond that attained with adenine. 6-Methylaminopurine is suggested to be converted to a 5'-nucleotide and then demethylaminated to inosinic acid.

B.M.Stevens

5725. STUDIES ON FERROVERDIN. A GREEN IRON-CONTAINING PIGMENT PRODUCED BY STREPTOMYCES WAK. SPECIES. A.Ballio, H.Bertholdt, A.Carilli, E.B.Chain, V.di Vittorio, A.Tonolo and L.Vero-Barcellona: Proc. roy. Soc. B, 1963, 158, 43-70 (Internat'l. Centre for Chem. Microbiol., Istit. Superiore di Sanita, Rome, Italy) The morphological features of an unidentified sp. of *Streptomyces Wak.* are described and optimum culture conditions for pigmentation in shake-flasks and in stirred fermenters determined. Details are given of the methods of production in submerged culture and purification of ferroverdin. The Prep. and identification of reductive and alkali degradation products are reported; on the basis of their structures it is suggested that ferroverdin is the ferrous complex of the n-vinylphenylester of 3-nitroso-4-hydroxybenzoic acid. G.M.Lev

5726. BIOSYNTHESIS OF PORPHYRIN AND BACTERIO-CHLOROPHYLL BY RHODOPSEUDOMONAS SPHEROIDES. IV. S-ADENOSYL^mOOTOT-MAGNESIUM PROTOPORPHYRIN METHYLTRANSFERASE. K.D.Gibson, A.Neuberger and G.H.Tait: Biochem. J., 1963, 88, 325-334 (Dept. Chem. Pathol., St. Mary's Hosp. Med. Sch., London, England)

An enzyme has been detected in chromatophores from *Rhodopseudomonas* which catalyses a reaction between S-adenosylmethionine and Mg protoporphyrin to form a product identified as Mg protoporphyrin monomethyl ester. The enzyme is also present in *R. rubrum*. It is absent from *Rhodopseudomonas* grown under high aeration in the dark. Under these conditions are cololess and do not contain chromatophores. The Mg-protoporphyrin and deuteroporphyrin are substrates for the enzyme. Of the metal ion-protoporphyrin complexes those with Zn and Ca are substrates, but those with Fe²⁺, Mn²⁺ and Mn³⁺ are strong inhibitors of the methylation of Mg protoporphyrin. Methyl groups are not substrates but some of adenosylhomocysteine and 5-adenosylethionine are both competitive inhibitors. The inhib. by the latter explains the observation that in whole organisms ethionine markedly inhibits bacteriochlorophyll synthesis.

5727. BIOSYNTHESIS OF X-S-¹⁴C-GRISEOPHENONE C AND P^d-GRISEOPHENONE B AND A. A.Rhodts, G.A.Somerville and M.P.McGonagle: Biochem. J., 1963, 98, 349-357 (Glaxo Res. Ltd., Sefton Park, Stoke-on-Trent, England) [14C]Griseophenone C and [¹⁴C]griseophenone B added to shake-flask fermentation broths of mutant strains D-3980 and Baiuer-Thom C-M.L3980 were incorporated into griseofulvin, thus confirming that both these benzophenones are intermediates in the biosynthesis of griseofulvin. Similarly, felling of griseophenone A from both P^d-griseophenone C and [36Cl]griseophenone B confirmed the

biochemical sequence previously found: griseophenone C → griseophenone B → griseophenone A. Complete failure to utilise [36Cl]griseophenone A for the biosynthesis of griseofulvin suggested that this benzophenone in the free state may not be an intermediate, although it is closely concerned with griseofulvin biosynthesis. The free-radical mechanism postulated for the final stages of griseofulvin biosynthesis is inadequate: an alternative hypothesis for biosynthesis of (+)-griseofulvin from griseophenone B is suggested. *

5728. FERREDQXIN REQUIREMENT FOR REDUCTION OF HYDROXYLAMINE BY CLOSTRIDIUM PASTEURIANUM. R.C.Valentine, L.E.Mortenson, H.F.Mower, R.L.Jackson and R.S.Wolfe: J. biol. Chem., 1963, 238, PC 856-858 (Dept. of Microbiol., Univ. of Illinois, Urbana, Ill., U.S.A.) The NH₂OH reductase system that converts NH₂OH into NH₃ is separated into two components. One of these is a mixture of enzymes containing hydrogenase and the other is the electron carrier, ferredoxin. Of a no. of electron carriers tested, only photosynthetic nicotinamide nucleotide reductase can replace ferredoxin. Probably this organism contains a sp. ferredoxin-linked NH₂OH reductase. J.N.Ashley

PLANT BIOCHEMISTRY

5729. BISBENZYLtetrahydroisoquinoline alkaloids. IV. MONODEMETHYLATED 1-CURINE. E.Hultin: Acta chem. scand., 1963, 17, 753-758 (Dept. of Pharmacol., Univ. California Med. Center, Los Angeles, Calif., U.S.A.) After treatment with cone. HCl and purification by a Soxhlet extraction with ether the monodemethylated 1-curine could be separated from the basic reaction mixture of curine and its methyl ethers. Only one isomer could be identified.

G.F.Blane

5730. APPARENT CONCENTRATION QUENCHING OF MORPHINE FLUORESCENCE. R.Brandt, M.J.Olsen and N.D.Cheronis: Science, 1963, 139, 1063-1064 (Brooklyn Coll., City Univ. New York, Brooklyn, N.Y., U.S.A.) Fundamental fluorescence equations were examined. Deviations from the theoretical were observed by varying the light path length to determine effects on apparent fluorescence. It was found that the decrease in emission of morphine soln. with the increase in concn. was caused by absorption effects that prevented excitation of the whole system. G.M.Lewis

5731. CONTINUOUS EXTRACTION DURING TREATMENT WITH ULTRASOUND. J.A.Lott and A.E.De Maggio: Science, 1963, 139, 825-826 (Coll. Pharm., Rutgers Univ., Newark, N.J., U.S.A.) An extraction apparatus is described for prep. of alkaloids from solanaceous plants which is more efficient than a Soxhlet extractor; the size of the container is not limited. G.M.Lewis

5732. STRUCTURE OF HUMIC ACID. IV. ELECTRON PARAMAGNETIC RESONANCE STUDIES. G.Tollin, T.Reid and C.Stealink: Biochim. biophys. Acta, 1963, 66, 444-447 (Dept. Chem., Univ. Arizona, Tucson, Ariz., U.S.A.) Evidence for the existence of quinhydrone and quinone moieties, as well as semi-quinone radicals, is presented. B.M.Stevens

BIOCHEMISTRY

5733. ESSENTIAL OIL IN BLACK TEA PRODUCTION AND STORAGE. V.T.Goglia: Biokhimiia, 1963, 28, 308-311. The essential oil content of the tea leaf changed appreciably during various processing stages, increasing during rolling and fermentation, but decreasing during desiccation and storage. The acidic no. of essential oil from tea increased at all stages of processing but remained more or less const, during storage. The ether and saponification no. increased during rolling and fermentation but decreased during storage and desiccation. The change in the total content of carbonyl compounds was similar to that in the ether and saponification no.

(Russian) B.J.Cooper

5734. THEAFLAVIN GALLATE AND THEARUBIGINS OF BLACK TEA. V.Subrahmanyam, D.S.Bhatia, C.P. Natarajan, T.N.Ramakrishnan, S.Ramamani, D.E. Leelavathi, R.Shakuntala and K.K.Gopalan: Indian J. Technol., 1963, 1, 244-246 (Central Food Technol., Mysore, India). I.A.B.S.

5735. DETERMINING THE DEGREE OF POLYMERISATION OF FLAVANS. J.L.Goldstein and T. Swain: Nature, Lond., 1963, 198, 587-588 (Low Temp. Res. Sta., Downing St., Cambridge, England) The Folin-Denis reagent is used to measure total phenolic groups in flavans and the vanillin-sulphuric acid reagent to measure phloroglucinol groups, the ratio between the two is correlated with the degree of polymerisation of the flavans as occurs in ripening fruits. G.M.Lewis

5736. STRUCTURAL AND CHROMATOGRAPHIC CORRELATIONS OF SOME FLAVONOID COMPOUNDS. D.G.Roux: J. Chromatography, 1963, 10, 473-478 (Leather Ind. Res. Inst., Rhodes Univ., Grahamstown, S. Africa) Rf values of 8 flavonoid compounds run in 3 solvent systems for paper chromatography are tabulated. Quinonechloroimides, Ehrlich's reagent and JD-toluenesulphonic acid have been tested for their usefulness as spray reagents. P.D.Dawkins

5737. CHROMATOGRAPHIC SEPARATION AND CHARACTERISATION OF COMPONENT ANTHOCYANINS IN RADISH POOT. ANTHOCYANINS. XXXVm. N.Ishikura and K.Hayashi: Bot. Mag. Tokyo, 1963, 76, 6-13 (Bot. Inst. Fac. Sci., Tokyo Kyoiku Univ., Ohtsuka, Tokyo, Japan) By means of column chromatography and paper electrophoresis, the anthocyanin from red root of radish, Raphanus sativus var. Iwakuni-aka, was separated into 5 components. They were shown to be acylated deriv. of raphanusin (3-di-glucosido-5-monoglucoside of pelargonidin) p-coumaric acid has been detected in raphanusin A, ferulic acid in raphanusin B-1, caffeic acid in raphanusin B-2, p-coumaric and ferulic acids in raphanusin C-1, and p-coumaric, ferulic and caffeic acids in raphanusin C-2. It is suggested that the cinnamic acid residues are linked to some of the sugar hydroxyl groups of raphanusin. N.J.Pinfield

5738. ON THE ANTHOCYANIN CRYSTALS OBTAINED FROM THE BERRIES OF EURYA JAPONICA. A. M.Shibata, N.Takakuwa and N.Ishikura: Bot. Mag. Tokyo, 1962, 75, 413-417 (Lab. of Plant Physiol., Biol. Inst., Foyama Univ., Japan) The anthocyanin component of ripe berries of Eurya japonica was separated into a dehydrated and a trihydrated form. It was identified as chrysanthemin (cyanidin-3-monoglucoside).

N.J.Pinfield

5739. OCCURRENCE OF METHYL A ZOXYMETHANOL IN CYCAS CIRCINALIS L. H-Matsumoto and F.M.Strong;

Arch. Biochem., 1963, 101, 290-310 (Dept. Biochem. Univ. of Wisconsin, Madison, Wis., U.S.A.) Three of the 9 fractions obtained chemically from C. circinalis. nuts were acutely toxic. The water sol. toxic fraction was passed through a C column and eluted material was chromatographed on a cellulose column. A compound occurring pure in 3 of 30 eluate fractions was cryst. and identified as cycasin. Toxicity in 2 of the fractions is suggested to be due to this. The ethyl ether sol. Fraction B produced acute liver damage and death when fed to rats in high doses. Smaller doses for long time periods produced hepatomas. The fraction appeared to contain methylazoxymethanol. Formaldehyde determination by the chromotropic acid method was applicable to rapid cycasin estimation in nuts. B.M.Stevens

5740. DI- AND TETRAHYDROPTERINS IN BLUE GREEN ALGA ANACYSTIS NIDULANS. L.Zieglen: Biochem. Z., 1963, 337, 62-68 (Botanisches Inst., Tech. Hochschule, Darmstadt, Germany) Tetrahydropterin was prep, from a culture of A. nidulans which was frozen in liquid N₂ and then treated with ultrasonic waves. Other pterins could be liberated from freeze dried material by grinding and extracting the debris. Dihydropterin was reduced by dihydrofolic acid reductase from chicken liver in the presence of NADPH₂*

(German) L.Cohn

5741. CHOLINE CONTENT IN SOME SPECIES OF EDIBLE AND NON-EDIBLE MUSHROOMS. Z.Kotomska and H-MJodecki: Roczn. Państ. Zatf. Hig., 1962, 13, 359-364 (Państwowy Zakład Higieny, Warszawa, Poland) Among 16 fungus spp. the highest choline (C) content - about 0*5% of dry wt. was found in Boletus edulis and Lactarius deliciosus. C was determined spectrophotometrically using trie Reinecke salt.

(Polish) T.Qlebicki

5742. LACHRYMATORY FACTOR IN ONION (ALLIUM CEPA) VAPOURS AND ITS PRECURSOR. CG.Spare and A.LVirtanen: Acta chem. scand., 1963, 17, 641-650 (Lab. Foundn. Chem. Res., Biochem. Inst., Helsinki, Finland) The unstable lachrymatory factor precursor was identified as (4)-S-(prop-1-enyl)-L-cysteine sulphoxide which is split in the onion by an enzyme into the lachrymatory factor (propenylsulphenic acid), pyruvic acid and ammonia. G.F.Blane

5743. FUNGUS PIGMENTS. XE TRAMESANGUIN, PIGMENT OF TRAMetes CINNABARINA. J.Gripenberg: Acta chem. scand., 1963, 17, 703-708 (Dept. of Chem., Inst. Technology, Helsingfors, Finland) The isolation of this cryst. pigment is described. It was identified as 2-amino-1-formylphenoxazin-3-one-9-carboxylic acid. The distribution of other fungal pigments is discussed. G.F.Blane

5744. BIOSYNTHESIS OF POLYACETYLENES. V. ROLE OF MALONATE DERIVATIVE AND COMMON ORIGIN OF FATTY ACIDS, POLYACETYLENES AND 'ACETATE DERIVED' PHENOLS. J.D.Bu'Lock and H.M.Smalley: J. chem. Soc., 1962, 4662-4664 (Dept. Chem., Univ., Manchester, England) Radioactivity from diethyl [a-14c]malonate was incorporated sp. into C-1 to C-8 of a C₁₀ polyacetylene and not into the terminal C₂ group. This was analogous to findings with fatty acids and with acetate-derived phenols and a hypothesis linking the three types of biosynthetic product was suggested. L.G. Gillies

5745. ENZYMIC OXIDATION OF WEDELOLACTONE CONTAINED IN ECLIPTA ALBA. S.Shimizu and

S.Hattori: Bot. Mag. Tokyo, 1963, 76, 59-66
 (Central Res. Inst., Japan Monopoly Corp., Yutaka-machi, Shinagawa-ku, Tokyo, Japan) The process of blackening of *E. alba* leaves on heating or injury was shown to be enzymic, the enzyme a polyphenoloxidase which oxidises wedelolactone, a phenolic compound. The enzyme was uncontaminated with ascorbic acid oxidase or peroxidase. The blackening process was retarded by ascorbic acid, but accelerated by the addition of Cu⁺. N.J.Pinfield

5746. REDUCTASES IN REDUCTION OF DISULPHIDE COMPOUNDS IN WHEAT FLOUR. N.I.Proskuriakov and E.S.Zueva: Biokhimiia, 1963, 28, 316-320.
 Two active enzyme systems were found in completely ground wheat grain and in 70% flour: glutathione reductase and protein disulphide reductase, both capable of reducing compounds with disulphide bonds. Cystine reductase was much less active. All the co-factors necessary for the enzymic reduction of S-S bonds, both in sol. low mol. disulphides and in proteins, were found in wheat flour. (Russian) B.J.Cooper

5747. OXALIC ACID METABOLISM IN BEGONIA PLANT. K.Sasaki: Bot. Mag. Tokyō, 1963, 76, 48-58 (Dept. Bot., Fac. Sci., Hokkaido Univ., Sapporo, Japan)
 Oxalic acid oxidase found in various tissues of *B. semperflorens* was associated mostly with the chloroplast fractions. Part of it was extracted with deoxycholate, digitonin or lipase. Oxalic acid was also isolated from these tissues. The partially purified enzyme has an optimum pH of 4.5 and an R.Q. of 2.4 for oxalic acid oxidation. This oxidation was stim. by the addition of Mn²⁺, but strongly inhibited by benzoate, chloropromazine, and nitrate and weakly inhibited by azide. Cyanide had no inhibitory effect. N.J.Pinfield

5748. OXALIC ACID SYNTHESIS IN SHOOTS OF OXALIS PES-CAPRAE: PRECURSORS OF GLYCOLIC ACID AND GLYOXYLIC ACID. A.Millerd, R.K. Morton and J.R.E.Wells: Biochem. J., 1963, 88, 276-281 (Dept. Agric. Chem., Waite Agric. Res. Inst., Univ., Adelaide, South Australia) Studies on oxalic acid synthesis in white shoots of *O. pes-caprae* have been extended by administering [2-14C]glucose, L1-A4C-glycose, [1,5-14C₂]isocitric acid and [-14C]glycolic acid. Identification of compounds that contained 14C activity has shown that both isocitric acid and glycolic acid serve as more efficient precursors of oxalic acid in ¹⁴C than does glucose or ribose. Oxalic acid synthesis in white *Oxalis* shoots appears to be associated with the oxidation of glyoxylic acid which may arise from the oxidation of glycolic acid and from the cleavage of isocitric acid. *

5749. ENZYMIC SYNTHESIS OF OXALIC ACID IN OXALIS PES-CAPRAE. A.Millerd, R.K.Morton and J.R.E.Wells: Biochem. J., 1963, 88, 281-288 (Dept. Agric. Chem., Waite Agric. Res. Inst., Univ., Adelaide, South Australia) The enzymes involved in oxalic acid synthesis have been investigated with cell-free extracts from white shoots of bulbs of *O. pes-caprae*. The production of glyoxylic acid from isocitric acid hydrolysed by isocitrate lyase has been demonstrated, glycolic acid and glyoxylic acid were oxidised by a vinyl-linked oxidase (or oxidases) which differed from a collate oxidase in that both substrates were oxidised at nearly equal rates. The oxidation of glyoxylic acid was not inhibited by oxalic acid. *Oxalis* extracts contained

isocitrate dehydrogenase as well as isocitrate lyase. Glyoxylic acid may be oxidised to oxalic acid, or reduced to glycolic acid by a NADP-linked glyoxylate reductase. The reduction of oxalic acid involving NADPH₂ and CoA has also been demonstrated. *

5750. STUDIES ON WHEAT PLANTS USING CARBON-14 COMPOUNDS. XK. OBSERVATIONS ON METABOLISM OF LYSINE-14C. S.N.Nigam and W.B.McConnell: Canad. J. Biochem., 1963, 41, 1367-1371 (Nat. Res. Council of Canada, Prairie Regional Lab., Saskatoon, Saskatchewan, Canada) When generally labelled [14C]lysine or ct-[6-14C]aminoacidic acid were administered to wheat seedlings 48 and 57%, respectively, of the 14C was recovered in H₂O-SOI materials, with 39 and 11% in the insol. residue. When [WcJ]lysine was administered, lysine, pipecolic acid, and CX-aminoacidic acid had high sp. activities, with glutamic acid and some related substances containing significant 14C. When O-[6-14C]aminoacidic acid was used, lysine and pipecolic acid were weakly labelled, and a-aminoacidic acid had very high sp. activity. Glutamic acid contained appreciable 14C, 63% being in C-5. a-Aminoacidic acid and pipecolic acid are probably on the pathway of lysine metabolism, with acetate a further degradation product. A.M.Gibbins

5751. ISOLATION OF PLANT PROTEINS AND VIRUSES BY PRESSURE-THAWING AND GEL FILTRATION. H.Stegmann and V.Loescheke: Z. Naturforsch. B, 1963, 18, 195-198 (Inst. Biochem., Biol. Bundesanstalt 351 Harm. Menden, Germany) Frozen plant material (-5°) was compressed in a filter press and the extruded sap purified on a Sephadex G25 column, this separated phenols from polyphenoloxidases at temp. below 0° which inhibited denaturation by tanning. This procedure was applied to potato tubers containing potato-S-virus. The Sephadex column was eluted with ammonium acetate buffer (pH 7). Fraction I contained the virus and various enzymes, peroxidase, phenoloxidase, catalase, lactic dehydrogenase and phosphatase. Increasing the buffer concn. liberated various peptides, amino acids and sugars. (German) J.C.Crawhall

5752. KINETIN AS ANTAGONIST OF TOXIC EFFECT OF PSEUDOMONAS TABACI. L.Lovrekovich and G.L. Farkas: Nature, Lond., 1963, 198, 710 (Res. Inst. for Plant Protection, Budapest, Hungary) In leaves of tobacco plants inj. with culture filtrates of *P. tabaci* the sol. protein content decreases, while the amino acid and NH₃ content increases. These effects were counteracted by spraying with 10-5M kinetin. G.M.Lewis

5753. PARTICIPATION OF DEHYDROGENASE IN DEFENCE REACTIONS OF CABBAGE PLANT. T.M.Ivanova and B.A.Rubin: Biokhimiia, 1963, 23, 288-294. The effect of the fungus infection *Botrytis cinerea* on dehydrogenase activity in the cabbage plant varied in different strains of the plant. In the resistant type of plant the infection inhibited the enzymic activity, but the enzyme was activated in the susceptible type of plant. In the resistant type, infection completely inhibited isocitric and succinic dehydrogenases. This effect constituted one of the tissue defence reactions against *B. cinerea*. (Russian) B.J.Cooper

5754. EFFECT OF INHIBITORS ON KINETICS OF IAA OXIDATION. J.A.Sachen Amer. J. Bot., 1963, 50, 116-122 (Dept. Bot., Los Angeles State Coll., Los

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Angeles, Calif., U.S.A.) Kinetic studies of the relative effectiveness of some phenolic antioxidants in causing a lag in IAA oxidation, by an enzyme from *Phaseolus vulgaris* pods supported the conclusion that they react with free-radical intermediates within the enzyme-substrate complex, thus greatly inhibited the rate of enzyme turnover. Results of expt. with partially purified enzyme indicate that a form of the enzyme active in the presence of H₂O₂ and IAA is involved in both inactivation of enzyme and the anaerobic destruction of phenolic inhibitors.

T.H.Thomas

5755. EXTRACTION OF REDUCED CYTOCHROME-552 AND -556 FROM EUGLENA GRACILIS (Z). G.Colmano and J.J.Wolken: Nature, Lond., 1963, 198, 783-784 (Biophys. Res. Lab., Eye and Ear Hosp., Pittsburgh, Pa., U.S.A.) Cytochrome-552 and -556 can be extracted from frozen and thawed *E.gracilis* in relatively high concn. by taking advantage of their water solubility and limiting die water phase in extraction so that total concn. of cytochromes remains above 5×10^{-4} M.

G.M.Lewis

5756. LIGHT INDUCED SINGLE ELECTRON TRANSFER REACTIONS BETWEEN CHLOROPHYLL *a* AND QUINONES IN SOLUTION. II. SOME EFFECTS OF NON-QUINOID DONORS AND ACCEPTORS: RIBOFLAVIN, THIOCTIC ACID AND NADH₂. G.Tollin and G. Green: Biochim. biophys. Acta, 1963, 66, 308-318 (Dept. Chem., Univ. Arizona, Tucson, Ariz., U.S.A.)

Reactions were observed in systems with chlorophyll and riboflavin or thioctic acid and in systems with NADH₂, chlorophyll and benzoquinone or riboflavin. Illumination of acidic soln. of chlorophyll and riboflavin produced a semiquinone of riboflavin and, through a side reaction, chlorophyll destruction. In the chlorophyll thioctic acid system, excitation of thioctic acid produced a sp. capable of forming free radicals on interaction with an electronically excited chlorophyll mol. From 2 to 8-fold enhancements in steady state radical concn. were obtained by adding NADH₂ to soln. of chlorophyll and acceptors.

B.M.Stevens

5757. PRIMARY PROCESS OF PHOTOSYNTHESIS: INTERPRETATION OF EMERSON EFFECT AND OF LIGHT INDUCED SPECTRAL CHANGES AT 7000A. G.Tollin: J. thporet. Biol., 1962, 2, 105-116 (Chem. Dept., Arizona Univ., Tucson, Ariz., U.S.A.)

Existing theories of the primary process of photosynthesis are discussed. An extension of the electron transfer theory is presented and a new interpretation of the Emerson effect is given in terms of this extended theory.

J.A.Dawson

5758. SHRINKAGE OF WHOLE CHLOROPLASTS UPON ILLUMINATION. M.Itoh, S.Izawa and K.Shibata: Biochim. biophys. Acta, 1963, 66, 319-327 (Tokugawa Inst. for Biol. Res., Tokyo, Japan) Illumination of a suspension of spinach chloroplasts reduced the vol. at the distribution max. to 51-78% of the vol. before illumination. The vol. change was reversed on return to darkness. Observations on the packed vol. confirmed the shrinkage phenomenon. Light scattering cross-sectional area, however, increased in the light and decreased in the dark. These changes were confirmed by E.M. to be due to changes in the axial ratios of the chloroplasts. Effects of ATP and inhibitors of photophosphorylation and the Hill reaction on the phenomenon are described.

B.M. Stevens

5759. AEROBIC AND ANAEROBIC PHOTOPHOSPHORYLATION [PP] IN SPINACH CHLOROPLAST PREPARATIONS UNDER CONTROLLED LIGHT CONDITIONS. M.Schwartz:

Biochim. biophys- Acta, 1963, 66, 292-307 (Div. Biol., Univ. Pennsylvania, Philadelphia, Pa., U.S.A.) Hie quantum requirements of PP at rate limiting intensities of red light were equal with @-naphthoquinonesulphonic acid, menadione and phenazine methorulphate under aerobic conditions. In an A atm. the quantum requirement increased with all 3, and 0-01N HCN inhibited PP. Aerobic conditions reversed the inhibn. but O₂ uptake and H₂O₂ production occurred. With 3-naphthoquinonesulphon* ic acid or menadione as catalyst, H₂O₂ prodjiced/O₂ con* sumed and ATP produced/O₂ consumed both approached 2. *g*-Phenanthroline and jj-chlorophenylidimethyl urea inhibited PP aerobically and anaerobically, the irihbn. being related to the inhibn. of Hill reaction activity. Only non-cyclic PP is concluded to have been demonstrated in chloroplast prep.

B.M.Stevens

5760. FLUOROMETRIC MEASUREMENT OF PHOTO-REDUCTION OF FLAVIN BY ILLUMINATED CHLOROPLASTS. B.Vennesland, H.-W.Gattung and E.Birkich: Biochim. biophys. Acta, 1963, 66, 285-291 (Max-Planck Inst. Zellphysiol, Berlin-Dahlem, Germany)

The method for measuring reduction and reoxidation of flavins in the presence of suspensions of chloroplasts or grana was based on the fact that oxidised flavins have a strong fluorescence band in the green whereas reduced flavins have no visible fluorescence. The procedure was used to show that illumination of chloroplasts with FMN in A led first to reduction of flavin, and that the reduced flavin was then reoxidised in a dark reaction, which lagged behind the reduction sufficiently to be directly demonstrable.

B.M.Stevens

5761. NITRATE REDUCTION IN LIGHT BY ISOLATED CHLOROPLASTS. F.F.Del Campo, A.Paneque, J.M. Ramirez and M.Losada: Biochim. biophys. Acta, 1963, 66, 450-452 (Sección de Bioquím y Fisiol Cel., Cen. de Invest. Biol., C.S.I.C., Madrid, Spain) NO₃- reduction was demonstrated in a reconstituted chloroplast system in which photoevolutLon of O₂ was suppressed and electrons were supplied by the couple ascorbate-dichlorophenolindophenol instead of water. Prelim, comm.

B.M.Stevens

5762. PHOSPHATASE ACTION ON PHOSPHOGLYCOLIC, 3-PHOSPHOGLYCERIC AND PHOSPHOENOLPYRUVIC ACIDS IN SPINACH CHLOROPLAST FRAGMENTS IN PRESENCE AND ABSENCE OF HIGH CONCENTRATIONS OF METHANOL. J.Ullrich: Biochim. biophys. Acta, 1963, 71, 589-594 (Lawrence Rad. Lab., Univ. of California, Berkeley, Calif., U.S.A.) Sonically broken chloroplasts, both before and after storage in the frozen state, hydrolysed [¹⁴C]phosphoglycolic acid rapidly in aq. soln. at room temp, or in 50% aq. methanol at 0°. C¹⁴CJphosphoglyceric acid, [¹⁴C]phosphoenolpyruvic acid and various sugar phosphates were converted to a no. of compounds usually built up during photosynthesis in aq. soln. at room temp. In ^Q_{Pjo} ipjethanol at 0°, phosphoglyceric and phosphoenolpyruvic acids were very slowly hydrolysed; sugar phosphates were unchanged. None of the compounds were hydrolysed in 80% methanol at 0°.

B.M.Stevens

5763. CHLOROPHYLLASE OF TOBACCO PLANTS. I. PREPARATION AND PROPERTIES OF WATER SOLUBLE ENZYME. S.Shimizu and E.Tamaki: Bot. Mag. TokyOt 1962, 75, 462-467 (Central Res. Inst. of Japan Monopoly Corp., Shinagawa, Tokyo, Japan) Using chloroplasts of *Nicotiana tabacum* var. Bright Yellow, a water sol. prep. of chlorophyllase was obtained. Seasonal changes in enzyme activity and chlorophyll content were

studied. The possible participation of chlorophyllase in biosynthesis of chlorophyll was discussed. N.J.Pinfield

GENERAL BIOCHEMISTRY

5764. SOME POTENTIAL AREAS FOR RESEARCH ON MEANS OF DRASTICALLY INCREASING THE HUMAN LIFE SPAN. L.V.Komarov: *J. theor. Biol.*, 1963, 4, 147-158 (Gerontology Branch, Moscow Soc. Naturalists, U.S.S.R.) Methods by which the life span of

People who have not yet reached old age may be extended are discussed. The principal contention is that the duration of pre-senile life is determined primarily by the level of disparity between the amount of substances coming into certain biosynthetic processes and the material handed on from these processes to subsequent links. Four possible fields of research are suggested.

G.F.Blane

5765. ON BIOCHEMICAL VARIABILITY AND INNOVATION. S.S.Cohen: *Science*, 1963, 139, 1017-1026 (Biochem. Dept., Univ. Pennsylvania Sch. Med.: Philadelphia, Pa., U.S.A.) A lecture. *A. T. C. w. s*

5766. STIMULATION BY MALONATE OR ISOCITRATE OF THE TRANSFER OF HYDROGEN FROM CL-OXOGLUTARATE TO d-OXOGLUTARATE PLUS AMMONIA IN RAT LIVER MITOCHONDRIA. J.M.Tager: *Biochim. biophys. Acta*, 1963, 73, 341-343 (Lab. Physiol. Chem., Univ. Amsterdam, Netherlands) Prelim, comm.

B.M.Stevens

5767. SWELLING PROPERTIES OF MITOCHONDRIAL PREPARATIONS FROM RETINA. D.Y.Wang, T.F. Slater and H.J.A.Dartnall: *Vision Res.*, 1963, 3, 171-181 (M.R.C. Vision Res. Unit, Inst. Ophthalmology, Judd St., London, England) Bovine retinae have been separated into sub-cellular fractions by flotation and differential centrifugation. The methods allow the isolation of distinctive sub-cellular fractions so that a "action rich in mitochondria could be obtained. By Measuring the changes in optical density at 520 m μ of a mitochondrial suspension the osmotic behaviour of the Mitochondria was examined in different concn. of KC1. They were observed to behave as osmometers. In ISO- ftnic media, mitochondria swelled when digitonin (10-4M) or thyroxine (2 x 10⁻⁵M) was added, but Ca²⁺ and HPO₄²⁻ ions, vit. A alcohol and aldehyde, £-chloro-¹⁴C-uribenzzoate and formaldehyde appeared to have little or no activity in this respect. Mitochondrial swelling caused by thyroxine or hypertonicity was reversed by the addition of a mixture of ATP (0.5 mM) Mg²⁺ (2 mM) and Plasma albumin (0.66 mg./ml.). J.Whiting

5768. OXIDATIVE PHOSPHORYLATION OF MITOCHONDRIA FROM TUMOUR AND EMBRYO CELLS. F.Feo, E.Grajeda, L.Galvial and T.Terranova: *Spijennale*, 1962, 112, 439-445 (Ist. PatoL Gen., Univ., Torino, Italy) The rate of oxidative phosphorylation of mitochondria isolated from rat hepatoma ⁵Cl⁴ cells (Yoshida), using succinate and a-keto-gf¹⁴rate as substrates, was not significantly different than that of mitochondria isolated from 10-day old embryo cells. The ATPase activity of mitochondria both sources was negligible under these expt. conditions. (Italian) G.N.Godson

5769. POLAROGRAPHIC STUDY OF MRTOCHONDRIAL SUSPENSIONS. G.D.Christian, E.C.Knoblock and W.C. Purdy: *Biochim. biophys. Acta*, 1963, 66, 415-419 (Div. Biochem., W.Reed Army Inst. Res., Washington, D.C., U.S.A.) Mitochondrial suspensions exhibited a characteristic polarographic wave which was independent of tissue source and found in 2 animal spp. The wave was anodic, irreversible and diffusion controlled. The anodic process resulted in Hg mercaptide formation, the source of mercaptan being SH within the mitochondrial membrane and apparently contained in the protein structure of the mitochondrial membrane. Ageing of the mitochondrial prep. resulted in loss of the early wave and the appearance of a second wave originating from the mitochondrial contents. B.M.Stevens

5770. POLAROGRAPHIC STUDY OF CHROMIUM-INSULIN-MITOCHONDRIAL INTERACTION.

G.D.Christian, E.C.Knoblock, W.C.Purdy and W.Mertz: *Biochim. biophys. Acta*, 1963, 66, 420-423 (Div. Biochem., W.Reed Army Inst. Res., Washington, D.C., U.S.A.) Insulin exhibited a polarographic wave due to reduction of an S-S, probably the intrachain S-S. Cr³⁺ formed complexes with insulin and mitochondria, both complexes involving Cr-S linkages. Insulin reacted with mitochondria through the formation of an SH-S-S linkage. Cr³⁺ enhanced this reaction. B.M.Stevens

5771. CONTRIBUTION OF THE VARIOUS PHOSPHORYLATING STEPS IN THE RESPIRATORY CHAIN TO THE DNP INDUCED ATPase OF RAT LIVER MITOCHONDRIA. H.C.Hemken: *Biochim. biophys. Acta*, 1963, 73, 311-323 (Lab. Physiol. Chem., Univ., Amsterdam, Netherlands) The curve relating ATPase to DNP

concn. at pH 7 showed 2 peaks at approx. 0.1mM and 0.2mM DNP. Low Amytal concn. had more effect on the latter peak whilst low antimycin concn. had more effect on the former. Curves relating DNP induced ATPase to antimycin or Amytal concn. each showed a clearly defined plateau. The effects of the 2 inhibitors were additive; together they produced almost complete inhibn. Without DNP, both induced an ATPase, the activity curves being identical with those where DNP was also present, at concn. of inhibitor at and above that giving max. ATPase without DNP. The DNP induced ATPase at pH 7.0 is suggested to contain 62% of an Amytal sensitive ATPase and 33% of an antimycin sensitive system. B.M.Stevens

5772. INDUCERS OF THE CRABTREE EFFECT AND ITS RELEASE BY UNCOUPLERS AND OTHER AGENTS.

D.Ram, H.S.Kalner and L.Bloch-Frankenthal: *Cancer Res.*, 1963, 23, 600-606 (Dept. Expt. Med. and Cancer Res., Hebrew Univ., Jerusalem, Israel)

Deoxyglucose and glucosamine depressed the oxidative decarboxylation of exogenous pyruvate and lactate by ascites tumour cells while inhibiting their O₂ consumption. DNP, dicoumarol and phenazine methosulphate relieved the inhibn. of endogenous respiration induced by glucose or glucosamine but not by deoxyglucose. Dicoumarol relieved the respiration inhibn. induced by any of the 3 in the presence of pyruvate or lactate and also relieved the depression of the oxidative decarboxylation of these substrates. Dicoumarol and DNP stim. O₂ uptake strongly in the presence of lactate or pyruvate without affecting endogenous respiration. B.M.Stevens

5773. ENERGY PATHWAYS OF HEPATOMAS H-35 AND 7800. A.C.Aisenberg and H.P.Morris: *Cancer Res.*,

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1963, 23, 566-568 (J.C.Warren Lab., Huntington Mem. Hosp., Boston, Mass., U.S.A.) Slices showed no aerobic or anaerobic glycolysis, no Crabtree effect and no glycolytically supported protein or DNA synthesis. A brisk response to succinate addition was shown in the respiratory rates of slices of both tumours and of Hepatoma 5123.

B.M.Stevens

5774. ENERGY METABOLISM OF THE LIVER OF MICE AFFECTED BY FRIEND'S LEUKAEMIA. G.Budillon, S.Papa, M.Coltorti and E.Quagliariello. *Biochim. Appl.*, 1962, 9, 383-390 (1st. Chim. Biol. Fisiol. Generale, Univ., Bari, Italy) The O₂ uptake of mouse liver homogenate was reduced in animals suffering from Friend's leukaemia. In particular O₂ uptake using (X-oxoglutarate as substrate was reduced by 30%. No consistent variation in O₂ uptake or P/O ratios was observed in the corresponding liver mitochondria.

(Italian) J.C.Crawhall

5775. ACETOIN AS METABOLITE OF ETHANOL. I-Hassinen: *Acta physiol. scand.*, 1963, 57, 135-143 (Med. Chem. Dept., Univ., Helsinki, Finland) Rabbits receiving disulphiram were given ethanol. Blood acetoin levels were raised by treatment with disulphiram alone. No increase was found after alcohol administration. In liver homogenates acetoin was formed only after giving ethanol and pyruvate. This was inhib. by disulphiram under aerobic conditions only. H.B.Waynfirth

5776. THREE ANTISTAPHYLOCOCCAL FACTORS FROM OX BRAIN. B.Kroenberg, E.S.Cook, C.B.Coutinho and L.G.Nutini: *Nature*, Lond., 1963, 198, 910-911 (Div. Biochem., Inst. Divi Thomae, Cincinnati, Ohio, U.S.A.) When deproteinised ox brain extract is fractionated on a Dowex column, 3 factors are separated which protect mice from lethal infections of a penicillin-resistant strain of *Staphylococcus aureus* when administered prophylactically at 2 mg./day for 5 days prior to infection. G.M.Lewis

5777. EFFECT OF BENZO-5,6-FLAVONE ON PROTEIN-AEMIA IN RAT. G.Zwingelstein, G.Peres and JJouanneteau: *C.R. Soc. Biol.*, Paris, 1962, 156, 2085-2087 (Lab. Physiol. générale, Fac. Sci., Lyon, France) Rats received s.c. injn. of 20 mg. benzo-5,6-flavone/day for 12 days. Electrophoretic separation of serum showed an increase in α-, β- and γglobulins. There was a decrease in serum albumin. These results were like those obtained with cortisone.

(French) M.A.Price

5778. FORMATION OF AN S-GLUCURONIDE FROM TETKAETHYLTHIURAM DISULPHIDE (ANTABUSE) IN MAN. J.Kaslanden *Biochim. biophys. Acta*, 1963, 71, 730-732 (Inst. for Org. Chem. T.N.O., Utrecht, Netherlands). B.M. Stevens

5779. VOLUME FLOW IN A SERIES MEMBRANE SYSTEM. J.T.Ogilvie, J.R.McIntosh and P.F.Curran: *Biochim. biophys. Acta*, 1963, 66, 441-444 (Biophys. Lab., Harvard Med. Sch., Boston, Mass., U.S.A.) B.M. Stevens

5780. INTERACTING SOLUTE FLOWS IN PERMEABILITY STUDIES ON THE SAND DOLLAR EGG. D.B.Ludlum: *Biochim. biophys. Acta*, 1963, 66, 386-396 (Dept. Physiol. and Biophys., New York Univ. Sch. Med., New York, U.S.A.) Equations are derived from the thermodynamics of irreversible processes which show that the flow of any permeable component across a semi-permeable membrane may depend on the simultaneous flows of all other such components through solute-solute inter-

actions. Expt. attempting to demonstrate such effects through their influence on classical swelling curves appeared to be successful. Reflection coeff. determined individually for ethylene glycol, propylene glycol and acetamide are compared with similar data for human r.b.c.

B.M.Stevens

5781. SIGNIFICANCE OF NITROGEN-15 EXCESS IN NITROGENOUS COMPOUNDS OF BIOLOGICAL ORIGIN. O.H.Gaebler, H.C.Choitz, T.G.Vitti and R.Vukmirovich: *Canad. J. Biochem.*, 1963, 41, 1089-1097 (E.B.Ford Inst. Med. Res., H.Ford Hosp., Detroit, Michigan, U.S.A.) Standard deviations of a series of analyses were too small, and values for 15N excess in the same amino acids isolated from different sources were too variable, to support the view that the observed 15N excess in nitrogenous compounds of biological origin was a reproducible error. Differences between amounts of excess 15N of amino acids or amides of animal and plant origin also indicated that the excess 15N had metabolic significance. The smallest 15N excess occurred in amino acids from legume proteins, and 15N concn. was often below normal abundance in synthetic amino acids.

A.M.Gibbins

METHODS

5782. CHEMICAL MICRODETERMINATION OF PHENYL- AND TOLYLSULPHONYLUREA DERIVATIVES IN BLOOD. W.Kern: *Analyt. Chem.*, 1963, 35, 50-53 (Dept. Chem. Res., Hoffman-La-Roche, Inc., Nutley, N.J., U.S.A.) A new quant. spectrophotometric micromethod for the determination of phenyl- and tolylsulphonylurea deriv. in blood was described. After selective extraction with org. solvents at pH 5, the compounds were nitrated reduced to aromatic amines, diazotised and coupled with N(1-naphthyl)ethylenediamine to produce azo dyes which were measured spectrophotometrically. L.G. Gillies

5783. POLAROGRAPHIC MEASUREMENT OF OXYGEN TENSION IN MOUSE EHRLICH ASCITES TUMOURS. M.Frimmer and ZJ.Zubrzycki: *Biochim. biophys. Acta*, 1963, 66, 440-441 (Pharmakol. Inst. der Justus Liebig-Univ., Giessen, Germany). (German) B.M.Stevens

5784. DETERMINATION OF TRUE Cl⁻ CONTENT OF BIOLOGICAL FLUIDS AND TISSUES. I. ANALYSIS BY 36d ISOTOPE DILUTION. E.Cotlove: *Analyt. Chem.-Metab.*, Nat. Heart Inst., N.I.H., Bethesda, Md., U.S.A.) An isotope diln. method using 36Cl was described by which the true value of the total Cl⁻ content of a sample of biol. fluid or tissue could be measured for amounts of 150 to 250 pequiv. of Cl⁻. The method involved complete isotopic exchange of stable with added 36Cl⁻ in a soln. formed by hot alk. digestion of the sample and determination of the correct value of the diluted sp. activity in purified soln. obtained by successive stages of alk. dry ashing, oxidation-reduction and distillation. Radioassay was performed by infinite thickness liquid counting and chem. assay was by automatic coulometric amperometric titration with Ag⁺.

L.G.Gulies

5785. DETERMINATION OF TRUE OT CONTENT OF RY BIOLOGICAL FLUIDS AND TISSUES. II ANALYSIS BY SIMPLE, NON-ISOTOPK METHODS. E.Cotjove Analyt. Chem., 1963, 35, 101-105 (Lab., Kidney and End-t-1 ³⁵M ch.. Nat. Heart Inst., N.I.H., Bethesda, MdTSSAO StoJU « Hablend 1115 f. S! for ifae determination of true cl-content were described and compared with an isotopic diln. method. In all cases the final measurement was by an automatic, coulometric-amperometric titration. In analysis of biol. fluids direct diln. and titrauorr were accurate. In analysis of tissue, a soln. ^{10**/1**}TM, ^ could be prep, in 3 ways alk. digestion of wet or dried tissue followed by Zn(OH)2 Pptn. of protein and Pirat e oxidation of SH group* in the supernatant, dU³⁵ TM J extraction of fat-free, dried, P^ veroed tissue. or water extraction. The non-isotopic alk. digestion method was the most consistently accurate and the most wW.... applicable.

L.G.GUUs

5786. ASSAY OF TRITIUM AND CARBON-14W ANIMAL TISSUES BY LIQUID SC^AALATION.

J.Dulcino, R.Boslo, W.G.Verly and J.R.Mabin. Clin. chim. Acta, 1963, 8, 58-65 l*\$*»*2&£3?" Study Centre of Nuclear Energy. Mol, Bd£um) Mouse organs were digested with hyamine, hyd-oxide methanoUc soln. and the digest diluted wrth dioxane before addition of a toluene scintillation contained up to 155 mg. of fresh tissue in a vol. of 16 ml. to the Packard Tri-Carb spectrometer. the y g * ° L counting without digest were 300 for 1^c and 17 ° t³H. with 100 mg. of stomach, intestine, bnuaiormuscle. 40% for 14c and 5% for 3H. Half those f ^ " * obtained with 100 mg. of liver 1? « ? • * a * g S a chemUuminescence is obtained with 14C. but a waning Period of 48 hr. is necessary when counting "M. K.Brew

5787. INISOPHENOLBLUEASACTOOM0GENICAGENT FOR IDENTIFICATION OF HALOGEN/TED AROMATIC HYDROCARBONS. S.O.Graham. Science, 1963, U⁹ State Univ., dye nated it tests, between 0 ¹⁰ µg./ ml. compounds varying in sensu G. Lewis

5788. APPARATUS FOR STERILISING HEAT-LABILE Med. Sen.. Univ.. Birmingham. England). G A # Lewis

5789. DENSITY GRADIENT FOR ILLATION OF METABOLICALLY ACTIVE THYMUSi NUCLEI. ^D-Fujer and 640. Ten nuclei which approached the metab... se prep. in isotonic sucrose; zonal centrifugation was used for increased resolution. B.M.Stevens

5790. DENSITY-GRADIENT SEPARATION OF ORGANIC AND INORGANIC PARTICLES BY CENTRIFUGATION. W.T.Lammers. Science, 1963, 139, 1298-1299 U.S.A. Particles (Da ed by between in a 2-bromoethanol density gradient. G.M.Lewis

5791. CENTRIFUGAL CHROMATOGRAPHY. V. APPARATUS FOR PREPARATIVE-SCALE PAPER CHROMATOGRAPHY IN CENTRIFUGAL FIELD. M.Pavlceek, J.Rosmus and Z.Deyl: J. Chromatography, 1963, 10, 497-501 (Automation Dept., Tech. Univ. Prague, Czechoslovakia) A simple technique for preparative-scale paper chromatography is described. The time of separation is reduced from 1/3-1/10 of the time required for conventional chromatography. P.D.Dawkins

5792. CHROMATOGRAPHY OF QUATERNARY NITROGEN COMPOUNDS ON BUFFERED CATION-EXCHANGE RESINS. D.D.Christianson, J.S.Wall, J.F.Cavins and R.J.Dimlen. J. Chromatography, 1963, 10, 432-438 (Northern Reg. Res. Labs., Peoria, HI., U.S.A.)

Amberlite IR-120 resin columns were used for the separation of quaternary N compounds and their amine analogues by employing buffers for elution. Substances of biol. interest such as betaine, stachydrine, choline, trigonelline, carnitine, and N-methylnicotinamide have been successfully separated and determined by the u.v. absorption of their periodide deriv.

P.D.Dawkins

5793. MULTIPLE-COLUMN HYDRAULIC METHOD FOR FRACTIONATION OF PARTICLES FOR CHROMATOGRAPHIC COLUMNS. D.R.Whitaker and G.A.Strasdine: Canad. J. Biochem., 1963, 41, 1105-1113 (Div. of Appl. Biol., Nat. Res. Council, Ottawa, Canada)

Liquid at const. temp. was freed of air bubbles and circulated at const. flow rate through a series of vertical columns of progressively increasing diam., a settling bottle, and a filter. The particles to be fractionated (cross-linked dextran, diatomaceous earth, microbead and micropowder ion-exchange resins used here) were either added gradually to the first column by passage of the return flow of liquid through a particle reservoir or were added at the outset to the first column. The flow of liquid distributes the particles between the columns according to particle size and density. A.M.Gibbins

5794. PREPARATIVE SCALE CHROMATOGRAPHY WITH ANALYTICAL COLUMNS. R.P.W.Scott: Nature, Lond., 1963, 198, 782-783 (W.G.Pye and Co., Ltd., Cambridge, England) Large samples may be satisfactorily analysed by gas chromatography if some minutes elapse after placing the charge before elution begins, and if the solute flow rate is adjusted so that thermal changes and column overload effects counteract each other to give a symmetrical peak. G.M.Lewis

5795. PREPARATION OF ECTEOLA-CELLULOSES OF VARIOUS CAPACITIES. H.A.Veder. J. Chromatography, 1963, 10, 507-508 (Biochem. Lab. Pediatric Clinic, Univ., Amsterdam, Netherlands) A modification of the method of Peterson and Sober for the prep. of ECTEOLA-celluloses of various capacities is applied to a prep. for the purification of antihaemophilic factor. P.D.Dawkins

5796. DETECTION OF SULPHUR COMPOUNDS ON PAPER CHROMATOGRAMS. C.de Marco: Nature, Lond., 1963, 198, 683 (Inst. di Chim. Biol., Univ. di Roma, Italy). G.M.Lewis

5797. IDENTIFICATION OF PURINES ON PAPER CHROMATOGRAMS. E.G.CClarke and S.Kalayci: Nature, Lond., 1963, 198, 783 (Dept. PhysioL, Royal Vet. Coll., London, England) Caffeine in 10-20 fig. amounts may be detected on paper chromatograms using a colour reaction with bromine. G.M.Lewis

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5798. PAPER CHROMATOGRAPHIC DETERMINATION OF AROMATIC CX-KETO ACIDS. K.H.Nielsen: *J. Chromatography*, 1963, 10, 463-472 (Biochem. Inst., Univ., Arhus, Denmark) A paper chromatographic method for the separation and quant. determination of phenylpyruvic, o-hydroxyphenylpyruvic, p-hydroxyphenylpyruvic and 3-indolylpyruvic acids in aq. soln. or urine as their 3-alkylquinoxalinols by reaction with o-phenylenediamine is described. Oxidation of the aromatic a-keto acids is prevented by NaHS. After separation and elution from the paper, the deriv. are determined by u.v. spectrophotometry. P.D.Dawkins

5799. CHROMATOGRAPHY OF 2,4-DINITROPHENYL-HYDRAZONES ON ACETYLATED PAPER. D.A.Forss and E.H.Ramshaw: *J. Chromatography*, 1963, 10, 268-271 (Div. of Dairy Res. C.S.I.R.O., Melbourne, Australia) Paper chromatography of the 2,4-dinitrophenylhydrazones of various n-alka-2-ones, n-alkanals, n-alk-2-enals and n-alka-2,4-dienals on acetylated paper is described. Good separations have been obtained by overnight equilibration with methanol sat. with heptane followed by development with heptane sat. with methanol. P.D.Dawkins

5800. DETECTION OF COMPOUNDS ON PAPER BY FLUORESCENCE AND PHOSPHORESCENCE AT LIQUID NITROGEN TEMPERATURES. M.P.Gordon and D. South: *J. Chromatography*, 1963, 10, 513-515 (Dept. Biochem., Univ. Washington, Seattle, Washington, U.S.A.) P.D.Dawkins

5801. DETECTION OF SOME AROMATIC ACIDS. D.W.Grant: *J. Chromatography*, 1963, 10, 511-512 (Defence Res. Chem. Lab., Ottawa, Ont., Canada) Paper chromatograms containing aromatic acids were developed, dried and lightly sprayed with 0<3% soln. of H₂O₂. Wet papers were exposed to u.v. light, when after a few minutes blue fluorescent spots became visible. P.D.Dawkins

5802. EVALUATION OF ACID DIAZO DYES BY CHLORIDE DETERMINATION AND PAPER CHROMATOGRAPHY. J.B.Lloyd and F.Beck: *Stain Technol.*, 1963, 38, 165-171 (Dept. Biochem. and Anat., Univ. College, Cardiff, Wales) Since many commercial dye samples vary not only in their dye content but also in the impurities which they contain some method of analysing them is helpful when trying to account for variations in staining prop. The authors suggest a paper chromatography procedure using 80% ethanol and Whatman No. 1 paper for qual. analysis of a no. of diazo dyes; moisture and salt analyses giving some indication of dye quantity. M.J.Bell

5803. METHYL YELLOW AS SPRAY REAGENT IN PAPER CHROMATOGRAPHY OF CHLORINATED HYDROCARBON PESTICIDES. L.F.Krzeminski and W.A.Landmann: *J. Chromatography*, 1963, 10, 515-516 (Amer. Meat Inst. Fndn., Chicago, Ill., U.S.A.) P.D.Dawkins

5804. THIN LAYER CHROMATOGRAPHY OF *cis-trans*-CARBOXYLIC ACID ISOMERS. G.Pastuska and H.J. Petrowitz: *J. Chromatography*, 1963, 10, 517-518 (Bundesanstalt für Materialprüfung, Berlin, Dahlem, Germany) Note. (German) P.D.Dawkins

5805. SIMPLE SATURATION CHAMBER FOR THIN LAYER CHROMATOGRAPHY. B.H.Davies: *J. Chromatography*, 1963, 10, 518-521 (Dept. Agric. Biochem.,

Univ. Coll. Wales, Aberystwyth, Wales) Note. P.D.Dawkins

5806. POLYPHOSPHATE-CELLULOSE, NEW CATION EXCHANGER. PREPARATION AND APPLICATION TO THIN-LAYER CHROMATOGRAPHY. E.Randerath and K.Randerath: *J. Chromatography*, 1963, 10, 509-510 (Inst. fdr Org. Chem., Techn. Hochschule, Darmstadt, Germany) The prep. of cellulose polyphosphate is described. A solvent system for the separation of purine and pyrimidine bases and nucleosides on thin layers of cellulose polyphosphate is given. Compounds were detected by viewing in u.v. light. (German) P.D.Dawkins

5807. GAS CHROMATOGRAPHY OF PYROLYTIC PRODUCTS OF PURINES AND PYRIMIDINES. E.C.Jennings, jun. and K.P.Dimick: *Analyt. Chem.*, 1962, 34, 1543-1547 (Wilkens Instrument and Res. Inc., P.O.Box 313, Walnut Creek, Calif., U.S.A.)

A simplified technique of pyrolysis for the identification of non-volatile materials in fig. quantities by gas chromatography using a H₂ flame ionisation detector. High temp pyrolysis at 1100° to 1200° gave max. yield of pyrolytic products from purines and pyrimidines. Under these conditions various mol. structures showed characteristic thermal fission patterns. The yield of a major pyrolytic product was, in some cases, directly related to the total amount of material subjected to pyrolysis. Slight changes in mol. structure could be detected in the kinds and amounts of the pyrolytic products. L.G.Gillies

5808. GAS CHROMATOGRAPHIC TRAP DESIGNED TO COLLECT COMPOUNDS WHICH TEND TO FORM AEROSOLS. R.K.Stevens and J.D.Mold: *J. Chromatography*, 1963, 10, 398-399 (Res. Dept., Liggett and Myers Tobacco Co., Durham, N.C., U.S.A.) Note. P.D.Dawkins

5809. QUANTITATIVE GAS-LIQUID CHROMATOGRAPHY OF SELECTED BILE ACID ESTERS ON SE-30, QF-1 AND XE-60 SILICONE POLYMERS. A.Kuksis and B.A.Gordon: *Canad. J. Biochem.*, 1963, 41, 1355-1366 (Biochem. Dept., Queen's Univ., Kingston, Ont. Canada) The suitability of the silicone polymers, SE-30, QF-1, and XE-60, for the quant. separation of the common bile acid methyl esters, their acetates, and trifluoroacetates was investigated using narrow bore columns (1/8 in. x 3 ft. or 5 ft., 195-220°, 1-2% w/w stationary phase). Complete and quant. separations were obtained only with trifluoroacetylated bile acid methyl esters on QF-1 columns. Complete separation of acetylated methyl esters was obtained on SE-30 columns, but the area response had to be corrected for quant. determinations. The other columns and deriv. failed to give either complete or quant. separations. A.M.Gibbins

5810. SIMPLE PIPELINE FOR APPLICATIONS OF SAMPLE IN AGAR GEL ELECTROPHORESIS. H.H.Kreutzen Clin. chim. Acta, 1963, 8, 167-168 (Lab. R.K.Ziekef K.Brew verpleging, Hilversum, Netherlaiids).

5811. MICRO STARCH GEL ELECTROPHORESIS. J.H.Daams: *J. Chromatography*, 1963, 10, 450-455 (Section of Exp. Path. and Gerontology, A.Van Leenwe hoekhuis, Netherlands Cancer Inst., Amsterdam, Netherlands) A micromethod for starch gel electro* phoresis on glass cover slips is described. The method has the same resolving power as larger scale apparatus, it is more rapid, taking 15 min. for electrophoresis of serum and requires only 0*2 jil. of serum. P.D.Dawkins

5812. ALTERED PATTERN OF \wedge FUSION IN DOUBLE DIFFUSION SYSTEM. I. BETWEEN TWO SOURCES OF ONE REACTANT. A.Benä & Biochim. biophys. Acta, 1963, 71, 562-567 (Pathophysiolog. Inst. Med. Fac., Univ., Zagreb, Yugoslavia) The diffusion of the reactant may depend on the ratio of concn. gradients of the reactant and dissolved substances in the gel which diffuse against the reactant, hence an increase of this ratio in the area between 2 diffusing sources results in an altered rate of diffusion. Diffusion expt. with and without chem. reaction showed that the mechanism of alteration of the diffusion rate was independent of the $P_{\text{tesene}}^{\circ}$ ent. In the gel. B.M.Stevens

5813. NUCLEAR MAGNETIC RELAXATION OF WATER PROTONS IN AQUEOUS SOLUTIONS OF PARAMAGNETIC MACROMOLECULES. H.Pfeifen Biochim. biophys. Acta, 1963, 66, 434-439 (Physikal. Inst. K.Marx-Univ., Leipzig, Germany) The part of the relaxation rate which was due to paramagnetic particles was proportional to the square of the effective magnetic moment of the particles multiplied by a factor \propto the shortest possible distance [a] between the paramagnetic centre of the particle and the water protons. The effective magnetic moment could often be calc. from the temp. dependent term of the static susceptibility. The function of Ca²⁺ is known only for Paramagnetic particles in S-state with equidistant Zeeman levels. Depending on the electron relaxation time, the diffusioncoefr and the magnetic field a dependence proportional to from I/a to I/a^3 was found for non-polar particles.

(German) B.M. Stevens

5814. EQUIVALENT CIRCUITS AS RELATED TO IONIC SYSTEMS. A.Finkelstein and A.Maura Biochim. J., 1963, 3, 215 (Rockefeller Inst., New York, U.S.A.)

As a direct algebraic consequence of the fundamental flux equations of Nernst and Planck one may construct two types of equivalent circuits for a homogeneous (charged or uncharged) membrane. One, the pure electrical equivalent circuit*, correctly predicts all the electrical p $\frac{d}{d}p$ of the membrane for both steady and transient states. The other, the mixed equivalent circuit*, predicts the steady state I. * characteristics of the membrane and the steady state ionic fluxes. With regard to the portrayal of the physical basis of the properties of atomo $\frac{g}{g}$ ous membrane, * e. mixed equivalent circuit can be misleading, because this same circuit can also be used to depict a mosaic membrane, in which case the circuit gives a pictorialisation of the physical origin of the membrane properties.

5815. ELECTRON SPIN RESONANCE INVESTIGATIONS OF IRRADIATED CARBOHYDRATES J.U.W. Garnett Nature, Chem., Univ. Nev. 8, 985 (Sch. Kensington, Australia). G.M.Lewis

1963, 28, 272-276'. Fractionation of the hyalopksm of hepatic cells from irradiated rabbits, by a modified Cohn V method K. revealed that irradiation caused an increase in the fatty acid content of sediments 1 and 2. Within 2-6 hr. to sediment 2 there was an increase in loosely bound lipids. These changes preceded the appearance of lipaemia. (Russian) B.J.Cooper

5817. LONG-TERM RAT FEEDING STUDIES ON IRRADIATION AND AGE. A.W.Phillips, H.R.Newcomb and D.

Toxicol. appl. Pharm., 1963, 5, 273-297 (Biol. Res. Labs., Dept. Bacteriol., Syracuse Univ., New York, U.S.A.) Chicken stew and raw cabbage, irradiated with γ rays in doses of 5 \times 58 and 0 \times 558 megarad respectively, were added in amounts of 35% each to the diet of postweaning rats. After consuming this diet for 19 days the rats showed decreased levels of alk. phosphatase in both sexes and of monoamine oxidase in ♀; the latter also showed an increase in alanyl- α -aminopeptidase and 2-naphthyl octanoate esterase levels. Sucrase, GOT and GPT were unaffected. Feeding of the same diet to older rats for 104 weeks had no effect on growth rate or reproductive performance and the incidence of pathological lesions. Irradiation of the food with lower doses of γ -rays did not affect the levels of enzyme activity in post-weaning rats. E.E.Hobbiger

5818. ACTION OF V-RAYS ON SODIUM DEOXYRIBONUCLEATE IN SOLUTION. IV. THE MECHANISM OF DENATURATION. P.H.Lloyd and A.R.Peacocke: Proc. roy. Soc. B, 1963, 158, 71-78 (Dept. Biochem., Univ., South Parks Rd., Oxford, England) The extent of denaturation of calf thymus DNA in NaCl soln. is not affected by dose of γ -rays over a 10-fold range if the ratio of dose to DNA concn. is const. The reaction was inhibited by free-radical inhibitors and was more effective if Cl⁻ was replaced by F⁻. The extent of denaturation did not decrease logarithmically with dose, due probably to different stabilities in the linkages between the base pairs of DNA. Denaturation probably occurs through the action of free radicals. G.M.Lewis

5819. SYNTHESIS OF DNA AS FUNCTION OF RADIATION DOSE TO LIVER IN PARTIALLY HEPATECTOMIZED RATS. W.B.Looney, M.L.Pardue and F.W. Banghart: Nature, Lond., 1963, 198, 804-805 (Radiobiol. and Biophys., Lab., Dept. Radiol., Univ. Virginia Sch. Med., Charlottesville, Va., U.S.A.)

DNA synthesis in the liver of partially hepatectomised rats was followed after local irradiation by various doses of X-rays. The dose-response curve resembled that found for DNA synthesis in other systems previously examined. G.M.Lewis

5820. EFFECTS OF ULTRAVIOLET LIGHT ON THYMIDINE DINUCLEOTIDE AND POLYNUCLEOTIDE. R.A.Deering and R.B.Setlow: Biochim. biophys. Acta, 1963, 68, 526-534 (Phys. Dept., New Mexico Highlands Univ., Las Vegas, N.Mex., U.S.A.) Absorbance changes in dithymidylic acid and in polythymidylic acid produced by u.v. irradiation are interpreted in terms of the reversible formation of dimers between adjacent thymine residues. Dimer formation, breakage and steady state fraction were all X dependent. Action spectra for dimer formation were approx. the same as the thymine absorption spectrum. Quantum yields were approx. 0 \times 01 for dithymidylic acid and approx. 0 \times 02 for polythymidylic acid. Action spectra for dimer breakage were the same for both polymers and similar to that for breaking the thymine dimer. The quantum yield was approx. 1. The steady state dimer fraction was approx. 70% for 280 mp and approx. 15% for 240 m(j) irradiation. B.M.Stevens

5821. ULTRAVIOLET INACTIVATION OF DNA PRIMER ACTIVITY. I. EFFECTS OF DIFFERENT WAVELENGTHS AND DOSES. F.J.Bollum and R.B.Setlow: Biochim. biophys. Acta, 1963, 68, 599-607 (Biol. Div., Oak Ridge Nat. Lab., Oak Ridge, Tenn., U.S.A.) U.v. irradiation of native or denatured DNA drastically

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reduced the ability of denatured DNA to act as primer. 280 mJt radiation was more effective than 239 mJi radiation; effects of 280 mJi radiation were partially reversed by 239 mJi radiation. Priming activity was not reduced to 0 but with high adenine-thymine DNA was reduced to approx. 10% of the initial activity. The polymer produced using such irradiated primer had a higher guanine/adenine ratio than normal.

B.M.Stevens

5822. EFFECT OF IONISING RADIATION ON PYRIDINE NUCLEOTIDES OF THYMOCYTES. J.F.Scaife: Canad. J. Biochem., 1963, 41, 1469-1481 (Defense Res. Chem. Lab., Dept. of Nat. Defense, Ottawa, Canada) NAD constituted 95% total oxidised pyridine nucleotides in thymocytes, with very low NADH₂ levels. Following *in vivo* or *in vitro* irradiation with as little as 25 rad, the thymocytes lost NAD, but not RNA, rapidly, with no concomitant rise in NADH₂. NAD loss was principally from the nucleus, and was characterised by an intracellular release of NADase from the mitochondria and nucleus into the cytoplasm. The capacity for thymocytes to synthesise NAD from [7-14C]nicotinamide was reduced. The presence of nicotinamide, but not nicotinic acid, cysteamine, L-cysteine, or promethazine, produced an unphysiol. increase in NAD in whole thymus or thymocytes, but did not prevent development of pyknotic degeneration in irradiated thymocytes. A.M.Gibbins

5823. EFFECT OF X-IRRADIATION ON CHROMIUM-51 CONTENT OF LIVER NUCLEIC ACIDS AND PROTEINS. P.V.Vittorio and E.W.Wight: Canad. J. Biochem., 1963, 41, 1349-1354 (Defense Res. Chem. Lab., Dept. Nat. Defense, Ottawa, Canada) When tracer amounts of Na radiochromate were inj. i.p. into mice, X-irradiation (600 r) produced an increase in the ⁵¹Cr content of the liver. This was accompanied by an increase in ⁵¹C r content of the liver proteins and nucleic acids which was greatest at 16 days, but at 37 days the X-irradiated and non-irradiated values were fairly similar. It was suggested that the ⁵¹Cr content of the liver or liver proteins could be used as an index of repair or recovery following injury by X-irradiation.

A.M.Gibbins

5824. RADIATION-INDUCED GELATION OF DILUTE AQUEOUS PECTIN SOLUTIONS. I.J.Wahba, D.F. Tallman and L.M.Massey, jun.: Science, 1963, 139, 1297-1298 (New York St. Agric. Expt. Sta., Cornell Univ., Ithaca, N.Y., U.S.A.) Gels are produced in pectin soln. by low dose ¹⁴C-irradiation under certain conditions of *pH*, concn., temp., and exposure time in the absence of O₂ and radiation protectants. Free radical intermediates are probably implicated in gel formation. G.M.Lewis

5825. CHANGE IN VISCOSITY OF MEDIUM AFTER IRRADIATION OF BACTERIA WITH U.V. LIGHT. C.N.Murty and A.Guha: Nature, Lond., 1963, 198, 902-903 (Biophysics Lab., Coll. of Med. Sci., Benaras Hindu Univ., Varanasi, India) U.v. irradiation of *E. coli* caused a rise in *r* of the medium, followed by a fall at higher doses. It is suggested that this is due to elution of viscous substances from the cell which are degraded at higher dose rates. G.M.Lewis

5826. LOSS OF SOLUBLE MATERIALS FROM IRRADIATED THYMOCYTES IN VITRO. D.K.Myers, D.E.De Wolfe, K.Araki and W.W.Arkinstalk: Canad. J. Biochem., 1963, 41, 1181-1199 (Biol. Branch, Atomic Energy Canada Ltd., Chalk River, Ont., Canada) Following exposure to X-radiation in doses above 100 r, rat thymo-

cytes incubated in Krebs-Ringer soln. at 37° and pH 7*4 lost acid-sol, ribonucleotide and K into the extracellular fluid, after a lag period of 1 hr. DNA was gradually depolymerised, and deoxycytidylate deaminase became inactivated. Similar losses occurred when the thymus gland was irradiated in the intact animal. A decrease in pH or temp, minimised K loss, which was probably due to a breakdown of intracellular binding structures. The loss of sol. materials appeared to be related to the death of the cells following X-radiation.

• A.M.Gibbins

5827. GLUCURONIDE EXCRETION AND DETOXIFICATION MECHANISM IN WHOLE-BODY IRRADIATED RATS. J.Chiriboga: Nature, Lond., 1963, 198, 803-804 (Agric. Res. Lab., Oak Ridge, Tenn., U.S.A.) Excretion of glucuronides decreased in rats after 1000 r of Co-60 v rays; the sensitivity to intragastrically administered naphthalene was also decreased. Irradiation did not increase the toxicity of chloral hydrate inj. i.p. G.M.Lewis

5828. UNCOUPLING OF OXIDATIVE PHOSPHORYLATION BY IONISING RADIATION. H. THE STABILITY OF MITOCHONDRIAL LIPIDS AND CYTOCHROME $\frac{1}{2}$. J.F.Scaife and B.Hilb: Canad. J. Biochem., 1963, 41, 1223-1233 (Defense Res. Chem. Lab., Dept. Nat. Defense, Ottawa, Canada) Rat or rabbit thymus mitochondria, which contained less than 0*2 pg. cytochrome $\frac{1}{2}$ /mg. protein, showed uncoupling of oxidative phosphorylation following treatment of the animals by 800 rad of ionising radiation 4 hr. prior to sacrifice. Heart Qr liver mitochondria from animals irradiated up to 12 hr. previously showed no uncoupling of oxidative phosphorylation, even though some prep. had reduced cytochrome $\frac{1}{2}$ contents, and irradiation had no apparent effect on endogenous cytochrome c or its binding. It was suggested that the low level of cytochrome c in thymus mitochondria, which contained no lipid uncoupling factor indicated a critical condition at which radiation damage could become manifest. A.M.Gibbins

5829. EFFECT OF IONISING RADIATION ON OXIDATION OF SUCCINATE BY RAT THYMUS MITOCHONDRIA. J.F.Scaife: Canad. J. Biochem., 1963, 41, 1486-1490 (Defense Res. Chem. Lab., Ottawa, Canada)

An examination was made of the succinate-tetrazole reductase activity of thymus from normal and irradiated rats (800 rads 4 hr. earlier). Phenazine methosulphate [PMS] was used to mediate the flow of electrons to 2- β -iodophenyl-3-E"-nitrophenyl-5-phenyl-monotetrazolium chloride hNT₂T. Irradiated prep., from fresh homogenates, exhibited slightly reduced activity in the absent of PMS, but markedly increased activity in its presence*. When the homogenates were centrifuged, a cofactor in the supernatant was required for enzyme activity of the mitochondria. The supernatant was capable of reacting directly with INT, this only occurring in the absence of mitochondria. The homogenate reaction was only slightly inhibited by antimycin A (5% at 2 fig./ml.).

A.M.Gibbins

5830. THYMUS: ITS ROLE IN LYMPHOID RECOVERY AFTER IRRADIATION. R.Auerbach: Science, 1963, 139, 1061 (Dept. Zool., Univ. Wisconsin, Madison, Wis., U.S.A.) In Fi (C3HXAKR) mice irradiated with 900 r X-rays, lymphoid cells of the spleen were # destroyed. Later, recovery was seen in the accumulation of lymphoid cells in spleen lymphoid creptes, except in₅ thymectomised animals. G.M.Lewis

5831. EFFECTS OF LOCAL IRRADIATION (60C0 TELE-THERAFY) ON PERIPHERAL BLOOD AND BONE MARROW. F.A.Goswitz, G.A.Andrews and R.M. Kniseley: Blood, 1963, 21, 605-629 (Oak Ridge Nuclear Studies Inst., Tenn., U.S.A.) ⁶⁰Co tele-therapy caused a reduction in w.b.c. and lymphocytes in peripheral blood. Local irradiation produced a parked hypoplasia in the irradiated sites with a reduction in the no. of megakaryocytes in r.b.c and w.b.c. precursors. After "cancercidar radiotherapy, some capacity of bone marrow to regenerate was retained. Haemosidenn increased in irradiated sites. H.B.Waynforth

5832. SERUM ACTION ON RADIATION RESPONSE IN TISSUE CULTURE. H.M.de Oca, E.J.Schilling, J.C. Bryant, V.J.Evans and W.R.Earle: J. nat. Cancer Inst., 1963, 30, 57-66 (Tissue Culture Sect., Nat. Cancer Inst., Bethesda, Md., U.S.A.) Serum modified the radiation response of NCTC 2071 cells in suspension culture by speeding recovery of the ^{radiated} cells when serum was added either before or immediately after radiations such cells began to recover at 10 days after radiation. Cells irradiated in serum-free medium did not resume growth, or if they did, recovery was delayed to 28 days after irradiation. J.G.Bennette

5833. ACTION OF X-RAYS ON NICTITATING MEMBRANE OF CAT. A.Dresse, M.-h¹T²?/1*³*?/!
Z.M.Bacq: Arch. int. Physiol. 1963, 71, 1-11 (Univ. Liège, Belgium) Brief comm.

(French) M.E.Nutt

5834. RELATION OF DEVELOPMENTAL STATUS OF LIMB FORMATION TO RADIATION SENSITIVITY

Univ. Oklahoma, Norman, Okla., U.S.A) closely graded series of chick embryos in stages 8-35 were X-irradiated with doses selected so that the lethaleffects at different stages were approx. equal. Three types of skeletal anomaly were observed. In limb, which was most marked totally, was * earliest to be induced. This was followed by sp. reduction in the size of individual skeletal components either laterally or at joints. The pattern of radiosensitivity is intimately related to the developmental progression. R.J. Walker

5835. CAN MAMMALIAN EMBRYO BE KILLED BY X-IRRADIATION? R.Rugh and M.Wohlfrohm: J. exp. Zool., 1962, 151, 227-243 (J. exp. Lab. Radiol. Dept., CoU. Phys. and Surg., Columbia Univ., New York, U.S.A.) 181 pregnancies and u. 825 in & £ of CH Lain mice were used to determine the level of X-irradiation necessary to kill 50% of their embryos. Embryos irradiated during the first half of gestation were more sensitive than those in the second half. 80% of embryos were most vulnerable. The periods of radiosensitivity occurred during the early stage and neurogenesis. The epiphysial period of greatest resistance was at implantation. In general the sex ratio was not great, disturbed by X-irradiation. The most consistent and equumult of embryonic or foetal X-irradiation Anting, a reduction in total body size. R.J.Walke

5836. INFLUENCE OF OXYGENATION ON RESTING CELLS ON SURVIVAL AFTER IRADIATION. T.Rudnicki: Pozn. Towarzy. Przyjaci. iur*- Wydz. lek., 1962, 22, 273-

293 (ZaHiad PatoL Ogłoszenia i Dolwiadczalnej, Akad. Med., Poznań, Poland) X-ray irradiation of white rats with a single dose of 430 rads, 2 and 3 days before partial hepatectomy lowered mitotic index and destroyed the chromosomal apparatus of regenerating liver, the effect was more pronounced the shorter the interval between irradiation and increased mitotic activity. Irradiation 45 days before hepatectomy had no effect upon mitosis.

(Polish) T.Qebicki

5837. VARIATION OF RADIATION SENSITIVITY OF PARAMOECIUM AURELIA AS FUNCTION OF TIME OF IRRADIATION IN INTERDIVISION GROWTH CYCLE. J.Calkins: Nature, Lond., 1963, 198, 704 (Dept.

Physics, Univ. Texas, Houston, Tex., U.S.A.) Using cultures of *P. aurelia* in a state of synchronised division, it was shown that sensitivity to X-irradiation varies only very slightly through the interdivision cycle while sensitivity to u.v.-irradiation is greatest shortly after division.

G.M.Lewis

5838. RADIOSENSITIVE STRUCTURE OF T2 BACTERIOPHAGE USING LOW ENERGY ELECTRON BEAMS.

A.Cole and R.Xangle: Biophys. J., 1963, 3, 189

(Dept. Phys., Univ. Texas, Houston, Tex., U.S.A.)

Hydrated T2 bacteriophage were irradiated with 0.75 to 90 kev electron beams. A thin foil isolated the sample chamber from the electron gun source. Survival (plaque formation) was observed. Apparent cross-sections and D37 doses were determined. The max. cross-section of about $5 \times 10^{-13} \text{ cm}^2$ is roughly equal to the cross-sectional area presented by the phage core. As beam energy was increased the average D37 dose first attained a min. value of about 23 kr for 1 kev electrons (which penetrate the relatively inert protein coat) after which the average D37 dose rose with beam energy to a max. value of about 50 kr for fully penetrating beams. These dependencies suggest that the radiosensitive structure exists as a peripheral shell rather than a uniformly sensitive core. A tentative model for the phage structure, based on this and other evidence, is presented. *

5839. COMPARATIVE KILLING EFFICIENCIES FOR DECAYS OF TRITIATED COMPOUNDS INCORPORATED INTO E. COLI. S.Persore: Biophys. J., 1963, 3, 183

(Grad. Sch. Committee Biophys., Pennsylvania State Univ., University Park, Pa., U.S.A.) The killing efficiencies due to the decay of incorporated [3H]thymidine, [3H]uridine, and [3H]histidine in *E. coli*. 15 T-L have been determined, i.e. labelled DNA, RNA and protein. Decays from [3H]thymidine are 2-3 times as effective in producing lethality as those from [3H]uridine and 2-5 times as effective as those from [3H]histidine. It seems that the greater part of damage from [3H]thymidine decays is due to chem. changes associated with nuclear transmutation. *

5840. RADIOPROTECTION BY ACCLIMATISATION TO COLD. R.Ghys: Nature, Lond., 1963, 198, 603 (Lab. Radiobiol., Dept. Biochim., Univ. Laval, Québec, Canada) In rats exposed to ⁶⁰Co-irradiation, the relative biol. effectiveness of chronic doses of 10-12 rad/hr. is about 72% of the efficiency of acute irradiation, all parameters other than dose rate being the same. In the LD₅₀ range the biol. efficiency of chronic irradiation is reduced by 50% in rats acclimatised to cold by exposure to 5° for 1 month; the protective effect lasts about a week. At the LD₅₀ level, the protection coeff. due to cold acclimatisation is reduced to 1/6, but variations for total doses above 1200 rad might be influenced by changes in radiosensitivity during prolonged irradiation.

G.M.Lewis

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5841. EFFECT OF DIETHYLENETRIAMINE-PENTACETIC ACID [DTPA] AND POLYPROPYLENEGLYCOLETHYLENE OXIDE POLYMER ['PLURONICS'] ON EXCRETION OF INHALED $^{239}\text{PuO}_2$ IN DOGS. E.G.Tombropoulos, W.J.Bair and J.F.Park: Nature, Lond., 1963, 198, 703-704 (Biol. Lab., Hanford Lab., Gen. Electric Co., Richland, Washington, U.S.A.) Dogs exposed to aerosols of $^{239}\text{PuO}_2$ were treated subsequently with aerosols of DTPA or 'Pluronics'. The rate of excretion of Pu was somewhat increased, but the distribution in the tissues, other than lymph nodes was scarcely affected.

G.M.Lewis

5842. EFFECT OF AET ON PERIPHERAL BLOOD CELLS OF RABBIT FOLLOWING GAMMA IRRADIATION. N.V.Colclough and CHanna: Arch. int. Pharmacodyn., 1963, 143, 8-16 (Pharmacol. Dept., Med. Coll., Vermont Univ., Burlington, Vt., U.S.A.) S,2-aminoethylisothiouronium bromide hydrobromide [AET] has a well defined ratio-protective effect in small rodents. It did not prolong the survival rate of rabbits exposed to γ -irradiation, but in the haemopoietic system it initiated faster recovery of surviving cells.

T.J.Sullivan

5843. PROTECTIVE EFFECT OF AROMATIC AMINES AGAINST RADIATION DESTRUCTION OF POLYMETHYLMETACRYLATE. Kh.S.Bagdasarian, V.A. Krongauz and N.S.Kardash: Dokl. Akad. Nauk, 1962, 144, 101-104. Spectrophotometry was used in the study of the mechanism by which certain aromatic amines (B-naphthylamine, phenyl-B-naphthylamine, diphenylamine, triphenylamine) have a protective effect against destruction by radiation (60Co yirradiation) of polymethylmethacrylate. Expt. were carried out in a vacuum at room temp, and at the temp, of liquid N₂. Diphenyl-picrylhydrazyl was found to have no such protective effect.

(Russian) BJ.Cooper

5844. PROTECTIVE PROPERTY OF TETRAHYDROXY-QUINONE AGAINST ACTION OF X-RAYS ON YEAST. M.M.Jean-Louis Seris and A.BNB C.R. Acad. Sci., Paris, 1962, 255, 4, 791-793 (Lab. Physiol. vegetale approfondie, Fac. Sci., Toulouse, France) Tetrahydroxyquinone effectively protects yeast cells against the effects of X-rays. The protection is optimal pH between pH 4-6. With concn. higher than 5mM/l. the % of survivors no longer varies with increase in concn. of tetrahydroxyquinone.

(French) J.M.Thomas

5845. REMOVAL OF STRONTIUM-90 FROM MILK. J.Silverman, D.Ghosh and R.L.Belcher: Nature, Lond., 1963, 198, 780 (Dept. Chem. Engineering, Glenn Martin Inst. Technol., Univ. Maryland, Md., U.S.A.) About 90% of Sr in milk is removed by contact with Ca phosphate which is subsequently removed.

G.M.Lewis

5846. RELATIONSHIPS BETWEEN THE DEPOSITION OF STRONTIUM-90 AND CONTAMINATION OF MILK IN THE U.K. E.R.Mercer, J.D.Burton and B.O.Bartlett: Nature, Lond., 1963, 198, 662-665 (A.R.C. Radiobiol. Lab., Letcombe Regis, Wantage, Berks., England) The slow process of plant-base absorption appears to be the major route of contamination of milk with 90sr.

G.M.Lewis

5847. STABILITIES OF SOME ALKALINE EARTH CHELATES OF TETRACYCLINE. D.C.Maxwell, P.J.A. Smith and S.P.Wilford: Nature, Lfcnd., 1963, 198, 577-578 (Chem. Divn., Atomic Weapons Res. Estab., Aldermaston, Berks., England) The acid dissociation const. of tetracycline and the stability const. of its Mg, Ca and Sr chelates were determined potentiometrically. Tetracycline would not appear to be of much value for the removal of radioSr from the skeleton.

G.M.Lewis

5848. STRONTIUM-90 IN HAIR. B.J.Hopkins, L.W. Tuttle, W.J.Pories and W.H. Strain: Science, 1963, 139, 1064-1065 (Sch. Med., Univ., Rochester... New York, U.S.A.) The hair of rats inj. with 90sr contained considerable amounts of this radionuclide when analysed ± 2 months after injn. Rats which had been inj. in utero retained much less Sr, presumably due to loss of hair during growth. Hair analysis may provide a non-destructive method for measuring bone-seeking elements.

G.M.Lewis

5849. CALIBRATION OF CAESIUM-137 CONTENT IN HUMAN BODY. T.A.Iinuma, N.Nohara, T.Nagai and R.Ichikawa: Nature, Lond., 1963, 198, 604-605 (Nat. Inst. Radiol. Sci., Chiba, Japan).

G.M.Lewis

5850. NATURALLY OCCURRING d-EMITTING NUCLIDE IN HUMAN BODY. B.Rajewsky and W.Stahlhofen: Nature, Lond., 1963, 198, 960-962 (M.-Planck-Inst.. Frankfurt am Main, Germany) The levels of 228Th, 226Ra, 210pb and 210Po were determined in human bones. Radiation doses absorbed in bones from 210Po are about 3*1 mrad/yr. and are about 4 times the doses absorbed from 226Ra and its daughter isotopes and from 228Th and its daughter isotopes.

J.R.Sargent

IMMUNITY TO INFECTION

5851. m. PRODUCTION AND PRELIMINARY CHARACTERISATION OF VACCINES FOR THE FIELD TRIAL. M.Kuczajowa and B.-Schiller. Przegl. epidem., 1963, 17, 23-32 (Wydawnictwo Naukowe Szczepionek, Kraków, Poland). J.Korbecki

5852. A QUANTITATIVE METHOD OF PROPERDIN DETERMINATION BY ESTIMATION OF ITS PROTEIN. C.Koziarowski and B.Potnicki: Przegl. epidem., 1962, 16, 461-465 (I Klinika Pediatriczna, Aficid. Med., Wrocław, Poland) The method is based on absorption of properdin on inulin and determination of Protein by the turbidimetric tannin micromethod. (Polish) M.Korbecki

5853. IMMUNISATION OF SCHOOL-AGE CHILDREN AGAINST DIPHTHERIA. A.Gstafazka and T.Olakowski Przegl. Viden., 1962, 16, 43f-442 (Pafistwowy Zakład Hig. Warszawa, Poland) A routine diphtheria-tetanol vaccine absorbed on Al(OH)₃, in spite of & effectiveness caused a high % ^JSS^00:/. The vaccine containing 2Lf of diphtheria toxoid gave a satisfactory response when applied as a repeating dose but was not sufficient as a basic vaccine dose. (Polish) M.Korbecki

5854. MICROMETHOD IN TESTING THE ASCVTITRE. K-W.Jodarczyk: Med. dosw.. Mikrobiol.. 1982, 14. 383-387 (In Klinika Chorob Dziecięcych, Akad. Med. Poznań, Poland). (Polish) H.Osowiecki

5855. SEROLOGICAL REACTIONS IN THE DIAGNOSIS OF RHEUMATIC FEVER IN CHILDREN. I. METHODS OF DETERMINING ANTISTREPTOLYSIN O IN HUMAN BLOOD SERUM. K.Ulewicz: Biul. Inst. Med. morski, 1962, 13, 189-193 (Lab. Sanitarno-Higieniczne Marynarki Wojennej, Gdynia, Poland). ^ j ^ ^ (Polish)

5856. A COMPARATIVE EVALUATION OF THE IMMUNOGENIC POTENCY OF ANTI-HOOPING-COUGH VACCINES IN MAN. II. EPIDEMIOLOGICAL EVALUATION OF PERTUSSIS COMPONENT OF Di Te **. COMBINED VACCINES. A. Adonarfa Przegl. epidem., 1962, 16, 423-430 (Pałtowy Zakład Higieny, Warszawa, Poland) Among children born in 1959-1961 immunised with Di Te Per vaccine 1.3% were affected with whooping-cough in contrast to 6.6% in a control group. The vaccine of Polish origin proved to be more effective than that of Swiss origin. (Polish) M.K.

5857. ANIMAL STUDIES ON ACTIVE ^UNISATION AGAINST TETANUS. L.Korzeni Z. Hyg.-InfektKr., 1962, 149, 1-10 (Behringwerke AG, Marburg a.d. Uhrt Germany) Using guinea-pigs the effectiveness of adsorbed and non-adsorbed tetanus toxoid was studied. Active immunity was dependent on the ^TMTATM*TM^ fte booster dose. (German) A.J.Wansbrough

5858. INCIDENCE OF NATURAL CLOSTRIDIUM WELCHII n-ANTITOXIN IN INDIAN EQUINES ITS RELATIONSHIP TO ANTI-ANTIGENIC STIMULUS. P.S.Basu and R.N.Roy. J. Hyg. Lond., 1963, 61, 213-215 (Bengal Immunity Lab., Calcutta, India) 17 horses and 5 mules had 1 unit or more of natural Circulating C. welchii a-antitoxin, and 5 of them had a ** of 4 uX as determined by the lecithovitellin reaction. 7 of the animals were hyperimmunised with S^welchU d-racins, but the titres produced were not

directly proportional to the natural immunity observed in each of them. J.B.Derbyshire

5859. ANTIBODY RESPONSE TO POLYVALENT INFLUENZA VIRUS VACCINE ADMINISTERED INTRADERMALLY OR SUBCUTANEOUSLY IN AN AGED POPULATION. S.Saslaw, H.N.Carlisle and B.Slutzken Amer. J. med. Sci., 1963, 245, 387-398 (Dept. Med., Ohio State Univ. Coll. Med., Columbus, Ohio, U.S.A.) In aged subjects the Ab response obtained with a polyvalent influenza vaccine was greater after s.c. than after i.d. vacccn. The same titre was obtained regardless of whether a subject has been previously vaccinated. E.E.Hobbiger

5860. DETERMINATION OF TYPE-SPECIFIC ANTIBODIES AGAINST POLIOVIRUS LABELLED WITH PHOSPHORUS-32 BY AN ELUTION TEST. R.Thomssen: Nature, Lond., 1963, 198, 613-614 (Dept. Virol., Inst. Hyg., Univ., Freiberg/Br., Germany) Polio-virus labelled with 32p treated with type sp. Ab was eluted from Al(OH)₃ gel at higher concn. of PO₄ than material incubated with heterologous serum or without antiserum. G.M.Lewis

5861. SAFETY OF IMMUNISATION WITH THE ATTENUATED POLIOVIRUS STRAINS TYPE 1 CHAT AND TYPE 3 W FOX. Przegl., epidem., 1962, 16, 377-388 (Pafistwowy Zakład Higieny, Warszawa, Poland) Immunisation with type 1 Chat was safe whereas occasional polio infections were noted in persons being on contact with those immunised with type 3 W Fox. (Polish) M.Korbecki

5862. DURATION OF HUMORAL IMMUNITY IN POPULATION IMMUNISED AGAINST POLIOMYELITIS. Przegl. epidem., 1962, 16, 405-413 (Pafistwowy Zakład Higieny, Warszawa, Poland) Ab for type 1 were detected in 85-100% and for type 3 in 71-10% of persons immunised against poliovirus. Serol. examination was performed 1-2 months and 1-3 yr. after immunisation. (Polish) M.Korbecki

5863. SEROLOGICAL STUDIES ON ANTIBODY LEVELS IN CHILDREN IMMUNISED AGAINST POLIOMYELITIS IN POZNAN CITY AND PROVINCE. J.Adamski, J.Wiza, B.Mazur Przegl. epidem., 1962, 16, 415-421 (Akad. Med., Poznań, Poland) Serol. examination of 435 children showed that before immunisation 23*4% of them had no Ab against poliovirus whereas 29*8% had Ab against all three types of the virus. After immunisation Ab were not present in 0.7% of children whereas 68*5% showed Ab against all types of the virus. After 2 yr. out of 130 examined children 73*8% showed Ab against all types and 23% against 2 types of the virus. (Polish) M.Korbecki

5864. POLYSACCHARIDE CONTENT OF SCHISTOSOMA SKIN TEST ANTIGENS AND THE REACTIVITY OF OXIDATIVE AND CARBOHYDRATE COMPONENTS. I.G.Kagan and C.G.Goodchild: Amer. J. Trop. Med. Hyg., 1963, 12, 179-183 (U.S. Pub. Health Serv., Atlanta, Ga., U.S.A.) A no. of skin test Ag were analysed for polysaccharide content by the anthrone method and N content by Nessler and micro-Kjeldahl methods. No correlation was observed between N and polysaccharide content of Ag prep, by several methods from cercariae and adults of Schistosoma mansoni. Ag prep, in different laboratories and adjusted to approx. similar N content gave comparable wheal areas when inj. i.d. The polysaccharide content of these Ag varied from 23 to 114 y/znl. It was concluded that polysaccharide

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content was an unreliable indicator of the in vivo activity of these skin test Ag.

A.A.Zimmerman

5865. GEL DIFFUSION STUDIES WITH TOXOCARA AND ASCARIS EXTRACTS. C.C.Huntley and A.Moreland: Amer. J. Trop. Med. Hyg., 1963, 12, 204-208 (Dept. Pediatrics, Bowman Gray Sch. Med., Winston-Salem, N.C., U.S.A.) Analysis of Toxocara canis and Ascaris lumbricoides extracts was made with a rabbit Toxocara antiserum. At least 9 antigenic components in the Toxocara extract and at least 5 cross-reacting Ag in the Ascaris extract were found. Precipitins to Toxocara extract were found in the sera of two children with visceral larva migrans. One of these two sera also contained precipitins to Ascaris.
A.A.Zimmerman

HYPERSENSITIVITY

5866. V-GLOBULINS AND FRACTIONS I AND m OF PORTER IN PASSIVE ANAPHYLAXIS IN VITRO.

M.Liacopoulos, B.N.Halpern, P.Liacopoulos and M.F. PerramanG C.R. Soc. Biol., Paris, 1963, 157, 76-82 (Inst. Nat. Hyg., H\$P. Broussais, Paris, France)

In the case of direct passive anaphylaxis which comprised previous sensitisation of guinea-pig intestine with Ab, y-globulins and fraction HI produced an anaphylactic response whereas fraction I was inactive. Addition of fraction I desensitised the tissue and made it insensitive to addition of ygtobulins. During previous sensitisation of the tissue with the Ag followed by addition of the sp. Ab, anaphylaxis was observed when the Ag was y-globulin or fraction HI. No reaction occurred with fraction I.
(French) M.A. Price

5867. HYPERSENSITIVITY TO A SYNTHETIC POLYPEPTIDE: INDUCTION OF A DELAYED REACTION.

S.Ben-Efraim, S.Fuchs and M.Sela: Science, 1963, 139, 1222-1223 (Israel Inst. Biol. Res., Nes Ziona, Israel) A multichain copolyptide, p(Tyr, Glu)-pAla-pLys, induced in guinea-pigs a prolonged state of delayed hypersensitivity not associated with detectable circulating Ab. Cross reactions of the delayed type were observed with chem. related polypeptides. G.M.Lewis

5868. PASSIVE TRANSFER OF CONTACT SENSITIVITY BY [3H]THYMIDINE-LABELLED LYMPHOID CELLS.

J.S.Najarian and J.D.Feldman: J. exp. Med., 1963, 117, 775-780 (Surg. Dept., Univ. California Sch. Med., San Francisco, Calif., U.S.A.) Passive transfer of [3H]thymidine labelled lymphoid cells sensitised to dinitrofluorobenzene [DNFB] into homologous guinea-pigs gave pos. skin reactions in the recipients 24 hr. after skin testing with DNFB. Labelled small and large lymphocytes and immature lymphoid cells accumulated at the reaction sites, whereas, labelled non-sensitised lymphoid cells did not appear non-specifically in contact skin reaction sites. These results indicate that contact sensitivity, like tuberculin sensitivity requires the sensitised cell to initiate the skin reaction.
H.E.H.Jones

TISSUE ANTIGENS (EXCLUDING TUMOURS)

5869. THE POSITIVE HAEMAGGLUTINATION-INHIBITION TEST IN HORSE SERA WITH A2 ANTIGEN. S.Woyciechowska and H.Grzelakowa: Med. dośw., Mikrobiol., 1962, 14, 355-364 (Zatfad Wirusologii, Państwowy Zatfad Hig., Warszawa, Poland) Highly pos. results of the haemagglutination-inhibition test were obtained in 35-5% of horse sera with A2 Wiktor 57 Ag and low pos. reactions with A2 Singapo# 57 and A2 Biela 57. 18-8% of horse sera showed a pos. test with A-equine Praha 56 Ag.
(Polish) H.Osowiecki

5870. A HUMAN 'D-LIKE' ANTIBODY. P.Levine, M.J.Celano, J.Wallace and R.Sangen: Nature, Lond. 1963, 198, 596-597 (Ortho Res. Fndn., Raritan, N.J., U.S.A.) G.M.Lewis

5871. SEROLOGY OF THE CHARACTER D". A.Lauer and H.H.Hoppe: Blut, 1963, 9, 1, 44 (Central Inst. Blood Distrib., Hamburg, Germany) Difficulties in the serol. differentiation of sera containing D and D^u character are described. (German) AJ.Wansbrough

5872. EXPERIMENTAL STUDIES ON PREVENTION OF Rh HAEMOLYTIC DISEASE. C.A.Clarke, W.T.A. Donohoe, R.B.McConnell, J.C.Woodrow, R.Finn, J.R.Krevans, W.Kulke, D.Lehane and B.M.Sheppard: Brit. med. J., 1963, i, 979-984 (Dept. Med., Univ. Liverpool, England) Rh+ blood was inj. into 96 Fb* men. When blood was followed after 1 hr. by 10-20 ml. anti-D sera with a high titre of complete Ab only 50% of inj. cells were cleared within 48 hr. and anti-D product was greater than in controls given blood only. When blood was followed by 35-50 ml. plasma containing incomplete Ab only 3 of 21 men developed anti-D after 3 or 4 stimuli, compared with 11 of 21 controls. Prelin¹, results with anti-D-y-globulin i.m. showed that this was more effective than the most powerful plasma used.

M.E.Nutt

5873. REACTION OF ERYTHROCYTE MUCOPROTEINS WITH ANTI-N PHYTOAGGLUTININS FROM Vicia GRAMINEA SEEDS. E.Lisowska: Nature, Lond., 1963, 198, 865-866 (Dept. Biochem., Ludwik Hirschfeld Inst. Immunol., Wroclaw, Poland) Muco* proteins from human horse and bovine r.b.c. were obtained by extraction of the stroma with hot phenol. Sialic acid was removed by hydrolysis and the serol. activity determined by inhibn. of aggl. of human group N r.b.c. by V. graminea extract. It was concluded that sialic acid & not a component of the r.b.c. receptor substance for the anti-N agglutinin of V. graminea. The activity of N sup' substances against anti-N phytohaemagglutinins of V. flava B was decreased by treatment v* ith trypsin and ficin.
G.M.Lewis

5874. IN VIVO LOCALISATION OF HETEROLOGOUS ANTI-LEUKOCYTE AND ANTI-BONE MARROW ANTIBODIES IN RAT BONE MARROW. T.Kuroyanagi, A.Kurisu and N.Sugiyama: Blood, 1963, 21, 594-604 (Third Dept. Int. Med., Univ. Tokyo, Japan)

131I-labelled heterologous anti-w.b.c. and anti-bone marrow Ab inj. into rats, localised in vivo, in the bone marrow. No localisation occurred in the lungs. The labels, when inj. Lv. disappeared from the plasma and became fixed to peripheral w.b.c. and bone marrow cell⁵ within 1 hr.
H. B. Waynfirth

5875. IMMUNOLOGICAL STUDIES OF SYSTEMIC LUPUS ERYTHEMATOSUS. I. QUANTITATIVE ESTIMATIONS OF NUCLEOPROTEIN-REACTIVE γ -GLOBULIN IN SYSTEMIC L.E. AND OTHER DISEASES. II. VARIATIONS OF NUCLEOPROTEIN-REACTIVE γ GLOBULIN AND HAEMOLYTIC SERUM COMPLEMENT LEVELS WITH DISEASE ACTIVITY. A.S.Townes, C.R.Steward, jun. and A.G.Oslen Bull. Johns Hopkins Hosp., 1963, 112, 183-201, 202-219 (Med. Dept., Johns Hopkins Univ. Med. Sch., Baltimore, Md. U.S.A.) Serum

Y-globulins which reacted with particles of calf thymus nucleoprotein were estimated by CF with a rabbit anti-serum to human γ -globulin. The values obtained were increased in the presence of fresh serum. Ab to DNA contributed only slightly to the reactivity of systemic L.E. sera with this prep. of nucleoprotein. Levels of nucleoprotein-reactive γ -globulin for normal and L.E. Patients and those with rheumatoid arthritis and several other conditions were indicated.

II. A correlation was made between serum levels of nucleoprotein-reactive γ -globulin and haemolytic serum C'. and the course of systemic L.E. High levels of Y-globulin with diminished serum C' activity were seen in patients with renal disease. Some fatalities occurred in these patients. The serol. changes reflected the clinical activity of the disease process. The application of these techniques to clinical evaluation of patients is discussed.* H. B. Waynfirth

5876. ANTIBODIES TO DENATURED DNA IN LUPUS ERYTHEMATOSUS SERUM. V. MECHANISM OF DNA-ANTI-DNA INHIBITION BY CHLOROQUINE.

D.Stollar and L.Levine: Arch. Biochem., 1963, 101, 335-341 (Grad. Dept. Biochem., Brandeis Univ., Waltham, Mass., U.S.A.) Chloroquine inhib. the fraction of denatured DNA with L.E. sera as measured by quant. CF. Chloroquine, unlike nucleotides, inhib. all pNA immune systems to approx. the same extent. Inhibitory effectiveness of chloroquine and several of its analogues was closely correlated with the association const. of the compounds for DNA. Chloroquine also inhib. bacterial transformation by DNA. B.M.Stevens

⁵⁸77. Gm ANTIBODIES IN INFANTS. I.Sander and E.Stichnoth: Blut, 1963, 9, 102-103 (Inst. Legal Med., Sestfal. Wilhelms-Univ., Münster/Westf., Germany) Of 25 infants 2 had anti-Gm serum Ab. The Possibility of the effect of immunisation is discussed. (German) A.J.Wansbrough

^{5g}78. LOCALISATION OF YIA-GLOBULIN (32A" GLOBULIN) IN TISSUE CELLS. A.O.Carbonara, J.A. Rodhain and J.F.Heremans: Nature, Lond., 1963, 198, 999-1000 (Med. Dept. A, Clin. Univ. St. Pierre, Louvain, Belgium) Immunochemical localisation of YIA-globulin in human lymph node cells indicated similar localisation to those of Yss" and YIM-globulins. G.M.Lewis

⁵⁸79. ANTIGENIC SPECIFICITY OF Y2-MYELOMA [MM] GLOBULINS. L.Korngold: J. nat. Cancer Inst., 1963, 30, 553-567 (Wilson Res. Found., Cornell Med. Center, New York, U.S.A.) The antigenic specificity of the MM globulins that were antigenically related to Y2-globulin which is the major component of the normal J-nirnunoglobulin system and is available in large amounts has been re-investigated. Evidence is presented that extensive adsorption of sp. anti-MM globulin sera with formal γ -globulins did not remove Ab against the homologous MM globulin. J.G.Bennette

5880. IMMUNOLOGICAL PROPERTIES OF KALLIKREINS. M.E.Webster, E.W.Emmart, W.A.Turner, H.Moriya and J.V.Pierce: Biochem. Pharmacol., 1963, 12, 511-519 (Nat. Heart Inst., Bethesda, Md., U.S.A.)

Rabbits immunised with crude or partially purified human urinary or pancreatic kallikreins developed Ab which inhib. the vasodilator activity of the kallikreins in dogs. The antigenic heterogeneity of the kallikreins was shown by the presence of multiple precipitin bands in agar gel. The kallikrein-antikallikrein band was tentatively identified with the use of purified kallikreins. Ab to human urinary kallikrein showed cross-reaction both in agar gel and by inhibn. of the vasodilator activity with human pancreatic kallikrein, but not with dog urinary or hog pancreatic kallikrein. L.G.Gillies

5881. DETECTION OF AUTO-IMMUNE ANTIBODY AND TISSUE ANTIGENS BY THE 'MICROSPOT' TECHNIQUE. J.G.Feinberg: J. clin. Path., 1963, 16, 282-284 (Beecham Res. Labs., Brockham Park, Betchworth, Surrey, England) The cellulose acetate membrane 'microspot*' test for pptg. Ab was satisfactory for the detection of Ab to human thyroglobulin in the sera of auto-immune thyroiditis patients. J.B.Derbyshire

5882. DETECTION OF AUTOANTIBODIES TO CYTOPLASMIC AND NUCLEAR ANTIGENS IN FREEZE-DRIED THYROID. R.C.Nairn, T.Ghose, LB.Porteus and J.A.Urquhart: J. clin. Path., 1963, 16, 281-282 (Path. Dept., Univ., Aberdeen, Scotland) Freeze-dried blocks of thyroid could be used for the detection of auto-Ab to cytoplasmic and nuclear Ag, in addition to colloid Ag, by de-waxing the sections with a 3:1 mixture of isopentone and abs. methanol. J.B.Derbyshire

5883. APPEARANCE OF ANTIBODIES TO TROPHOBlast DURING THE POSTPARTUM PERIOD IN NORMAL HUMAN PREGNANCIES. J.F.Hulka, V.Brinton, J.Schaaf and C.Baney: Nature, Lond., 1963, 198, 501-502 (Dept. Obstetrics, Univ. Pittsburgh, Pa., U.S.A.) Ab to placental syncytiotrophoblastic cytoplasm were not detected in pregnant human sera after treatment with fluorescein, but appeared in postpartum sera from about the 4th day. G.M.Lewis

5884. AUTO-IMMUNE PHENOMENA IN PERNICIOUS ANAEMIA [PA]. D.Doniach, LM.Roitt and K.B.Taylor: Brit. med. J., 1963, i, 1374-1379 (Middx. Hosp. Med. Sch., London, England) The incidence of thyroid Ab was higher in PA patients without overt thyroid disease than in normal controls. Microsomal Ab was present in 45% of patients and in 13% of controls. Thyroid function tests in PA patients with high titres revealed sub-clinical thyroiditis. Gastric cytoplasmic Ag were present in 83% of patients with PA in 27% of those with Hashimoto's disease and in 33% with thyrotoxicosis. The incidence of anti-nuclear factor was lower in PA patients than in controls. The incidence of non-organ-sp. CF factor was similar in both PA and control groups.

M.E.Nutt

5885. IMMUNOLOGIC STUDIES ON GONADOTROPHINS. II. BIOLOGICAL ASSESSMENT OF ANTIGENIC NATURE OF FOLLICLE-STIMULATING PRINCIPLE IN HUMAN CHORIONIC GONADOTROPIN PREPARATIONS. C.Isersky, B.Lunenfeld and M.C.Shelesnyak: J. clin. Endocr., 1963, 23, 54 (Biol. Reproduction, Weizmann Inst. Sci., Rehovoth, Israel) Antiserum to human urinary menopausal gonadotrophin [HMG] neutralised FSH activity of both HMG and human chorionic gonadotrophin

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[HCG] prep, without affecting the HCG activity of the HCG prep. Antiserum to HCG neutralised HCG activity and also that FSH activity which was contained in the HCG prep.

G.F.Blane

5886. SUPPRESSION OF ALLERGIC ENCEPHALOMYELITIS [EAE] IN RATS BY MEANS OF ANTIBRAIN SERUM.

P.Y.Paterson and S.M.Harwin: *J. exp. Med.*, 1963, 117, 755-774 (Med. Dept., New York Univ. Sch.

Med., New York, U.S.A.) Rats inj. with nervous tissue in adjuvant regularly developed signs of EAE within 2 to 3 weeks which generally regressed to give clinically and histol. normal rats by the 6th to 9th week. Serum collected from rats 3 to 6 weeks after sensitisation contained CF antibrain Ab and was able to suppress the development of EAE when given to rats inj. with nervous tissue and adjuvant. Serum pools which did not contain the CF Ab were not able to suppress the disease. Serum containing CF Ab after treatment with 2-mercaptoethanol no longer fixed C* with brain Ag in vitro and no longer suppressed EAE.

H.E.H.Jones

5887. FATE OF TRANSPLANTED BONE. R.Mawdsley and G.A.Harrison: *Nature*, Lond., 1963, 198, 495-496 (Dept. Anat., Univ., Liverpool, Lancs., England)

One whole humerus of a 2 day-old C57 mouse was transplanted s.c. into an adult C57 x R11 hybrid and the other humerus into a C57 adult. After 28 days, both bones were retransplanted into another adult C57, and the transplants examined histol. after another 28 days. In the latter case, the bone was healthy and well vascularised; in the former it was largely avascular and the marrow was necrotic. It was concluded that in isografts, the new bone deposited was of donor origin.

G.M.Lewis

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5888. MICROSOMAL FRACTIONS AS TRANSPLANTATION ANTIGENS. D.C.Dumonde, S.Al-Askari, H.S. Lawrence and L.Thomas: *Nature*, Lond., 1963, 198, 598 (Dept. Med., New York Univ. Sch. Med., N.Y., U.S.A.)

Suspensions of microsomes from livers and spleens of A/J and C57BL donor mice were capable of sensitising recipient mice to cause accelerated rejection of subsequent skin grafts from the donor strain.

G.M.Lewis

5889. ABSENCE OF SECONDARY DISEASE IN RATS TREATED WITH HOMOLOGOUS BONE MARROW TRANSFUSIONS AFTER ADMINISTRATION OF 'MYLERAN'. A.Dunjic: *Nature*, Lond., 1963, 198, 603-604 (Dept. Radiobiol., Cancer Inst., Univ., Louvain, Belgium)

L-strain rats treated with bone marrow from donors of the same L strain did not present delayed mortality during the 2nd or 3rd month after lethal doses of Myleran or X-irradiation. The delayed mortality with symptomatology of secondary disease occurred in irradiated L strain rats surviving the 1st 30 days, as a result of homologous bone marrow treatment from R strain donors. A higher incidence of delayed mortality was observed among the rats receiving bone marrow treatment within 2 hr. or on die 3rd day following irradiation as compared with the incidence among the rats treated on the 1st day.

G.M.Lewis

5890. SEX-LINKED DRUMSTICK APPENDAGE FREQUENCY AS MARKER FOR BONE MARROW TRANSPLANTATION IN MONKEYS. E.Magliulo, B.G.Crouch and M.J.de Vries: *Blood*, 1963, 21, 620-655 (Med. Biol. Lab., Nat. Defence Res. Org., TNO, Tijswijk, Netherlands) The mean values of drumstick counts in the neutrophil granulocytes in cf and ? of rhesus

monkeys were estimated. The drumstick appendage freq* was not effected by X-irradiation and treatment with autologous bone marrow. The counts were of importance in assessing the 'take*' of a bone marrow graft when ? donors and cf hosts are used.

H.B.Waynfirth

5891. RUNT DISEASE PRODUCED IN THYMECTOMISED F1 HYBRID MICE INJECTED WITH PARENTAL STRAIN LYMPHOID CELLS. C.Martinez, A.P.Dalmasso,

M.Blaese and R.A.Good: *Proc. Soc. exp. Biol.*, N.Y.# 1962, 111, 404-407 (Dept. Physiol., Variety Club Heart Hosp., Minneapolis, Minn., U.S.A.)

Thymectomy performed at birth increased the susceptibility of (AxC3H) F1 recipients to runt disease produced by injn. of A strain parent spleen cells. Operation even at 40 days after birth enhanced disease in (A x C57B1) F1 recipients to A strain cells but not in (A x C3H) F1 recipients to C3H strain cells.

* M.M.Shapland

5892. ROLE OF CHEEK POUCH IN EFFECTING TRANSPLANTATION IMMUNITY IN HAMSTER. D.Shepro, N.Kula and J.A.E.Halkete: *J. exp. Med.*, 1963, 117, 749-754 (Simmons Coll. and Boston Univ. Biol. Sci. Center, Boston, Mass., U.S.A.)

The cheek pouch has no lymphatic supply and large mol. which cannot penetrate the vascular endothelium reach the general circulation by slow diffusion through the cheeji: pouch membrane to lymph vessels of the neck. This 'barrier*' was demonstrated by injn. into the cheek pouch of India ink, 32p (as chromic radiophosphate) and thorotrust.

H.E.H.Jones

5893. ASSAY OF GRAFT-HOST INTERACTIONS ACROSS STRONG AND WEAK HISTOCOMPATIBILITY BARRIERS IN MICE. J.Miller, J.C.Pierce, C.Martinez and R.A. Good: *J. exp. Med.*, 1963, 117, 863-878 (Physiol. Dept., Variety Club Heart Hosp., Minnesota, Minn., U.S.A.)

This new assay of graft-host compatibility consisted of finding cell infiltrates in the livers of mice 1 to 3 days after i.v. injn. of competent lymphoid tissue cells. The infiltrates were of donor origin and could be increased by prior immunisation of donor to the recipient and decreased by prior immunisation of the recipient to the donor. Splenomegaly also occurred in this early perio and was a product of both donor and host-sp. immune reactivity plus a small non-sp. component of host reactivity. Graft-host interactions could be demonstrated in strain combinations isogenic at the H-2 locus without prior immunisation of the donor. Differences in reactivity of reciprocal donor-recipient combinations could be detected in this group as well as in groups differing at the strong H-2 locus.

H.E.H.Jones

5894. CELLULAR INFILTRATION IN HOMOTRANSPLANTED KIDNEYS. W.JdJempster, M.A. Williams, P.Burgess and R. Sparks: *Brit. med. J.*, 1963, i, 18-23

(Postgrad. Med. Sch., London, England) Dog kidney⁵ were transplanted into hosts in which DNA had been labelled by 3H-thymidine. The activity of labelled pyroninophilic cells in subsequent biopsies was 15-58*⁷ that of labelled mononuclear cells in the host blood. Results did not exclude a renal origin for some of the pyroninophilic cells. There was no increase in the no. of labelled cells in transplants to hosts which bore, or had rejected, skin grafts from the kidney donor. The differentiation of infiltrating cells was difficult even by electron microscopy. No labelled cell: were recorded in autotransplanted kidneys.

M.E.Nutt

5895. TIME OF ANTIGEN RELEASE FROM HOMOGRAFTS.

W.J.Dempster, J.S.Calnan and A.E.Kulatilake: Brit. med. J., 1963, i, 23-25 (Postgrad. Med. Sch., London, England) Homografts of skin were made in dogs, rats or mice-and removed just before the expected time of rejection. Second grafts from the same donor, made 10-14 days later, survived as long as the first. Similar results were obtained with kidney homografts in dogs. It is suggested that natural tissue transplantation Ag does not exist, but that die tissue becomes antigenic during disruption and rejection. M.E.Nutt

whether given Lv., i.p. or i.m. with Freund's adjuvant. After this time, titres after Lv. injn. fell; after i.p. injn. they remained steady and after i.m. injn. they continued to rise slowly. In newborn animals inj. i.p. within 18-24 hr. of birth, the Ab gave no pptn. in the Ouchterlony test. G.M.Lewis

5900. 'IMMUNOBLASTS' AND 'IMMUNOCYTES' ATTEMPT AT FUNCTIONAL NOMENCLATURE.

W.Dameshek: Blood, 1963, 21, 243-245 (Med. Dept., Tufts Univ. Med. Sch., Boston, Mass., U.S.A.) 'Immunol. competent cells*' are discussed, and described. H.B.Waynforth

5901. IMMUNOLOGICALLY COMPETENT CELL

(*IMMUNOCYTE^f) SYSTEM. ATTEMPT AT DELINEATION OF CELLULAR RELATIONSHIPS. L.Berman: Blood, 1963, 21, 246-249 (Path. Dept., Wayne State Univ. Med. Coll., Detroit, Mich., U.S.A.) H.B.Waynforth

5902. CEREBRAL CORTEX AND ANTIBODY PRODUCTION. D.F.Pletschy, A.M.Monaenkov and Iu.B.

Ostrovskii: Dokl. Akad. Nauk, 1962, 144, 242-243. Expt. on dogs showed that the intensity of Ab accumulation was related to the strength of various nervous processes in the cerebral cortex. (Russian) B.J.Cooper

5a03. ENHANCEMENT OF ANTIBODY FORMATION BY WHOLE BODY X-RADIATION. F.J.Dixon and P.J. McConahey: J. exp. Med., 1963, 117, 833-848 (Div. Expt. Pathol., Scripps Clinic, La Jolla, Calif., U.S.A.)

Enhancement and acceleration of the Ab response was achieved with large cytotoxic doses of X-radiation given after Ag stimm. The timing of radiation was critical and varied with the physical form of the Ag. It is suggested that radiation depletes the lymphoid tissues of cells and the surviving Ag-stim. cells multiply more rapidly than the non-stim. cells to repopulate the depleted tissues. X-radiation enhancement of Ab formation is produced by different means from those operating in endotoxin and colchicine induced enhancement. H.E.H.Jones

5904. ANTIGENICITY OF POLYPEPTIDES: IMMUNOLOGICAL UNRESPONSIVENESS TO COPOLYMERS OF (X-AMINO ACIDS. P.H.Maurer, R.Lowy and CKierney: Science, 1963, 139, 1061-1062 (Seton Hall Coll. Med., Jersey City, N.J., U.S.A.) Immunol. tolerance toward 3 synthetic random copolymers of the CX-amino acids, glutamic, lysine, alanine and tyrosine, was produced by a single injn. of the polymers into newborn rabbits. The tolerant state could be extended by an additional i.v. injn. of Ag. Repeated injn. of the polymer in adjuvant mixture could "break" die tolerant state. G.M.Lewis

5905. IMMUNOLOGICAL IMPLICATIONS OF ACQUIRED TOLERANCE TO HETEROLOGOUS TUMOURS.

M.R*Anderson and H.N.Green: Nature, Lond., 1963, 198, 861-862 (Dept. Expt. Pathol., Univ., Leeds, Yorks., England) One intrafoetal injn. 2-4 days before birth of a cell suspension of Crocker sarcoma growing in Strong A strain mice produced tolerance to the tumour in Wistar rats. The tumour could then be transplanted by untreated adult rats for 3 generations, presumably due to species-sp. rat protein in the cell surface; at this stage the tumour could not be transplanted back to adult Strong A mice. Strong A mice inoc. s.c. at 1-day old with rat Rd/3 sarcoma supported vigorous growth of this heterologous tumour. G.M.Lewis

ANTIBODY FORMATION

5896. FOETAL RESPONSE TO ANTIGENIC STIMULUS.

H. ANTIBODY PRODUCTION BY FOETAL LAMB. A.M.Silverstein, J.W.Uhr, K.L.Kraner and RJ.Lukes: J. exp. Med., 1963, 117, 799-812 (^nobiol. Branch, Armed Forces Inst. Pathol., Washington, D.C., U.S.A.) The foetal lamb In utero formed Ab in response to Ag stimm. by the 66th to 70th day of the 150 day gestation period. The highest Ab titre was obtained in response to bacteriophage cpX174. Horse ferritin was lightly less effective whereas ovalbumin was only a "weak Ag". *Diphtheria toxin*, *Leishmania tigris* and BCG were unable to stim. Ab production during foetal or early neonatal life. The earliest anti-phage Ab produced by the lamb foetus was a macroglobulin sensitive to the action of 2-mercaptoethanol. Only in older foetuses - with long-lasting stimm. were appreciable amounts of 7S y-globulin Ab formed. H.E.H.Jones

5897. IN-VITRO PRODUCTION OF ANTIBODY LYMPHOCYTES. M.W.Elves, S.Roath, CTaylor and M.C.G. Israels Lancet, 1963, i, 1292-1293 (Clin. Haematol., Dept., Univ., Manchester, England) Lymphocytes from a previously immunised donor transformed and simult. produced Ab in vitro under antigenic stimulus. The small lymphocyte is a potential producer of Ab under appropriate conditions, which shows itself in vivo in the form of the secondary response. G.H.Bell

5898. LOCALISATION OF ANTIBODIES DJJASMA CELLS BY E.M. S.de Petris, G.Karlsbad and B.Perne I. exp. Med., 1963, 117, 849-862 (Sept. Pathol. Lab., Clin. del Laboro'L.Devoto'. Univ. Milan, Italy) Lymph node cells from rabbits hyperimmunized with ferritin were incubated with the Ag. The Ag-Ab RPt-was realised in the cisternae of the endoplasmic reticulum and the perinuclear space of plasma cells. Control animal cells immunised with an unrelated Ag showed no Celling when incubated with ferritin. From direct counts of ferritin in plasma cells a lower limit was determined IS Se w nca Df Ab in the endoplasmic reticulum <12*2 mg./ml. and for the total Ab content of Ae Wasma cell (7*0 x 10*13 g.). H.E.H.Jones

5899. EFFECT OF ROUTE OF ADMINISTRATION OF BOVINE Y-GLOBULIN ON ANTIBODY FORMATION IN THE GUINEA-PIG. T.D.Glover and D.W.Bishop: Nature, Lond., 1963, 198, 901-902 (Dept. Vet. Anat., Univ. Liverpool wtuw-t *-@*- / -~-duction is tested by the PCA procedure, rose sharply for the 1st 10 days after injn. with bovine y-globulin,

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5906. BREAKDOWN OF POLYVALENT TOLERANCE IN THE CHICKEN BY THYMIC GRAFTS. A.Szenberg and N.L.Warner. *Nature. Lond.*, 1963, 198, 1012-1013 (Hall Inst. Med. Res., Melbourne, Australia) Noii-inbred chickens were rendered tolerant to histocompatibility* Ag by prenatal injn. of embryonic spleen cells so that their circulating w.b.c. were incapable of producing focal lesions on the chorioallantoic membrane. This polyvalent tolerance could be destroyed by grafting 2 lobes of thymus from a 2-month old chicken at 1 week post hatch. G.M.Lewis

5907. EFFECT OF NEONATAL INJECTION OF NORMAL HORSE SERUM ON ELIMINATION OF HORSE ANTI-TOXIN FROM BLOODSTREAM OF ADULT RABBITS. G.Gowland and CL.Oakley. *J. Path. Bact.*, 1963, 85, 221-232 (Nat. Inst. Med. Res., Ridgeway, Mill Hill, London, England) Young rabbits (up to 84 hr. old) given a single s.c. injn. of 400 mg. of normal horse serum proteins were tolerant of horse albumin when challenged at 8-10 months, the tolerance persisting through 2 antigenic challenges and being present at 20 months. Rabbits so treated, when challenged with crude horse *Clostridium welchii* (X-antitoxic serum showed only a transient period of tolerance to antitoxic globulin and decreased tolerance to normal horse globulin. After 2 challenge doses of anti-serum, the rabbits showed no tolerance to antitoxic or normal globulins. D.Murray

5908. IMMUNOLOGICAL TOLERANCE TO LCM VIRUS. E. TREATMENT OF VIRUS CARRIER MICE BY ADOPTIVE IMMUNISATION. M.Volkerc *Acta path. micsobiol. scand.*, 1963, 57, 465-487 (Virus Dept., Statens Seruminst., Copenhagen, Denmark) There was marked decrease of the virus titres in LCM virus carriers following the transplantation of isologous immune lymphoid cells. This effect was first demonstrable 1 or 2 weeks after transplantation, reaching its max. 5 or 6 weeks later but total elimination of the virus has not been observed. Immune lymphoid cells were readily obtained from infected mice. L.Friedmann

5909. EFFECTS OF STEROID SEX HORMONES ON IMMUNOLOGICAL PHENOMENA. A.Kappas, H.E.H. Jones and LM.Roitt: *Nature. Lond.*, 1963, 198, 902 (Courtauld Inst. Biochem., Middlesex Hosp. Med. Sch., London, England) Oestrone given to 7 guinea-pigs and rats inj. with homologous thyroglobulin in Freund's adjuvant reduced the intensity of skin reactions to tuberculin and thyroglobulin, and adjuvant-induced arthritis was suppressed. Oestrone did not affect the rejection of skin homografts or incidence of expt. allergic encephalitis. Auto-allergic thyroiditis in cf was reduced by testosterone. G.M. Lewis

5910. HOMOLOGOUS BONE MARROW TRANSPLANTATION IN DOGS RECEIVING X-RADIATION PLUS URETHANE OR 6-MERCAPTOPURINE. L.J.Cole and E.L.Alpem *Blood*, 1963, 21, 373-385 (U.S. Naval Radiobiol. Defence Lab., San Francisco, Calif., U.S.A.) Mongrel dogs were given homologous bone marrow after prior treatment with 6-mercaptopurine or urethane and with X-irradiation. The mean survival time in these dogs was 23 days as opposed to 10 days for dogs not treated with chemicals. The treated animals showed good recovery of peripheral blood granulocyte count. Secondary disease in these dogs was characterised by anorexia, infection, liver lesions and anaemia. The marrow showed active haematopoiesis in treated animals.

It is concluded that the drugs used are additive to X-irradiation in suppressing the homograft rejection in dogs. H.B.Waynfirth

5911. IMMUNOLOGICAL STUDIES IN BLOOD DISEASES. E.Korinth: *Blut*, 1963, 9, 20-41 (Med. Univ. Clin., Mainz, Germany) A range of patients with various blood diseases including leukaemias, anaemias and RE system conditions were immunised with AB substance, and their iso-agglutinin response compared with that of healthy persons. In proliferate blood disease the degree of competence of response diminished with the degree of malignancy. (German) AJ.Wansbrough

IMMUNOCHEMISTRY

5912. ANTIGENIC DETERMINANTS IN FRAGMENTS OF Y-GLOBULIN FROM RABBIT SERUM. J.W.Goodman: *Science*, 1963, 139, 1292-1293 (Dept. Microbiol., Univ. California Sch. Med., San Francisco, Calif., U.S.A.) When fraction III from papain-digested rabbit serum y-globulin was digested with pepsin, the fragments which were non-dialysable retained (he capacity to ppt. with sp. antiserum. Smaller fragments did not ppt. with Ag but inhib. the pptn. of Ab with fraction III. It is concluded that they carry the antigenic determinants of the y-globulin mol. G.M.Lewis

5913. ANTICOMPLEMENT (ANTI-C^f) ANTI-GLOBULIN REAGENTS. F.Stratton and H.H.Gunsor: *Nature. Lond.*, 1963, 198, 554-556 (Nat. Blood Transf. Serv., Roby St., Manchester, England) Anti-C^f anti-globulin sera were prep. in rabbits by injn. of rabbit r.h.c coated with human Ab and C^f, or human cells sensitised with anti-Lea in the presence of C^f. The antisera were examined by immunoelectrophoresis and contained anti-YI and anti-Y2t 2 anti-pi, anti-3ic and anti-Og Ab. G.M.Lewis

5914. SYNTHESIS OF CHICKEN ANTIBODIES OF HIGH AND LOW MOLECULAR WEIGHT. A.A.Benedict, C.Larson and H. Nik-Khah: *Science*, 1963, 139, 1302-1303 (Dept. Bacteriol., Univ. Kansas, Lawrence, Kans U.S.A.) When primary, secondary and hyperimmune chicken Ab to bovine serum albumin were fractionated by starch-block electrophoresis, 2 major populations of macroglobulin Ab were associated with slow and fast-moving y-globulins. Treatment of these fractions with 2-mercaptoethanol revealed 2 populations of 7S Ab. C.M.Lewis

5915. STRUCTURE OF SPECIFIC ANTIBODY SITE. M.H.Winkler *J. theor. Biol.*, 1963, 4, 237-241 (Protein Fndn., 281 South St., Jamaica Plain, Mass., U.S.A.) Model building expt. are reported which indicate that a small peptide, devoid of fixed three dimensional structure in the absence of the Ag, can distinguish between closely related haptens. It is suggested that Ab specificity may reside in such a peptide. G.F.Blane

5916. PEPTIDE CHAINS OF ANTIBODIES. F.Franek and R.S.Nezlin: *Biokhimia*, 1963, 28, 193-203. A method was devised for destroying the most reactive (interchain) disulphide bonds in the mol. of horse diphtheria and tetanus antitoxins. The S-sulphoantitoxins thus obtained were made to disintegrate into heavier H-chains

and lighter L-chains. The results obtained showed that *e sp. determinant of the antitoxins was most probably contained in the H-chain, but that for the reaction with Ag a complex of H- and L-chains was required.

* (Russian) B.J.Cooper

5917. GEL DIFFUSION PRECIPITIN METHOD FOR ESTIMATION OF C-REACTIVE PROTEIN. R.A.Crookson: J. clin. Path.. 1963,16. 287-289 (Dept. Expt. Path., Med. Sch., Birmingham, England) The error » a gel diffusion precipitin plate method for the estimation of C-reactive protein was 15% in 5 replicate tests-on sera. In tests on 265 sera, the method was intermediate in sensitivity between the conventional capillary precipitin method and the more sensitive ¹⁴Mar^j ^ J J ^ ire

5918. TECHNIQUE FOR COMPLEMENT TITRATION WITH CAPILLARY BLOOD. K.Mai^a nd S-^c-jf ^{**%}. 2- Hyg. InfektKr., 1962. 149. 1. 35-43 (tat., Clin. Bacteriol., Univ. Hamburg, Germany) Ration of venous and capillary blood was earned out. Using the latter, the C values obtained were lower.

(German) A.J.Wansbrough

5919. PRECISE STANDARDISATION OF REAGENTS FOR COMPLEMENT FIXATION. J-F.Kent ^a E.H.Fife, Jan.: Amer. J. trop. Med. Hyg.. 1963, 12. 103-116 (Div. Labs. and Res., New York State Dept. Health. Albany, N.Y., U.S.A.) CF was affected by the coenen. of ncnrAb serum components, as well as by the time and temp. of p:imary incubation. The influence of fce factors on Ag standardisation is illustrated widi. Samples from the reactions of treponemal, trypanosomal and trichirL.l Ag with homologous antisera. A.A.Z ^{TM^} erman

Univ., Columbus, Ohio, U.S.A.) The colons of 304 cT Wistar rats were treated with 2 potent carcinogens using either impregnated strings or oil enemas. Only 1 invasive adenocarcinoma and 2 carcinomas in situ were observed. 12 lymphosarcomas and 3 spindle cell sarcomas also occurred.

B.M. Stevens

5923. FAILURE OF INOCULATION WITH POLYOMA VIRUS TO INFLUENCE CHEMICAL CARCINOGENESIS IN MICE. R.A.Malmgren and A.S.Rabson: J. nat. Cancer Inst., 1963, 30, 203-203 (Pathol. Anat. Dept., Nat. Cancer Inst., Bethesda, Md., U.S.A.)

C3H/HeN ? mice, treated with 3-methylcholanthrene by s.c injn. or skin painting, developed the same no. of tumours and at the same rate in polyoma-virus infected and uninfected animals. A/LN <?mice treated with urethane developed the same no. of lung tumours in polyoma-infected and uninfected animals. It is concluded that polyoma virus does not interfere with or protect against chem. carcinogenesis under these conditions.

J. G. Bennette

5924. BLADDER IMPLANTATION IN THE MOUSE AS A MEANS OF DETECTING CARCINOGENIC ACTIVITY: USE OF CRUSHED PARAFFIN WAX OR STEARIC ACID AS VEHICLE. G.M.Bonser, E.Boylard, E.R.Busby, D.B.Clayson, P.L.Grover and J.W.Jull: Brit. J. Cancer, 1963, 17, 127-136 (Med. Sch., Leeds, England)

A range of materials (mostly aromatic hydroxyamines) was tested by surgical implantation into the bladder of albino mice in the form of pellets mixed with paraffin wax or stearic acid. The tests were carried out, in part, to confirm the reliability of such a test for bladder carcinogens. Among compounds found to be active were 2-naphthylhydroxyamine, hi&(2-amino-1-naphthyl) sodium PO4 and 1-phenylazo-2-anthrol. D.Hamer

5925. A SHORT TERM TEST FOR CARCINOGENICITY. P.M.Peacock and E.Dick: Brit. J. Cancer, 1963, 17, 59-61 (Royal BeatsonMem. Hosp., Glasgow, Scotland)

A screening test for carcinogenic activity is described. Embryo skin, lung, stomach and bladder implants from BALB/C strain \$ parents were made into 8-week old mice of same strain. These implants were made into the leg muscle and tests were made by touching grafts against the solid test material before implantation. Mice were killed, examined and grafts sectioned after 16 weeks.

D.Hamer

5926. COMPARISON BETWEEN THE EFFECTS OF THOROTRAST AND A NON-RADIOACTIVE ZIRCONIUM HYDROXIDE SOL IN MICE. J.P.M.Bensted and J.O.CroDkall: Brit. J. Cancer, 1963, 17, 62-69 (Physics Dept., Inst. Cancer Res., London, England)

When tested by i.v. injn. with Schofield strain mice, no difference was observed in the long term effects of thorotrast and *zirconotrust* (zirconium dioxide sol). Only one tumour was observed in each group though the no. of survivors at 17 months was small.

D.Hamer

5927. CYTOLOGICAL AND CYTOCHEMICAL ALTERATIONS IN THE RESPIRATORY TRACT OF MICE AFTER EXPOSURE TO CIGARETTE SMOKE, INFLUENZA VIRUS AND BOTH. C.Leuchtenberger, R.Leuchtenberger, F.Ruch, K.Tanaka and T.Tanaka: Cancer Res., 1963, 23, 555-565 (Dept. Biol. and Cytochem., Children's Cancer Res. Foundn., Boston, Mass., U.S.A.) Atypical proliferative lesions accompanied by moderate intracellular DNA, RNA and protein increases occurred in all 3 groups. Exposure to virus alone or with

EXPERIMENTAL ONCOLOGY

5920. INFLUENCE OF INITIAL TISSUEMETABOL^ ON THE EXPERIMENTAL BLASTOMIOGENESK PRO-CESS. O.M.Pozdnyakow Nature, V^o » " ^ r f' 699 (Inst. Normal and Pathol. Physiol., Acad. Med.

ate dehydr red. Tumors occurred only in the thoracic muscle. ^ ich was characterised by intensive Glycolysis »*» tow Miration level. G.M.Lewis

5921. INFLUENCE OF PSEUDOPREGNANCY ON BREAST TUMOUR INDUCTION IN C57B1 MICE BY VARIOUS CHEMICAL CARCINOGENS. J.Merchant: Brit. J. Cancer, 1963, 17, 119-126 (Cancer Res. Lab., Univ. Birmingam, tngaiiu; VJ*W"J~ . . olive oil pregn-C57B1 mice were painted with methylcholan-solin, one of the carcinogens: DMBA, benzene, or 3,4-benzpyrene. The potency of breast turnout s feathly increased in pregnant mice. The latter 2 compounds were of low potency in both virgin and pseudopregnant mice. D.Hamer

5922. INDUCTION OF SARCOMAS IN THE COLON OF RATS BY INTRALUMINAL APPLICATION OF mTORO-CARBONS. J.L.Stevenson and E.VonHaam: Cancer ^ s., 1963, 23.* 569-570 (Dept. Pathol., Ohio State

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cigarette smoke produced a striking increase in abnormal intracellular RNA agglomerations associated with absence of mitosis and cell destruction, preceding the development of atypical proliferative lesions. The freq. of atypical proliferative changes was lowest after smoke alone; virus and smoke combined gave the highest freq. In the group exposed to both smoke and virus, squamous cell metaplasia and transgression of epithelial cells into lung parenchyma were found more often in 4 than ?.

B.M.Stevens

5928. FURTHER STUDIES ON LUNG CANCER FROM CERIUM-144 F3- H.Cember. *Health Physics*, 1963, 9, 539-544 (Kettering Lab., Univ. Cincinnati, Ohio, U.S.A.) Rats were exposed to irradiation with particulate 144CeF3 by intratracheal injn. Several levels of radioactivity, varying from 0.5 to 4 fie, all induced tumours. Deaths of many animals took place, including three given least concn. of treatment, where lymphosarcoma followed total radiation amounting to 600 rad.

M-S.Laverack

5929. EXPERIMENTAL CARCINOGENESIS OF LUNG. INHALATION OF GASEOUS FORMALDEHYDE OR AEROSOL OF COAL TAR BY C3H MICE. A.W.Horton, R.Tye and K.L.Stemmen. *J. nat. Cancer Inst.*, 1963, 30, 31-43 (Kettering Lab., Cincinnati Univ. Med. Coll., Ohio, U.S.A.) A pathol. study.

J.G.Bennette

5930. CARCINOGENIC ACTION OF HUMAN SMEGMA. D.G.Reddy and L.K.S.M.Baruah: *Arch. Path.*, Chicago, 1963, 75, 414-420 (Upgraded Dept. Path., Andhra Med. Coll., Visakhapatnam, India) d*and ? Swiss mice receiving thrice weekly genital applications of fresh human smegma for 16 months failed to develop any malignant disease.

R. Mitchell

5931. TUMOUR PROMOTING PROPERTIES OF ANTHRAX LIN (1:8:9-ANTHRATRIOL). F.G.Bock and R.Burns: *J. nat. Cancer Inst.*, 1963, 30, 393-398 (Roswell Park Mem. Inst., Springville, N.Y., U.S.A.) A descriptive account.

J.G.Bennette

5932. CARCINOGENIC EFFECTS OF N, N'-2:7-FLUORENYLENE-BIS, 2:2:2-TRIFLUOROACETAMIDE ADMINISTERED ORALLY TO BUFFALO STRAIN RATS. H.P.Morris, B.P.Wagner, F.E.Ray, H.L.Stewart and K-CSnell: *J. nat. Cancer Inst.*, 1963, 30, 143-161 (Nat. Cancer Inst., Bethesda, Md., U.S.A.) A pathol. study.

J.G.Bennette

5933. INDUCTION OF MALIGNANT TUMOURS IN GUINEA-PIG BY ORAL ADMINISTRATION OF DI-ET HYLNITROSAMINE. M.F.Argus and C.Hoch-Ligeti: *J. nat. Cancer Inst.*, 1963, 30, 533-551 (Med. Biochem. Dept., Tulane Univ. Med. Sch., Publ. Hlth. Service Hosp., 210 State St., New Orleans, La., U.S.A.) A pathol. study.

J.G.Bennette

5934. TUMORIGENIC PROPERTIES OF 2-CYANO-4-AMINOSTILBENE IN RATS. W.E.Ribelin, C.B.Shaffer and G.J.Levinskas: *Toxicol. appl. Pharm.*, 1963, 5, 344-349 (Environmental Health Lab., Central Med. Dept., American Cyanamid Co., Princeton, N.J., U.S.A.) Repeated s.c. injn. of 2-cyano-4-aminostilbene produced in rats fibromas at the site of injn., characteristic liver cell changes with occasional hepatoma formation, and an increased incidence of mammary tumours.

E.E.Hobbiger

5935. ROLE OF THE DRAINING LYMPH NODE IN CHEMICAL CARCINOGENESIS. M.R.Andersom *Nature*, Lond., 1963, 198, 599-600 (Inst. Pathol., Sch. Med.. Leeds, Yorks., England) The no. of tumours appearing after s.c. injn. of mice with 20-methylcholanthrene was reduced by prior treatment of the local lymph nodes with thorotrust or X-irradiation. The delay in tumour induction was 6-7 weeks, about the time taken for the lymph nodes to regenerate. It is suggested that chern* carcinogenesis may be mediated by an immune reaction originating in the regional lymph nodes about the area of carcinogen application.

G.M.Lewis

5936. INFLUENCE OF URETHANE ON SUBCUTANEOUS CARCINOGENESIS BY 'TEFLON' IMPLANTS. L.Tomatis and P.Shubik. *Nature*, Lond., 1963, 198, 600-601 (Div. Oncol., Chicago Med. Sch., Chicago, U.S.A.) Urethane given to mice greatly shortened their life span and increased the incidence of tumours induced by implantation of Teflon.

G.M.Lewis

5937. MODIFICATION OF ONCOGENIC EFFECTS OF S-POLYOMA VIRUS BY 'ATTENUATED' M-POLYOMA VIRUS. L.W.Law and A.S.Rabson. *J. nat. Cancer Inst.*, 1963, 30, 635-641 (Biol. Lab., Nat. Cancer Inst., Bethesda, Md., U.S.A.) Attempts are described to use the attenuated M-polyoma variant to prevent induction of tumours in C3H/Bi strain mice also receiving later injn. of the highly oncogenic S variant. Considerable degrees of suppression of S-variant oncogenicity were observed which may have been the resultant of viral Ab produced in response to the M-variant challenge! the possible effects of viral interference, or interferon production.

J. G. Bennette

5938. POLYOMA TUMOUR ANTIGEN IN CELLS TRANSFORMED IN VITRO BY POLYOMA VIRUS. K.Habek *Virology*, 1962, 18, 553-558 (Virus Biol. Lab., N.I.H., Bethesda, Md., U.S.A.) 'Foreign*' cellular Ag previously found in in vivo induced polyoma tumours in hamster or mouse have also been found in in vitro polyoma-transformed cells. The presence of these tumour Ag was determined by showing that polyoma virus' immune animals were resistant to tumour production after challenge with the in vitro transformed cells or with early transplant passage tumours derived from them. Resistance was shown against a challenge with transformed mouse embryo culture cells carrying infectious virus, and against a transplantable tumour derived from them in which no virus could be demonstrated. No resistance was shown in virus-immune mice challenged with a tumour derived from an infected control mouse embryo culture.

J.G.Bennette

5939. TUMOUR FORMATION IN TRANSPLANTED ORGANS OF POLYOMA-INOCULATED HAMSTER. V.Defendi and J.F.Duplanr *Arch. Path.*, Chicago, 1963, 75, 332-336 (Dept. Path., Univ. Pennsylvania! Philadelphia, Pa., U.S.A.) Heart and kidneys from baby hamsters inoc. at birth with polyoma virus were transplanted to the pouch of adult hamsters at various intervals after infection. Sarcomas developed in 9 out of 71 recipients. The latency period, rate of growth and histology were similar to tumours developing in non-transplanted heart and kidney. Polyoma virus localised within organs in 24-48 hr. Growth was not influenced by the age of the host and did not depend upon the production of virus sufficient to induce an Ab response in the host.

R.Mitchell

5940. MALIGNANCY OF POLYOMA VIRUS INFECTION IN MICE IN RELATION TO STRESS. A.F.Rasmussen, W.B.Hildemann and M.Sellers: J. nat. Cancer Inst., 1963, 30, 101-112 (Infect. Dis. Dept., California Univ. Med. Schv, Los Angeles, U.S.A.) Stress by avoidance learning and high freq. sound was applied to weanling Webster-Swiss mice inoc. at birth with polyoma virus by the intracardiac route. The stressing procedure had no significant effect on either overall tumour incidence or survival times.

J.G.Bennette

5941. ROLE OF THYMUS IN POLYOMA VIRUS INFECTION. M.Kodama and G.E.Moore: J. nat. Cancer Inst., 1963, 30, 225-239 (Roswell Park Mem. Inst., Buffalo, N.Y., U.S.A.) Virus from a single culture pool was inj. i.v. into AKR and C3H and their F1 WJN* within 24 hr. of birth. Half the mice were thymectomised 2 weeks later. It is concluded from the results that there is a close correlation between the predisposition of AKR mice for leukaemia and their sensitivity to polyoma virus infection, and that the thymus is partly, if not entirely, responsible for the high sensitivity. The incidence of leukaemia was not significantly affected by the presence of polyoma infection:

J.G.Bennette

5942. VARIATION IN ONCIGENICITY OF POLYOMA VIRUS RELATED TO DIFFERENCES IN CELL CULTURE MEDIA. A.S.Rabson and L.L.Law: J. nat. Cancer Inst., 1963, 30, 367-375 (Pathol. Anat. Dept., Nat. Cancer Inst*, Bethesda, Md., U.S.A.) The results of repeated passage of the attenuated M strain of polyoma virus in P388 DL cells grown in 40% human serum medium are described. Under these conditions the weakly oncogenic variant underwent conversion to a highly oncogenic form. The plaque characteristics of the M variant and a highly oncogenic polyoma virus are:

J.G.Bennette

5943. NEOPLASTIC TRANSFORMATION BY POLYOMA VIRUS. M.G.P.Stoken: Brit. med. J., 1968, 1, 1305-1311 (Dept. Virology, Univ., Glasgow, Scotland) A lecture. 52 ref.

5944. LOW MALIGNANCY OF ROUS SARCOMA CELLS AS EVIDENCED BY POOR TRANSPLANT ABILITY IN TURKEYS. V.V.Bergs and V.Groupe: Science, 1963, 139, 922-923 (Inst. Microbiol., Rensselaer Univ., New Brunswick, NJ, U.S.A.) When homologous or isologous transplants of Rous sarcoma cells were made in turkeys, it was found that the main tumor was formed by normal cells by virus wa

hours;

forma-

> of neoplasms. Immunity to the virus may limit growth and systemic dissemination.

C.M.Lewis

5945. A FLOCK OF CHICKENS FREE FROM ANTIBODY TS o? AN mbs % B & s TUMOr'm TKSUE CULTURE. H.Rabin, C.E.A.Hayen, M.Foard and J.B. Pathobiol., Johns Hopkins Univ., Baltim., Md., U.S.A.)

entirely free from Rous Ab was maintained for 2 yr. through 3 generations. Eggs were hatched and chickens reared in isolation. When the Ab-free birds were put in close contact with b. expt induced tumours, a few of them developed. None of the progeny developed a b. w & e p t in Yooms with b. The same proportion of embryos was in the Ab-free flock as in the open flock. Analysis

of the embryo resistance in individuals from Ab-free and open flocks is in agreement with the interpretation that resistance is a single recessive character, and excludes a single dominant but not multifactorial characters.

II. Attempts are described to establish through selection a strain of Rous tumour closer to the natural prototype and to find whether tumours grown in tissue culture under conditions unfavourable to virus production might yield active tumours lacking virus. Serial alternate in vitro and in vivo passages of tumour tissue cultures were grown in media containing Ab, and subsequently maintained at a lower temp, of incubation to decrease virus yield. All cultures produced virus when returned to normal incubation temp.

J.G.Bennette

5946. RESISTANCE OF CHORIOALLANTOIC MEMBRANE [CAM] OF CHICK EMBRYOS TO ROUS SARCOMA VIRUS [RSV] AND MH2 RETICULOENDOTHELIOMA VIRUS. S.S.Dhaliwal: J. nat. Cancer Inst., 1963, 30, 323-336 (Zool. Dept., Malaya Univ., Kuala Lumpur, Malaya) Differences in sensitivity to RSV and MH2 were found in CAM from different chick strains. There was no correlation between the resistance of the CAM and of the adult chick or the embryo proper to RSV. With both viruses at various titres, die *jo* of non-reactors decreased with increase in virus titre, due to the resistant membranes producing a mild reaction when exposed to higher concn. of virus. The effect of CAM resistance to RSV and MH2 is dominant and not sex-linked.

J.G.Bennette

5947. FOCAL CELLULAR ALTERATION IN STABLE AMNION CELLS PRODUCED BY INOCULATION WITH HUMAN LEUKAEMIA BRAIN EXTRACTS. J.A.Whitaker, R. Bo vis, S.L.Andrews and S.E.Sulkin: Cancer Res., 1963, 23, 519-522 (Dept. Pediatrics, Univ. Texas • Southwestern Med. Sch., Dallas, Tex., U.S.A.)

Cell-free brain extracts from leukaemic children were inoc. into cultures of Fernandes, FL and WISH strain amnion cells and Cl'ang liver cells. An alteration in the cells was produced, apparently originating in the nucleus and gradually increasing in size. Affected cells frequently became enlarged and misshapen. The same effects were obtained with serial passages of tissue culture supernatant fluids and with cells frozen and thawed in growth media. Removal of cellular debris by filtration or centrifugation or alterations in cell media did not prevent the effect. Inocn. of extracts from normal human brain did not produce the effect.

B.M.

Stevens

5948. MULTIPLICITY OF CELL RESPONSE TO BAI STRAIN A (MYELOBLASTOSIS) AVIAN TUMOUR VIRUS. I. HISTOLOGICAL ALTERATION AND ADENOSINETRIPHOSPHATASE ACTIVITY OF THYMUS OF CHICKENS WITH MYELOBLASTOSIS. L.Arvy, J.R.Sommer, G.de Thé, U.Heine, H.Ishiguro, D.Beard and J.W.Beard. IV. ULTRASTRUCTURAL CHARACTERISTICS OF THYMUS IN MYELOBLASTOSIS AND OF ADENOSINETRIPHOSPHATASE ACTIVITY OF THYMIC CELLS AND ASSOCIATED VIRUS. G.de Thé, U.Heine, J.R.Sommer, L.Arvy, D.Beard and J.W.Beard: J. nat. Cancer Inst., 1963, 30, 401-413, 415-455 (Surg. Dept., Duke Univ. Med. Center, Durham, N.C., U.S.A.)

HI. The normal lymphocytic cells of the thymic cortex were replaced by blast-like elements, originating in small foci and invading the cortex in an orderly manner, with no overall enlargement of the gland and no changes in the medulla. A strong ATPase reaction was seen in the cortex, at the cytoplasmic membranes of the blast-like cells. This histol. picture was not found in

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any other organ examined, and was not in evidence in the thymus of birds with erythroblastosis.

IV. An E.M. study is presented giving morphol. ultrastructural details of the blast-like cells in the thymus of birds with myeloblastosis. Virus elaboration was shown by the appearance of buds at the cell membrane. Evidence is presented that the source of ATPase associated with virus is also the cell membrane, and that it becomes incorporated in the virus in the process of budding. None of the sp. E.M. changes observed were seen in specimens from birds with erythroblastosis. J.G.Bennette

5949. ORIGIN AND DISTRIBUTION OF VIRUS-LIKE PARTICLES ASSOCIATED WITH MAMMARY TUMOURS IN DBA STRAIN MICE. I. VIRUS-LIKE PARTICLES IN MAMMARY GLAND TISSUE. II. VIRUS-LIKE PARTICLES IN BLOOD AND ORGANS. III. VIRUS-LIKE PARTICLES IN TRANSPLANTED TUMOURS. D.G.Feldman: *J. nat. Cancer Inst.*, 1963, 30, 477-501, 503-515, 517-531 (Rockefeller Inst., New York, U.S.A.)

I. Neither A nor B particles were found in DBA ? virgins up to 6 months of age, but later the mammary glands contained both types of particle. Both types were also found in tissue of pregnant or lactating agent-carrying Rin and (C3H x A)Fi x C3H mice, but no particles were found in mammary tissue of agent-free C57BL and (C3H x A)Fi x C3H. The bearing of the findings on whether the A or B particle is the mammary tumour agent is discussed.

II. Several organs were examined but no A or B particles were found. A single B particle was found in a capillary of a spontaneous tumour and blood of a tumour-bearing mouse contained many B particles. A-type particles were found within the endoplasmic reticulum of the epididymis of both high cancer strain DBA and agent-free C57BL C2.

III. The parent spontaneous tumour contained many A and B particles. Mature B particles were found in transplants up to the 3rd passage only. Occasionally budding and detached B particles without nucleoids were seen in later passages. A particles persisted throughout all the passages examined, up to the 45th. During transplantation, the tumours dedifferentiated from an acinar to a solid alveolar type. J.G.Bennette

5950. ACTION OF CELL-FREE EXTRACTS OF PS TUMOURS ON MICE OF SAME STRAIN. C.Mouriand, J.Mouriand, J.Terrier and B.Martineu *Ann. Inst. Pasteur*, 1963, 104, 460-468 (Inst. Pasteur, Lyon, France) Inj. of cell-free extracts of PS mammary tumours or leukaemias into newborn mice produced the same % of mammary tumours and leukaemias as in controls in ? mice, but there was an increase in the latent period for mammary tumours, and a small decrease in incidence of other malignancies. In c? PS mice there was a larger increase in leukaemias, 4-5% in controls rising to 35% in inj. animals, but they occurred generally later in life in inj. animals. (French) B.Payne

5951. COMPARATIVE VIRULENCE OF MAMMARY TUMOUR AGENT FROM DIFFERENT SOURCES: QUALITATIVE AND QUANTITATIVE DIFFERENCES. K.P.Hummel and CCLittle: *J. nat. Cancer Inst.*, 1963, 30, 593-604 (R.B.Jackson Mem. Lab., Bar Harbor, Maine, U.S.A.) Tumour rates were observed in the offspring of mice inoc. with blood containing mammary tumour agent [MTA] from 4 high-tumour strains. Differences due to quality of MTA were expected to show in the tumour rates of the offspring of inoc. mice,

whereas quant. differences were expected to show only in the inoc. generation. MTA from C3H mice had greater virulence for BALB/c mice than MTA from the other 3 strains: the difference was qual. in character. MTA from ? mice induced more and earlier tumours than that contained in the blood of cf donors: this difference was a quant. one, not reflected in the offspring. J.G.Bennette

5952. MORPHOGENESIS AND GROWTH POTENTIALITY OF MAMMARY GLANDS IN MICE. E. QUANTITATIVE TRANSPLANTATION OF MAMMARY GLANDS OF NORMAL MALE MICE. K.Hoshino: *J. nat. Cancer Inst.*, 1963, 30, 585-591 (Anat. Dept., Yale Univ. Med. Sch., New Haven, Conn., U.S.A.) A new technique for quant. transplantation is described. 15 d* donated mammary glands, transplanted into the fat pads of 11 virgin 9 of die same strain regenerated fully developed glands and lactated. They were indistinguishable from the hosts* intact mammary glands at parturition. J.G.Bennette

5953. PRODUCTION OF TRANSPLANTABLE HEPATOMAS BY INTRASPLENIC IMPLANTATION OF NORMAL LIVER IN MOUSE. E.H.Leduc and J.W.Wilson: *J. nat. Cancer Inst.*, 1963, 30, 85-99 (Biol. Dept., Brown Univ., Providence, R.I., U.S.A.) A pathol. study. J.G.Bennette

5954. MALIGNANT TRANSFORMATION OF M01XSE CONNECTIVE TISSUE GROWN IN DIFFUSION CHAMBERS. E.Shelton, V.J.Evans and G.A.Parker: *J. nat. Cancer Inst.*, 1963, 30, 377-391 (Biochem. Lab., Nat. Cancer Inst., Bethesda, Md., U.S.A.)

After 23 months of continuous cultivation of C3H fibroblasts in diffusion chambers placed by laparotomy into isologous hosts, intraocular or i.m. inoc. resulted in the production of rapidly growing transplantable sarcomas, but after 18 months of cultivation, tumours were not produced. Tissue cultivated in chambers for over a yr. and then grown in vitro produced tumours at the same or earlier times. Tissue that had been maintained in one chamber for periods of 260-378 days gave rise to tumours with the same regularity as tissue that had been repeatedly transplanted into new chambers. Thus fibroblasts cultured in chambers under different physiol. conditions underwent malignant change at the same time. J.G.Bennette

5955. EXPERIMENTAL PRODUCTION OF INTRAMANDIBULAR CARCINOMA IN MICE BY MECHANICAL DAMAGE. C.F.Hollander and T.G.van Rijssel: *J. nat. Cancer Inst.*, 1963, 30, 337-359 (Pathologisch Laboratorium, Leiden, Netherlands) Isologous whisker hair, nylon thread or steel wire when introduced into the alveolar socket produced chronic mechanical injury to the enamel-forming epithelium leading to the development of intramandibular carcinoma, with cyst formation. J. G. Bennette

5956. HEPATOMAS IN RATS FED DIETS CONTAINING PEANUT MEAL AS A MAJOR SOURCE OF PROTEIN. W.D.Salmon and P.M.Newberne: *Cancer Res.*, 1963, 23, 571-575 (Dept. Animal Sci., Agric. Expt. Station, Auburn, Ala., U.S.A.) 64 of 73 Charles River CD rats, fed diets containing 33#3% commercial peanut meal 7-9% dried lean beef or commercial casein and 20% fat, developed hepatomas. 16 rats developed kidney tubule adenomas. When peanut meal was continuously extracted with hot methanol for 72 hr. before use in the diet, only 15 of 88 rats developed hepatomas and none developed kidney adenomas. None of 50 rats receiving a similar

total dietary protein level in the form of dried beef developed hepatomas or kidney adenomas.

B.M.Stevens

5957. INHIBITORY EFFECT OF GUINEA-PIG SERUM ON A NUMBER OF NEW LEUKAEMIAS IN MICE. E.A.Boyse, L.J.Old and E.Stockert: *Nature*, Lond., 1963, 198, 800 (Div. Expt. Chemotherapy, Sloan-Kettering Inst., New York, U.S.A.) Out of 18 new leukaemias of various types arising in inbred colonies of mice, 10 were sensitive to injn. of guinea-pig serum. Suppression of tumour growth occurred under conditions where iso- "nnunity was not a contributory influence. G.M.Lewis

5958. GROWTH INHIBITION OF SARCOMA 180 BY HORMONE ANTISERA AND 5-FLUOROURACIL. L-Anigstein, D.M.Anigstein and E.G.Rennels: *Acta endocr. Kbh.*, 1963, 42, 453-464 (Preventive Med. Dept., Texas Univ. Med. Branch, Galveston, Tex., U.S. A.) Antisera to bovine and human somatotrophic hormone inhib. the growth of sarcoma 180 in young Swiss mice. Antiserum given to mice primed with J²e antiserum in very early life had a greater effect. Combination of antiserum and 5-fluorouracil was more effective than 5-fluorouracil alone which was also inhibitory. H. B. Waynfirth

5959. LEUKAEMIA-INHIBITING PROPERTIES AND L-ASPAPAGINASE ACTIVITY OF SERA FROM CERTAIN SOUTH AMERICAN RODENTS. L.J.Old, E.A.Boyse, H.A.Campbell and G.M.Daria: *Nature*, Lond., 1963, 198, 801 (Div. Expt. Chemotherapy, Sloan-Kettering Inst., New York, U.S.A.) In a study of 7 animals injected to the guinea-pig, only those in the family Cavioidea possessed sera with high levels of L-asparaginase activity and inhibitory activity against mouse leukaemias. G.M.Lewis

5960. SELECTIVE INHIBITION OF RESPIRATION OF PIGMENTED S91 MOUSE MELANOMAS BY PHENYL LACTATE, AND POSSIBLY RELATED EFFECTS ON GROWTH. H.B.Demopoulos and G.Kaley: *J. mit. Cancer Inst.*, 1963, 30, 611-633 (Expt. Pathol. Lab., Nat. Inst. Arthritis, Bethesda, Md., U.S.A.) The Wosinase inhibitor, DL-p-phenyl lactic acid [PLA] increased O₂ consumption in pigmented S91 cells but not melanotic cells from the same tumour. The effect was seen in a tyrosine-free medium was accompanied by a simult. increase in aerobic glycolysis. The time course and kinetic character of this reaction are described, both studies in vitro correlated with the manometric results. PLA also inhib. growth of melanotic S91 tumours ethy transplanted into young DBA/2 mice whereas growth of their somatic tissues was not impaired, but it had no effect on established tumours. J.G.Bennette

5961. EFFECT OF HORMONES ON PODOPHYLLIN-INDUCED VAGINAL ATYPIAS. T.S.Kline: *Arch. fath.*, Chicago, 1963, 75, 343-349 (Dept. Path., Michael Reese Hosp., Chicago, Ill., U.S.A.) Female rats were given daily topical 10% podophyllin for Periods of 1 day to 1 month. Mucosal changes fumbling ^{flaccid} of carcinoma in situ are described, 5^{mg} most severe after 1 or 2 weeks and then gradually finishing. Oestrogens and/or testosterone had no effect on mucosal changes due to podophyllin. R.Mitchell

5962. EFFECT OF OXYGEN TENSION ON SENSITIVITY OF NORMAL AND TUMOUR TISSUES TO ALKYLATING AGENTS. N.Back and J.L.Ambrus: *J. nat. Cancer*

Inst., 1963, 30, 17-29 (Roswell Park Mem. Inst., Buffalo, N.Y., U.S.A.) Under conditions of increased O₂ tension at both normal and raised atm. pressures, no increased sensitivity of normal or neoplastic mouse tissues to the biol. effects of nitrogen mustard was demonstrated. Indirect evidence is presented suggesting that the action of alkylating agents is unrelated to free radicals. Thus the similarity of response between ionizing radiation and alkylating agents may be due to attack on the same molecular sites but mediated through unrelated chem. mechanisms. J. G. Bennette

5963. EFFECT OF OLFACTORY LOBECTOMY AND INDUCED PSEUDOPREGNANCY ON THE INCIDENCE OF METHYLCHOLANTHRENE-INDUCED MAMMARY AND OVARIAN TUMOURS IN C3Hb MICE. C.Biancifiori and F.Caschera: *Brit. J. Cancer*, 1963, 17, 116-118 (Univ. of Study, Perugia, Italy)

A comparison was made of the incidence of mammary and ovarian tumours in three groups of methylcholanthrene-treated C3Hb mice: (a) virgin, (b) mice subjected to olfactory lobectomy, (c) pseudopregnant mice. The incidence of mammary tumours in the three groups was 33% 19% and 18% multiple tumours only being observed in the pseudopregnant group. The incidence of ovarian tumours was not significantly different in the 3 groups.

D.Hamer
5964. THE COMPARISON OF INTRAVENOUS AND • INTRA-ARTERIAL NITROGEN MUSTARD AFTER THE ARTERIAL INJECTION OF TUMOUR CELLS.

K.P.Robinson and E.T.Hoppe: *Cancer*. Philad., 1963, 16, 350-354 (Surg. Dept., Univ. Illinois Coll. Med., Chicago, Ill., U.S.A.) Nitrogen mustard was inj. into either the aorta or the peripheral vein of rabbits, following the injn. of tumour cell suspension into the aortic root. Autopsies were made on the twentieth day to count the metastases. Nitrogen mustard reduced the no. of metastases* that resulted from the arterial injn. of tumour cells. The i.v. and intra-arterial routes of injn. were equally effective, but the intra-arterial was the more hazardous. D.L.Connell

5965. INFUSION OF MARROW IN MOUSE AND DOG AFTER THIO-TEPA. H.L.Lochte, jun., S.Kasakura, M.Karetzky, J.W.Ferrebee and E.D.Thomas: *Blood*, 1963, 21, 424-428 (Bassett Hospt., Cooperstown, N.Y., U.S.A.) Infusions of marrow into dogs and mice reduced the toxicity of inj. thio-TEPA only in that range of dose of the drug in which prompt restoration of haematopoiesis was critical to survival.

H.B. Waynfirth

5966. PRELIMINARY EXPERIMENTATION WITH SPECIFIC IMMUNOTHERAPY OF NEOPLASTIC DISEASE IN MAN. I. IMMEDIATE EFFECTS OF HYPERIMMUNE EQUINE Y-GLOBULINS. S.De Carvalho: *Cancer*, Philad., 1963, 16, No. 3, 306-330 (Haematol. Dept., Doctors Hosp., Cleveland, Ohio, U.S.A.)

Hyperimmune ygtobulins, Prep, from the sera of horse and donkey receiving purified Ag from a variety of cancer and leukaemic tissues, were given to leukaemia and cancer patients, some of whom had previously received hormono- and chemotherapy. Of the 15 leukaemia patients 13 had remissions on yglobulin, lasting from 4 weeks to 29 months. Of 16 cancer patients 15 were beneficially affected; this included the partial or complete clearance of objective tumour lesions, lasting from 2 weeks to 11 months. Side effects of this treatment are discussed. D.L.Connell

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5967. EFFECTS OF SULPHATED DEGRADED LAMINARIN ON EXPERIMENTAL TUMOUR GROWTH. B.Jolles, M. Remington and P. S.Andrews: Brit. J. Cancer, 1963, 17, 109-115 (Radiotherapy Dept., Gen. Hosp., Northampton, England) Male mice of strain TI bearing sarcoma S180 were given injn. of saline soln. of laminarin SO₄ at the site of tumour transplant. Possibly due to interference with stroma, there was an inhibitory effect on tumour growth. D.Hamer

5968. EXPERIMENTAL STUDY OF THE RELATIONSHIP BETWEEN VITAMIN B12 AND TWO ANIMAL TUMOUR SYSTEMS. C.C.Rigby and M.Bodian: Brit. J. Cancer, 1963, 17, 90-99 (Hosp. Sick Children, Gt. Ormond St., London, England) Massive vit. Bi₁₂"dosage was given to August strain rats carrying fibrosarcoma PWAZ and to CAF/JAX mice bearing neuroblastoma C1300. In rats, tumour growth increased by 200% whereas in mice there was a 23% decrease in growth. Concn. of vit. B12 in mouse tumours were 18 times those in rat tumours (estimated by tracers). D.Hamer

5969. SPONTANEOUS REGRESSION OF INDUCED MAMMARY TUMOURS IN RATS. Stretton Young and D.M.Cowan: Brit. J. Cancer, 1963, 17, 85-89 (Imperial Cancer Res. Fnd., London, England)

A study was made of the growth prop. of mammary tumours induced in Sprague-Dawley rats by a single oral dose of 50 mg. of DMBA in oil. The histol. of regressing tumours was very similar to growing tumours and mitoses were common even after pronounced regression. Regressing tumours were not reactivated by injn. of oestradiol, progesterone, growth hormone or cortisone. D.Hamer

5970. HISTOCHEMICAL EVALUATION OF ENZYMIC ACTIVITIES IN HUMAN SQUAMOUS CELL CANCER.

*K.Kawakatsu and M.Mori: Cancer Res., 1963, 23, 539-545 (Dept. Oral Surgery, Osaka Univ. Dental Sch., Osaka, Japan) Alk. phosphatase was confined to stroma. Activity was usually lost in malignant epithelium. Acid phosphatase was localised in neoplastic epithelium. Esterase activity was higher in neoplastic than normal epithelial cells. B-Glucuronidase activities in neoplastic and homologous epithelia were similar. Aminopeptidase activity was generally decreased in tumour parenchyma but was present in basal cell and anaplastic carcinomas and occasionally in stroma. Succinic dehydrogenase was found in peripheral layers of epidermoid cancer and throughout basal cell cancers except in Highly keratinised or necrotic areas. Lactic, malic, glycerophosphate, glucose 6-phosphate and iso-citrate dehydrogenases were localised peripherally to squamous cell cancer subcornified layers. B.M.Stevens

5971. SERUM LACTIC DEHYDROGENASE [LDH] LEVELS IN MICE DURING DEVELOPMENT OF AUTOCHTHONOUS AND CHEMICALLY INDUCED TUMOURS.

C.G.Crispens jun.: J. nat. Cancer Inst., 1963, 30f 361-366 (Anat. Dept., Maryland Univ. Med. Sch., Baltimore, Md., U.S.A.) No correlation was found between tumour size and LDH activity in mice with diem, induced tumours. Both spontaneous and chem. induced tumours reached palpable size before significant increases in LDH levels were recorded. Thereafter, the LDH time curves were similar for both types. The implication of the results in relation to attempts to use LDH assays in the diagnosis of early cancer is discussed. J.G.Bennette

5972. CULTURAL CHARACTERISTICS OF MALIGNANT HISTIOCYTOMAS AND FIBROUS XANTHOMAS.

L.Ozzello, A.P.Stout and Margaret R.Murray: Cancer* Philad., 1963, 16, 331-344 (Div. Surgical Path., Columbia Univ. Coll. Physn. and Surgn., New York, U.S.A.) The cultural behaviour of malignant histiocytomas and fibrous xanthomas was studied in vitro using the Maximow double-coverslip, lying-drop technique. A histiocytic outgrowth was obtained in both groups of tumours, confirming the histiocytic derivation previously suggested by histol. observations. Transformation of neoplastic histiocytes into fibroblasts was followed in vitro. D.L.Connell

5973. INTRANUCLEAR INCLUSIONS IN MULTIPLE MYELOMA AND MACROGLOBULINAEMIA. G.M.Britte Y.Tanaka and G.Brecher: Blood, 1963, 21, 335-351 (Clin. Path. Dept., N.L.H., Bethesda, Md., U.S.A.) Inclusion bodies in the plasma cell nuclei of patients with multiple myeloma and macroglobulinaemia were readily identified in Giemsa stained smears of bone marrow. Their PA-Schiff positivity could be related to the hexose content of the patients' abnormal serum protein. It is suggested that the inclusion bodies represent nuclear elaboration of glycoprotein. H.B.Waynforth

5974. ENDOREDUPLICATION IN ACUTE LEUKAEMIA. C.Bottura and I.Ferrari: Blood, 1963, 21, 207-212 (Clin. Med. Dept., Ribeirao Preto Med. Sch., Ribeirao, São Paulo State, Brazil) Chr. studies in cases of acute myeloblastic leukaemia often showed a normal karyotype before the start of treatment. During treatment with 6-mercaptopurine 44 chr. plus a small fragment were observed. Leukaemic cells also showed repeated endoreduplication. H. Waynforth

5975. CHRONIC GRANULOCYTIC LEUKAEMIA AND PHILADELPHIA CHROMOSOME. P.H.Fitzgerald, A.Adams and F.W.Guna: Blood, 1963, 21, 183-196 (Cytogenet. Unit, Christchurch Hosp., Christchurch, New Zealand) Chronic granulocytic leukaemic patients in relapse showed a high no. of Philadelphia chr. (Phi) pos. mitoses in both blood and marrow whereas those in remission had a much higher no. in the marrow. Demonstration of the Ph¹ by examination of the marrow was of much value in the acute phase of the disease. Therapy depressed the no. of Phi pos. mitoses. H.B.Waynforth

5976. A PATTERN OF CHANGE IN TUMOUR-CELL POPULATIONS IN VIVO. D.C.Roberts: Brit. J. Cancer, 1963, 17, 142-148 (Imperial Cancer Res. Fndn., Mill Hill, London, England) Ascites sublines of epithelioma 255/Bl in C57 mice and Sarcoma BAS/56AA in C3H mice were used and studies of the nuclear characteristics of cell populations were made for 3 weeks after i.p. transplantation. The pattern of change observed with time was repeated in successive transplants but was not cumulative from one transport generation to the next. D.Hamer

5977. E.M. OBSERVATIONS GTI CYTOPLASMIC COMPLEXES OF TRANSPLANTABLE HEPATOMAS IN MICE. N.L.Trotten: J. nat. Cancer Inst., 1963, 30, 113-133 (Anat. Dept., Columbia Univ. Coll. Phys. and Surg., New York, U.S.A.) A descriptive account J.G.Bennette

5978. E.M. OF SCLEROSING ADENOSIS AND INFILTRATING DUCT CARCINOMA OF HUMAN MAMMARY GLAND. S.R.Wellings and P.Roberts: J. nat. Cancer Inst., 1963, 30, 269-287 (Pathol. Dept., Oregon Univ. Med. Sch., Portland, Ore., U.S.A.) A descriptive account. J.G.Bennette

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5979. MERCUROCHROME FLUORESCENCE IN TUMOUR TISSUE. H.Katsuya, T.Kinoshita, Y.Doi, T.Hashizume and H.Motoyama: *Nature, Lond.*, 1963, 198, 497-498 (Dept. Surg., Kumamoto Univ., Kumamoto, Japan) Mercurochrome (Hisodium-2,7-dibromo-4-hydroxy mercurifluorescein) localises in the area of stroma surrounding transplanted mouse Ehrlich ascites tumours and fluoresced *n.u.v. for 15 days. G.M.Lewis

5980. MECHANISMS INVOLVED IN PRODUCTION OF RED FLUORESCENCE OF HUMAN AND EXPERIMENTAL TUMOURS. F.N.Ghadially, W.J.P.Neish and H.C. Dawkins: *J. Path. Bact.*, 1963, 85, 77-92 (Path. Dept., Univ., Sheffield, England) Protoporphyrin yas inj. i.p. or i.v. into mice or rabbits bearing expt. induced or transplanted tumours and non-neoplastic ulcers. Red fluorescence in u.v. light developed in ordinary ulcers as readily as in tumours. The necrotic centres of transplantable tumours of mice and hamsters showed red fluorescence after injn. of certain bacteria isolated from malignant ulcers of rabbit or man. Such organisms produced red fluorescence in infected muscle of mice or rabbits but not of rat, hamster or monkey and also red fluorescent colonies when grown on blood agar containing 5-aminolaevulinic acid. D.Murray

5981. EFFECTS OF EXTRACTS OF PRIMARY AND METASTATIC PANCREATIC ISLET CELL TUMOURS ON GASTRIC SECRETION. G.A.Hallenbeck, C.F.Code and J.C.Kennedy: *Gastroenterology*, 1963, 44, 631-636 (Sect. of Surg. Res., Mayo Clinic, Rochester, Minn., U.S.A.) Some extracts from primary or secondary human islet cell tumours possessed substances >*ich stim. gastric secretion in dogs and also caused kypoglycaemia. The 2 effects are not thought to be Mediated by the same substance, but it seems that the gastric secretion stimulator may be similar to gastrin. D.N.Wheatley

5982. INFLUENCE OF THE HOST AND THE NEOPLASTIC CELL POPULATION ON THE COLLAGEN CONTENT OF A TUMOUR MASS. P.M.Gullino and F.H.Grantham: *Cancer Res.*, 1963, 23, 648-653 (Sect. Tumour-Host Relations, Lab. Biochem., Nat. Cancer Inst., Bethesda, Md., U.S.A.) In Novikoff hepatoma and Hepatomas 129 and 134 collagen of the tumour mass was formed by the host, as shown by separation of epithelial cells from fibroblasts and evaluation of the collagen content of tumours derived from fibroblast-free cells. In Novikoff hepatoma and an osteogenic sarcoma, grown in various hosts, the host was shown to have little influence on the overall collagen content of a tumour. The collagen content of a tumour was changed when a change in the neoplasmic cell population was produced. B.M.Stevens

5983. LEUKAEMIA AND LYMPHOMA IN PATIENTS WITH AGAMMAGLOBULINAEMIA. A.R.Page, A.E. JW and R.A.Good: *Blood*, 1963, 21, 197-206 (Pediatrics Dept., Minnesota Univ., Minneapolis, Minn., U.S.A.) Reports of children with congenital *Sammaglobulinaemia who later developed malignant lymphoma are presented. The occurrence of disease of ** group among patients with this immunological defect 2?Pears to have a significance, reasons for which are cussed. H.B.Waynfirth

5984. IN VIVO PHAGOCYTOSIS. L.J.™! & F. PHAGOCYTOSIS BY INTACT NEOPLASTIC BODY FLUIDS. S.G>Kimball and J.L.Brody: *Blood*, 1963, 21, 462-469 (Med. Dept., V.A. Hasp., Coral Gables, Fla.)

U.S.A.) By means of a skin window technique it was shown that suspensions of Ag, such as rice starch or Candida albicans, made in sera of patients with leukaemic disorders were not phagocytosed normally. The results suggest that certain factors interfere with normal phagocytic activity in the rabbit and perhaps in the human. H. B. Waynfirth

5985. COMPARISON OF OXYGEN TENSIONS IN NORMAL TISSUES AND YOSHIDA SARCOMA OF THE RAT BREATHING AIR OR OXYGEN AT 4 ATMOSPHERES. D.Jamieson and H.A.S.Van den Brenk: *Brit. J. Cancer*, 1963, 17, 70-78 (Cancer Inst. Board, Melbourne, Australia) Male Wistar Hooded and albino rats were used in these tests in conjunction with the Yoshida sarcoma. pO₂ during pressurisation with O₂ was followed in normal tissues and sarcoma tissue. On pressurisation to 4 atm. a 12-fold rise in tumour pO₂ occurred, compared with 15-50 fold increases in normal tissues. A high partial pressure of CO₂ added to the O₂ did not affect the tumour pO₂ level. D.Hamer

5986. GROWTH AND METASTASIS OF TUMOUR IN ORGAN CULTURE. J.Folkman, D.M.Long, jun. and F.F.Becker: *Cancer, Philad.*, 1963, 16, 453-467 (Naval Med. Res. Inst., Bethesda, Md., U.S.A.)

An apparatus was developed to maintain a canine thyroid gland by isolated perfusion with Hb-serum soln. for periods up to 1 week. Mouse melanomas and mast cell tumours implanted in the gland during perfusion grew rapidly, liberated tumour cells into the circulation and, in 1 case, produced metastases. D.I.Connell

5987. VASCULAR MODIFICATIONS IN THE CHEEK POUCH OF GOLDEN HAMSTER DURING DEVELOPMENT OF GRAFTS OF MELANOMA. J.Delarue, J.Mignot and T.Caulet: *C.R. Soc. Biol., Paris*, 1963, 157, 69-71 (Lab. Anat. pathol., Fac. Méd., Paris, France)

A fragment of malignant melanoma was inserted to the cheek pouch of golden hamsters. After 2 days a vascular network appeared around the graft and after 4-8 days the capillary and venous network increased in size with vascularisation of the tumour. Sections of the tumour region showed an inner avascular necrotic zone, an intermediate tumour region with a marked vascular network and an outer zone containing enlarged blood vessels. After 2-4 months metastases appeared in various tissues of the animal. (French) M.A.Price

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5988. HYPOTHERMIA AND INFECTION. H. ENDOGENOUS PERTONIRIS AND BACTERAEMIA IN HYPO-THERMIC MICE. G. Tune vail and T.Lindner,

m. INFLUENCE OF HYPO-THERMIA ON COURSE OF EXPERIMENTAL PNEUMOCOCCAL INFECTION IN MICE. T.Lindner and G.Tuneyall: *Scand. J. clin. Lab. Invest.*, 1963, 15, 115-124, 125-131 (Bact. Central Lab. Stockholm City, Stockholm, Sweden) IL Deep and prolonged hypothermia of mice (22-23° main-tained for more than 40 hr.) resulted in an invasion of bacteria from the intestine into the peritoneal cavity,

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into the bloodstream or both. No major change of the intestinal flora was effected by the hypothermia. Hypothermia disturbed the elimination of inj. bacteria from the bloodstream. Antibacterial treatment reduced the incidence of peritonitis and bacteraemia, but did not increase the survival time of hypothermic mice.

m. Hypothermia postponed the bacteraemia in mice caused by expt. pneumococcal peritonitis. Once the bacteraemia was established bacterial multiplication was slower in the hypothermic mice than in the normothermic controls. Warming up of the hypothermic mice resulted in a rapidly increasing bacteraemia and death, or in death not preceded by bacteraemia. E. Parkinson

5989. EXPERIMENTAL INTESTINAL STRANGULATION OBSTRUCTION IN GERM FREE RATS. E.Amundsen and B.E.Gustafsson: *J. exp. Med.*, 1963, 117, 823-832 (Germfree Res. Dept., Karolinska Inst., Stockholm, Sweden) The mean survival time of germfree rats with expt. low ileal strangulation obstruction was 240 hr. whereas conventional rats survived for about 44 hr. The strangulation obstruction fluid from the germfree animals was sterile and non-toxic when inj. into mice. The same fluid from conventional animals contained a great no. of micro-organisms and caused death within 24 hr. when inj. i.p. into mice.

H.E.H.Jones

5990. RETROGRADE PROTEUS PYELONEPHRITIS IN RATS. LOCALISATION OF ANTIGEN AND ANTIBODY IN TREATED STERILE PYELONEPHRITIC KIDNEYS. R.S.Cotran: *J. exp. Med.*, 1963, 117, 813-822 (Mallory Inst. Pathol., Boston City Hosp., Boston, Mass., U.S.A.) Rats with retrograde *Proteus* pyelonephritis were treated with antibiotics until their kidneys became sterile. Using fluorescent Ab, sp. *P. mirabilis* Ag was found in some of these kidneys 20 weeks after treatment. Persistent Ag was associated with interstitial chronic inflammation but not with acute inflammation or progressive scarring. Rat yglobulin and *Proteus* Ab were localised in plasma cells of the renal inflammatory infiltrates. It is suggested that persistent Ag in chronic pyelonephritis may lead to the continued local appearance of Ab-producing cells.

H.E.H.Jones

5991. GENERALISED SHWARTZMAN REACTION IN THE PREGNANT GOLDEN HAMSTER. M.Galton: *Science*, 1963, 139, 923-924 (Dept. Pathol., Dartmouth Med. Sch., Hanover, N.H., U.S.A.) A single i.p. injn. of colchicine elicited the generalised Schwartzman phenomenon in the pregnant golden hamster. The condition could not be produced in non-pregnant animals even by bacterial endotoxin in addition to colchicine, such as is effective in rabbits and pregnant rats. It is suggested that colchicine-induced mitotic arrest may damage the intestinal mucosa, permitting endotoxin from the gut flora to enter the body.

G.M.Lewis

5992. ENDOTOXIN TOLERANCE. I. ITS INDUCTION BY EXPERIMENTAL PYELONEPHRITIS. W.R.McCabe: *J. clin. Invest.*, 1963, 42, 610-617 (Dept. Med., Univ. Illinois Coll. Med., Res. and Educ. Hosp., Chicago, Ill., U.S.A.) Using rabbits with induced pyelonephritis tolerance was obtained to the pyrogenic effects of *Salmonella enteritidis* endotoxin over a 4-fold range of dosage: tolerance was reversed by RE blockage with colloidal thorium dioxide or by the eradication of renal infection with antibiotic treatment. The non-endotoxin producing bacteria, *Streptococcus faecalis*, did not produce endotoxin tolerance.

M.J.Bell

5993. ENDOTOXIN HYPERSENSITIVITY AND ITS RELATION TO SHWARTZMAN PHENOMENON.

T.G.Kováts, G.Lázár and P.Végh: *Acta physiol. Acad. Sci. hung.*, 1963, 23, 169-187 (Inst. Pharmacol., Med. Univ., Szeged, Hungary) In guinea-pigs, rabbits and rats there was a natural endotoxin hypersensitivity. The acquisition or inheritance of this could be explained on the basis of ancient symbiosis with endotoxin-producing micro-organisms. The inherited hypersensitivity probably diminished during the first few weeks of life but then const. endotoxin exposure contributed to life-long hypersensitivity (Schwartzman reaction). Defense mechanisms prevented endotoxin from intestinal flora from damaging the organism except when such defense was impaired.

H.G.Bevan

5994. MECHANISM OF ENDOTOXIN INTOXICATION IN RABBITS. T.Fukuda: *Jap. J. Physiol.*, 1963, 13, 155-168 (Dept. Physiol., Chiba Univ. Sch. Med., Chiba, Japan) The depression, dyspnoea (induced by adrenaline discharge) and diarrhoea of endotoxin shod in rabbits were due to central autonomic disturbances and could be sedated by antipyretics. The late stage of intoxication with hepatic glycogen depletion, due to enhanced glycogen utilisation and relative adrenocortical insufficiency, led to hypoglycaemia, hypothermia and arterial hypotension which could not be influenced by antipyretics. A dual mechanism of endotoxin intoxication is postulated: central autonomic disturbances related to the activation of the febrile mechanism and metabolic disturbances leading to carbohydrate depletion.

M.J.Bell

5995. DURATION OF EFFECT OF PVP AND DEXTRAN PREPARATIONS IN HAEMORRHAGIC SHOCK OF CAT. S.Simon and T.Simon: *Acta physiol. Acad. Sci. hung.*, 1963, 23, 189-198 (Pharmacoindustrial Control Lab-i Budapest, Hungary) Cats were bled 25 ml. /kg. or more and PVP or dextran infused in equiv. amounts. The maintenance of blood pressure over 12 hr. was not so good as after reinfusion of blood. Dextran gave a higher survival rate than PVP. High doses of heparin in re-infused blood gave low b.p.

H.G.Bevat

5996. THE ROLE OF COMPLEMENT AND NATURAL ANTIBODIES IN PHAGOCYTOSIS. S.Slopek,

K.Grzybek-Hryncewicz and J.Tfadosz: *Arch. Immunol. Ter. dośw.*, 1962, 10, 559-574 (Inst. Immunol. i Terapii Doświadczalnej, Polska Akad. Nauk, Wrocław Poland) The opsonising prop. of normal guinea-pig serum depended on the presence of natural Ab and C-components C¹, C² and C⁴ were indispensable for opsonisation. Absence of component C³ did not lower this activity.

H.Osowiec-W

5997. INFLUENCE OF THE THYROID ON THE EARLY STAGES OF EXPERIMENTAL INFLAMMATION.

L.Thiebolt, J.Berthelay and S.Blaise: *C.R. Soc. Biol.*, Paris, 1962, 156, 2060-2063 (Ljab. Physiol. Fac Méd., Clermont-Ferrand, France) Injn. of thyroxine to rats or thyroidectomy had inconsistent effects on the oedema produced by implantation of a sponge pellet beneath the skin of the back. Thyroidectomy decreased the no. of w.b.c. migrating to the sponge. 10-100 µg thyroxine/day to rats for 10 days before implantation increased the no. of w.b.c. in die sponge.

(French)

M.A.Price

5998. EXPERIMENTAL INVESTIGATION OF THE UPTAKE OF PROTEIN, VIRUSES AND BACTERIA DURING EMBRYOGENESIS OF THE RABBIT. W.Zimmermannfl

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G.H.M.Gottschewski, H.Flamm and C.Kuna Develop. Biol., 1963, 6, 233-249 (Dept. Develop. Physiol., Max-Planck-Inst. animal Breeding, Mariensee/Trenhirst, Germany) Transfer of albumin and Ab from maternal blood into the yolk sac commenced at 1 days 12 hr. post coitum. Viruses given to the mother i.v., or into the uterine lumen entered the yolk sac at 6 days 16 hr. post coitum, as did bacteria introduced into the uterus. It is suggested that discontinuities develop in the non-Cellular mucoprotein coats surrounding the conceptus, and that injurious substances may reach the embryo at the time of implantation. The possibility that early uptake of protein may lead to immunol. tolerance is discussed. (German) J.W.S.Harris

5999. RENAL-CARDIOVASCULAR CHANGES BY SALT-LOADING IN ADRENALECTOMISED RATS.

G.F.Wilgram; S'Young and D.J.Ingle: Arch. Path., Chicago, 1963, 75, 271-275 (Dept. Physiol., Univ. Chicago, Chicago, I.I., U.S.A.) Adrenalectomised-uninephrectomised rats were fed dietary supplements of 4 and 12% salt for 6 months and 4% salt for 1 yr. Hypertension, increased cardiac wt. and lesions of nephrosclerosis in the kidney were found in d¹ rats after 6 months on 12% NaCl diet and in d²rats after 1 yr. on 4% N j g * * ^ R ftct

6000. MORPHOLOGICAL CHANGES IN HYPERCHOLESTEROLEMIC RABBITS GIVEN SATURATED FAT WITHOUT SUPPLEMENTARY CHOLESTEROL.

N.G.Stormby and G.Wigand: J. Atheroscler. Res., 1963, 3, 103-120 (Dept. Path., Univ. Lund, Sweden) The aorta and coronary arteries of rabbits treated with a diet containing either hydrogenated coconut oil or glyceryl trilaurate but no added cholesterol developed atheromatous changes which resembled those seen in rabbits fed cholesterol. G.F.Blane

6001. EFFECT OF ECK FISTULA ON THE DOG LIVER.

S.Castro, F.K.Voutz and A.G.Foraken Arch. Path., Chicago, 1963, 75, 350-359 (Baptist Mem. Hosp., 800 Miami Road, Jacksonville, Fla., U.S.A.) Eck Fistula operations were performed in 6 young adult greyhounds. After 6 weeks, comparison of normal and Post-fistula material showed areas of hepatic: cell degeneration in the latter, with deposition of Fe'. Pigment in Kupffer cells. Amylophosphorylase. *uccuu dehydrogenase and DPN diaphorase showed the same distribution in pre- and post-fistula livers. ^Mitchell

6002. CORN AND COCONUT OIL EFFECTS IN

DIETARY CIRRHOSIS OF RATS. AJ.Patek, N.M.de Fritsch, F.E.Kendall and R.L.Hirsch: Arch. Path., Chicago, 1963, 75, 264-270 (Columbia Univ. Res. Service, Goldwater Mem. Hosp., Welfare Island, N.Y., U.S.A.) Male Sprague-Dawley rats 100-115 gm. wt. were fed low protein, cirrhosis Producing diet for 6 months. One group received 10% corn oil and another 10% coconut oil. Cirrhosis developed in 75% of rats fed corn oil and only 25% of those fed coconut oil. Both groups accumulated liver lipid » J ^ . W. ^ S S ; , - It is suggested that some factor other than lipid accumulation is responsible for the development of expt. dietary cirrhosis. R.Mitchell

6003. SOME LONG-TERM EFFECTS FOLLOWING INFUSION OF INTRAVENOUS FAT EMULSIONS INTO DOGS. S.W.Thompson, II, Q.L.Hartwig, M.Atik, M.A.Fox and t. Cohn, jun.: Toxicol. appl. Pharm., 1963/f. 30B-318TPamöl. Div., U.S. Army Med. Res..

Fitzsimons Gen. Hosp., Denver, Colo., U.S.A.) Dogs infused i.v. with cottonseed oil emulsions over longer periods showed a fall in the Hb concn. during the infusion and a deposition of fat pigment in the liver. The latter gave rise to a foreign body type of host response, with formation of focal intralobular granulomas and interlobular and portal scarring. The infusion had no immediate effect on liver function tests. E.E.Hobbiger

6004. TEMPORARY HEPATIC ISCHAEMIA IN THE

RABBIT. R.Carroll: J. Path. Bact., 1963, 85, 67-75 (Path. Dept., Univ., Liverpool, England) In rabbits anaesthetised with ether, the right ant. and left lobes of liver were rendered ischaemic for periods varying from 5 min. to 3 hr. Following re-establishment of blood flow, the livers were examined at varying intervals. At 3 days, infarcts were found at random throughout the lobes, varying in size according to duration of ischaemia. After 1/2 hr. ischaemia, the earliest evidence of infarction was seen at 6 hr. By 12 hr. a central dead area and polymorph zone had developed and a peripheral dead zone was differentiated from a zone of partial survival by 24 hr. D.Murray

6005. PRODUCTION AND COMPOSITION OF WHITE

BILE IN RAT. M.H.Haber and K.R-Rees: J. Path. Bact., 1962, 85, 127-137 (Dept. Morbid Anat., Univ. Coll. Hosp. Med. Sch., London, England)

The common bile ducts of albino rats anaesthetised with ether were doubly ligated and divided between the ligatures, the animals being killed at intervals of 6 hr.-36 days. The contents of the distended bile duct were collected and analysed chem. After 17-21 days, 'white bile*' was produced. This was a clear, colourless fluid of low sp. gr. In contrast with normal bile, it contained* little or no bilirubin, normal alk. phosphatase, less protein and DNA, normal Na and K but low Ca and no sialic acid. Na31I passed readily from the distended bile duct into the peripheral blood. D.Murray

6006. ALTERATIONS IN FINE STRUCTURE OF HEPATOCYTES PRODUCED BY (3-3-TIENYLALANINE).

Z.Hruban, H. Swift and R.W.Wisslen: J. ultrastructure, Res., 1963, 8, 236-250 (Path. Dept., Chicago Univ., Chicago, I.I., U.S.A.) In the hepatocytes of rats fed on p-3-thienyl-DL-alanine there was an increase of nucleolar size, disorganisation of the endoplasmic reticulum, decrease in glycogen, and alteration of the Golgi and mitochondria apparatus. H.B.Waynfirth

6007. WATER-INDUCED CEREBRAL OVER-HYDRATION

IN THE MATURING RAT BRAIN. M.J.Seller and R.G. Specton: Nature, Lond., 1963, 198, 489-490 (Paediatric Res. Unit, Guy's Hosp. Med. Sch., London, England) Oedema of the forebrain in rats induced by i.v. injn. of water could not be produced in animals less than 11 days old, even when the dose was sufficient to cause pitting oedema, ascites and pleural effusions. It is suggested that this phenomenon may be related to the absence of an effective 'sodium pump' in the brain at this stage. G.M.Lewis

6008. FORMATION AND STRUCTURE OF THE COLLAGEN FIBRIL. R.C.Curran and A.E.Clark: Nature, Lond., 1963, 198, 798-799 (Dept. Pathol., St. Thomas's Hosp. Med. Sch., London, England)

Observations of collagen formation in avascular granulomas produced on the surface of peritoneal implants of egg white and agar showed that the fibrils developed as tubular structures. G.M.Lewis

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See also Biochemistry

GENERAL

(INCLUDING STRUCTURE AND VARIATION)

- 6009. INTERPRETATION OF DISTRIBUTIONS OF INDIVIDUAL RESPONSE TIMES IN MICROBIAL INFECTIONS.** G.G.Meynelb Nature, Lond., 1963, 198, 970-973 (Guinness-Lister Res. Unit, Lister Inst. Prev. Med., London, England). G.M.Lewis
- 6010. HIGH RESOLUTION E.M. ON SURFACE STRUCTURE OF *E. COLI*** M.Ogura: J. ultrastructure Res., 1963, 8, 251-263 (Bioquimica Dept., Esuela BioL, Fac. Ciencias, Univ. Central de Venezuela, Caracas, Venezuela) The cell wall of *E. coli* is composed of 2 layers, the outer one of which is denser and contains interwoven filaments. The bacterial capsule also contains these filaments and also materials of a homogeneous nature. The formation of filaments on the surface at cell division occurs later than the formation of the inner dense layer of the cell wall at the new surface. The plasma membrane has a 3 layered structure. H.B. Waynforth
- 6011. CHARACTERISATION OF [^{51}Cr]LABELLED ENDOTOXIN AND ITS IDENTIFICATION IN PLASMA AND URINE AFTER PARENTERAL ADMINISTRATION.** L.Chedid, R.CSkarnes and M. Pa rant: J. exp. Med., 1963, 117, 561-571 (Centre Nat. de la Rech. Sci., Paris, France) Endotoxin was labelled by incubating with $\text{Na}^{51}\text{CrO}_4$. By agar diffusion and autoradiography the ^{51}Cr was attached only to the heavy fractions. These fractions contained more than 99% of the total toxicity of the endotoxin. ^{51}Cr -endotoxin could be found in the plasma taken up to 6 hr. after i.v. injn. of LD₅₀ or sub-lethal doses, and was not totally detoxified as these plasma samples were toxic to adrenalectomised mice. The endotoxin was identified in urine specimens, but it was no longer toxic or radioactive. H.E.H.Jones
- 6012. CHANGES IN SEROLOGICAL REACTIVITY OF ENDOTOXIN INDUCED BY FRACTION IV. (COHN) OF NORMAL HUMAN SERUM.** J.A.Rudbach and A.G. Johnson: Proc. Soc. exp. Biol., N.Y., 1962, 111, 651-655 (Dept. Bact., Univ. Michigan Med. Sch., Ann Arbor, Mich., U.S.A.) A substantial loss in the ability of endotoxin to be ppt. by homologous Ab occurred after incubation with Fraction IV-1 of normal human serum. Immunodiffusion studies revealed that this was associated with dispersion of a major Ag, with formation of a more rapidly migrating component which formed a line of identity with the O-polysaccharide hapten. M.M.Shapland
- 6013. EFFECT OF LARGE DOSES OF BACTERIAL PYROGEN IN THE DOG. II. AN EXPLANATION FOR THE URINE DILUTION.** J.L.Brandt, L.J.Voudoukis and J.Harrop: Canad. J. Biochem., 1963, 41, 1317-1324 (Renal Lab., Dept. Med., Jewish Gen. Hosp., Montreal, Que., Canada) Renal cortical tissue Na concn. was unaffected by endotoxin whereas renal Na concn. of outer and inner medullary portions showed a striking fall. It was postulated that the rise in total renal blood flow, following endotoxin, was mainly medullary and caused a washout of medullary interstitium multiplier deposited Na. The efficiency of the renal countercurrent exchanger was impaired and tubule to interstitium gradient reduced. A.M.Gibbins

- 6014. GROWTH ANOMALY AND LYSIS WITH PRODUCTION OF VIRUS-LIKE PARTICLES IN AN AXENICALU REARED MICROANNELID.** E.C.Dougherty, D.J.Ferral, B.Brody and M.L.Gottbold: Nature, Lond., 1963, 198, 973-975 (Dept. Nutr. Sci., Univ. California, Berkeley Calif., U.S.A.) In axenic cultures of *Enchytraeus*

fragmentosus abnormal outgrowths are induced by a sufficiently large amount of aq. phase in addition to the agar medium, so that a worm becomes trapped therein; this growth anomaly is largely reversible. Cultures of 3 months or more may suddenly lyse releasing virus-like entities somewhat resembling non-inclusion viruses of insects. They are non-infectious. G.M.Lewis

- 6015. EFFECTS OF POSTINCUBATION ON INDUCED MUTATION FREQUENCY. II. THE ROLE OF NUCLEIC ACID AND PROTEIN SYNTHESIS IN SURVIVAL AND MUTATION FREQUENCY.** M.Tabaczynski: Acta micEobiol. pol., 1962, 11, 301-312 (ZaHilad Mikrobiol., Uniwersytet Warszawski, Warszawa, Poland) The mutation freq. of u.v. irradiated double auxotrophic strains of *E. coli* depended upon the degree of protein and nucleic acid synthesis, which were regulated by adding Δ withdrawing adenine or tryptophan. These changes were connected with different survival times of the mutant and parenteral forms on the post-incubation media. M.Korbeck

- 6016. ORIGIN OF BACTERIAL VIRUSES.** Vn: EFFECT OF VARIOUS MUTAGENS (URETHANE, ETHYL URETHANE, HYDROGEN PEROXIDE, DEOXYCHOLATE, MALEIC HYDRAZIDE, BUTADIENE DIOXIDE, TRIETHYLENE MELAMINE, VERSENE AND ACRIFLAVINE) ON PROPORTION OF VIRUS-PRODUCING AND STREPTOMYCIN-RESISTANT CELLS IN CULTURES OF *BACILLUS MEGATERIUM* 20A J.H.Northrop: J. gen. Physiol., 1963, 46, 971-981 (Lab. Rockefeller Inst., Dorner Lab. Biophys. Med. Rhys., Berkeley, Calif., U.S.A.) All the mutagens tested, except acriflavine increased the proportion of virus-producing cells and streptomycin-resistant cells in *B. megaterium* 20A cultur^g to about the same extent. Acriflavine had no effect on the proportion of either type of the cell and triethylene melamine appeared to cause mutations to occur without cell division. K.Jones

- 6017. SIMULTANEOUS ACQUISITION OF OI AND O37 FACTOR BY GROUP G SALMONELLA AS A RESULT OF LYSOGENESIS (ANTIGENIC CONVERSION).** L.Le Min^o, H.W.Ackermann and P.Nicolle: Ann. Inst. Pasteur, 1963, 104, 469-476 (Inst. Pasteur, Paris, France) A phage from *S. poona* which possesses factor O37 was able to induce the appearance of this factor in Salmonella group G which lack it. Factor O37 was apparently always accompanied by OI factor in wild and converted strains. Phage PLT22 capable of inducing OI factor to Salmonella groups A, B and D which lack it has no action on Salmonella OI - belonging to group G. Immuno-fluorescence showed that factor 37 appeared on bacteria 8 to 9 min. after addition of phage to a culture in exponential phase. (French) B. Payne

- 6018. MKED COLONY AUXOTROPHS AND WILD TYPE CELLS FORMED BY THE ACTION OF NITROUS ACID ON *E. COLI*.** F.Kaudewitz and K.Moebus: Z. Naturforsch. B, 1963, 18, 244-253 (Max-Planck-Inst. vergleichende Erbbiol. und Erbpathol., Berlin-Dahleif^r Germany) Cells of *E. coli* incubated with 0[#]2M sodium nitrite gave rise to 3 types of colonies: (a) unchanged wild types, (b) mixed colonies of wild types and

auxotrophic cells, (c) colonies of auxotrophic cells only. The results were correlated with deamination of cytosine and adenine in the genetically determinant DNA chains.
 (German) J.C.Crawhall

BACTERIA

6019. SERO-DIAGNOSIS OF GONORRHOEAL INFECTION IN FEMALE. B.R.Murti, Rajyalakshmi and B.P.Deyi:

Indian J. Microbiol., 1962, 2, 107-110 (Dept. Microbiol., Med. CoU., Guntur, India) A study of cervical exudates by culture for gonococci and the serum for c'-fixing Ab in 44 women with tubo-ovarian masses, showed that the gonococcal CF test was useful for diagnosis in chronic cases of gonorrhoea but not in acute cases.

G.M.Lewis

6°20. IDENTIFICATION OF STAPHYLOCOCCUS AUREUS ANTIGENS AND ANTIBODIES BY MEANS OF THE GEL PRECIPITATION TECHNIQUE. P.Oeding and

G.Haukenes: Acta path. microbiol. scand., 57, 438-450 (Dept. Microbiol., Univ. Bergen, Norway) Three of the 'specific' agglutinogens previously identified by the slide aggl. typing system (agglutinogens h, f and n) have been identified by means of the agar pptn. Method. Two group Ag of *S. aureus*, polysaccharide A and Ag A (Jensen) also produced characteristic agar lines.

L.Friedmann

6°21. CORRELATION BETWEEN THE ESSENTIAL AMINO ACID REQUIREMENTS OF STAPHYLOCOCCUS AUREUS, THEIR PHAGE TYPES AND ANTIBIOTIC PATTERNS. C.B.Coutinho and L.G.Nutini: Nature, Lond., 1963, 198, 812-813 (Div. Biol., Inst. Dify

^{nf} Thomae, Cincinnati, Ohio, U.S.A.) Examination of 40 individual staphylococcal strains of predetermined * a.g. types indicated that expt. induction of resistance * antibiotics is reflected in sp. and similar changes in their amino acid requirements as well as their phage types.

G.M.Lewis

6°22. PHAGE TYPING OF SELECTED STAPHYLOCOCCAL STRAINS. K.Matz and P.Schulze: Z. Hyg. InfektKr..

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AL INFEC- 'ERISTICS

OF STAPHYLOCOCCAL a-HAEMOLYSIN. VI. MECH-
ANISM OF IMMUNITY CONFERRED BY ANTI-a-
HAEMOLYSIN. K.Goshi, I.-E.Clirfand P.& Newman:
Bull. Johns Hopkins Hosp., 1963, 112, 15-30, 31-47
 (Med. Dept., Johns Hopkins Univ. Med. Sch., Balti-
 more, Md., U.S.A.) V. Immunol. and electro-
 photometrically pure γ -haemolysin of *Staphylococcus aureus*
 was prep. by pptn. ana croraiuBajj» v * ; ?X
 Haemolytic activity was lost after treatment with
 glycosidase sand a protease. The haemolysin produced
 w. u. c. u. o. n. rabbit and sheep r.b.c human and rabbit
 A. r. b. -c and dermonecrosis in rabbit and guinea-pig skin.
 n. haemolysin inhib. these effects. n. was
 ass. Vt. Staphylococcal Y - ^ O T o l ^ i n , m m ^ ^ m ^ , m
 associated with a rapid infiltration of w.b.c. and macro-
 phages and phagocytosis of staphylococci at sites of
 localisation of bacteria in the skin and kidney. Growth
 of the bacterium was also prevented.

H.B.Waynforth

6024. PATHOGENICITY OF STAPHYLOCOCCI. INTER- ACTION OF ANTI-a-HAEMOLYSIN AND STAPHYLO- COCCUS AUREUS IN MICE. A.M.Fisher and K.Goshi: *Bull. Johns Hopkins Hosp.*, 1963, 112, 143-150 (Med. Dept., Johns Hopkins Univ. Med. Sch., Baltimore, Md., U.S.A.) a-Haemolysin was obtained from

peritoneal exudates of mice after their death produced by i.p. injn. of staphylococci. Large doses of rabbit antisera were given to the mice concurrent with the bacteria and a mild protective effect was observed.

H.B.Waynforth

6025. EFFECT OF CARBOHYDRATES ON PRODUCTION OF STAPHYLOCOCCAL PIGMENT. A.E.Brown and

H.R.Harris: J. clin. Path., 1963, 16, 261-262 (Gen. Hosp. Path. Dept., West Hartlepool, Co. Durham, England)

The fermentation of 5 carbohydrates by 50 strains of *Staphylococcus aureus* was studied. Those strains which ferment eTa carbohydrate showed enhanced pigment production when growing in its presence. For some strains this effect was clearest at low concn. of the carbohydrate.

J.B.Derbyshire

6026. HEMATOLOGICAL CHANGES IN STAPHYLO- COCCAL INFECTIONS IN GUINEA-PIGS.

W.#awkowicz and M.Ochocka: Polski. Arch. Med. Wewn., 1962, 32, 1109-1116 (Inst. Hemat., Warszawa, Poland) I.p. or s.c. injn. of *Staphylococcus aureus* in guinea-pigs produced hypertrophy of lymphatic nodules, extravasation and inflammatory changes in spleen, lymphatic glands, liver, lungs and kidney. The no. of r.b.c. was decreased to 1-2 x 10⁶/mm.3; in a few cases polychromatic and orthochromatic erythroblasts were observed accompanied with a transitory leucocytosis or leucopenia and an increase in the no. of characteristic lymphocytes (lymphoplasmocytes).

(Polish) E.Qlewicka

6027. MICROBIAL ANTAGONISM BY STAPHYLOCOCCUS AUREUS. G.LBarrow: J. gen. Microbiol., 1963, 31, 471-481 (Public Hlth. Lab., Bradford, England)

Seven strains antagonistic to indicator corynebacteria on solid media were found among 100 *S. aureus* strains of human origin. Sharply defined inhibn. zones were obtained. The inhibitory strains belonged to bacteriophage type 71 and were isolated from superficial infections. The specificity of inhibitory activity against other spp. and strains is described. *S. aureus* strains producing hazy inhibn. zones in the original test "showed similar but less extensive antibacterial activity. Oleic acid prevented inhibn. by both kinds of staphylococci. The prop. of the antagonistic agents are described.

K.Brew

6028. INVESTIGATIONS ON ISOANTAGONISMS

AMONG STAPHYLOCOCCI. E. BACTERIOLOGICAL CHARACTERISTICS OF THE ANTAGONISTIC STRAINS AND THEIR SENSITIVITY TO STAPHYLOCOCCIN A.

T.Lachowicz and T.Romanowski. IE. PROPERTIES AND MECHANISM OF ACTION OF CRUDE PREPARATIONS OF STAPHYLOCOCCIN A. T.Lachowicz.

IV. BACTERIOLOGICAL CHARACTERISTICS AND SENSITIVITY TO STAPHYLOCOCCIN A OF STAPHYLOCOCCI ISOLATED FROM PATHOLOGICAL CONDITIONS OF THE SKIN. T.Lachowicz, T.Romanowski and S.Walczyński. V. SENSITIVITY TO STAPHYLOCOCCIN A OF STAPHYLOCOCCI ISOLATED FROM CARRIERS. T.Lachowicz and T.Romanowskfc Med. dośw., Mikrobiol., 1962, 14, 281-287, 290-296, 297-304, 305-309 (Wojskowe Lab. Sanitarno-

Higieniczne, Kraków, Poland) n. 137 strains showed isoantagonistic prop. No correlation was found between

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their antagonistic and pathogenic prop. 59% of strains were sensitive to 8 antibiotics, 40% were resistant to penicillin and 80% were susceptible to staphylococcin A in concn. of 5-400 U/ml.

m. Staphylococcin A remained fully active for a long time on storage at -20° and for 6 months when kept at +4°. Changes in pH from 1[#]0 to 10, pepsin and trypsin did not affect activity. It was active against Gram-pos. bacteria in concn. of 1-400 U/ml., while Gram-neg. bacteria, *Candida* spp. and BCG were not inhib. in concn. up to 800 U/ml. Studies with the E.M. seem to contradict the bacteriophage nature of staphylococcin A.

IV. 83% of strains isolated from subjects suffering from skin diseases were sensitive to staphylococcin A in concn. of 40 U/ml. while the remaining strains were sensitive to concn. up to 400 U/ml.

V. 89% of 1288 strains isolated from healthy carriers were sensitive to staphylococcin A. The coagulase-pos. strains were inhib. by concn. of 200 U/ml., and coagulase-neg. strains by concn. of 400 U/ml. The most resistant strains were those of phage types 7, 71, 29/71, NT/-, 44A/42B. (Polish) H.Osowiecki

6029. TWO DIPHTHERIA-LIKE STRAINS ISOLATED IN POLAND. A.Kraszewska: Med. dośw. Mikrobiol., 1962, 14, 311-313 (Zatfad Bakteriologii. Państwowy ZaHfed Hig., Warszawa, Poland). (Polish) M.Korbecki

6030. PROPERTIES OF TOXINS OBTAINED FROM DIPHTHERIA-LIKE STRAINS INVESTIGATED IN VITRO AND IN VIVO. A.Kraszewska: Med. dośw., Mikrobiol., 1962, 14, 315-322 (Państwowy Zatfad Higieny, Warszawa, Poland) The diphtheria-like strains produce toxin in vivo and in vitro. This toxin ppt. with diphtheria antitoxin, the process being inhib. by normal horse serum. In addition to changes typical for diphtheria toxin, the toxin produces some necrotic changes of skin, which could not be prevented by the anti-diphtheria serum. (Polish) H.Osowiecki

6031. PROTEIN FRACTIONS OF PURIFIED AND CONCENTRATED DIPHTHERIA TOXOID. J.Iskierko: Med. dośw. Mikrobiol., 1962, 14, 323-329 (Zatfad Chemii Ogólnej. Wydziały Lekarski, Lublin, Poland) Three protein fractions and a glycopeptide fraction were isolated from the purified cone, diphtheria toxoid. Fractions I and II consisted of sp. toxoid protein while bacterial wall and bacterial cell fragments constituted fractions III and IV respectively. (Polish) H.Osowiecki

6032. PHYSICO-CHEMICAL CHANGES OF THE ADSORBENT USED IN DIPHTHERIA TOXOID-VACCINE APPEARING ON PROLONGED STORAGE. W.Wojciak and E.Wolska: Med. dośw. Mikrobiol., 1962, 14, 331-337 (Katedra Chemii Fizycznej Uniwersytetu Adama Mickiewicza, Poznań, Poland) Structural changes due to storage were revealed on roentgenograms of aluminium hydroxide used as an adsorbent for diphtheria toxoid vaccine. (Polish) H.Osowiecki

6033. COAGULATION COMPONENTS IN EXPERIMENTAL AND CLINICAL TUBERCULOSIS. V.V.Chiplunkar and M.Sirs: Indian J. Physiol. Pharmacol., 1963, 7, 44-54 (Pharmacol. Lab., Ind. Inst. ScL. Bangalore, India) Accelerated clotting process with diminished whole blood coagulation and calcium clotting times, a statistically significant increase in the fibrinogen content

and decrease of prothrombin concn. were observed in acute guinea-pig tuberculosis. In ? patients with chronic tuberculosis the biochem. derangement was similar but with the addition of increased whole blood and calcium clotting times. The possibility of using the fibrinogen level of the blood as an index of the extent of the spread of tubercular lesions is discussed.

G.F.Blane

6034. LYtic ACTIVITY ON YEAST CELL WALLS AS A USEFUL CHARACTER FOR THE SEPARATION OF STREPTOMYCES AND NOCARDIA. J.R.Villanueva, S.Gascón and LG.Acha: Nature, Lond., 1963, 198, 911-912 (Inst. 'Jaime Ferran' de MicrobioL, Velazquez 138, Madrid, Spain). G.M.Lewis

6035. 'FLICKERING' IN PROTOPLASTS OF BACILLUS MEGATERIUM. D.M.Millec: Science, 1963, 139, 1060-1061 (Res. Inst., Canada Dept. Agric, London, Ont., Canada). G.M.Lewis

6036. SPORE ANTIGENS OF CLOSTRIDIUM SPOROGEN# C. BIFERMENTANS AND C. SORDELLE. P.D.Walker: J. Path. Bact., 1963, 85, 41-49 (Wellcome Res. Lab., Beckenham, Kent, England) The prep. of spore Ag# of vegetative cell Ag and of corresponding antisera is described. In no case does the spore anti-sera give observable reactions with the vegetative ^H and ^O Ag* Spores of all strains studied of C. sporogenes posses common agglutinogens and precipitinogens. Strains of C. bifermentans and C. sordellii can be differentiated on the basis of spore agglutinogens but not on basis of precipitinogens. No cross reactions occur between spores of strains of C. sporogenes and those of strains of the C. bifermentans-C. sordellii group or with spores of other spp. of the genus Clostridium. D.Murray

6037. HAEMOLYSINS OF E. COLI H.W.Smith: J. Path. Bact., 1963, 85, 197-211 (Animal Health Trust, Stock, Essex, England) Haemolytic E. coli are isolated from faeces of cattle, pigs, sheep and man. Two different haemolysins, a and p are identified. The former is filterable and antigenic. It is best prep. from young cultures from a special alk. broth extract. Neutralising Ab can be induced by i.v. injn. or can be found naturally according to incidence of a-haemolytic JLCOILⁱⁿ faeces. a-Haemolysin is toxic for mice, rabbits and guinea-pigs on i.v. injn., producing intra-vascular haemolysis. g-Haemolysin cannot be obtained cell-free and is not antigenic. D.Murray

6038. COMPARISON OF COLICINE PRODUCTION AND DIFFUSION ON DIFFERENT SOLID MEDIA. J.McGeachie and W.McCormick: J. clin. Path., 1963, 16, 278-280 (Royal Infirmary Bacteriol. Dept.# Glasgow, Scotland) Colicine was extracted by freezing and thawing from various solid media on which E. coli was cultivated for at least 6 hr., and demonstrated on diffusion plates inoc. with Shigella sonnei. Digest nutrient agar gave the highest yield of colicine, the production of which was inhib. by certain peptones. The diffusion of colicine was reduced by incorporation of dextrose in the agar. J.B.Derbyshire

6039. COLICINOGENIC ACTIVITY AND COLICINE SENSITIVITY OF STRAINS OF E. COLI SEROTYPES ISOLATED FROM GASTROENTERITIS AND DIARRHOEA CASES. O.Prakash: Indian J. Microbiol., 1962, 2, 127-134 (Dept. Microbiol., All India Inst. Med. Sci-P New Delhi, India). G.M.Lewis

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6040. NEW ANTIGENIC TYPES OF KLEBSIELLA BACILLI. J.Maresz-Babczyszyn: Arch. Immunol. Ter. dosw., 1962, 10, 589-617 (Inst. Immunol. i Terapii doswiadczałnej, Polska Akad. Nauk, Wrocław, Poland) Four new capsular Ag of Klebsiella were isolated and were designated as K:73, K:74, K:75, K:76. A new subgroup of the somatic Ag 0:10 was also separated. H.Osowiecki

6041 AMINO ACID DECARBOXYLASES AND THE INFLUENCE OF POTASSIUM CYANIDE ON THE GROWTH OF KLEBSIELLA BACILLI. LDurlakowa, J.Maresz-Babczyszyn and A.Przondo-Hesek: Arch. Immunol., Ter. dosV, 1962, 10, 619-632 (Inst. Immunol. i Terapii Doswiadczałnej, Polska Akad. Nauk, Wrocław, Poland) Most Klebsiella strains show lysine decarboxylase activity. In addition strains of ?yPe K:73, and K:75 decarboxylate arginine and ornithine. strains that give neg.*capsule swelling reaction with standard anti-K sera show decarboxylase activity only towards lysine or to all 3 amino acids. H.Osowiecki

6042. INFLUENCE OF THE AMOUNT OF LIVE TYPHOID BACILLI ON THE RESULTS OF BACTERIOLOGICAL TESTS. Z.Kurdziel: Med. dosw. Mikrobiol., 1962, 14, 389-395 (Zahfad Mikrobiol., Slgskiej Akad. Med., Zabrze-Rokitnica, Poland). (Polish) M.Korbecki

6043. DISTURBANCES IN ANTIGEN Vi PRODUCTION AS A RESULT OF HP MUTATION IN SALMONELLA TYPHIL. K.Taylor and Z.Buczowskk Biul. Inst. Med. ttorsk., 1962, 13, 223-225 (Inst. Med. Morskiej, Gdańsk, Poland) HP S. typhi mutants resistant to Vi Phage are devoid of Ag Vi, whereas susceptible strains possess this Ag. This indicates that the genetic unit responsible for the disturbance in HP mutants is a gene Wtfch determines synthesis of Vi Ag. (Polish) M.Korbecki

6044. CATALASE AND SALMONELLA TYPHIMURIUM VIRULENCE. U Mayre and W.Zimmerman: Z. Hyg. InfektKr., 1962, 149, 44-56 (Inst. Hyg., Univ. Saarland, Homburg/Saar, Germany) Virulence and catalase activity were low in strains with high respiration efficient, and vice versa. (German) A.J.Wansbrough

6045. BACTERIOLOGICAL AND EPIDEMIOLOGICAL STUDIES IN EXTENSIVE FOOD CONTAMINATION BY SALMONELLA BAREILLY. LNudemusz, P. Krajcsovic and S Szuchovsky: Z. Hyg. InfektKr., 1962, 149, 57-70 (inst. Food Sci., Budapest, Hungary) Symptoms and illness in immediate and latent cases of infection were studied. The outbreak, due to a bakery contamination did not lead to an epidemic, and is discussed in relation to studies on the less virulent Salmonella types. (German) A.J.Wansbrough

6046. MILK-BORNE OUTBREAK OF FOOD POISONING DUE TO SALMONELLA HEIDELBERG. W.A.Knox. T.S.Galbraith, M.J.LewV ^• H J ? !? f i d _ f H ; r M r Johnston: J. Hyg., Lond., 1963, 61, 175-185 (Cent. Public Health Lab., London, England) In a milk-borne outbreak of S. heidelberg infection there were 77 cases of clinical disease and 144 symptomless excretors of E. coli. The source of infection was a cow with a clinical salmonella mastitis, and the origin of the J g f a n was thought to be cat Min ^ ^ ^ tg ^ y

6047. SALMONELLA AND SHIGELLA IN A O O O P OF PERIURBAN SOUTH AFRICAN BANTU SCHOOL CHILDREN. N.J.Richardson and V.Bokkenheuser.

J. Hyg., Lond., 1963, 61, 257-263 (S. African Inst. Med. Res., Johannesburg, S. Africa) Faeces examinations were made on 75 Bantu children on 8 occasions during 1 yr. Salmonella infections occurred in 22 children, and 2 had a Shigella infection. The infections were usually asymptomatic. 18 Salmonella and 2 Shigella serotypes were isolated in the survey. S. typhi, S. paratyphi B and S. paratyphi C were absent. The organisms were highly resistant to penicillin, erythromycin and novobiocin, and some strains were resistant to chloramphenicol and tetracycline. J.B.Derbyshire

6048. VIRULENCE STUDIES OF PASTEURELLA PESTIS ISOLATES FROM THE GREAT SALT LAKE DESERT. B.D.Thorpe, N.J.Marchette and J.B.Bushman: Amer. J. trop. Med. Hyg., 1963, 12, 219-222 (Ecol. and Epizool. Res. Lab., Univ. Utah, Salt Lake City, Utah, U.S.A.) P. pestis has been isolated from 2 Ord Kangaroo rats. Virulence studies on this strain and on another strain isolated from deer mice showed the latter strain to be slightly more virulent. A.A.Zimmerman

6049. CULTURAL CONDITIONS AFFECTING GROWTH OF PASTEURELLA SEPTICA. C.L.Sehgal and R.Mukherjee: Indian J. Microbiol., 1962, 2, 117-120 (Pathol. and Bacteriol. Divn., Indian Vet. Res. Inst., Mukteswar-Kumaun, India). G.M.Lewis

6050. ISOLATION OF PASTEURELLA TULARENSIS ON MEDIA, FROM MATERIALS ORIGINATING FROM PATIENTS AFFECTED WITH TULARAEMIA. E.Skrodzki: Biul. Inst. Med. morsk., 1962, 13, 201-203 (Inst. Med. Morskiej, Gdańsk, Poland) P. tularensis has been isolated from the lymphatic gland of a man affected with tularaemia. The strain was medium virulent and lost its virulence completely on storage in the laboratory. M.Korbecki

6051. TULARAEMIA IN SZCZECIN PROVINCE. FURTHER INVESTIGATIONS. E.Skrodzki, Cz.Dominowska, J.Golba and H.W^uszkiewicz: Biul. Inst. Med. morsk., 1962, 13, 205-218 (Inst. Med. Morskiej, Gdańsk, Poland) 109 cases of tularaemia were recorded during 1952-1960: hares proved to be the main source of infection. 18 strains of Pasteurella tularensis were isolated from hares, Microtus arvalis and ticks. (Polish) M.Korbecki

6052. NASO-PHARYNGEAL CARRIAGE OF HAEMOPHILUS INFLUENZAE TYPE B. D.C.Turk: J. Hyg., Lond., 1963, 61, 247-256 (King's Coll Med. Sch., Newcastle-upon-Tyne, England) The incidence of H. influenzae type B was less than 3% in naso-pharyngeal swabs from white or coloured children in Jamaica. The incidence was much higher in households in which cases of haemophilus meningitis had recently occurred, and also in children in a day nursery and in an orphanage nursery, although no case of meningitis occurred here. J.B.Derbyshire

6053. TAXONOMIC POSITION OF HAEMOPHILUS VAGINALIS*. K.Zinnemann and G.C.Turner: J. Path. Bact., 1963, 85, 213-219 (Bact. Dept., Sch. Med., Leeds, England) Examination of 6 strains of this organism - including the type strain no. 594, shows that on optimum media under reduced O₂ and increased CO₂ tension they grow as Gram-pos. organisms resembling Corynebacteria, differing from those found in man only in being catalase-neg. It is recommended that the organism be named Corynebacterium vaginalis. D.Murray

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- 6054.** CHOLERAGENIC PROPERTIES OF EL TOR, NON-AGGLUTINABLE AND WATER VIBRIOS CONFIRMED EXPERIMENTALLY. N.K.Dutta, M.V.Panse and H.I. Jhala: Brit. med. J., 1963, i, 1200-1201 (Haffkine Inst., Bombay, India) Rabbits 8-10 days old developed cholera-like symptoms and post-mortem appearance after infection with El Tor and non-agglutinable vibrios isolated from water and serol. distinct from true cholera vibrios of Ogawa, Inaba and Hikojima strains. The disease resembles human cholera and there is a potential danger that these organisms may cause sporadic or endemic cholera in human subjects. M.E.Nutt
- 6055.** CHOLERA VACCINES AND THE EL TOR VIBRIO. E.E.Vella: Brit. med. J., 1963, i, 1203-1207 (Bruce Lab., East Everleigh, nr. Marlborough, Wilts., England) The El Tor vibrio responsible for the 1961 cholera epidemic in Hong Kong was compared with V. cholerae (Inaba strain) by virulence tests in mouse and guinea-pig, active and passive protection tests in mice and agglutinin production in rabbits. The El Tor vibrio is a virulent organism. Active or passive immunisation of mice to V. cholerae gives some protection against El Tor. A trivalent vaccine incorporating Inaba, Ogawa and El Tor strains may be preferable to that in present use, but field trials are necessary to decide this. M.E.Nutt
- 6056.** E.M. OF EXTERNAL AND INTERNAL STRUCTURE OF REITER TREPONEMA. A.Ryter and J.Pillot: Ann. Inst. Pasteur, 1963, 104, 496-501 (Inst. Pasteur, Serv. Photomicrographie, Paris, France) Reiter treponema has been studied by E.M. using ultra thin sections and neg. staining. The helical shape of the cell was found to be due to a bundle of fibrils extending between the 2 extremities. They were to be found between the cell wall and the cytoplasmic membrane. The cell wall was not rigid and did not seem responsible for its cylindrical shape. (French) B.Payne
- 6057.** SURVIVAL OF LEPTOSPIRA CANICOLA IN TICKS, IX ODES RICINUS. Z.Dymowska and S.Szymański: Med., dośw. Mikrobiol., 1962, 14, 379-382 (Zaltfad Parazytoligii Lekarskiej, Pafistwowy ZaHlad Hig., Warszawa, Poland) The survival time of L. canicola in I. ricinus does not exceed 3 days. No evidence was obtained proving that it can be transmitted by ticks. A suspension of ground ticks showed anti L. canicola action. (Polish) HTSowiecki
- 6058.** LEPTOSPIRA CANICOLA INFECTION: REPORT OF 81 CASES AND REVIEW OF THE LITERATURE. A.Pertzelan and W.Pruzanski: Amer. J. trop. Med., Hyg., 1963, 12, 75-81 (Med. B Dept., Assaf Harofe Govt. Hosp., Zerifin, Israel) A review. 52 ref. A.A.Zimmerman
- 6059.** DEVELOPMENTAL EFFECTS OF THE SEX-RATIO AGENT IN EMBRYOS OF DROSOPHILA WILLISTONI. S.J.Counce and D.F.Poulson: J. exp. Zool., 1962, 151, 17-31 (Dept. Biol., Yale Univ., New Haven, Conn., U.S.A.) Developmental disturbances associated with the sex-ratio [SR] condition may occur before zygote formation, during cleavage, during the syncytial blastoderm stage or after cellular differentiation has started in D. willistoni. The chr. seem to be very sensitive to the "effects of the SR agent. Following the first signs of cytol. abnormalities in SR embryos, there is a rapid breakdown of the blastoderm. In such animals there is an effective spread from abnormal to healthy cells and a blackening of the embryos which die after differentiation has begun. The SR agent is a treponema-like

spirochaete. The details of transmission of the SR spirochaete from generation to generation have not yet been determined.

R. J. Walker

RICKETTSIAE AND VIRUSES

- 6060.** PURIFICATION OF PSITTACOSIS AGENT WITH ANION EXCHANGE CELLULOSE - 'ECTEOLA'. R.Silberman and P.Fisec: Nature, Lond., 1963, 198, 699-700 (Dept. Microbiol., Sch. Med., Univ. Rochester, N.Y., U.S.A.) Purification of strain 6BC psittacosis virus by a procedure involving treatment with ECTEOLA, yielded a product with high infectivity and antigenicity and without anticomplementary activity. G.M.Lewis
- 6061.** SUBCELLULAR CULTIVATION OF VIRUS: GROWTH OF ORNITHOSIS VIRUS IN NON-NUCLEATE CYTOPLASM. T.T.Crocker and J.M.Eastwood: Virology, 1963, 19, 23-31 (Cancer Res. Inst., California Univ. Med. Sch., San Francisco, Calif., U.S.A.) Cytoplasmic fragments from human amnion cells that are motile and undergo pinocytosis, incorporate amino acids but not nucleotide precursors so far tested. The attachment, penetration and initiation of virii growth to the point of moderately advanced maturation of virus inclusions have been studied following infection of cytoplasmic fragments with ornithosis virus. Synthesis of viral DNA was shown by autoradiography. Nuclear participation in the infectious process was not necessary during the events studied, but may be necessary for the renewal of cytoplasmic materials which are equally essential to functional survival of cytoplasm alone. J.G.Bennette
- 6062.** TRACHOMA. H. COMPARISON OF FLUORESCENT ANTIBODY, GIEMSA, AND EGG ISOLATION METHODS FOR DETECTION OF TRACHOMA VIRUS IN HUMAN CONJUNCTIVAL SCRAPINGS. R.L. Nichols, D.E. McComb, N.Haddad and E.S.Murray: Amer. J. trop. Med. Hyg., 1963, 12, 223-229 (Dept. Microbiol., Harvard Sch. Public Health, Boston, Mass., U.S.A.) A controlled study of the 3 methods is presented. The morphology of trachoma inclusions as shown by sp. immunofluorescence is described. Evidence for the superiority of the fluorescent Ab method to Giemsa is discussed. Field and laboratory applications of this method are suggested. A.A.Zimmerman
- 6063.** STRUCTURE OF VACCINIA VIRUS. W.F.Noyes: Virology, 1962, 18, 511-516 (Exp. Pathol. Dept., Sloan Kettering Inst., New York, U.S.A.) A neg. contrast E.M. study is presented. The mature intact particle has a surface covered-Kith 15 m μ projections which are easily denatured to form surface cords. The cords and projections are probably formed from small ring like or tubular subunits covered with an adherent envelope. A double membrane and an internal nucleoid have been visualised. Ultrasonically disrupted particles show internal filaments which may be the DNA macromolecules of the virus. J.G.Bennette
- 6064.** HAEMAGGLUTINATION BY VARIOLA VIRUS. B.R.Murti: Indian J. Microbiol., 1962, 2, 111-116 (Dept. Microbiol., Med. Coll., Guntur, India) Haemaggl. of fowl r.b.c. by strains of vaccinia and

variola viruses was studied. Fowl cells aggl. by vaccinia were not necessarily aggl. by variola. Scar suspensions contained no haemagglutinins. Haemaggln. titres were the same at 22* and 3**. but there was no reaction at 0-4*. G.M.Lewis

6065. SURFACE DIFFERENCES BETWEEN VMONS OF TWO STRAINS OF HERPES SIMPLEX VIRUS.
B.Roizman and P.R.Roane jun.: Virology, 1963, 19, 198-204 (Microbiol. Dept., Johns Hopkins Univ. Med. Sch., Baltimore, Md., U.S.A.) Patterns of elution from calcium phosphate gel differed for 2 variants of herpes simplex virus, which were also shown to be antigenically closely related but not identical. No differences were found in kinetic or multiplicity analyses of inactivation by ether, chloroform or urea. It is concluded that the virions of mP and MP strains of the virus differ in surface structure and composition of the capsid of the envelope. J.G.Bennette

6066. E.M. PARTICLE COUNTS ON HERPES Vm^{TM*} USING PHOSPHOTUNGSTATE NEGATIVE STAINING TECHNIQUE. D.H.Watson, W.C.Russell and P.Wildy: Virology, 1963, 19, 250-260 (Virol. Inst., Glasgow Univ., Scotland) The technique used is described. The particle infectivity ratio was about 10, provided *at the suspensions were not dialysed. Attempts have been made to relate the different morphol. types of Particle with-infectivity. J.G.Bennette

6067. ROLE OF POLYOMA VIRUS AND INTERFERON IN HERPES SIMPLEX VIRUS INFECTION IN VITRO. L.A.Glasgow and K.Habeb: Virology, 1963, 19, 339 (Virus Biol. Lab., N.I.H., Bethesda, Md., U.S.A.) A continuous line of mouse embryo cells persistently infected with polyoma virus was found to be resistant to challenge with herpes simplex virus. The relationship between competing viruses and factors ^P^oTM b¹ c¹ d¹ e¹ f¹ fesistance of the culture and maintenance of the carrier state are defined. J.G.Bennette

6068. ROLE OF SURFACE STATE IN MORPHOGENESIS OF INFLUENZA VIRUS FILAMENTS. H.A.Blough: Virology, 1963, 19, 112-114 (Virus Lab., Pathol. Dept., Cambridge Univ., England) Prelim^comm.

6069. ANTIGENIC STRUCTURE AND BIOLOGICAL PROPERTIES OF SOME INFLUENZA B STRAINS. BO-

j₁f₁S₁t₁S₁; R35ft.ftft^
tag 1940-1959 but no differences could be seen in sensitivity to inhibitors and haemaggln. with r.b.c. of birds and mammals. Has*aggln. of B strain isolated * 1959 showed the highest W₁ lability and the highest destroying act v ty₀ f₁₀₀₀d receptors among auotter Elated B strains. (Polish) H.Osowiecki

6070. LABORATORY INVESTIGATION ON THE INFLUENZA B EPIDEMIC IN WARSAW IN 1962. H.Horbowska and H.Wielopolska: Med. dosw. Mikro-

Epidemiol. Warszawa, Poland) F₁? TM J₁f₁f₁
ns of influenza B virus, 5 were classified as type B, corresponding to Ag structure of B.Johannesb/58 and one J₁ta was 5 U & as type A2, corresponding to We. A₂*Sing a/L/57. (Polish) H.Osowiecki

6071. HAEMAGGLUTINATION INHIBITION: INTERACTION OF INFLUENZA VIRUSES WITH HORSE SERUM INHIBITOR. A.Cohen and F.Biddle: Nature, Lond., 1963, 198, 508-509 (Dept. Bacteriol. Univ. Coll. Hosp. Med. Sch., London, England) An examination

was made of the absorption and effects of horse serum Y-inhibitor on influenza virus strains A/Sing, ASH, PR8, ROB and LEE. Variations in affinity for, and sensitivity to the inhibitor were observed and their significance discussed. G.M.Lewis

6072. EFFECT OF VITAMIN A ALCOHOL ON MORPHOLOGY OF MYXOVIRUSES. I. PRODUCTION AND COMPARISON OF ARTIFICIALLY PRODUCED FILAMENTOUS VIRUS. H.A.Blough: Virology, 1963, 19, 349-358 (Virus Lab., Pathol. Dept., Cambridge Univ., England) Evidence is presented that vit. A, by adsorption to the infected cell surface of the chorioamniotic membrane can produce filamentous virus (influenza PR8 and Newcastle disease virus, Milano strain). Structural differences between the two viruses resulting from this treatment can be used to differentiate them. The mechanism of filament formation is discussed with ref. to E.M. data. J.G.Bennette

6073. CHEMICAL MUTAGENESIS OF NEWCASTLE DISEASE VIRUS. L.Thiry: Virology, 1963, 19, 225-236 (Brabant Pasteur Inst., Brussels, Belgium) Three mutants were produced by HNO₂ treatment of the wild virus, red*-plaque, small plaque and minute plaque. The mutation from white to red was independent of size plaque mutations. Hydroxylamine produced the same 3 mutants, but neither mutagen induced back-mutations towards the wild type. Ethylethane sulphonate and dimethyl sulphate transformed a proportion of red viruses into white-plaque formers, phenotypically similar to the wild type. Mutation from white to red was not seen with these latter agents, which also did not produce plaque-size mutants. J.G.Bennette

6074. PATHOGENESIS OF VIRAL MENINGOENCEPHALITIDES. A.M.Rahman and C.M.Luttrell: Bull. Johns Hopkins Hosp., 1963, 112, 1-14 (Med. Dept., Johns Hopkins Univ. Med. Sch., Baltimore, Md., U.S.A.) Evidence of meningoencephalitis was noted in Swiss mice which were given the Newcastle disease virus after administration of E. coli endotoxin. No effect was observed after giving the virus alone. H.B.Wayforth

6075. VARIANT MEF1 STRAIN OF TYPE 11 POLIOVIRUS READILY GROWN IN CHICKEN EMBRYOS AND RETAINING PATHOGENICITY FOR MONKEY KIDNEY TISSUE CULTURES AND MICE. M.Roca-Garcia: Nature, Lond., 1963, 198, 715-716 (Viral and Rickettsial Res. Sect., Lederle Lab., American Cyanamid Co., Pearl River, N.Y., U.S.A.) G.M.Lewis

6076. PROTECTION AGAINST POLIOVIRUS PARALYSIS BY PRETREATMENT WITH GUANIDINE-DEPENDENT POLIOVIRUS STRAIN. B.Lodd, A.Spanedda, G.Brotzu and W.Ferrari: Life Sci., 1963, No. 5, 331-333 (Dept. Microbiol., Cagliari Med. Sch., Italy) Prelim, note. K.Jones

6077. INTERACTION OF POLIOVIRUS RNA WITH E.COLIRIBOSOMES. J.Warner, M.J.Madden and J.E.Darnell: Virology, 1963, 19, 393-399 (Biol. Dept., Massachusetts Inst. Technol., Cambridge, Mass., U.S.A.) Poliovirus RNA attaches to E. coli

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ribosomes and stimulates incorporation of amino acids into protein, at least some of which is antigenically related to poliovirus capsid protein. J.G.Bennette

6078. EPIDEMIC SITUATION OF POLIOMYELITIS IN POLAND IN 1961. Przegl. epidem., 1962, 16, 369-375 (Państwowy ZaWad Hig., Warszawa, Poland)

Mass vaccn. in 1959 with the attenuated vaccines (type 1 Chat and type 3 W Fox) resulted in marked changes in epidemiology, aetiology, and clinical symptoms of poliomyelitis in Poland. Since 1960 the no. of poliomyelitis infections in children and the mortality dropped significantly. In 1960 type 3 was the dominating virus. 16% of infections were caused by Coxsackie or ECHO viruses. (Polish) M.Korbecki

6079. ROLE OF NON-POLIO ENTERIC VIRUSES IN CASES REGISTERED AS POLIOMYELITIS. Przegl. epidem., 1962, 16, 389-395 (Państwowy ZaHład Hig., Warszawa, Poland) 15 • 5% of poliomyelitis were caused by Coxsackie and ECHO viruses. Infection with Coxsackie A4 virus occurred most frequently. M.Korbecki

6080. ETIOLOGICAL ROLE OF ENTERIC VIRUSES IN DISEASES OF THE NERVOUS SYSTEM. F.Z.Taytsch: Przegl. epidem., 1962, 16, 397-403 (Państwowy ZaHład Hig., Warszawa, Poland)

Fifty-seven enterovirus strains were isolated from patients with nervous diseases; 40 strains (14 Coxsackie, 14 ECHO and 9 unidentified) were derived from aseptic meningitis. The remaining 17 strains belonged to the Coxsackie (9) and ECHO (3) groups while 5 strains were not identified. The most frequent were A4 and Bi Coxsackie strains and E4 and E9 ECHO strains. (Polish) M.Korbecki

6081. I. PLAQUE ASSAY OF DENGUE AND OTHER GROUP B ARTHROPOD-BORNE VIRUSES UNDER METHYL CELLULOSE OVERLAY MEDIA. II. INHIBITION OF INFECTIOUS AND HAEMAGGLUTINATING PROPERTIES OF TYPE 2 DENGUE VIRUS BY AQUEOUS AGAR EXTRACTS. LT.Schultz and R.W.Schlesinger. Virology, 1963, 19, 40-48, 49-57 (Microbiol. Dept., St. Louis Univ. Med. Sch., Mo., U.S.A.)

L Conditions are defined under which max. cytopathic effects [CPE] of dengue-2 virus are obtainable in KB cell cultures. Agar was found to prevent CPE and demonstrable virus multiplication, and a plaque assay procedure, replacing agar by methyl cellulose in the overlay, has been devised. The general usefulness of this technique for plaque assay of other group B arboviruses is discussed.

n. Aq. agar extract [AE] added to liquid or methyl cellulose overlay medium, inhibits CPE or plaque formation by dengue-2 virus. Intracerebral pathogenicity, plaque formation in KB monolayers, and haemaggl. are all reduced when free virus is mixed with AE. Evidence is presented that the inhib. is due to direct combination of an inhibitory substance with free virus particles. The inhibitor has been partially purified and characterised as a sulphated polysaccharide. J.G.Bennette

6082. IMMUNOLOGICAL STUDIES WITH GROUP B ARTHROPOD-BORNE VIRUSES. IV. PERSISTENCE OF YELLOW FEVER ANTIBODIES FOLLOWING VACCINATION WITH 17D STRAIN YELLOW FEVER VACCINE. E.C.Rosenzweig, R.W.Babione and C.L.Wisseman, jun.: Amer. J. trop. Med. Hyg., 1963, 12, 230-235 (Dept. Microbiol., Univ. Maryland Sch. Med., Baltimore, Md., U.S.A.) Neutralising and haemagglut-inhibiting Ab have been found to persist 16 to 19 yr. following a

single dose of 17D strain yellow fever vaccine in retiring Navy and Marine personnel who gave no evidence of other group B arthropod-borne virus exposure.

A.A.Zimmerman

6083. NON-INFECTIOUS HAEMAGGLOTTININ AND COMPLEMENT-FIXING ANTIGEN OF JAPANESE B ENCEPHALITIS. M.Kitoaka and CNishimura: Virology, 1963, 19, 238-239 (Virol. Dept., N.I.H., Tokyo, Japan) Prelim, comm. J.G.Bennette

6084. KINETICS OF NEUTRALISATION REACTION BETWEEN JAPANESE ENCEPHALITIS VIRUS AND ANTI-SERUM. N.Hashimoto and A.M.Prince: Virology* 1963, 19, 261-272 (Virus Dept., U.S.Army Med. Command Japan, APO343, San Francisco, Calif., U.S.A.) Kinetic antiserum neutralisation curves with the virus were characterised by exponential inactivation phases of short duration, sometimes followed by recovery phases in which surviving virus increased progressively in the neutralisation mixture. An investigation of this phenomenon has led to the hypothesis of a combined action of dissociation of virus: neutralising Ab complexes, and replacement with either blocking Ab or Ab with ability to alter the critical site or sites on the virus surface such as to prevent further combination with neutralising Ab. J.G.Bennette

6085. IMPROVED CONDITIONS FOR PRODUCTION OF ARTHROPOD-BORNE VIRAL HAEMAGGLUTINS IN INFECTED HeLa CELL CULTURES. M.Likar, S.M. Buckley and D.H.Clarke: Virology, 1962, 18, 647-649 (Virus Lab., Rockefeller Found., New York, U.S.A.) Prelim, comm. J.G.Bennette

6086. CYTOPATHOGENIC EFFECT ON THE TISSUE LINE GIRARDI AFTER INFECTION WITH TICK-BORNE ENCEPHALITIS VIRUS. Z.Kawecki: BiuL Inst. Med. morsk., 1962, 13, 219-222 (Inst. Med. Morskiej, Gdańsk, Poland) The tissue line Girardi adapted to human serum (in contrast to that adapted to horse serum) did not show cytopathogenic effect after infection with the virus. An Ag was obtained from the vims grown on Girardi tissue which gave pos. reaction in CF-tests with serum of guinea-pigs hyperimmunised with K5 strain and with sera of persons recovered from tick-borne encephalitis. M.Korbecki

6087. EXPERIMENTAL OSTEITIS PROVOKED BY A VIRUS. J.Markowa: Pozn. Towarzy. Przyjac. nauk. Wydz. lek., 1962, 23, 255-285 (II Klin. Chirurg., Akad. Med., Kraków, Poland) Mice with expt. osteitis induced by the tick-borne encephalitis virus S47 survived 8-10 days, depending upon the no. of passages of the virus. Radiol. and histol. examination revealed inflammatory changes, necrosis associated with swelling* proliferation of marrow tissue, extravasation followed by proliferation of connective tissue. Viruses introduced into the marrow were still alive after 10 days. (Polish) T.qtfbicki

6088. E.M. DEMONSTRATION OF PURIFIED VENEZUELAN EQUINE ENCEPHALITIS VIRUS. M.Mussgay and J.Weibel: Virology, 1963, 19, 109-112 (Virol. Dept-i I.V.L.C, Apartado 1827, Caracas, Venezuela) Prelim, comm. J.G.Bennette

6089. HAEMAGGLUTINATION WITH REOVIRUSES. A.M.Lerner, J.D.Cherry and M.FInland: Virology» 1963, 19, 58-65 (Med. Dept., Harvard Med. Sch.,

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Boston, Mass., U.S.A.) The effects of various receptor reactive substances on the haemaggl. prop. of reoviruses on human R.b.c. are described. Conditions for adsorption and elution of the viruses to R.b.c. have been studied. It is concluded that reovirus-R.b.c. union involves mucoproteins on the surface of both reactants. Those on the virus surface contain SH groups, but those of the R.b.c. do not, so that the essential bond between them may not be of SH character. J.G.Bennette

**6090. PICORNAVIRUS GROUP. INTERNATIONAL
ENTEROVIRUS STUDY GROUP.** Virology, 1963, 19,
114-117 (J.L.Melnick, Tumor Inst., Houston, Tex.,
U.S.A.) Prelim, comm. J.G.Bennette

6° 91. HAEMAGGLUTINATION BY MEASLES VIRUS.
III. IDENTIFICATION OF TWO DIFFERENT HAEM-AGGLUTININS. f.Norrby: Virology, 1963, 19, 147-157 (Virus Res. dept., Karolinska Inst., Stockholm, Sweden) Two fractions with haemagglutinating [HA] activity were separated by sucrose density gradient centrifugation. The 'large' HA component that sedimented more rapidly is responsible for almost all the infectivity and haemolysing activity, although it constitutes only a small part of the total HA material present in unseparated retract. The conversion of large into small, slowly sedimenting HA material without infectivity or haemolysing activity, can be effected by treatment with heat, ether or Tween 80, and particularly by a combination of the last two." The 2 fractions are immunologically identical, as shown by cross adsorption tests, but the large HA material seemed to adsorb 3 times more Ab per particle than the small. J.G.Bennette

⁶° 92. DIARRHOEA OF TRAVELLERS. IV. VIRAL STUDIES OF VISITING STUDENTS IN MEXICO WITH FURTHER BACTERIOLOGICAL AND PARASITOLOGICAL OBSERVATIONS. M.A.Rosenbluth, W.Schaffner and B.H. Kean: Amer. J. trop. Med. Hyg., 1963, 12, 239-245 (Dept. Public Health and Prev. Med., New York Hosp.-
T Cornell Univ. Med. Center, New York, U.S.A.)
Investigations of 195 college students arriving in Mexico City as tourists showed that about one third became ill. Viruses were isolated from 2 stool specimens from sick objects but appear to play only a minor role in the aetiology of tourists' diarrhoea. A.A.Zimmerman

⁶ 93. I. OPTIMUM TEMPERATURE FOR GROWTH AND
SENSITIVITY TO INTERFERON AMONG DIFFERENT
VIRUSES. E. INTERFERON PRODUCTION BY DIFFER-
ENT VIRUSES. J. Ruiz-Gomez and A. Isaacs: Virology,
1963, 19, 1-7, 8-12 (Nat. Inst. Med. Res., Mill Hill,
London, England) I. The optimal temp, for plaques
Production by 11 viruses in chick embryo fibroblast cul-
tu*es varied between 32T and 42f Good correspondence
w*s found between the optimal temp, for growth and the
sensitivity of these viruses*t6 interferon in the same type
of Plaque assay. A relationship was found between these
Prop, and the virulence of these viruses for the chick
embryo, but 2 exceptions were noted. - * << .
H. Viruses with an optimal temp, of growth of 35" in
*ick embryo fibroblasts generally gave good yields of
^terferon in these cells. Viruses with higher optimal
temp, gave much lower yields. When production of
^terferon was measured at different temp, in a single
cVcl_e of virus growth, the highest yields of interferon
wer'e found at temp, above the optimal temp, for virus
growth. Newcastle disease virus showed contrasting
behaviour in primary cultures of chick and human cells.

The results favour the suggestion that poor production of interferon may be one factor in virus virulence.

J.G.Bennette

6094. VIRAL INTERFERENCE IN TWO LINES OF HeLa CELLS. K.Cantell and K.Paucken Virology, 1963, 19, 81-87 (Virus Lab., Philadelphia Children's Hosp., Pa., U.S.A.) The S3 and F lines of HeLa cells were compared for interferon production and behaviour in interference assays. Protection against vesicular stomatitis virus was established in both lines by u.v. -irradiated Newcastle disease virus [NDV_{Uv}] hut in neither by influenza virus [PR8uv3-]. On exposure to NDV_{WT} however, the S3 line yielded 10-50 times less interferon than either F or primary human amnion cells. The age of the culture had a pronounced effect on the sensitivity of S3 cells to NDV_{Uv}^{anc*}^{tu} interferon, whereas the behaviour of F cells was not age dependent. The implications of the results on the cancerous origin of the HeLa lines and their sensitivity to interferon are discussed. J.G.Bennette

6095. BIOLOGICAL STUDIES OF INTERFERON. II. TEMPORAL RELATIONSHIPS OF VIRUS AND INTERFERON PRODUCTION BY CELLS INFECTED WITH EASTERN EQUINE ENCEPHALOMYELITIS [EEE] AND INFLUENZA VIRUSES. R.R.Wagnen *Virology*, 1963, 19, 215-224
(Microbiol. Dept., Johns Hopkins Univ. Med. Sch., Baltimore, Md., U.S.A.) Under all the conditions studied, interferon was detected only after virus multiplication had reached a peak. EEE virus could induce interferon production in L cells in the absence of demonstrable cytopathology, but interferon yields were greater in L and chick embryo cell cultures undergoing rapid cell destruction after infection at high multiplicity. In chorioallantoic membrane the onset of interferon production coincided with the disappearance of influenza . haemagglutinin from the cells. Cellular levels of influenza S Ag were not significantly affected by endogenous interferons. The physical and biol. prop. of S Ag and interferon served to differentiate these 2 products of influenza-infected cells. J.G.Bennette

6096. VACCINIA VIRUS PLAQUE FORMATION AND INHIBITION BY INTERFERON. L DYNAMICS OF PLAQUE FORMATION. J.Lindenmann and G.E.Gifford. **H. DYNAMICS OF PLAQUE FORMATION IN PRESENCE OF INTERFERON.** G.E.Gifford, S.T.Toy and J.Lindenmann. **IE. SIMPLIFIED PLAQUE INHIBITION ASSAY OF INTERFERON.** J.Lindenmann and G.E.Gifford: *Virology*, 1963, 19, 283-293, 294-301, 302-309 (*Microbiol. Dept., Florida Univ. Med. Coll., Gainesville, Fla., U.S. A.*) I. Plaques of vaccinia virus in chick embryo monolayers without agar emerged into visibility according to a normal sigmoid curve. The distribution of plaque diam. could be approximated by a normal Gaussian curve with a variable proportion of plaques hidden below the threshold of visibility. The time course of plaque induction and of diam. increase is described. Strains of vaccinia virus differ in the rate of appearance of primary and secondary plaques.

IL Pre-incubation with interferon only slightly reduced plaque formation as compared to simult. addition of interferon with the infecting virus. Plaque counts, diam. and the log of total plaque area were linearly inhib. by interferon, and the lesions emerged more slowly into visibility. The growth rate of treated plaques was reduced but remained independent of plaque size or time. Some of the infected cells seemed to be permanently prevented from forming plaques.

EH. Interferon and virus are added simult. to chick

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- embryo monolayers without agar, and plaque counts made after staining with crystal violet 44-48 hr. after incubation started. The dose-response curve and other characteristics of the assay are described. J.G.Bennette
- 6097. STRUCTURE OF CAPSID OF GAL VIRUS.** D.H.Watson, I.A.Macpherson and M.CDavies: Virology, 1963, 19, 418-419 (Virol. Inst., Glasgow Univ., Scotland) Prelim, comm. J.G.Bennette
- 6098. TWO ATTENUATED STRAINS OF MTCOMA VIRUS ISOLATED IN GREAT BRITAIN.** P.J.Chapple and E.T.W.Bowen: J. Hyg., Lond., 1963, 61, 161-168 (M.A.F.F. Infestation Control Lab., Worplesdon, Surrey, England) Two field strains of myxoma virus isolated in Great Britain were tested for virulence in rabbits by i.d. inocn. Both strains were relatively attenuated, and one resembled the KM13 strain. The characteristics of the strains suggested that the evolution of myxoma virus in Great Britain was similar to its evolution in Australia. J.B.Derbyshire
- 6099. ANTIGENIC DIFFERENCES BETWEEN STRAINS OF FOOT-AND-MOUTH DISEASE [FMD] VIRUS OF TYPE SAT 1.** N.StG.HysloR J.Davie and S.P.Carten J. Hyg., Lond., 1963, 61, 217-230 (Res. Inst., Pirbright, Surrey, England) Cross-protection tests in cattle with formalised vaccines showed that 2 strains of FMD virus (type SAT 1 - RV11 and SA 13/61) were antigenically different. CF and neutralisation tests in tissue cultures confirmed this observation. J.B.Derbyshire
- 6100. HEAT-LABILE COMPLEMENT-FIXING ANTIGENS IN THE GROWTH-CYCLE OF FOOT-AND-MOUTH DISEASE VIRUS.** D.N.Planterose, B.Cartwright and F.Brown: Nature, Lond., 1963, 198, 864-865 (Res. Inst. (Animal Virus Diseases), Pirbright, Surrey, England) Heat-labile (at 56° C)-fixing activity has been observed in all cultures of foot-and-mouth disease virus studied. Attempts to separate a heat-labile component from the 25 mfi and small components of the virus by sucrose density gradient centrifugation failed. Observation of the formation of the heat-labile material in pig kidney tissue cultures indicated that it is present at some stage of the virus growth cycle. G.M.Lewis
- 6101. CHEMICAL AND MORPHOLOGICAL CHANGES OF FELINE KIDNEY CELLS INFECTED BY A CYTOPATHOGENIC AGENT OF THE CAT (VPG = PERUGIA CAT VIRUS).** V.Torlone and F.Titoli: Sperimentale, 1963, 113, 42-53 (1st. Zool. Profilattico Sperimentale Umbria e delle Mache, Perugia, Italy) When feline kidney cell monolayers were infected with the cytopathogenic agent isolated from cats with rhinitis and conjunctivitis (previously reported), a paranuclear mass containing RNA appeared, which resembled the paranuclear mass appearing after enterovirus or poliovirus infection. There was an increase in total RNA and a decrease in total DNA in the infected cells; the protein content remained unchanged. Viral Ag was demonstrated by fluorescent Ab techniques in the cytoplasm and cytoplasmic lesions. (Italian) G. N. Godson
- 6102. EQUINE HERPES VIRUSES.** G.Plummer and A. P. Waterson: Virology, 1963, 19, 412-416 (Wellcome Res. Lab., Beckenham, Kent, England) Prelim. comm. J.G.Bennette
- 6103. PATTERN OF VIRAL AND CELLULAR DNA SYNTHESIS IN PSEUDORABIES VIRUS-INFECTED CELLS IN**

LOGARITHMIC PHASE OF GROWTH. A.C.Kaplan and T.Ben-Porat: Virology, 1963, 19, 205-214 (Microbiol. Dept., Albert Einstein Med. Center, Philadelphia Pa., U.S.A.) The biphasic character of the kinetics of thymidine incorporation into the DNA of logarithmically growing rabbit kidney cells is the resultant of 2 con* current processes: progressive inhibn. of the rate of synthesis of cellular DNA and gradual increase in the rate of synthesis of viral DNA. Expt. on the mechanisms of inhibn. of cellular DNA synthesis in infected cells are described. This inhibn. is not due to the failure of the infected cells to enter into the DNA-synthesising period of their growth cycle, nor is it the result of the degradation of cellular DNA in these cells. In infected cells there is a shift of the cellular DNA towards the periphery of the nucleus which may be responsible for the inhibn. o» cellular DNA synthesis. J.G.Bennette

6104. ADAPTATION OF HORSE SICKNESS VIRUS TO TISSUE CULTURE. H.Mirchamsy and H.Taslimi: Nature, Lond., 1963, 198, 704-706 (Razi Serum and Vaccine Inst., Karadj, Iran) Details are given of the interaction between horse sickness virus and hamster kidney cells and of the development of infectivity during a single growth cycle of the virus. G.M.Lewis

6105. CANINE DISTEMPER VIRUS IN CHICK EMBRYO CELL CULTURE: PLAQUE ASSAY, GROWTH AND STABILITY. R.H.Bussell and D.T.Karzon: Virology* 1962, 18, 589-600 (Bacteriol. Dept., Buffalo Univ. Med. Sch., N.Y., U.S.A.) Cytopathic effects were studied in chick embryo cultures infected with 3 strains of the virus. One of these, an egg-adapted strain, show# reduced cytopathogenicity for the chorioallantoic membrane after culture in chick embryo cell cultures. Virus attachment was slow, was followed by an eclipse period of 8-10 hr., after which there was an increase in cell associated virus. 2-4 hr. after this, virus appeared in the fluid phase, but always in smaller amounts than that recoverable from the cells. In the plaque assay, a linear relationship was found between virus concn. and plaque no. Hie virus is relatively thermolabile. J.G.Bennette

6106. TRANSFORMATION IN HAMSTER KIDNEY MONOLAYERS BY VACUOLATING VIRUS, SV-40. P.H.Blad and W.P.Rowe: Virology, 1963, 19, 107-109 (Infect. Dis. Lab. N.I.H., Bethesda, Md., U.S.A.) Prelim. comm. j. G. Bennetts

6107. SIMIAN-VIRUS-40-INDUCED EPENDYMOSES IN NEWBORN HAMSTERS. I. VIRUS-TUMOUR RELATIONSHIPS. P.Gerber and R.L.Kirschstein: Virology, 1962, 18, 582-588 (Viral Immunol. Lab., N.I.H., Bethesda, Md., U.S.A.) Intra-cerebral inocn. of newborn hamsters with SV40 produced ependymomas with a latency a* freq. depending on the concn. of virus used. No evidence of virus multiplication was fourfd in brain, tumour or oth* tissue extracts, but trace amounts of virus were detected when intact tumour cells were seeded* on monkey kidney monolayers. Only a small proportion of the tumour cells contained infectivity. No free virus was obtained from cultured ependymoma cells. Other simian viruses were tested for ependymoma production and none was found active. J.G.Bennette

6108. GROWTH CYCLE OF VISNA VIRUS IN MONOLAYER CULTURES OF SHEEP CELLS. H.Thorman: Virology, 1963, 19, 273-278 (Enterovirus Dept., State Serum Inst., Copenhagen, Denmark)

The kinetics of visna virus growth and its cytopathogenicity are described. Increase in free virus almost coincided with increase of cell-associated virus, and more virus was found in the fluid phase than in the cell-associated form throughout the growth period, indicating rapid release of newly formed virus, most of which was found on the external surface of the cells. This agrees with the E.M. evidence for visna virus formation by budding in the cell membrane.

J.G.Bennette

6109. ADVERSE REACTIONS IN CATTLE FOR VACCINATION WITH LAPINISED RINDERPEST VIRUS. G.R.Scott

J. Hyg., Lond., 1963, 61, 193-203 (Vet. Res. Lab., Kabete, Kenya) 310971 cattle in Kenya, vaccinated with lapinised rinderpest virus, were observed for adverse reactions, the overall incidence of which was 0·0%. However, as the true population at risk embraced only rinderpest-susceptible cattle, the real incidence of adverse reactions was almost 0·W%. These ^" " . ^ t -n t e aggravation of latent protozoal infections, " " " " " " " " reactions, and transient spermatolysis in bulls. Anaphylaxis was rarely recorded. Four strains of virus isolated from reacting cattle had the characteristics of rinderpest virus.

J.B.Derbyshire

6110. STUDIES IN TISSUE CULTURE ON THE PH-STABILITY OF RINDERPEST VIRUS. B.Liess and

W.Plowright: J. Hyg., Lond., 1963, 61, 205-211 (E.A.V.R.O., Muguga, P.O.Box 322, K.C. ^ ^ S. Iya) The stability of rinderpest virus in veronal-acetate buffer of pH 3-0-10 at 4° was measured by infectivity titrations in bovine kidney tissue cultures. An attenuated strain was relatively stable from pH 4-10-2, with a half-life of 2 hr. at the extremes of this range. Max. stability was in the range pH 7·2-8·0. Two virulent strains showed a marked stability at high pH, but were much less stable at low pH.

J.B.Derbyshire

6111. E.M. OF RINDERPEST VIRUS IN BOVINE MOLTNEY

Animal Dis. Lab. Isla N. Dept. Alf kidney cells infected at htfli n S S w & with *e virus were *in-sectioned and WrtnedS, E.K. Tie effects of Infection were visible \ll 3 hr. but development of inclusion* was slower. Virus developed within or in contact with TM; " ? ^ S 11 \ll smic sac. of vims are described. Karaqf small Oracles and inclusion aggregates are 1^{MF}. J.Bennette

6112. RABBIT POX: EXPERIMENTAL STUDY OF PATHWAYS

M.J.Duckworth: J. Path. Bact., 1963, 87, 101-110 (Bact. Dept., Univ. Liverpool, England) Infection is induced by intranasal, i.d. and conjunctival inoc. of Utrecht and of Rockefeller Inst. strains of virus into rabbits and also by contact with previously infected animals. The latter produces primary sites of infection in upper and lower respiratory tracts, rarely in conjunctiva. Invasion involves successively primary site, regional lymph nodes, circulating w.b.c., spleen and other remote tissues. Widespread dissemination of virus precedes other signs gene Rabb tract are not infective until second day of illn s. pite high initial litres of virus. D.Murray

6113. MOUSE SALIVARY DISEASE

L RNA, DNA AND PASCHIFF REACTIONS IN SGV-

INFECTED LIVER. N.G.Grand and E.R.Grandel.

n. SULPHYDRYL AND DISULPHIDE REACTION IN SGV-INFECTED LIVER. N.G.Grand, E.R.Grandel and LLyon: Arch. oral Biol., 1963, 8, 265-270, 271-274 (Dept. Oral Pathology, Coll. Dent., Univ. Illinois, Chicago, Ill., U.S.A.)

I. SGV intranuclear inclusions contained RNA and increased amount of glycoproteins. Glycogen and glycoproteins in the cytoplasm of inclusion-bearing cells may be sources of substances essential for the formation of viral nucleic acid glycoprotein complexes. The halo encircling the inclusion body is probably an artefact of aggregation or dehydration.

II. SGV infected mouse liver showed increases in sulphhydryl and disulphide protein groups especially in SGV-induced inclusion bodies. The increase was disproportionately greater for disulphide than for sulphhydryl groups suggesting changes in the aggregation or hydration states of inclusion body proteins.

6114. ISOLATION OF A MURINE LEUKAEMOGENIC

VIRUS P-LLV. A.Precerutti and L.W.Law: Nature, Lond., 1963, 198, 801-803 (Nat. Cancer Inst., Bethesda, Md., U.S.A.)

G.M.Lewis

6115. E.M. AND BIOASSAY STUDIES ON MURINE

LEUKAEMIA VIRUS (RAUSCHER). R.F.Ziegel and F.J.Rauschen: J. nat. Cancer Inst., 1963, 30, 207-219 (Viral Oncol. Lab., Nat. Cancer Inst., Bethesda, Md., U.S.A.) Prelim, descriptive account.

J.G.Bennette

6116. RAPID INTRACEREBRAL PASSAGE AND RECOVERY OF MOLONEY LEUKAEMIA VIRUS FROM MOUSE BRAIN TISSUE. H.J.Spencen: J. nat. Cancer Inst., 1963, 30, 313-321 (Med. Res. Lab., M.L.Bassett Hosp., Cooperstown, N.Y., U.S.A.)

The virus was recoverable in large quantities from brain harvested 7 days after intracerebral inoc. of newborn BALB/c mice. Serial brain passage resulted in enhancement when harvested at 7 day intervals, but not at 3 day intervals, when leukaeomogenic activity of brain extracts declined rapidly. There was no evidence of neurotropic adaptation. Virus persisted in brain at high titres until advanced stages of the disease. It was also recovered from brain following i.p. infection.

J.G.Bennette

6117. STRUCTURE OF GROSS LEUKAEMIA VIRUS.

D.F.Parsons: J. nat. Cancer Inst., 1963, 30, 569-583 (Ontario Cancer Inst., Toronto, Canada) A descriptive E.M. study.

J.G.Bennette

6118. ASSAY AND MULTIPLICATION OF AVIAN

MYELOBLASTOSIS VIRUS [AMV]. P.K.Vogt and H.Rubin: Virology, 1963, 19, 92-104 (Virus Lab., California Univ., Berkeley, Calif., U.S.A.) A simple quant. assay for AMV depending on interference between AMV and Rous sarcoma virus is described. This has been applied to the study of AMV growth in vitro and in vivo. It was also found that AMV can be assayed directly using the fluorescent Ab stain to identify foci of cells producing viral Ag.

J.G.Bennette

6119. FACTORS INFLUENCING DETERMINATION OF CELLULAR MORPHOLOGY IN CELLS INFECTED WITH ROUS SARCOMA VIRUS [RSV]. A.M.Prince: Virology, 1962, 18, 524-534 (Pathol. Dept., Yale Univ. Med.

Sch., New Haven, Conn., U.S.A.) The composition of the medium favouring morphol. alteration of turkey fibroblasts by RSV in vitro is described. Tumours induced in vivo by single virus particles varied widely in

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morphology, showing spindle-cell, round-cell, giant-cell and fusiform-cell types. Possible correlations between in vitro and in vivo morphol. changes are discussed, and in vitro morphol. conversion is related to neoplastic potential.

J.G.Bennette

6120. SENSITIVITY OF ROUS SARCOMA VIRUS [RSV] ASSAYS. R.M.Dougherty and P.J.Simons: *Virology*, 1962, 18, 559-566 (Exp. Biol. and Virol. Div., Imp. Cancer Res. Fund, Mill Hill, London, England)

Statistical analysis of RSV assays on Brown Leghorn embryo chorioallantoic membrane gave results similar to those from White Leghorn embryos in some respects, but comparative assays of standard frozen stocks of RSV showed that the Brown Leghorns were 10-50 times more sensitive than White Leghorns on the chorioallantoic membrane and about 10 times more sensitive by the focus method in tissue culture. In contrast to other reports, the incidence of non-reactors to RSV on the chorioallantoic membrane was very low (2 out of 800 embryos). A modification of the technique for counting RSV foci in tissue culture is described.

J.G.Bennette

6121. GROWTH OF NORMAL AND ROUS SARCOMA VIRUS INFECTED CHICK EMBRYO CELLS IN RAT BRAINS. T.M.Scotti, M.Dorsey jun., S.S.Lefkowitz, A.Duwelius and M.M.Sigel: *Cancer Res.*, 1963, 23, 531-534 (Variety Children's Res. Foundn., Miami, Fla., U.S.A.) Infected cells grew more efficiently and developed into typical Rous sarcomas even when cells had been in contact with virus for only 15-90 min. More abundant growths were often obtained when cells had been exposed to virus for 2 days. Infected cells showed no morphol. evidence of transformation by virus at die time of implantation. Haemorrhage was noted in many of the Rous tumours.

B.M.Stevens

6122. ABSENCE OF INFECTIOUS ROUS VIRUS IN RAT TUMOUR XC, WHOSE STRUCTURALLY INTACT CELLS PRODUCE ROUS SARCOMA WHEN TRANSFERRED TO CHICKS. J.Svoboda, P.Chfle, D.Simkovis and L.Hilgerc *Folia biol.*, Praha, 1963, 9, 77-81 (Inst. Expt. Biol., Czech. Acad. Sci., Prague, Czechoslovakia) Intact cells of tumour XC from rats induced tumours in chicks, but cell-free prep. (filtrates, cone, microsomes and main cell fractions) were not effective in causing tumours. Virus was not found in sediments from centrifuged culture fluid. Anti-sera from chicks, capable of neutralising Rous virus in tissue culture did not affect the ability to produce Rous sarcoma in chicks. No haemagglg. agent of polyoma virus type was obtained from Rous sarcoma, Rous virus or culture fluids from tumour XC and Rous sarcoma cell cultures.

M.S.Laverack

6123. CHARACTERISTICS OF NORMAL AND TRANSFORMED CLONES ARISING FROM BHK21 CELLS EXPOSED TO POLYOMA VIRUS. M.Stoker: *Virology*, 1962, 18, 649-651 (Virol. Inst., Glasgow Univ., Scotland) Prelim, comm.

J.G.Bennette

6124. POLYOMA VIRUS VARIANT WITH NEW ANTIGENIC DETERMINANTS. J.D.Hare and H.R.Morgan: *Virology*, 1963, 19, 105-107 (Microbiol. Dept., Rochester Univ. Med. Sch., N.Y., U.S.A.) Prelim. comm.

J.G.Bennette

6125. LYtic INTERACTION AND CELL TRANSFORMATION WITH LARGE- AND SMALL-PLAQUE MUTANT OF POLYOMA VIRUS. D.Medina and L.Sachs:

Virology, 1963, 19, 127-139 (Virol. Lab., Weizmanf Inst., Rehovoth, Israel) Evidence is presented that the small-plaque polyoma mutant SP2 has a higher efficiency both for the lytic interaction and for cell transformation than the large-plaque virus BP5. The results also indicate some conditions that can change the rate of cell transformation.

J.G.Bennette

6126. PURIFICATION OF POLYOMA VIRUS. E.WinocoU* *Virology*, 1963, 19, 158-168 (California Inst. Technol., Pasadena, U.S.A.) Homogeneous purified prep. of the virus were obtained by equilibrium density gradient centrifugation in CsCl. Homogeneity was shown by ultracentrifugal analysis, E.M. observations and u.v. absorption spectrum. Two bands were formed in the density gradient, one which contained complete virus particles showing infectivity comparable to haemagglg* power, and the other containing empty particles in which haemagglg. was not accompanied by corresponding in* fectivity. From the difference in buoyant densities between the 2 types of particles, the amount of DNA in the full particles was estimated as 13*4%.

J.G.Bennette

6127. PHYSICAL CHARACTERISTICS OF POLYOMA VIRUS. II. NUCLEIC ACID. L.V.Cra*ford: *Virology* 1963, 19, 279-282 (Virol. Dept., Glasgow Univ., Scotland) DNA extracted from polyoma virus is double stranded and has a base composition of 48% guanine plus cytosine. Problems of mol. size determination are discussed.

J.G.Bennette

6128. INHIBITORS OF POLYOMA VIRUS HAEMAGGLUTINATION IN NORMAL MOUSE SERA AND ORGANS. P.Baldazzi and S.Salmon: *Sperimentale*, 1962, 112# 446-456 (1st. Microbiol., Univ. Firenze, Italy) Extracts (0-05M phosphate pH 7*2, 15 min, 40°) from salivary and thymus glands, liver, lungs, kidney, brain and brain fat tissue of normal mice and mice immunised against polyoma virus, contained a polyoma-virus haemagglg. inhibitor. Sera from normal mice also con⁰tained this inhibitor. The activity was thermolabile. Organ extract inhibitors bound the virus at 4°, and 37° whereas normal serum inhibitors bound the virus only at 4°. There were no differences between the vims binding ability of organ extracts from normal and immune mice* (Italian) G.N.Godson

6129. POLYOMA VIRUS AND L CELL RELATIONSHIP. I. SOME CHARACTERISTICS OF CELL LINE PERSISTENTLY INFECTED WITH POLYOMA VIRUS. J.D.Hare, P.Baldazzi and H.R.Morgan: *J. nat. Cancer Inst.*, 1963, 30, 45-56 (Microbiol. Dept., Rochester Univ.# N. Y., U.S.A.) An L cell clone has supported active proliferation of polyoma virus without cytopathic effect for 2 yr., without increase in neoplastic capacity, as indicated by failure to produce tumours in C3H mice or in cheek pouches of cortisonised hamsters. Some conditions for the maintenance of the earlier state are described. Evidence is present that persistent infection is the usual relationship between polyoma virus and the strain L cell* (Italian) J.G.Bennette

6130. MOLECULAR STRUCTURE OF SOME INSECT VB^W INCLUSION BODIES. G.H.Bergold: *J. ultrastructure Res.*, 1963, 8, 360-378 (Virologia Dept., I.V.L.C., Apartado 1827, Caracas, Venezuela) E.M. studies have shown the presence of dot and line patterns in poly* hedra and capsule insect virus inclusion bodies. The inclusion body protein mol. were spheres arranged in a face-centered cubic system. This ?rrange*ment indicated that there were 6 selective points of special attraction on

*e surface of each mol which led to die cubic system.
Virus particles in the inclusion bodies did not run a ito
cryst. lattice. H.B.waymionn

6131. PHAGE RELEASED FROM SALMONELLA TYPHI-MURUM LYSOGENISED BY P22. R-Benzingen
Virology. 1962. 18. 643-645 (M <- R an *£=?':>
Munich Germany) Prelim, comm. J.G.Bennette

6132. AUTORADIOGRAPHICS OF TOBACCO MOSAIC VIRUS INOCULATIONS ON HOST AND NON-HOST SPECIES. E.A.Herridge and D. & ScM_BU. Virology. 1962. 18. 517-523 (Want PathoL Dept.. California Univ.. Berkeley. Calif. non-host spp. and the H4c]TMV was inoc. into host and non-host spp. and the of virus was studied in leaves. The results suggest that damage associated with trichomes is important in the infection sites in hosts of TMV. Virus accumulation in epidermis and broken trichomes of non-hosts suggests that susceptibility is determined by other factors. J.G.Bennette

6133. L SIZE OF LESIONS OF TOBACCO MOSAIC VIRUS ON PINTO BEAN. K - ^ ^ ^ o f M^g McIntyre.
 II. MASKING OF LOCAL LESIONS AND BIOLOGY OF INFECTIONS OF TMV ON PINTO BEAN KJHf ms
 Virology, 1962, 18, 535-545, 546-552 (Ham Induwr. W. C.S.I.R.O., Canberra, Australia)
 I- TMV strains UI and U2 produced distinct lesion^{on}
 Pinto bean leaves of different colour and »» vTM B C tivity from the 2 types of lesion was identical. A population distribution pattern analysis is presented. The no. of macro lesions increased for both ^trains when TM g ^ RNA was used instead of intact virus for infection. The effect of virus concn. on lesion size is <ta> *ed. F s ? train III Aere was heterogeneity in respect to tonowne bttween leaves of the same or different age and between areas

[^] o f So leaves, me no. of macro[^]ns due to strain U2 TMV (but not UI) decreased b--- n 2 and 6 TMV-U2 reached [^]ons continued to ons of TMV-U2 and TMV-U2 RNA appeared ea r and more synchronously than those of TMV-UI and TMV-UI RNA, and the mean times of appearance are quoted. It was concluded that the time-course decrease in no. of macro lesions of masking of lesions caused by post-leaves in association with rapid but ^{J.G. Bennette}
[^]united lesion growth.

⁶134. DETERMINATION OF LIMITING AMOUNT OF TOBACCO MOSAIC VIRUS ATTACHING TO ION EXCHANGE RESIN AND DISSOCIATION CONSTANT OF THEIR COMPLEX. T. Taruguchi, Virology, 1962, 18, 646-647 (Plant Pathol. Lab., Nagoya Univ., Anjo, Japan) Prelim. comm. J.G. Bennette

⁶135. SIMILARITY IN A C C UTM ^ ^ TOBACCO
L NECROTIC MOSAIC VIRUS IN SYSTEMIC-ANDLOCA- 19, 237-
INFECTION. T.Taniguchi B Virology. 1963, 14, 238 (Plant Pathol. Lab., Nagoya Univ., J.G. Bennett
Pr. eijim comm. TICLES

81. 36. E.M. OF TOBACCO M O S A I C ^ ^ ^ and
FROM APHID STYLETS. C j ^ W - ^ S S j (Plant
T.Kikumoto: Virology, I f ³ ? ^ Prelim- comm.
Pat. Lab., Nagoya Univ., Japan) *J.G.Bennette

6137. EFFECT OF U.V. LIGHT ON TOBACCO MOSAIC VIRUS CONTAINING 5-FLUOROURACIL. A.Becarevifi, B.Djordjević and D.Sutić. *Nature. Lond.*, 1963, 198, 612-613 (Inst. Appl. Nuclear Sci. Agric., Zemun, Belgrade, Yugoslavia) Tobacco leaves infected with TMV were incubated with 5-fluorouracil; this treatment rendered the virus particles significantly more susceptible to inactivation by u.v. light. G.M.Lewis

6138. DENSITY HETEROGENEITY ZN PURIFIED PREPARATIONS OF BROAD BEAN MOSAIC VIRUS.

A.Laronson and J.B.Bancroft: Virology, 1962, 18,
570-575 (Plant Pathol. Dept., Purdue Univ.,
Lafayette, Ind., U.S.A.) An apparently homogeneous
purified prep. of the virus separated into 2 closely placed
bands on density gradient CsCl centrifugation. Only the
bottom band yielded infective virus or RNA. Small
differences in the amount of RNA between the 2 com-
ponents could account for the density difference.
Evidence from sedimentation studies suggested that die
missing nucleotides did not result in extensive frag-
mentation of the RNA. J.G.Bennette

6139. KINETICS OF LABELLING OF TURNIP YELLOW MOSAIC VIRUS WITH PHOSPHORUS-32 AND SULPHUR-35. R*E.F.Matthews, E.T.Bolton and H.R. Thompson: *Virology*, 1963, 19, 179-189 (*Microbiol.*)

Dept., Auckland Univ., New Zealand) The time course of labelling has been followed using ^{35}S to label protein and ^{32}P to label RNA. A theoretical treatment for the relation between virus protein and nucleoprotein is presented. The simplest model is one in which the protein is formed reversibly and the nucleoprotein irreversibly from the same pool of precursor protein sub-units. The minor nucleoprotein components cannot be stages in the assembly between the empty protein shell and complete virus. J.G.Bennette

**6140. EVIDENCE OF RELATIONSHIP BETWEEN TURNIP
YELLOW MOSAIC VIRUS AND WILD CUCUMBER
MOSAIC VIRUS. R.Macleod and R.Markham:**

Virology, 1963, 19, 190-197 (A.R.C. Virus Res. Unit, Huntingdon Rd., Cambridge, England) A serological relationship has been found between the 2 viruses which are not known to have any common host plant. Similarities in physicochem. prop. and morphology are noted and considered as a possible basis for grouping plant viruses. J.G.Bennette

b141. MECHANICAL TRANSMISSION OF WHEAT
STRIATE MOSAIC VIRUS TO US LEAFHOPPER
VECTOR, ENDRIA INIMICA SAY. P.E.Lee: Virology,
1963, 19, 88-91 (Plant Res. Inst., Canada Agric.
Dept., Ottawa, Canada) The virus was transmitted
mechanically to virus-free leafhopper by injn. of clar-
ified extracts of viruliferous leafhoppers. Having become
infective the leafhoppers transmitted the virus until they
died. J.G. Repette

6142. ISOLATION FROM WHEY OF INHIBITORS OF THE BARLEY STRIPE MOSAIC VIRUS [BSMV]. W.A.F.Magborg, N.M.Chopra and W.S.Chełack: *Canad. J. Bot.*, 1963, 41, 1-12 (Canada Dept. Agric. Res. Sta., Winnipeg, Manitoba, Canada) Fractions isolated from whey were bioassayed to determine their potency as inhibitors of BSMV. Potent proteinaceous substances were obtained by dialysis, denaturation with ethyl alcohol and fractional pptn. with $(NH_4SO_4^*$). Increase in potency was associated with an increase in die proportion

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of material that moved towards the cathode in electrophoresis at pH 8[#]6. Elutions from the electrophoretic bands gave evidence of high potency in the 2 substances that moved towards the cathode but there was also evidence of degradation during elution. Solway purple had no effect on the inhibitory material but ninhydrin destroyed all its activity.

A.Meany

6143. STABILISATION OF BROME MOSAIC VIRUS BY MAGNESIUM AND CALCIUM. M.K.Brakke: *Virology*, 1963, 19, 367-374 (Plant Pathol. Dept., Nebraska Univ., Lincoln, Neb., U.S.A.) A descriptive account of stabilisation at various pH produced in purified virus prep, by Mg and Ca ions. J. G.Ben net te

6144. OLPIDIUM AS VECTOR OF TOBACCO NECROSIS VIRUS. D.S.Teakle and A.H.Gold: *Virology*, 1963, 19, 310-315 (Plant Pathol. Dept., California Univ., Berkeley, Calif., U.S.A.) Evidence is presented establishing that tobacco necrosis virus and the Olpidium zoospore form a sp. and intimate relationship which leads to transmission of infection. The fungus appears to be able to carry the virus both when swimming in suspension and when the zoospore protoplast penetrates the root.

J.G.Bennette

6145. CHROMATOGRAPHIC STUDIES ON PLANT VIRUSES. I. ISOLATION OF POTATO VIRUS X BY VARIOUS SYSTEMS OF ADSORPTION CHROMATOGRAPHY. J.H.Venekamp and W.H.M.Mosch: *Virology*, 1963, 19, 316-321 (Phytopathol. Res. Inst., Wageningen, Netherlands) A new chromatographic method is described that uses cellulose and various mixtures of polyethylene glycol in NaCl soln. Chromatography using calcium phosphate and DEAE-cellulose did not yield pure vias, as judged by the absence of nucleoprotein.

J.G.Bennette

6146. USE OF PROTEIN IN EXTRACTION OF COCOA SWOLLEN-SHOOT VIRUS FROM COCOA LEAVES. A.A.Brunt and R.H.Kenten: *Virology*, 1963, 19, 388-392 (West African Cocoa Res. Inst., Tafo, Ghana)

Macerating cocoa leaves infected with the virus in a medium containing phosphate, thioglycolate, diethylidithiocarbamate, and protein released virus that could be pelleted. Little or no virus separated in the absence of protein. Various proteins were tested. It was found that the amount of protein relative to the wt. of leaf material being extracted was more important than the concn. of protein in the medium. It is suggested that protein combines with leaf tannins diminishing the formation of non-infective virus-tannin complexes.

J.G.Bennette

6147. COMMENT ON 'APHID VECTOR AFFECTED BY ELECTROSTATICS'. R.Markham: *Virology*, 1962, 18, 647 (A.R.C. Virus Res. Unit, Huntingdon Rd., Cambridge, England) Prelim, comm.

J.G.Bennette

YEASTS AND FUNGI

6148. INFLUENCE OF NICOTINIC ACID ON THE GROWTH-STIMULATING EFFECT OF INOSITOL ON SACCHAROMYCES CARLSBERGENSIS. O.F.Braekkan and G.Boge: *Nature*, Lond., 1963, 198, 585-586 (Government Vitamin Lab., Norwegian Fisheries Res. Inst., Bergen, Norway) A marked depression of the

growth-stimulating effect of inositol on S. carlsbergensis was produced by addition of nicotinic acid. For reliable results in the assay of inositol, nicotinic acid must be added to this system.

G.M.Lewis

6149. E.M. OF MITOCHONDRIAL CHANGES IN SACCHAROMYCES. T.Hirano and C.C.Lindegreri: *J. ultrastructure Res.*, 1963, 8, 322-326 (Biol. Res. Lab., Southern Illinois Univ., Carbondale, Ill., U.S.A.) New lamellated mitochondria were observed in old cultures of yeasts under partial anaerobic conditions. They appeared to result from changes in the inner membrane of other mitochondria.

H.B.Waynfirth

6150. TOXIC METABOLITES OF ASPERGILLUS FLAVUS. R.D.Hartley, B.F.Nesbitt and J.O'Kelly: *Nature*, Lond., 1963, 198, 1056-1058 (Trop. Prod. Inst., London, England) Four unidentified toxic components have been purified from a crude toxin prep, of A. flavus. U.v., i.r. and nuclear magnetic resonance spectra of the 4 compounds are presented and discussed. Elementary analysis are also presented. The results indicate close similarities between the 4 components.

J.R.Sargent

6151. RAMULOSIN FERMENTATION. C.W.Hesseltine, C.R.Benjamin, B.Bradle and W.F.Hendershot: *Amer. J. Bot.*, 1963, 50, 209-210 (N.Region Res. Lab., Peoria, Ill., U.S.A.) A non-sporulating strain of Pestalotia ramulosa v Beyma NRRL 2826 produced large amounts of ramulosin but 2 other sporulating strains of this sp. did not. All 3 strains have similar C and N utilisation patterns. On optimal media 58% of the total dry wt. of culture consisted of ramulosin. It is not produced until after most of the mycelium is formed. A sporulating form that fails to produce ramulosin has been found in fermentations carried out at elevated temp.

T.H.Thomas

6152. MODIFIED CELLULOSIC MEDIUM FOR THE ISOLATION OF CELLULOLYTIC FUNGI FROM INFECTED MATERIALS AND SOILS. R.G.Bose: *Nature*, Lond., 1963, 198, 505-506 (Microbiol. Sect., Indian Jute Mills Assocn. Res. Inst., Calcutta, India) A cellulose medium prep, from filter paper treated with HCl is very suitable for isolation of cellulolytic fungi.

G.M.Lewis

6153. FINE STRUCTURE OF MYCOTA. K. FUNGAL MITOCHONDRIA. R.T.Moore and J.H.McAlear: *J. ultrastructure Res.*, 1963, 8, 144-153 (E.M. Lab., California Univ., Berkeley, Calif., U.S.A.) A survey of the micro-morphology of over 50 genera of Eumycota shows a variability of mitochondrial structure similar to that of algae and higher plants. There appear to be no main characteristics of fungal mitochondria.

H.B.Waynfirth

OTHER MICRO-ORGANISMS

(Some abstracts on Protoza, Diatoms etc. may be found in the Experimental Zoology and Botany Sections)

6154. MALARIA IN CHIMPANZEES. X. PRESUMED SECOND GENERATION OF THE TISSUE PHASE OF PLASMODIUM OVALE. R.S.Bray, R.W. Burgess and J.R.Baker: *XL EARLY FORMS OF THE PRE-ERYTHROCYTIC PHASE OF LAVERANIA FALCIPARA*. R.S.Bray

and A.E.G)nders Amer. J. trop. Med. Hyg., 1963, 12, 1-12. 13-18 (Liberian fast. Amer. Fndn. Trop.MW, Harbel, Liberia) X. 8 and 9 day old pre-erythrocytic schizonts of *P. ovale* and the exo-erythrocytic schizonts found in liver biopsies taken from chimpanzees 16 to 19 days after inoc. with sporozoites of *P. falciparum*. Evidence is presented to support the hypothesis of successive growing exo-erythrocytic generations of *P. ovale*.

X? ^ e2..2-5, 3, 3-5, and 4-day-old P"£<**>f_{rf} cytic forms of *L. falciparum* are described from the liver of a chimpanzee. These ranged with age from 4 to 24 fm. w diam. and from 2 to 250 in no. of nuclei. AU laying Parenchyma cells of the liver. A.A.Zimmerman

6155. LEISHMANIASIS IN THE SUDAN REP^{LIC.}

K. ECOLOGICAL RELATIONSHIPS OF SANDFLY SPECIES AND LEISHMANIA INFECTION. H.Hoogstraal and D.R.Dietlein. X. NATURAL INFECTIONS IN RODENTS. H.Hoogstraal. P.F.D.van Peenen, T.P.Reid and D.R.Dietlein: Amer. J. ^ . ^ i ! ^ 1963, 12, 165-174. 175-178 (Bureau Med. and Surg., Navy Dept., Washington, D.C.) Dan. no Leishmania

SSS^MSiBrWftfESgS
Jan in this Province. *P. orientalis* showed a high infection rate. *i*Sectrons identical with *L.donovani* on the basis of appearance in culture and pathogenesis in hamsters were recovered from 2 rodents, WZ^tf^{gg}Eg. PP.. trapped in Malakal town. Upper Nile province. It appears that a rodent-sandfly-rodent cycle of leishmaniasis occurs in this town, but that in the absence of man-biting sandflies, humans do not become infected in this urban centre. A.A.Zimmerman

6156. EPIDEMIOLOGY AND CONTROL OF H ^ A N TRYPARASOMIASIS IN GLOSSINA MORSITANS FLY BELTS. L.van den Berghe and F-L-Lambrechts Amer. J. trop. Med. Hyg., 1963, 12, 129-164 (Dept. Trop. Med. and Public Health, Tulane Univ, New CMjg ^ La., U.S.A.) *Trypanosoma pambiensis* is transmissible by flies of the *G. palpalis* group from inai to tsetse fly. This, together with fly control, is discussed fully. A.A.Zimmerman

6157. BOVINE TRYPARASOMIASIS ^ NIGERIA.

U. INCIDENCE AMONG SOME MIGRATING CATTLE WITH OBSERVATIONS ON KAMDJATK) N O P W r BLOOD PREPARATIONS AS METHOD OF SURVEY.

Sectn.

W. African Examination o brought for trypanosomiasis treatment during an annual migration through Zaria Pt ed significantly more *Trypanosoma congolense* than examination of corresponding wet prep. *T. vivax* was found in 23.3% of the infected animals, *T. congoense* in 76.7% and *X. brucei* in 4.7%. *T. uniforme* was not found. A. Meany

6158. CDLTWATIDNOFTOTOBJA ^ CONDII IN VITRO IN CONDITIONS IN WHICH TISSUES ARE

CULTIVATED. G.Jan: Wiad. parazyt., 1962, 8, 307-313 (Wojewódzki Zakład Hig. Weterynaryjnej, Katowice, Poland) Survey of literature. (Polish) M.Korbecki

6159. GROWTH REQUIREMENTS OF ENTAMOEBA HISTOLYTICA. VIE. THERMOLABILITY OF THE GROWTH-PROMOTING PROPERTIES OF THE CLG AND SHAFFER-FRYE MEDIA. J.G.Shaffer and V.Iralu: Amer. J. trop. Med., Hyg., 1963, 12, 19-21 (Lutheran Gen. Hosp., 1775 Dempster St., Park Ridge, IL, U.S.A.) The heat lability of the growth promoting ability of the CLG and Shaffer-Frye media for propagation of *E. histolytica* has been studied. The initial temp, for 15 min. heating is 55° and 53° respectively, but differences in pH, the presence of agar or loss of volatile gaseous elements may also play a role in determining heat lability. A.A.Zimmerman

6160. PASSAGE OF BACTERIOLOGICALLY STERILE ENTAMOEBA HISTOLYTICA IN HAMSTER LIVERS.

H.L.Wiles, S.E.Maddison, S.J.Powell and R.Elsdon-Dew: Ann. trop. Med. Parasitol., 1963, 57, 71-74 (Amoebiasis Res. Unit, Univ. Natal, Durban, S.Africa) Direct inoc. of pus from human cases of amoebic liver abscess and inoc. of *E. histolytica* from cultures (where it was associated with *Clostridium welchii*) produced bacteriologically sterile lesions in the liver of hamsters. P.J. Baron

6161. ALGAE: NITROGEN FIXATION BY ANTARCTIC SPECIES. O.Holm-Hansen: Science, 1963, 139, 1059-1060 (Dept. Bot., Univ. Wisconsin, Madison, Wis., U.S.A.) *Nostoc commune* was the only sp. of alga from terrestrial and freshwater habitats in Antarctica capable of growing in N-free medium. Assimilation of 15N was confirmed. G.M.Lewis

6162. EFFECTS OF TRIS (HYDROXYMETHYL) AMINO METHANE ON THE GROWTH OF HAEMATOCOCCUS PLUVIALIS FLOTOW: J.McLachlan: Canad. J. Bot., 1963, 41, 35-40 (Atlantic Regional Lab., Nat. Res. Council of Canada, Halifax, N.S., Canada) Tris inhibits growth of *Haematococcus* in ASM medium, a modified ASM medium. Inhibn. is reduced by increasing the Ca concn. of the medium; pH has no effect on Tris tolerance unless the level of Ca is increased and then an increase in pH reduces Tris toxicity. The results with *Haematococcus* are compared with results of a previous study on *Microcystis aeruginosa*. A.Meany

6163. EPIDEMIOLOGY OF ECHINOCOCCOSIS IN THE MIDDLE EAST. H. INCIDENCE OF HYDATID INFECTON IN SWINE IN LEBANON AND ITS SIGNIFICANCE. G.W.Luttermoser and M.Koussa: Amer. J. trop. Med., Hyg., 1963, 12, 22-25 (Dept. Trop. Health, Sch. Public Health and Med., American Univ. Beirut, Lebanon) One third of 300 mature swine examined were infected with hydatid cysts. The condition of the cysts indicates that swine are not important hosts of this infection in the Lebanon. A.A.Zimmerman

6164. HUMAN INFECTION WITH GONGYLONEMA IN GEORGIA. J.CDismuke, jun. and C.F.Routh: Amer. J. trop. Med. Hyg., 1963, 12, 73-74 (Georgia Dept. Publ. Hlth., Div. Lab., Atlanta, Ga., U.S.A.) This report describes the extraction of a single *Gongylonema* from the lower lip of a man in Georgia and suggests the source was shallow wells or the ingestion of cockroaches. A.A.Zimmerman

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AGENTS ACTING AGAINST MICRO-ORGANISMS

(See also Pharmacology)

ANTIBIOTICS AND CHEMOTHERAPY

6165. MODIFIED SUBSTRATE SPECIFICITY OF CELL-BOUND PENICILLINASE. E.Ron-Zenizer and N.Citri: Nature, Lond., 1963, 198, 887-888 (Dept. Bacteriol., Hebrew Univ., Hadassah Med. Sch., Jerusalem, Israel) The membrane-bound Y'Penicillinase of Bacillus cereus 569/H has a different and broader range of specificity than the extracellular penicillinase. Its activity against methicillin is 10 times greater than that of a-penicillinase. It is suggested that the location of an enzyme with respect to a cell structure may determine the range of its activity. G.M.Lewis

6166. TECHNIQUES FOR RAPID AND SENSITIVE DETECTION OF PENICILLINASE. R.J.Holt and G.T. Stewart: J. clin. Path., 1963, 16, 263-267 (Queen Mary's Hosp., Carshalton, Surrey, England) Penicillinase production was detected by spot inocn. of the test organism onto membrane filters placed on the surface of nutrient agar containing 2jjg./ml. penicillin G and seeded with the Oxford staphylococcus. For the newer penicillins a two-stage technique was employed. For quant. estimations, antibiotic gradient plates were used. The method was suitable for staphylococci, coliforms and Proteus, and for lysates, filtrates and dialysates. J.B.Derbyshire

6167. INFECTIONS DUE TO METHICILLIN-RESISTANT STRAINS OF STAPHYLOCOCCUS PYOGENES. J.W.Harding: J. clin. Path., 1963, 16, 268-270 (Central Middlesex Hosp. Path. Dept., London, England) Methicillin- resistant strains of S. pyogenes were isolated from 2 human infections. Both strains were of the same phage type, but the infections differed markedly in severity. J.B.Derbyshire

6168. ANTIBACTERIAL ACTIVITY OF DEMETHYL-CHLOROTETRACYCLINE COMPARED WITH OTHER TETRACYCLINES. S.Gay and L.Grassi: Biochim. appl., 1962, 9, 303-308 (Lab. ricerche Gibipharma S.p.A., Milano, Italy) Demethylchlortetracycline was shown to be superior in vitro to chlortetracycline against Bacillus cereus, Salmonella typhi, Staphylococcus pyogenes and Corynebacterium diphtheriae. (Italian) J.C.Crawhall

6169. LIPOLYTIC ACTIVITY OF STAPHYLOCOCCI V. EFFECT OF CHLORAMPHENICOL. VI. EFFECT OF PENICILLIN. N.Macri: Biochim. appl., 1962, 9, 349-354, 355-360 (1st. Microbiol., Fac. Di Scienze, Univ. Messina, Italy) V. The hydrolytic cleavage by staphylococci of Tweens 20, 40, 60 and 80 was studied in the presence of chloramphenicol (10-80 (zg./ml.) at increasing diln. of inoculum. Inhibn. of hydrolysis of Tween 80 occurred most readily, followed by Tween 20. Tween 40 and 60 were about equiv. in this assay.

VI. Penicillin at levels of 5000-100000 U/ml. was not as effective as chloramphenicol in inhibiting the hydrolysis of any Tween, though hydrolysis of Tween 80 was the most readily affected. (Italian) J.C.Crawhall

6170. EFFECT OF 5-IODO-2'-DEOXYURIDINE ON VACCINIA VIRUS IN VITRO. B.Loddo, S.Muntoni and W.Ferrari: Nature, Lond., 1963, 198, 510

(Dept. Pharmacol., Univ. Cagliari, Italy) 3[#]3 |ig⁷ ml. 5-iodo-2'-deoxyuridine inhibits the cytopathogenic effect of vaccinia virus (a DNA virus) but is without effect even at 100 times this concn. on the RNA viruses polio 1 and Coxsackie B3. G.M.Lewis

6171. CURE OF VACCINIA INFECTION BY 5-IODO-2'-DEOXYURIDINE [IDU]. H.E.Kaufman, A.B.Nesburn and E.D.Malone: Virology, 1962, 18, 567-569 (Ophthalmol Div., Florida Univ., Gainesville, Fla. U.S.A.) IDU is known to cure or greatly improve severe corneal herpes simplex infection. IDU also cures advanced corneal vaccinal keratitis in rabbits. In about half the treated eyes, no virus could be detected after treatment, whereas virus was present in all the untreated eyes. J.G.Bennette

OTHER AGENTS

6172. EFFICIENCY OF ANTISEPTICS WHEN ACTING ON DRIED ORGANISMS. R.Hare, E.Raik and S.Gash: Brit. med. J., 1963, i, 496-500 (St. Thomas's Hosp. London, England) Ability of antiseptics to kill several spp. of organisms in dried broth films on glass surfaces was investigated. 1% sol. of cresol, phenolic coal-tar distillate, chloroxylenol and of Na hypochlorite and 70-90% ethyl alcohol killed all spp. tested in < 5 min Longer periods were required with 0.5% and 0.02% chlorhexidine, 0.5% and 1% phenol, 1.4% formaldehyde and 0.5% phenol + 1% formaldehyde (liquor formaldehydi chirurgicalis). Spores of Bacillus subtilis were unaffected by all except Na hypochlorite and formaldehyde. Tests with 6 more strains of Staphylococcus aureus showed that 0.5% chlorhexidine took 20-30 min. to kill all the organisms compared with < 5 min. for 1% chloroxylenol and 1% lysol. Similar tests with 14 more strains of Pseudomonas pyovanea showed that 1% chloroxylenol and 0.5% chlorhexidine were as effective against this organism as 1% lysol. M.E.Nutt

6173. DISINFECTION OF HANDS; REMOVAL OF RESIDENT BACTERIA. E.J.L.Lowbury, H.A.Lilly and J.P.Bulb: Brit. med. J., 1963, i, 1251-1256 (Accident Hosp., Birmingham, England) Various soap and detergent prep, containing hexachlorophane or polyvidone iodine were more effective than ordinary bar soap in removal and suppression of resident bacteria of the hands. A single application of hexachlorophane prep, had little disinfecting action, but reduction in flora was apparent 1 hr. after the first application and was progressively greater after 1-2 days repeated use. Polyvidone iodine had a larger initial effect and also some cumulative action after repeated use. M.E.Nutt

6174. EFFECT OF SOME ANTISEPTIC REAGENTS ON THE BACTERIAL FLORA OF SMALLPOX LYMPH. E.Cardone: J. Hyg., Lond., 1963, 61, 187-192 (New York City Health Dept., E. 16th St., New York, U.S.A.) Smallpox calf pulp derived from animals whose skin was treated with Roccal (alkyl dimethylbenzy¹ ammonium chloride) showed a more rapid diminution in bacterial flora in the presence of 0.5% phenol and 0.8% ether than prep, from calves which were not skin-treated. Vaccine lymph containing 0.2% Roccal caused no untoward reactions in rabbits or humans, and the viral potency of the vaccines was not affected." J.B.Derbyshire

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6175. CASE OF VACCINIA NECROSUM (OR PROGRESSIVE VACCINIA), WITH SEVERE HYPOGAMMAGLOBULINAEMIA, TREATED WITH n-METHYL ISATIN B-THIOSEMICARBAZONE (33T57). T.H.Flewett and F.L.Ken J. cUn-Path., 1963, 16, 271-277 (Little Bromwich Gen. Hosp., Birmingham, England) In a total case of vaccinia necrosom with hypogammaglobulinemia in a baby, treated with γ -globulin and 33T57, intranuclear as well as cytoplasmic inclusion bodies were found in the skin epithelial cells. Vaccinia virus was isolated from the skin lesion, local lymph node, brain and kidney. • J.B. Derbyshire

6176. HEAT INACTIVATION OF INFECTIOUS RNA OF POLIO AND TOBACCO MOSAIC VIRUSES. M.P.Gordon, J.W.Huff and I.J.Holland: Virology, 1963, 19, 416-418 (Biochem. Dept., Washington Univ., Seattle, W\$h., U.S.A.) Prelim. comm. J.G.Bennette

6177. STERILISATION OF AIR FILTERS FOR HIGH PRE-VACUUM AUTOCLAVES. R.J.Fallon: J. clin. Path., 1963, 16, 259-260 (Ruchill Hosp., Glasgow, Scotland) Two spp. of bacteria failed to grow. * rough a glass fibre filter when placed on the outside of the filter, or through the glass fibre filter paper, but a fungus did penetrate through squares of glass fibre paper. Glass fibre filter retained its efficiency. In a steriliser which was used for 96 sterilisation cycles during 1 yr. J.B.Derbyshire

SOIL MICROBIOLOGY

§178. DEVELOPMENT CYCLE OF RHIZOBIUM LUPINI IN ROOT NODULES. J.Gqlfbowska and U.Stypniewska:

Acta microbiol. poi., 1962, 11, 313-318 (ZaHlad Roflin Pastewnych, Poznañ, Poland) Six stages have been distinguished using a differential staining technique. M.Korbecki

6179. EFFECT OF THE PLANT AND OF ECOLOGICAL CONDITIONS ON DEVELOPMENT OF SYMBIOSIS BETWEEN LUPINE AND RHIZOBIUM LUPINI. J.Gqlebiov/ska and U.Stypniewska: Acta microbiol., pol., 1962, 11, 319-328 (ZaHlad Roflin Pastewnych, Poznañ, Poland) Symbiosis with R. lupini was not observed in lupine plants grown in alk. media, N-deficient media and under conditions of light deficiency; red-light was indispensable for development of R. lupini. M.Korbecki

6180. PHOSPHATASE ACTIVITY OF RHIZOZIUM. L.Zelazna: Acta microbiol. pol., 1962, 11, 329-334 (Uniw. Marii Curie-Styfodowskiej, Lublin, Poland) Rhizobium strains (52/60) showed alk. phosphatase and 41 strains acid phosphatase: the activity of the former enzyme being distinctly higher. The activity of alk. phosphatase was higher in the strains showing higher growth rate. M.Korbecki

6181. DEHYDROGENASES OF RHIZOBIUM. AN 'EFFECTIVE' AND 'NON-EFFECTIVE' STRAIN OF RHIZOBIUM TRIFOLII. J.De Ley and P.Manik Ann. Inst. Pasteur, 1963, 104, 524-528 (Lab. Microbiol., Fac. Sci., Ghent, Belgium) 'Effective*' and 'non-effective*' bacterial prep. from R. trifolii have been studied with regard to their dehydrogenase activity. Dehydrogenases for D-galactose, D-xylose, L-arabinose, lactose, maltose, Na D-gluconate, Na lactobionate, Na D, L-lactate, mannitol, sorbitol, Na D,L-malonate, Na fumarate, Na succinate, Na L-mandelate were demonstrated. The activities were variable, but no significant differences between 'effective*' and "non-effective*" strains were noted. (French) B.Payne

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ANTIBIOTICS AND CHEMOTHERAPY

6182. A GLUCURONIDE METABOLITE OF SULPHAMETHOMIDINE IN HUMAN URINE. F.J.DiCarlo, S.G.Malamant and G.E. Phillips: *Toxicol. appl. Pharm.*, 1963, 5, 392-400 (Biochem. Dept., Warner-Lambert Res. Inst., Morris Plains, NJ., U.S.A.) Sulphamethomidine is excreted in human urine partly as an N⁴-acetyl conjugate and partly as an ether glucuronide in which the glucuronic acid moiety is linked to the pyrimidine nucleus. E.E.Hobbiger

6183. LABORATORY STUDIES ON OXACILLIN. J.O.Klein, L.D.Sabath and M.Finland: *Amer. J. med. Sci.*, 1963, 245, 399-412 (Dept. Med., Harvard Med. Sch., Boston, Mass., U.S.A.) Oxacillin (5-methyl-3-phenyl-4-isoxazolyl penicillin) is orally effective and acts on penicillinase-producing staphylococci and those that do not produce penicillinase. It is more active than methicillin against the former but less active than penicillin G against the latter. The new penicillin has an affinity for plasma proteins and data on its absorption, after oral and i.m. administration, and urinary excretion are presented. E.E.Hobbiger

6184*. COMPARATIVE LABORATORY AND CLINICAL OBSERVATIONS ON TWO NEW ORAL PENICILLINS, QXACILLIN AND ANCILLIN. H.Abu-Nassar, T.W. Williams, jun. and E.M.Yow: *Amer. J. med. Sci.*, 1963, 245, 459-466 (Dept. Med., Baylor Univ. Coll. Med., Houston, Tex., U.S.A.) A therapeutic and laboratory investigation of 2 new partially-synthetic penicillins which are penicillinase-resistant and stable in acid. The results indicate that the new penicillins are approx. equiactive in vitro and in vivo and are devoid of serious toxicity. E.E.Hobbiger

6185. INTERFERENCE OF PYRIDOXINE METABOLISM BY PENICILLIN. V.Perotti: *Atti. Acad. med. Lombarda*, 1962, 17, 466-468 (Lab. di Biochim. Ospedale Maggiore Milano, Italy) Male rats maintained on a vitamin controlled diet were given 50000 I.U. of penicillin G i.m. daily for 30 or 75 days and then oxalic or xanthemic acid was administered and the amount of these compounds excreted in the urine measured after 24 hr. In animals on a complete diet, the addition of penicillin to the diet caused no changes in the amount of oxalic and xanthemic acid excreted in the urine compared with the non-penicillin treated animals. In animals maintained on a pyridoxine-deficient diet, penicillin caused a significant increase in urinary oxalic acid excreted after oxalic acid dosing as compared with the non-penicillin treated controls, but had no effect on the xanthemic acid excretion. (Italian) G.N.Godson

6186. PENICILLIN IN GERM-FREE GUINEA-PIGS. S.B.Formal, G.D.Abrams, H.Schneider and R-Laundy: *Nature, Lond.*, 1963, 198, 712 (W.Reed Army Inst. Res., Washington, D.C., U.S.A.) Normal guinea-pigs inj. with a single dose of penicillin died within 7 days from enterocolitis, the bowels containing large no. of Gram-neg. organisms. Guinea-pigs reared in a germ-free environment did not succumb to penicillin, nor to infection with *E. coli* isolated from a moribund penicillin-treated animal. G.M.Lewis

6187. SALIVARY EXCRETION AND INACTIVATION OF SOME PENICILLINS. CADLER-HRADECKY and

B.Kelentey: *Nature, Lond.*, 1963, 198, 792-793 (Dept. Stomatol., Dept. Pharmacol., Univ. Med. Sch. Debrecen, Hungary) After administration i.m., I.v. or per os of procaine-penicillin, methoxy-phenyl penicillin, ethoxyphenyl-penicillin, penicillin G potassium, dibenzylethylenediaminedi-penicillin or dimethoxyphenylpenicillin to rabbits previously inj. with pilocarpine, blood and saliva levels of the penicillins were measured for 24 hr. G.M.Lewis

6188. PENICILLAMINE AND VITAMIN B₆ INTER-RELATIONSHIPS IN THE RAT. J.G.Heddle, E.W.McHenry and G.H.Beaton: *Canad. J. Biochem.*, 1963, 4: 1215-1222 (Dept. Nutr., Sch. Hyg., Univ., Toronto, Ont., Canada) Changes in blood transaminase activities after 13 days of treatment were used to illustrate a definite antagonism of vit. B₆ to DL-penicillamine (0-25% level of diet) in rats of either sex. The effects of the drug on food intake, body wt., and transaminase activity were not completely prevented by even 2000 fig vit. B₆/10 g. diet. 50 mg. pyridoxine HCl was suggested as giving near-max. protection against possible vit. B₆ antagonistic effects of 1[#]5 g. DL-penicillamine. These studies may have significance in the treatment of Wilson's disease by penicillamine. A.M. Gibbins

6189. THE FUNGISTATIC ACTION OF SOME CHEMIC COMPOUNDS ON CANDIDA ALBICANS. J.Alkiewicz E.Janiak and S.Kucharski: *Arch. Immunol. Ter. dosw* 1962, 10, 633-638 (Szkola Med., Poznań, Poland) The fungistatic action of some chemical compounds on *C. albicans* was defined in fungistatic units. The strong fungistatic action was shown by merthiolate, quinosol ar Gentian Violet. H.Osowiecki

6190. ACTION OF ANTIFUNGAL ANTIBIOTIC, NYSTATIN ON THE PROTOZOA LEISHMANIA DONOVANI. IE. STUDIES ON THE LYSIS OF CELLS OF L. DONOVANI B.K.Ghosh and A.N.Chatterjee: *Ann. Biochem.*, 1963, 23, 173-186 (Indian Inst. for Biochem. and Expt. Med., Calcutta, India) Lysis of the cells by nystatin was studied under different conditions and results compared with lysis of the cells by other surface-active compounds. In the presence of nystatin the cells were lysed to the same extent as by osmotic shock. The lysis was very sensitive to pH change. L.Barne

6191. EFFECT OF DITHIAZANINE, GIVEN AT VARIOUS INTERVALS AFTER INFECTION ON TRICHINELLA SPIRALIS IN MICE. M.ftlvey and T.CDefeo: *Amer. J. trop. Med. Hyg.*, 1963, 12, 62-64 (Dept. Microbiol., Univ. of Missouri, Mo., U.S.A.) Dithiazanil iodide, given orally to mice infected with *T. spiralis*, proved effective at 2 and 4 mg. levels Ag- body wt. only if given soon after infection. The same concn. of drug given on the 7th, 14th or 21st day after infection for 3 days did not cause a reduction in the no. of larvae recovered. Dithiazanine at 1 mg./kg. body wt. caused 1 reduction in larvae regardless of the time interval between infection and administration. A.A.Zimmerman

6192. EFFECT OF COMBINING STREPTOMYCIN WITH NITROFURAZONE ON THE DEVELOPMENT OF RESISTANCE OF STAPHYLOCOCCUS AUREUS IN VITRO. J.Bielawski: *Arch. Immunol. Ter. dosw.*, 1962, 10t 639-644 (Akad. Med., Wrocław, Poland) It was found that the combined treatment of *S.aureus* with streptomycin and nitrofurazone slowed the development of resistance to both these antibacterial drugs. H.Osowiecki

6193. TUBERCULOSTATIC EFFECT OF NITROFURANE DERIVATIVES. S.A.Oiler, K-K.Medne, K.K.Venter, S.K.Germane and A.Ia.Zile: Dokl. Akad. Nauk., 1962, 144, 108-111. A study was made of the tuberculostatic effect of a-, β -unsat. and polyene aldehydes and ketones of the 5-nitrofuran series. Their effect was compared with that of streptomycin and isoniazid. Some of the deriv. were found to be effective for resistant strains. (Russian) B.J.cooper

6194. DIRECT PROPORTIONALITY OF EXCRETION RATE AND SERUM LEVEL OF TETRACYCLINE IN HUMAN SUBJECTS. T.Chulski, R.H.Johnson, C.A. Schlagel and J.C.Wagner: Nature, Lond., 1963, 200, 450-453 (Upjohn Co., Kalamazoo, Mich., U.S.A.). Urinary excretion rate of unchanged orally administered tetracycline is directly proportional to the serum level of tetracycline in man. The apparent vol. of distribution of tetracycline was determined to be about 100% of the body wt. J.R.Sargent

6195. TURBIDIMETRIC ASSAY OF CHLORAMPHENICOL. R.B.Mukherjee, J.K.Chatterjee, B.K.Bose and B.N. Dutta: Indian J. Microbiol., 1962, 2, 101-11 (es. and Develop. Lab., Dey's Med. Stores (Mfg) Pvt. Ltd., Calcutta, India). Turbidimetric methods are described for the assay of chloramphenicol employing different test organisms e.g. Micrococcus PVOgenes var. 4ureus, E. coll, iridescens, pyymomaes, Salmonella, tifiosa, S. paratyphirosa B and S. Typhimurium. The dose ^ 3 S curve is linear up to at least 25 μ g/mL. G.M.Lewis

6196. PYRVINIUM PAMOATE IN THE TREATMENT OF STRONGYLOIDIASIS. E.D.Wagne: Amer. J. trop. Med. Hyg., 1963, 12, 60-61 (Dept. Microbiol., Sch. Med., Univ., Loma Linda, Calif., U.S.A.) Use of pyrvinium pamoate on 34 Ethiopians suggests that this drug may have a curative effect in infections or Strongyloides stercoralis. A.A.Zimmerman

6197. CLINICAL TRIALS WITH THIABENDAZOLE [MK-360] AGAINST HUMAN STRONGYLOIDIASIS. K.H.Franz: Amer. J. trop. Med. Hyg., 1963, 14, 211-214 (Firestone Plantations Co., Harbe, uoenaj MK-360 has proved to be effective in the treatment of Strongyloidiasis. Side effects can be repressed by the use of small-particle formulations. A.A.Zimmerman

6198. STUDIES ON CHEMOPROPHYLAXIS OF LOASIS. n. OBSERVATIONS ON D^THY^RBAMA Zme CITRATE (BANOCIDE) AS PROPHYLACTIC IN MAR. B.O.Duke: Ann. trop. Med. Parasitol., 1963, 57, 82-96 (Helminth. Res. Unit W.African Coanc. Med. Res., Kumba, W. Cameroon) Expt. carried out on 4 volunteers indicate that 5jrg./kg. Banocide taken daily for 3 consecutive days once a month should give complete prophylaxis against Loa loa. r.j.uaron

6199. HOOKWORM PROBLEM IN THE GREATER BUENOS AIRES AREA WITH PARTICULAR REFERENCE TO CHLOROPHENOL THERAPEUTIC EFFICACY OF TR. Med. Hyg., PIPERAZINE. J.Waks: Amer. J. trop. Rawson Hosp., 1963, 12, 56-59 (Dept. Parasitology, ts in 30 patients Buenos Aires, Argentina) Trial of chlorophenol suggest that single dose treatment with PiPerazine can be used for mass *era Py A #A zimmerman

6200. SUPPRESSIVE ACTIVITY OF SODIUM ANTIMONY DIMERCAPTOsuccinate [TWSB] IN EXPERIMENTAL INFECTIONS WITH SCHISTOSOMA MANSONI. J.I.Bruce and E.H.Sadun: Amer. J. trop. Med. Hyg., 1963, 12, 184-187 (Dept. Med. Zool., W.Reed Army Med. Center, Washington, D.C., U.S.A.) Lm. injn. of TWSB into Macaca mulatta monkeys, expt. infected with S. mansoni, resulted in suppressing the passage of eggs in their faeces. Drug toxicity was not observed.

A. A. Zimmerman

6201. SYNTHESIS AND BIOLOGICAL PROPERTIES OF 1-(4-METHYLELENOBIPHENYL-4')-2-DICHLORO-ACETYLAMINOPROPANDIOL-1,3[MS]. J.Supniewski, F.Rogoz and J.Krupifiska: Dissert. Pharm., 1962, 14, 21-27 (Zalfad Farmakol., Polska Akad. Nauk. Krakow, Poland) MS has been synthesised from 2-methylselenobiphenyl. It is highly toxic for white mice; it inhibits Gram-pos., Gram-neg. and the acid fast bacilli but does not affect pathogenic fungi. (Polish) W.Chmurzyfiska

6202. SYNTHESIS AND BIOLOGICAL PROPERTIES OF 1-(4-METHYLTHIOBIPHENYL-4')-2-DICHLORO-ACETYLAMINOPROPANDIOL-1,3) [MTP]. J.Supniewski, F.Rogoz and J.Krupifiska: Dissert. Pharm., 1962, 14, 13-20 (Zalfad Farmakol., Polska Akad. Nauk. Krakow, Poland) MTP was synthesised and the corresponding biphenyl analogue of chloromycetin obtained after Bambas were proved more toxic than chloromycetin itself. Both deriv. inhibited Gram-pos. bacteria and acid fast bacilli and to a lesser extent Gram-neg. bacteria. No action was observed on pathogenic fungi. (Polish) W.Chmurzyfiska

6203. DEHYDROXYLATION OF CAFFEIC ACID BY RAT AND RABBIT CAECAL CONTENTS AND SHEEP RUMEN LIQUOR. A.N.Booth and R.T.Williams: Nature, Lond., 1963, 198, 684-685 (Dept. Biochem., St. Mary's Hosp. Med. Sch., London, England) Inhibn. of intestinal micro-organisms by neomycin or "Dimol" prevented the dehydroxylation of caffeic acid administered orally to rats. Incubation of caffeic acid with caecal contents led to the appearance of 3,4-dihydroxyphenylpropionic acid, ja-hydrazycyphenylpropionic acid and ni-hydroxycinnamic acid. Similar dehydroxylation was produced by caecal contents from the rabbit and by sheep rumen micro-organisms. G.M.Lewis

CENTRAL NERVOUS SYSTEM

6204. STUDIES OF RESPIRATORY GAS FLOWS. A COMPARISON USING DIFFERENT ANAESTHETIC AGENTS. E.S.Munson, M.Farnham and W.K.Hamilton: Anesthesiology, 1963, 24, 61-67 (Div. Anaesthesiol., State Univ., Iowa City, Iowa, U.S.A.) An analysis is given of 72 pneumotachogram tracings on patients anaesthetised with different anaesthetics.

A.A.Zimmerman

6205. ANESTHETIC MANAGEMENT DURING OPEN INTRACARDIAC SURGERY. R-A.Theyre, E.A.Moffitt and J.W.Kirklin: Anesthesiology, 1962, 23, 823-827 (Sect. Anesthesiol., Mayo Clinic, Rochester, Minn., U.S.A.) An account is given of current anaesthetic practice at the Mayo Clinic during all phases of open intracardiac surgery. Pre-operative medication, induction

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and maintenance of anaesthesia and management during perfusion are discussed.
A.A.Zimmerman

6206. CLINICAL AND BIOCHEMICAL STUDIES OF CYCLOPROPANE ANALGESIA IN OBSTETRICS. S.M.Snidler, F.Moya, V.Thorndike, A.Bossers, H.Morishima and L.S.James: *Anesthesiology*, 1963, 24, 11-17 (Dept. Anaesthesiol., Columbia Univ., New York, U.S.A.) Cyclopropane analgesia is claimed to be a safe, simple and effective means of inducing maternal pain relief with no apparent depression of the infant. 26 ref. A.A.Zimmerman

6207. HAEMODYNAMIC AND CENTRAL NERVOUS ACTIONS OF CYCLOPROPANE IN THE DOG. H.L.Price, W.A.Cook, jun., S.Deutsch, H.W.Linde, R.D.Mishalove and H.T.Morse: *Anesthesiology*, 1963, 24, 1-10 (Dept. AnesthesioL, Univ. Pennsylvania Sch. Med., Philadelphia, Pa., U.S.A.)

A report is given of studies on the autonomic and circulatory actions of cyclopropane in dogs. Perfusion of the head alone with blood containing cyclopropane increased the systemic arterial mean and pulse pressures and catecholamine concn., but exposure of the body alone gave diametrically opposed results. The effect of depressing 'depressor' neurones in the medulla oblongata is discussed. A.A.Zimmerman

6208. ESTIMATION OF HALOTHANE TENSIONS IN BLOOD BY GAS CHROMATOGRAPHY. I.F.H.Purchase: *Nature*, Lond., 1963, 198, 895-896 (Dept. Vet. Clin. Studies, Sch. Vet. Med., Cambridge, England) A method is described for the rapid and accurate estimation of halothane in blood by determination of its concn. in a gas phase in equilibrium with blood. G.M.Lewis

6209. PERFORMANCE OF DIGITALISED HEART DURING HALOTHANE ANAESTHESIA. S.Shimosato and B.Etsten: *Anesthesiology*, 1963, 24, 41-50 (Dept. Anaesthesia, Tufts Univ. Sch. Med., Boston, Mass., U.S.A.) Determinations of left and right ventricular function curves, tension time index and left ventricular stroke power were made in non-medicated and non-operated dogs prior to and after digitalisation, and during halothane anaesthesia. Ventricular function curves were drawn and discussed. 47 ref. A.A.Zimmerman

6210. INCIDENCE OF CATECHOLAMINE-INDUCED ARHYTHMIAS DURING HALOTHANE ANAESTHESIA. N.Andersen and S.H.Johansen: *Anesthesiology*, 1963, 24, 51-56 (Dept. Anesthesia, County Hosp. Copenhagen, Gentofte, Hellerup, Denmark)

Increased myocardial excitability occurs as readily with infusion of adrenaline as with noradrenaline during halothane anaesthesia. The risk of evoking ventricular arrhythmias is increased with infusion rates of >10 fig./min. and in the presence of arteriosclerotic cardiac disease. A.A.Zimmerman

6211. TRYPTAMINE RECEPTORS IN THE C.N.S.: EFFECTS OF ANAESTHETICS. E.Marley and J.R.Vane: *Nature*, Lond., 1963, 198, 441-444 (Inst. Psychiatry, Maudsley Hosp., London, England) Small doses of pentobarbitone depressed spinal reflexes in cats and their response to tryptamine mainly through an action on the reticular formation, whereas anaesthetic doses also depressed spinal reflexes directly. The effects of anaesthetic doses of chloralose, hydroxydione and halothane on spinal reflexes and the action of tryptamine and its analogues is also reported. G.M.Lewis

6212. EFFECT OF METHOTRIMEPRAZINE ON RESPIRATION. J.W.Pearson and T.J.DeKornfeld: *Anesthesiology*, 1963, 24, 38-40 (Dept. Anaesthesiol., Baltimore City Hosp., Baltimore, Md., U.S.A.)

A study was made of respiratory depression produced by 3 new phenothiazine analgesic, methotriimeprazine. 15 mg. produced no significant respiratory depression.

A. A. Zimmerman

6213. ANTAGONISM BETWEEN NALORPHINE AND CHLORPROMAZINE. E.Frommel, LV-LeSebur and M.Beguin: *Arch. int. Pharmacodyn.*, 1963, 143, 52-77 (Inst. Therapeutics, Fac. Med., Geneva, Switzerland) Nalorphine antagonised and prevented the hypothermic and sedative actions of chlorpromazine in various animals, but had no effect on the respiratory depressant action of chlorpromazine. The hypothesis of competitive antagonism between alkaloids is discussed and questioned. (French) T.J.Sullivan

6214. ELECTRICAL ANAESTHESIA. A.van Poznak: *Anesthesiology*, 1963, 24, 101-108 (Cornell Univ. Med. Coll., New York, U.S.A.) A review. 41 ref. A.A.Zimmerman

6215. ACTIVE STRUCTURE OF LOCAL ANAESTHETICS. EFFECTS ON ELECTRICAL AND CHOLINESTERASE ACTIVITY. P.Rosenberg, H.B.Higman and E.Bartels: *Biochim. biophys. Acta*, 1963, 66, 406-414 (Dept. Neurol., Coll. Phys. and Surg., Columbia Univ., New York, U.S.A.) The inhibn. of AChase purified from electric tissue by procaine, dibucaine and tetracaine and the quaternary analogue of tetracaine decreased as the pH increased from 6 to 9. As the pH was raised from 7.5 to 9 the inhibiting effects of procaine and tetracaine decreased more than that of the quaternary tetracaine. Carbamylcholine and quaternary tetracaine blocked the electrical activity of the isolated single electroplax about equally well at pH 6 and pH 9. Tetracaine was more potent at pH 6 than at pH 9. B.M.Stevens

6216. MEMBRANE POTENTIALS IN ISOLATED AND ELECTRICALLY STIMULATED MAMMALIAN CEREBRAL CORTEX. EFFECTS OF CHLORPROMAZINE [CPM], COCAINE [CC], PHENOBARBITONE [PB] AND PROTAMINE [PTM] ON TISSUES' ELECTRICAL AND CHEMICAL RESPONSE TO STIMULATION.

H.H.Hillman, W.J.Campbell and H.McD.Lwain:

J. *Nearochem.*, 1963, 10, 325-339. Using glass capillary microelectrodes a mean value of -38 mV for resting membrane potential [RMP] was found in guinea-pig brain slices. 1 min. after cessation of 1 min. stimn. RMP fell to 0 to 20 mV. Recovery to prestimn. levels took approx. 3 min. RMP were diminished by 50 pM CPM and increased by 0-3 mg./ml. PTM. The fall in RMP after stimn. was diminished or recovery accelerated by 50 μ M CPM, 300 μ M PB or 20 fM CC. CPM inhibited Na and K fluxes during stimn. Spike discharges with after potentials were frequently observed when the micro-electrodes pierced the tissue. These discharges were unaffected by any of the drugs studied. R. Woodman

6217. INFLUENCE OF NEOCORTICAL AND HIPPOCAMPAL SPREADING DEPRESSION ON THETA RHYTHM* ELICITED BY PHYSOSTIGMINE.

Z.Bohdanecky, T.Weiss and E.Fifkova: *Arch. int. Pharmacodyn.*, 1963, 143, 23-33 (Res. Inst. Pharmacy and Biochem., Prague, Czechoslovakia) High voltage, 4-7 c/s, e.e.g. waves are recorded from the hippocampus and the tegmental reticular formation in rats. The waves are elicited by physostigmine 1 nig./kg.

i.p. and are hot influenced by spreading depression in *e neocortex or in the contralateral hippocampal and reticular areas.
S.E. Smith

6218. PHARMACODYNAMICAL EFFECTS OF A VOLATILE FRACTION ISOLATED FROM SESELI SIBIRICUM (BENITH). K.S.Jamwal, O.P.Sethi and L.C.Chopra: Arch. int. Pharmacodyn., 1963, 143, 41-51 (Dept. Pharmacol., Res. Lab. Jammu and Kashmir, Jammu Tawi, India) Pharmacol. effects of a suspension of *S. sibiricum* oil in 10% aq. gum acacia are studied using intact rats and dogs and isolated organ Prep. The oil induces sedation and slight analgesia and Potentiates the action of pentobarbitone. It causes hypotension and respiratory stimn. in morphine-phenobarbitone-anaesthetised dogs, vasoconstriction in the isolated hind-Umb and a spasmolytic action in uterine and intestinal Prep.
S.E. Smith

6219. SOME CENTRAL NERVOUS SYSTEM DEPRESSANT PROPERTIES OF 2-METHYL-3- α -TOLYL-4(3H)-QUINAZOLINONE (TR-495). L.C.Weaver, W.R.Jones and T.L.Kerley: Arch. int. Pharmacodyn., 1963, 143, 119-126 (Biomed. Res. Dept., Pitman-Moore Co., Indianapolis, Ind., U.S.A.) In mice and rats TR-495 50-400 mg./kg. orally or i.p. produces central depressant effects: enhancement of hexobarbitone hypnosis, hypnosis, hypothermia, antagonism to pentylenetetrazole seizures and tremorine tremors.
S.E. Smith

6220. PROCAINE ESTERASE ACTIVITY IN HUMAN BRAIN. R.Guiffre, G.Moricca, R.Cavaliere and A.Masla: Clin. chim. Acta, 1963, 8, 54-57 (Inst. Biol. Chem., Univ., Rome, Italy) Human brain substance homogenates were shown to catalyse the hydrolysis of procaine to ϵ -aminobenzoic acid and diethyl-aminoethanol. The effects of pH and substrate concn. on the initial velocity of hydrolysis were studied. K.Brew

6221. PHARMACOLOGICAL PROPERTIES OF SOME OXAZOLINE DERIVATIVES. J.Krupińska and R.Rembiesa: Dissert. Pharm., 1962, 14, 131-142 (ZaHiad Farmakol., Akad. Med., Kraków, Poland) 2-(1-naphthylamine)- and more so 2-(4-merhoxy-1- α -phthylamine)-deriv. of oxazoline show tranquillising Prop. in contrast to 2-phenylamine- and 2-(1-biphenyl-amine)deriv. The effects of both naphthylamine deriv. were tested with regard to the level of b.p., the rate of Aspiration and function of nictitating membrane in cat, the movements of isolated intestine and body hyper-tension in rabbits, the menstrual cycle in mice, diuresis in rats, and sugar, lactic acid, pyruvic acid and cholesterol level in blood of rabbits. Some observations were also made during evipan anaesthesia, cardiazol and strychnine convulsions¹ (Polish) J.Barafiska

6222. CENTRAL NEUROUS EFFECT OF ANTIDIABETIC SULPHONYLUREA COMPOUNDS. K.Lehotzky, LMészáros and L.Tardos: Acta physiol. Acad. Sci. hung.* 1963, 23, 219-223 (Pharmacol. Lab., Chinoiin Pharmaceut. Works, Budapest, Hungary) Lv. tolbutamide causes strychnine-like convulsions; e.g. show these to involve the entire cortex. H.G.Bevan

6223. VARIATIONS IN PLASMA POTASSIUM LEVELS OF MOTHER AND FOETI OF RATS ACCORDING TO THE NATURE OF THE ANAESTHETIC ADMINISTERED TO

GESTATING FEMALES. J.Manley: C.R. Soc. Biol., Paris, 1963, 157, 82-84 (Lab. Physiol. comparSe, Fac. Sci., Paris, France) 40 rats in the 21st day of gestation were anaesthetised by diethyl ether or s.c. injn. of 5 mg./100 g. Nembutal. The plasma K level of rats receiving ether was 4¹03 mequiv./l. while that of rats receiving Nembutal was 4¹9 mequiv./l. In the case of the foeti the level of those from Nembutal anaesthetised rats was 4²25 mequiv./l* and from ether anaesthetised rats 5¹ mequiv./l. (French) M.A.Price

6224. SUICIDE WITH TOFRANIL, A PSYCHO-PHARMACEUTIC. J.L.Obersteig and J.B.Sumlen: Arch. Toxicol., 1962, 19 (6), 339-344 (Med. Inst. Univ. Basel, Switzerland) A new method of estimation of tofranil is described. Use is made of thin layer chromatography and u.v. spectroscopy. The drug is very easily oxidised and undergoes rapid metabolic changes. Special colour tests are given for the identification of these metabolites. (German) LCornish

6225. ON THE DETECTION OF REVONAL [BARBITURATE FREE NARCOTIC] POISONING. M.G.Mallinckrodt and L.Lautenbach: Arch. Toxicol., 1963, 20, 31-37 (Inst. Med. Univ., 853 Erlangen-Nürnberg, Germany) The widespread use of Revonal coupled with some fatal suicide attempts has led to a novel method of detection. Use is made of u.v. spectroscopy and various chromato-graphic techniques allied with sp. spot tests. It is claimed that Revonal can be extracted from human organs 9 months after death. (German) LCornish

6226. THE DETECTION OF CONTERGAN AND DORIDEN [GLUTARIC ACID DERIVATIVES] ESPECIALLY IN CADAVEROUS MATERIAL. W.Paulus and R.Keymer: Arch. Toxicol., 1963, 20(1), 38-43 (Inst. Med. Univ., 53 Bonn, Germany) A method is described for the simult. detection of these 2 drugs. The tests are: resorcinol melt, treatment with hydroxylamine, cobalt acetate and metal complex formation, chromatographic techniques etc. Details for the extraction from human organs are also given. (German) LCornish

6227. ELIMINATION OF INTERFERENCE DUE TO UREA IN THE DETERMINATION OF MEPROBAMATE WITH ρ -DIMETHYLAMINOBENZALDEHYDE. S.L. Kanten: Clin. chim. Acta, 1963, 8, 2-4 (V.A. Hosp., Palo Alto, Calif., U.S.A.) Incubation of 1¹0 ml. of serum at 50' for 15 min. with one drop of urease prior to extraction eliminates the interference of urea with the colorimetric determination of serum meprobamate with ρ -dimethylaminobenzaldehyde. Urease does not affect the drug, as it is being extracted from either water or serum. K.Brew

6228. INTERFERENCE PATTERNS IN TWITCH POTENTIATION OF THE RAT PHRENIC NERVE-DIAPHRAGM BY ARYL ESTERS OF TROPINE AND β -TROPINE. IV. S.L.Friess and R.C.Durant: Toxicol. appl. Pharm., 1963, 5, 358-370 (Div. Physical Biochem., Naval Med. Res. Inst., Nat. Naval Med. Center, Bethesda, Md., U.S.A.) The enhancement of the twitch response of the isolated phrenic nerve diaphragm, stim. directly or indirectly, by mixtures of ϵ -tolylacetate esters of tropine and β -tropine and of α -chlorophenylacetates was investigated. The results, which give information on the extent to which the effects of the drugs are additive, are discussed in terms of Waser's pore model of the post-synaptic membrane. E.E.Hobbiger

PHARMACOLOGY

6229. EFFECT OF ALKALOSIS ON THE ACTION OF THE NEUROMUSCULAR BLOCKING AGENTS. R.L.Katz, S.H.Ngai and E.M.Pappen: *Anesthesiology*, 1963, 24, 18-22 (Dept. Anaesthesiol., Coll. Phys. and Surg., Columbia Univ., New York, U.S.A.) The effect of Na₂CO₃-induced alkalosis on the action of the neuromuscular blocking agents was studied in the cat sciatic nerve-tibialis muscle prep. Alkalosis antagonised the action of (+)-tubocurarine and decamethonium but potentiated the action of gallamine, dimethyl tubocurarine, and succinylcholine. A.A.Zimmerman

6230. DECURARISING ACTION OF COFFEE ON STRIATED MUSCLE OF MAMMALS. J.Delga and P.Foulhoux: *CR. Soc. Biol.*, Paris, 1963, 157, 54-58 (Centre d'Etudes du Bouchet, Vert-le Petit, S.-et-O., France) I.v. injn. of 50 mg./kg. caffeine to chloralose anaesthetised mice after curarisation with 1 mg./kg. (+)-tubocurarine resulted in reappearance of contractions of the right abdominal muscles. Caffeine reversed the effects of 0.1 mg./kg. (+)-tubocurarine on the sciatic-gastrocnemius prep. of the chloralose anaesthetised rat. (French) M. A. Price

6231. ACTIONS OF METHAMINODIAZEPoxide ON CARDIAC, SMOOTH AND SKELETAL MUSCLES. B.R.Madan, J.D.Sharma and D.S.Vyas: *Arch. int. Riarmacodyn.*, 1963, 143, 127-137 (Pharmacol. Dept., Med. Coll., Bikaner, India) Methaminodiazepoxide had weak anti-ACh activity on isolated smooth and skeletal muscles. It did not antagonise the inhibitory action of ACh on the atria nor benefit auricular arrhythmias. However, it suppressed ectopic ventricular tachycardia after ligation of the coronary arteries in dogs. T.J.Sullivan

6232. ACTION OF SUCCINYL CHOLINE ON MUSCLE FIBRE CONTRACTION: POSSIBLE THERAPEUTIC USES. G.Francesco and G.Rossi: *Atti. Acad. med. Lombarda*, 1962, 17, 447-449 (Clin. Ostet. and Ginecologia, Univ. Milano, Italy) Review. 24 ref. (Italian) G.N. Godson

6233. EFFECT OF SUCCINYL CHOLINE ON THE MUSCULAR SPASMS OF THE UTERUS (TOCOGRAPHIC EXPERIMENTS). G.Francesco, A.Ferrero and G.Rossi: *Atti. Acad. med. Lombarda*, 1962, 17, 450-452 (Clinica Ostet. e Ginecologia, Univ. Milano, Italy) Tocographic tracings taken before and after the i.v. administration of succinylcholine to patients undergoing caesarian section, showed that the drug depressed the uterine contractions. (Italian) G.N.Godson

6235. EFFECT OF ACh ON ISOLATED HEART FROM THIAMINE DEFICIENT RATS. B.Bhagat: *Arch. int. Pharmacodyn.*, 1963, 143, 17-22 (Dept. Physiol. and Pharmacol., Chelsea Coll. Sci. and Technol., London England) Thiamine deficiency or slight excess did not affect die amplitude or rate of the isolated rat heart, nor the response to ACh. T.J.Sullivan

6236. CONDUCTION BLOCK PRODUCED BY ACETYLCHOLINE IN CETYLTRIMETHYLMONIUM-TREATED FROG NERVES. R.R.Walsh and G.D.Webb: *Biochem. Pharmacol.*, 1963, 12, 451-456 (Dept. Physiol., Univ. Colorado Med. Sch., Denver, Colo., U.S.A.) After pretreatment with the synthetic cationic surfactant, cetyltrimethylammonium bromide, frog sciatic nerves were found to be very susceptible to axonal conduction block by externally applied ACh, as shown by depression of the amplitude of the A-potential. The block was completely reversible at 0.02M, and largely but not completely reversible at 0.1M. The response was not due to deficiency of Na in the medium* The effect appeared to be non-sp. but the surfactant pre-treatment might have modified the physico-chem. prop* of the axonal membranes and thus any previously existing specificity. L.G. Gillies

6237. INFLUENCE OF ATROPINE ON ENZYME PRODUCTION IN PANCREAS. K.Heinkel and H.Rubin: *Z. Ges. exp. Med.*, 1963, 136, 571-581 (Med. Clin. and Polyclinic, Univ. Erlangen-NHrnberg, Erlangen, Germany) In rats, amylase and lipase activity were reduced in the serum and increased in xht pancreas after atropine(0.005-1.0 mg. i.p.). (German) P.F.Meyer

6238. BIOSYNTHESIS OF NORADRENALINE IN ISOLATE! CANINE HEART. C.A.Chidsey, G.A.Kaiser and E.Braunwald: *Science*, 1963, 139, 828-829 (Cardiology Branch, Nat. Heart Inst., Bethesda, Md., U.S.A.) When radioactive dopamine was inj. into the blood perfusing an isolated dog heart, noradrenaline obtained from the heart 1 hr. later contained between 1-10% of the radioactivity. The turnover of noradrenaline was higher in the ventricles than in the atria. G.M.Lewis

6239. NORADRENALINE SYNTHESIS FROM TYROSINE-14C IN ISOLATED PERFUSED GUINEA-PIG HEART. S.Spector, A.Sjoerdsema, P.Z.Nirenberg, M.Levitt and S.Udenfriend: *Science*, 1963, 139, 1299-1301 (Nat. Heart Inst., N.I.H., Bethesda, Md., U.S.A.) The isolated, perfused guinea-pig heart synthesised nor-adrenaline from [14c]tyrosine at rates comparable to those reported for the intact animal. G.M.Lewis

6240. DIFFERENCES IN D- AND L-NORADRENALINE-3H. J.J.Kopin and W.Bridgers: *Life Sci.*, 1963, No. 5, 356-362 (Barnes Hosp., St. Louis, Mo., U.S.A.) 1 hr. after the administration of the labelled catecnolamines, the 3H/14C ratios of noradrenaline [NA] in the heart and spleen were similar in rats receiving the mix*. tures containing L- or D,L-NA-1⁴C. The 3H/14C ratio in the tissue NA of animals receiving D, L-NA-1⁴C with D, L-NA-3H was the same at 1 and 24 hr. K.Jones

6241. RELEASE OF NORADRENALINE FROM SYMPATHETIC POST GANGLION FIBRE. J.H.Burn: *Bull. Johns Hopk. Hosp.*, 1963, 112, 167-182 (Pharmacol. Dept., Oxford Univ., Oxford, England) Review. 48 ref. H.B.Wayforth

AUTONOMIC NERVOUS SYSTEM

6234. FURTHER STUDIES ON THE CONFORMATION OF ACh. J.H.Feliman and T.S.Fujita: *Biochim. biophys. Acta*, 1963, 71, 701-705 (Div. Neurol., Univ. Oregon Med. Sch., Portland, Ore., U.S.A.) I.r. absorption spectra and acylation rates of a no. of ACh analogues were examined. Results indicated that the shift toward the higher energy of the i.r. absorption of the ACh carbonyl peak and its higher rate of acylation argued against a cyclic conformation and for an inductive influence of the quaternary N. B.M.Stevens

^{6242.} METABOLISM OF [14C]NORADRENALINE BY CAT BRAIN IN VIVO. E.Mannarino, N.Kirshner and B.S. Nashold: J. Neurochem., 1963, 10, 373-379 (Duke Univ. Med. Center, Durham, N.C. U.S.A.) After injn. of 35 µg. [14C]noradrenaline (2 pc) into the lat. ventricle of cat brain under amytal anaesthesia, chief metabolites found in brain tissue were normetadrenaline (NMA) and 3-methoxy-4-hydroxyphenyl glycol (MPG). TMA and MPG conjugate appeared in the urine. Ipronilazid (i.p. injn. 24, 15 and 3 hr. before adrenaline, injn.) did not affect brain catabolites apart from slightly accelerating their formation but inhibited their subsequent oxidation as judged by a higher proportion of urinary NMA. Evidence for catechol-O-methyl transferase as the main system in brain for adrenaline inactivation is discussed. R. Woodman

^{6243.} MODE OF ACTION OF γ -AMINOBUTYRIC ACID ON THE CARDIOVASCULAR SYSTEM. H.C.Stanton: Arch. int. Pharmacodyn., 1963, 143, 195-204 (Pharmacol. Dept., Colorado Univ. Med. Center, Denver, Colo., U.S.A.) Lv. administered GABA caused hypotension in dogs, rabbits, guinea-pigs and cats. Results suggested that this effect was due to a transient block of peripheral autonomic ganglia.

T.J.Sullivan

^{6244.} POTENTIATION OF THE PRESSOR ACTIVITY OF L-NORADRENALINE BY GUANETHIDINE. L.Cavalca, U.Marini and C.Novi: Atti. Acad. med. Lombarda, 1962, 17, 378-384 (1st. patologia spec. med., Univ., Milano, Italy) In dogs, normal and deprived of their Mnal medulla from C1-L2 and infused with (-)-noradrenaline, treatment with guanethidine (5 mg./kg. body w/f) Produced protracted strengthening of the pressor effects of the noradrenaline infusion. A second and third Buanethidine administration did not produce this potentiation but gave a hypotensive effect.

(Italian) G.N.Godson

^{6245.} INHIBITION BY SPARTEINE AND POSTHYPOPHYSEAL EXTRACTS OF THE INVERSION OF ADRENALINE DURING URETHANE ANAESTHESU. A.Baisset, P.Montastruc and G.Puig; C.R. Soc. Biol., Paris, 1962, 156, 2127-2130 (Lab. de Physiol., Fac. de M6d., Toulouse, France) 25 mg. /kg. asparteine pltfiae inhibited the inversion of the effect of 2 mg./⁸. adrenaline on b.p. of dogs anaesthetised with 1 g. Jtrethane/kg. A similar inliibn. was obtained with totuitary extracts containing 6 I.U. vasopressm to 10 I.U. ^o*ytocin. Oxytocin did not inhibit the inversion of the adrenaline effect. Sparteine sulphate lowered the pH of *e blood. (French) M.A.Price

^{6246.} A VASOPRESSOR RESPONSE TO ISOPRSNALINE IN THE CAT. K.R.Butterworth: Nature, Lond., 1963, 198, 897-898 (Dept. Pharmacol., St. Mary's Hosp. Med. Sch., London, England) Large doses of iso-fenallnc given i.v. to cats have 2 effects on the vascular system:- (i) a 0-adrenergic blocking action which prevents the falls in b.p. normally produced by small doses, w/tfe not antagonising the depressor effect of other substances such as ACh and histamine; it converts the [^]pressor effect of ethyl noradrenaline to a pressor one and prevents the fall in b.p. from small doses of ^{ad*}enaline, (ii) an excitatory effect on a-adrenergic receptors which causes a rise of b.p. G.M.Lewis

^{6247.} LATENT VASOPRESSOR EFFECT OF 5HT TO THE CHICKEN R.D.Bunag and E.J.Walaszek: Arch. int. S. T. S. S. 1963, 1443, 10881118 (Dept. Pharmacol., ffil^SSi Mod. Centr. Kansas City, Kansas, U.S.A.) Vascular effects of 5HT are studied in phenobarbitone-

anaesthetised White Leghorn hens. The initial depression response is blocked by atropine, compound 48/80 or para-bromdylamine. The latent pressor effect is diminished by BAS-phenol and UML-491 but unaffected by reserpine, cocaine, or phenoxy-benzamine. 5HT is shown to have a vasoconstriction action on the isolated wing. The action is thought to be due to a direct effect on smooth muscle.

S.E.Smith

^{6248.} DEMETHYLATION OF METANEPHRINE-7-H IN VIVO. A.F.de Schaepdryver, Z.M.Bacq, W.de Potter, J.Rensonand G.Crieb Arch. int. Pharmacodyn., 1963, 143, 285-286 (Heymans Inst. Pharmacol., Ghent Univ., Belgium) Following the administration of 25-75 [ic [7-3H]metanephrine to rabbits, [3H]adrenaline, noradrenaline and 3,4-dihydroxymandelic acid are isolated from urine and liver, demonstrating that both O and N-demethylation of metanephrine occur.

S.E.Smith

^{6249.} NEUROMUSCULAR EFFECT OF 5HT. M.M.Gromakovskia: Dokl. Akad. Nauk, 1962, 144, 236-241. Expt. on frog muscle prep, showed that the increased work capacity in skeletal muscles produced by anticholinesterase substances is effected by the participation of 5HT. (Russian) BJ.Cooper

^{6250.} HYPERTENSIVE ACTION OF SODIUM GLUTAMATE. P.Bouvet, T.Gayet-Hallion and N.Dorme: C.R. Soc. Biol., Paris, 1962, 156, 2001-2005.

I.v. injn. of 20-60 mg. Na glutamate/kg. to rabbit resulted in a moderate hypertensive response which was abolished by mecamylamine and attenuated by phenolamine. Adrenalectomy decreased the effect of Na glutamate. /fid*! • (French) M.A.Price

^{6251.} BLOOD PRESSURE EFFECTS OF GUANETHIDINE AND TYRAMINE IN DOG. JJ.Reuse and F.Bergmanre C.R. Soc. Biol., Paris, 1962, 156, 2146-2149 (Lab. Pharmacodynamie, Univ. libre de Bruxelles, Belgium)

The threshold dose for an increase in b.p. of pentobarbital anaesthetised dogs by guanethidine was 0*5 mg./kg. Max. response was obtained with a dose of 4-5 mg. Aft-Pretreatment with 1 mg. guanethidineAg- increased the hypertensive effects of 0*8 fig. adrenaline/kg, and 50 jig. tyramine/kg. inj. 20-40 min. later. (French) M.A.Price

^{6252.} EFFECTS OF RESERPINE, GUANETHIDINE AND a-METHYL-dopa ON RESISTANCE TO COLD. M.Pouliot and J.Leblanc: Arch. int. Physiol., 1963, 71, 73-82 (Dept. Physiol., Laval Univ., Quebec, Canada) Rats were adapted to cold by exposure to 5° for 1 month. Injn. of reserpine, 1 mg./kg. i.m., 2 hr. before exposure to -20° accelerated fall in body temp, and decreased survival time. A similar dose given 48 hr. before exposure had no effect. Injn. of 15 mg./kg. guanethidine i.p. 24 hr. before exposure to -20° had no effect, but when this was given (10 mg./kg. i.p.) every 3 days during cold adaptation resistance to cold increased. Administration of a-methyl-dopa, 300 mg./kg. i.p., twice daily during acclimatisation had the opposite effect. Administration of similar doses of a-methyl-dopa to non-acclimatised rats for 3 days before exposure to -20° also decreased their survival time compared with that of controls. Results confirm the importance of catecholamines in resistance and adaptation to cold. The increase in thermogenic activity of noradrenaline injn. during chronic exposure to cold may be due to a relative deficiency of the amine which increased the sensitivity of the animals to its metabolic effects.

(French)

M.E.Nutt

PHARMACOLOGY

6253. DOPAMINE: ITS OCCURRENCE IN MOLLUSCAN GANGLIA. D.Sweeney: *Science*, 1963, 139, 1051 (Biol. Lab., Harvard Univ., Cambridge, Mass., U.S.A.) Fluorometric and paper chromatographic evidence indicates that dopamine is the only catecholamine present in the ganglia of 3 gastropods and 7 pelecypods examined. G.M.Lewis

6254. DL-DIHYDROXYPHENYLALANINE AND ELEMENTARY EMOTIONAL BEHAVIOUR. B.N.Halpern, C.Drudi-Baracco and D.Bessirard: *C.R. Soc. Biol.*, Paris, 1963, 157, 85-90. In mice, administration of DL-dopa induced a modification of emotional behaviour which appeared as a group toxicity. Pretreatment with MAO inhibitors reduced the dose of dopa which induced group toxicity. The group toxicity of dopa was influenced by the ambient temp. Chlorpromazine and reserpine attenuated the group toxicity provoked by dopa but at higher doses than those necessary to abolish the group toxicity of amphetamine. (French) M.A.Price

6255. 3,4-DIHYDROXYPHENYLACETIC ACID [DOPAC] IN RABBIT CORPUS STRIATUM NORMALLY AND AFTER RESERPINE TREATMENT. Nils-Erik Anden, Björn-Erik Roos and B.Werdin: *Life Sci.*, 1963, No. 5, 319-325 (Dept. Pharmacol., Univ. of Göteborg, Sweden) 2 hr. after the administration of reserpine the DOPAC value in the corpus striatum increased about 3 times. The rise of the DOPAC concn. corresponded to about 60% of the released dopamine and returned to normal after 12 hr. The effect of reserpine on the 5HIAA level in the brain stem was also studied, and the results are discussed. K.Jones

6256. AMPHETAMINE AND AMMONSHORN-SCLEROSIS. T.McLardy. *Nature*, Lond., 1963, 198, 900 (St. Andrew's Hosp., Northampton, Northants., England) A neurohistol. survey has been made of 11 guinea-pigs in which 10 mg. amphetamine was inj. i.m. before exposure to carbon monoxide hypo-oxia. Five animals showed full seizures and 2 of these had ischaemia in CA2 cells, and 6 animals had no seizure and no ischaemia. In 11 controls not premedicated with amphetamine, there was ischaemia and seizures in all the animals. This expr. evidence may point to a reason for the development of ammonshorn-sclerosis in young epileptics receiving a daily small dose of amphetamine. G.M.Lewis

6257. EFFECTS OF DIPHTHERITIC TOXAEMIA ON BLOOD VESSELS. S.N.Arsecularatne: *J. Path. Bact.*, 1963, 85, 21-33 (Bact. Dept., Univ. of Ceylon) The vascular response to i.v. injn. of (-)-noradrenaline is examined in the rabbit sedated with i.m. Na pentobarbitone by direct observation of mesenteric vessels of an exteriorised loop of upper ileum and of scrotal vessels. Constrictor response is assayed by % reduction of vessel diam. 30 hr. after i.m. injn. of *Corynebacterium diphtheriae* gravis, the response to this drug is reduced: injn.-to-response times before and after infection are equal. Lesions are found at this time in the adrenal glands of infected animals. D.Murray

ENDOCRINES

6258. INFLUENCE OF ANABOLIC STEROIDS VERSUS EFFECT OF GLUCOSE ON MUSCULAR DEGENERATION

IN PIGS. P.C.Hart, D.Kroeske, W.Sybesma and H.E.v.d.Veen: *Nature*, Lond., 1963, 198, 716 (Res. Inst. for Animal Husbandry, 'Schoonoord', Driebergenweg, 10 D, Zeist, Netherlands) When examining the degree of muscle degeneration in pigs, the transmission value method provides a sharper distinction than visual examination. Treatment of pigs with anabolic steroids ('Durabolin') favourably affects muscle degeneration, while the abnormality is promoted by administration of glucose in the feed. - G.M.Lewis

6259. EFFECT OF CERTAIN CYTOSTATIC AND FUNGISTATIC STEROIDS ON ACTIVITY OF THE RETICULO-ENDOTHELIAL SYSTEM. T.Nicol and D.L.J.Bilbey. *Nature*, Lond., 1963, 198, 492 (Dept. Anat., King's Coll., Strand, London, England) Six synthetic steroids inj. s.c. into mice were tested for their effect on the phagocytic activity of the RE system after injn. of carbon. Two main inhibitors of phagocytosis were androst-5-ene-30,16g-diol and 3|3-methoxyandrost-5-en-16g-o_l. G.M.Lewis

6260. REVIEW OF WORK WITH LCI. 33828. A NON-STEROIDAL PITUITARY INHIBITOR. A.S.Parkes: *J. Reprod. Fertil.*, 1963, 5, 460-461 (Physiol. Lab., Univ. Cambridge, Cambridge, England). Abstract. H.E.H.Jones

6261. THYROID FUNCTION DURING TREATMENT WITH ERGOT DERIVATIVE LYSERGIC ACID BUT^aNOLAMIDE [MLAB]. L.Szánó, A.L.Reviczky and T.Grynaeus: *Acta med. Acad. Sci., hung.*, 1963, 19, 169-183 (2nd Dept. Med., State Inst. Rheumatol., Budapest, Hungary) MLAB a known 5HT antagonist, was found to increase thyroid activity of rats in every parameter studied. There was evidence of increased secretion of TSH and it is suggested that MLAB may increase peripheral deiodination, stimulate thyroid function directly, and stimulate thyroid function indirectly via the hypothalamic-pituitary system. G.F.Blane

6262. ANTI-FERTILITY EFFECTS WITH SOME RETROSTEROIDS [17a- ALLYL-90-10a-ANDROST-4-EN-17-OL-3-ONE, 3,17-DIACETOXY-9B-100C-ANDROSTA 3,5-DIENE, 17a -(2^f-METHALLYL)-9|3,10a-ANDROST 4-EN-17-OL-3-ONE] IN ANIMAL EXPERIMENTS. H.F.L.SchWen J. *Reprod. Fertil.*, 1963, 5, 457 (N.V. Philips-Duphar, Weesp, Netherlands). Abstract. H.E.H.Jones

6263. CONTRACEPTIVE EFFECT OF ORAL PROGESTINS: PROPERTIES OF COMPOUND SC-11800, A NEW ORAL INHIBITOR. V.A.Drill: *J. Reprod. Fertil.*, 1963, 5, 464 (Div. Biol. Res., G.D.Searle and Co., Chicago, Ill., U.S.A.) Abstract. H.E.H.Jones

6264. EFFECTS OF LONG-TERM USE OF OVULATION INHIBITORS ON EXCRETION OF OVARIAN STEROIDS. R.P.Shearman: *J. Reprod. Fertil.*, 1963, 5, 459 (Obstet. Dept., Univ. Sydney, Sydney, N.S.W., Australia). Abstract. " H.E.H.Jones

6265. ANTIOVULATORY AND OTHER BIOLOGICAL PROPERTIES OF MEGESTROL ACETATE, 17a-ACETOXY-6 METHYL PREGNA 4:6-DIENE-3:20-DIONE (B.D.H. 1298). A.David, K.Edwards, K.P.Fellowes and J.M.Plummen J. *Reprod. Fertil.*, 1963, 5, 333-348 (Biol. Dept., British Drug Houses Ltd., Godalming, Surrey, England) B.D.H. 1298 appears to be the most potent anti-ovulatory compound so far reported. It is also a highly active oral progestational substance, being

more active in the Clauberg assay than medroxy progesterone acetate, norethynodrel and dimethisterone given orally, and progesterone s.c. It is non-toxic in mice and rats except at high doses in rats where some adrenal atrophy was observed. It has no anabolic, androgenic or oestrogenic prop, and no virilising effect on the developing foetus,

H.E.H.Jones

6266. ABSENCE OF ANTI-PROGESTATIONAL EFFECTS OF JTI-XYLOHYDROQUINONE IN WOMEN. P.K.Malkan and S.Suijan: J. Reprod. Fertil., 1963, 5, 458 (All India Inst. Med. Sci., New Delhi, India). Abstract. H.E.H.Jones

6267. ORAL CONTRACEPTION AND BLOOD COAGULABILITY. O.Egeberg and P.A.Owren: Brit. med. J., 1963, i, 220-221 (Univ. Hosp. Rikshospitalet, Oslo, Norway) In 5 healthy women contraceptive therapy with Enovid was followed by shortened plasma cephalin time, marked increase in factor VIII activity and slight increase in factor VII activity. No significant changes were observed in blood samples collected at intervals during 1 menstrual cycle in 5 healthy non-treated women. M.E.Nutt

6268. ORAL AND RECTAL THYMOLYTIC ACTIVITIES OF SOME ANTI-INFLAMMATORY STEROIDS IN WEANLING RATS. M.A.Pratt, R.M. Atkinson, E.A. Woollett and E.G.Tomich: J. Endocrin., 1963, 26, 451-455 (Glaxo Res. Ltd., Greenford, Middx., England)

Anti-inflammatory steroids, including cortisone, prednisolone, becamethasone and dexamethasone, and some of their phosphates, acetates and hemisuccinates were compared for thymolytic activity in rats by oral and rectal routes. A comparison is made between the information obtained on rectal absorption and published information on rectal absorption in man. It appeared that the degree of rectal absorption, both in man and weanling rat, depends on the chem. nature of the steroid and the form in which it is presented.

G.F.Biane

6269. TISSUE PREDNISOLONE DISAPPEARANCE. V.Kemeny and P. Vecsei: Acta physiol. Acad. Sci. hung., 1963, 23, 137-142 (Res. Dept., State Inst. Rheumatol., Budapest, Hungary) Rats weighing 150-200 g. were given 12·5 mg. of prednisolone i.v. and killed at 5-60 min. Blood disappearance rates for Prednisolone corresponded to $\frac{1}{2}$ -life values from the literature. Liver homogenates contained amounts increasing with time after dose. The kidney contained both prednisolone and prednisone, the rate of conversion to Prednisone increasing for 30 min. and thereafter decreasing. H.G.Bevan

6270. RESPONSE OF SUBMANDIBULAR GLAND OF CASTRATED MOUSE TO LOCAL AND SYSTEMIC and I.

Dept., Univ., Birmingham, England) The atrophic submandibular glands of the castrated mouse are restored in wt. by both systemic and local administration of testosterone and 17 α -ethyl-19-nor-testosterone. From a concomitant study of levator ani muscles and seminal vesicles it is concluded that the effect on the submandibular glands presents an anabolic rather than androgenic activity and the utilisation of this response in an assay procedure is discussed.

G.F.Biane

6271. PRESENCE OF A POSSIBLE CAFFEINE-STEROID COMPLEX IN HUMAN URINE. EXMihlawa and K.B.Eik-Nesr: J. Chromatography, 1963, 10, 493-496

(Dept. Biol. Chem., Univ. Utah, Coll. Med., Salt Lake City, Utah, U.S.A.) A caffeine-cortisone complex has been isolated and characterised from human urine. This complexing phenomenon was found only in about 36% of normal individuals. Acid hydrolysis yielded cortisone and caffeine. After infusion of 14-14C]cortisol, [14C]cortisone bound to caffeine was isolated from the urine. No complex was detected from individuals maintained on a caffeine-free diet. P.D.Dawkins

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6272. CUMULATIVE DOSE-RESPONSE CURVES.

J.M.Van Rossum and F.G.Van Den Brink: Arch. Int. Pharmacodyn., 1963, 143, 240-246 (Pharmacol. Dept., R.C. Univ. Med. Sch., Nijmegen, Netherlands) Cumulative dose-response curves for stimulant drugs on isolated intestine can be made by increasing the drug concn. in the organ bath step by step without washing out after each single dose. The time for making a complete curve is about 2 min. Histaminic and muscarinic drugs were used as stimulants.

T.J.Sullivan

6273. METHOHEXITAL AND ITS EFFECT ON LIVER FUNCTION TESTS. N.M.Bitrich, A.V'R.Kane and R.E.Moshen: Anesthesiology, 1963, 24, 81-90 (Dept. Anaesthesiol., Providence Hosp., Detroit, Mich., U.S.A.) Methohexitol produces more depression of liver function than thiopental or thiamyal, but produces less depression on the basis of equal anaesthesia.

A.A.Zimmentfan

6274. EFFECT OF HISTAMINE ON ARTERIAL BLOOD AMMONIA IN MAN. M.D.Turner and O.A.Arpaek: Nature, Lond., 1963, 198, 590-591 (Dept. Med., Royal Free Hosp., London, England) In human subjects with liver disease treated with promethazine i.m., histamine caused a rise in blood ammonia levels within 0·5-1 hr.; this was presumably related to gastric secretion.

G.M. Lewis

6275. HISTAMINE ACTION OF THE LATEX OF CALOTROPIS GIGANTEA AIT. J.C.Saha and S.Kasinathan: Arch. int. Pharmacodyn., 1963, 143, 78-89 (Biol. Dept. Med. Coll., Pondicherry, India) C. gigantea

latex was found to possess all the pharmacol. prop. of histamine, and results of paper chromatography and electrophoresis indicated the presence of histamine in the latex in large quantity.

T.J.Sullivan

6276. INHIBITION BY ANTIHISTAMINES OF THE CYTOTOXIC ACTION OF HISTAMINE IN CLONE CULTURED CELLS. LFand: Arch. int. Pharmacodyn., 1933, 143, 1-7 (Cytopsiol. Lab., Creedmoor Inst. Psychobiol. Studies, Queens Village, New York, U.S.A.) In the quant. clonal tissue culture bioassay, homogeneous populations of a stable cell-culture strain, D-98 (normal adult bone marrow) were used. Chlorglycine and diphenhydramine protected a significant proportion of the cell population from lethal concn. of histamine, and were not themselves cytotoxic. No histamine release from these cells by 48/80 was detected.

T.J.Sullivan

6277. ANTIHISTAMINE DRUGS ON RAT PREGNANCY: EFFECTS OF PYRILAMINE AND MECLOZINE.

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F.Bovet-Nitti, G.Bignami and D.Bovec Life Sci., 1963, No. 5, 303-310 (Dept. Therap. Chem., Inst. Super, di Sanita, Roma, Italy) Pyrilamine [mepyramine] administration in the early stages of pregnancy in rats caused an increase in the freq. of implantation anomalies and several toxic effects appearing in the last stages of pregnancy. Meclozine had no effects.

K.Jones

6278. ANTIHISTAMINE AND ANTIBRADYKININ EFFECTS OF NORMAL URINE EXTRACTS. B.A.Kovacs and K.I.Melville: Nature, Lond., 1963, 198, 1060-1061 (Dept. Pharm., McGill Univ., Montreal, Canada) Extracts of mammalian urine contain a substance (or substances) which antagonises both in vitro and in vivo the effects of histamine and bradykinin and in vitro antagonises the anaphylactic response.

J.R.Sargent

6279. MECHANISM OF DECIDUALISATION. H. HISTAMINE-RELEASING ACTION OF PYRATHIAZINE. G.J.Marcus, P.F.Kraicer and M.CShelesnyak. **HI. DECIDUALISATION IN HISTAMINE-DEPLETED RAT.** P.F.Kraicer, G.J.Marcus and M.CShelesnyak: J. Reprod. Fertil., 1963, 5, 411-418, 419-423 (Biol. Reprod. (Biodynamics), Weizmann Inst. Sci., Rehovoth, Israel) n. Injn. of the antihistamine pyrathiazine in rats induced extensive decidualisation of the uterus, produced a characteristic histamine-release syndrome, and increased the urinary excretion of histamine two-fold. Pretreatment with pyrathiazine protected rats from the lethal effects of histamine-liberator compound 48/80, but not of histamine. Pyrathiazine was therefore shown to release histamine in the rat, and its effectiveness as a decidual inducer is consistent with the postulated role of histamine in decidual induction.

In pregnant and pseudopregnant rats depleted of histamine by treatment with compound 48/80 or pyrathiazine the decidual reaction in response to endometrial trauma was markedly reduced, while systemic induction with pyrathiazine was prevented completely. These observations support the hypothesis that decidualisation by systemic pyrathiazine is mediated by histamine released systemically, whereas induction by local stimuli is mediated by histamine released in the uterus only.

H.E.H.Jones

6280. ATTEMPTED DECIDUALISATION IN HAMSTER AND RAT WITH PYRATHIAZINE. M.W.Orsini: J. Reprod. Fertil., 1963, 5, 325-332 (Anat. Dept., Wisconsin Univ., Madison, Wis., U.S.A.) Limited decidioma formation was seen in hamsters inj. i.p. with 10 or 15 mg. pyrathiazine on the 4th day of pseudopregnancy. Trauma of the uterus on the 4th day of pseudopregnancy induced decidioma in a much larger % of the treated hamsters. Only 1/19 rats inj. i.p. with 20 mg. or more of pyrathiazine on the 4th day of pseudopregnancy showed decidualisation. These results suggest that i.p. pyrathiazine is not an effective means of producing Hp.cidioma of the hamster and rat.

H.E.H.Jones

6281. PHARMACOLOGICAL PROPERTIES OF PENTAERYTHRITE DERIVATIVES. HI. PENTAERYTHRITE DIBENZOATE. J.Maj: Dissert. Pharm., 1963, 15, 1-15 (Zaklad Farmakodynamiki A.M. w Krakowie Kierownik, Podchorazych 1, Poland) Pentaerythrone dibenzoate was found to prolong amycal anaesthesia, diminish mobility of mice stim. with ritalin, caffeine, cocaine and morphine, inhibit the reaction to mescaline, and enhance the analgesic action of morphine. The hypotensive activity of this compound in rabbits was attributed to diminished force of cardiac contraction; the sympathetic nervous system was not involved.

G.F.Blane

6282. MECHANISM OF TYRAMINE STIMULATION OF ISOLATED HEARTS. P.Fresia, A.Mortari and G.Siolk Atti. Acad. med. Lombarda, 1962, 17, 502-503 (1st. Farmacol. Univ. Milano, Italy) Rats were depleted of catecholamine by treatment with reserpine or tyramine or both together and the effect of tyramine on the isolated perfused heart studied. The inotropic and tachyphylactic effects of tyramine were no different from those on normal hearts. Tyramine effects in vitro, therefore are independent of the heart catecholamine content and act directly. (Italian) G.N. Godson

6283. ACTION OF DIGITOXIN ON MOVEMENT OF 42K IN ISOLATED GUINEA-PIG ILEUM. T.Godfraind and A.Godfraind-De Becker: Arch. int. Physiol., 1962, 70, 738-741 (Univ. of Lovanium, Leopoldville, Congo) Brief commn. (French) M.E.Nutt

6284. STUDIES ON THE APPEARANCE AND TERMINATION OF ACONITINE-INDUCED ATRIAL FIBRILLATION WITH MICROELECTRODES. M.Goto, T.Tamai and T.Yanaga: Jap. J. Physiol., 1963, 13, 196-207 (Dept. Physiol., Kyushu Univ., Fukuoka, Japan)

Using the isolated right atrium from a young rabbit the authors have examined the effect of aconitine-induced fibrillation, the electrical activity from two fibres being traced simult. in order to clarify die mechanism. Aconitine-induced atrial fibrillation has been found to be preceded or attended by acceleration and fluttering of atrial activity followed by the formation of local blocks and disturbances of the spread of sinus rhythm; a formation of one or more ectopic pace-makers; an irregular interaction of activity among the adjacent fibres. The formation of local blocks and the formation of ectopic pace-makers are believed of prime importance for the generation of the atrial fibrillation.

M.J.Bell

6285. EFFECT OF ANTIMONY DIMERCAPTOSUCCINATE ON THE ELECTROCARDIOGRAM IN PATIENTS TREATED FOR SCHISTOSOMIASIS. A.Abdalla and A.Badran: Amer. J. trop. Med. Hyg., 1963, 12, 188-192 (Res. Inst. Trop. Med., Cairo, Egypt) The effect of antimony dimercaptosuccinate [Astiban] on the e.c.g. has been studied. T wave charges occurred slightly more frequently with this drug than with tartar emetic, and the intensity of these charges was greater.

A.A.Zimmerman

6286. COMPARISON OF THE ACTIVITIES OF ASPARTATES AND NICOTINIC ESTERS OF DIETHYLAMINOETHANOL ON CARDIAC CHANGES DURING ACUTE HYPO-OXIA. M.Lamarche, R.Royer and M.Bas: C.R. Soc. Biol., Paris, 1962, 156, 2099-2101 (Lab. Pharmacol., Fac. M&d., Nancy, France) A mixture of K and Mg aspartates had a pos. inotropic action on the isolated heart of guinea-pig. A similar effect was obtained with nicotine esters of diethylaminoethanol. Injn. of aspartates protected the animal against the changes in cardiac function during acute hypo-oxia. The nicotine ester of diethylaminoethanol was without effect. (French) M.A.Price

6287. DIURETICS. G.M.Wilson: Brit. med. J., 1963, i, 285-292 (Dept. Pharmacol., Univ., Sheffield, England) A lecture, 149 ref. M.E.Nutt

6288. THE INFLUENCE OF TBr AND CHLORAZANIL ON DIURESIS, EXCRETION OF ELECTROLYTES AND ON THE ANTIDIURETIC ACTION OF HYPOPHYSIN AND NICOTINE. M.Chrusciel: Dissert. pharm., 1962, 14, 143-157 (Zahlad Farmakol., Sljska Akad. Med.,

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Zabrze, Poland In white rats 4,6-diamino-1- ϵ -bromophenoxy-A,2- α ihydro-2,2-dimethyl-1,3,5-triazine [TBr] increased urine excretion to a greater extent than 2-chloroanilo-4-amino-1,3,5-triazine [chlorazanil] and did not show antidiuretic action typical for high doses. Chlorazanil increased markedly excretion of Na and simult. decreased that of K. The effect of TBr was similar but somewhat weaker. Injn. of TBr increased excretion of Cl⁻ but was antagonistic to nicotine and hypophysin, whereas chlorazanil stim. their antidiuretic Prop. (Polidi) J.Baranska

6289. THE INFLUENCE OF TBr AND CHLORAZANIL ON INHIBITIVITY OF CARBONIC ANHYDRASE.

f 1 S ^ Dissert, pharm., 1962, 14, 159-163
Prof. A. Farmakolo & U S^ska Akad. Med., Zabrze,
1-B-KD, ^ In contrast to acetazolamide, 4,6-diamino-
trifl?n S hi enylo A 1 2 dihy dro - 2 - dimethyl-1,3,5-
azini-1,3,5-trifl?n and 2- ϵ -chloroanilo-4-amino-1,3,5-tri-
vitrifl?n chlorazanil] did not inhibit carbonic anhydrase in sum- i, bren a PP li d in vivo, TBr inhib. and chlorazanil of rahn?n enz y mic activity in the haemolysate of r.b.c.
by i-, s and rats. The measurements were performed
* me Warburg manometric technique.

6290. (Polish) J.Baranska

"L u E F E C T O F HYDROCHLOROTHIAZIDE [HCT] ON WORMOTENSIVE DOGS. F.Gilardi, U.Marini and S. S * Atti L Acad. med. Lombarda, 1962, 17,
Itali 1965 (Ist# za lolo & spec. Med., Univ., Milano,
ko K. JO I # m- in J n > of normotensive dogs with 2*5 mg./
trollo w y wt. of HCT increased the renal water and elec-
not V excretion i decreased the plasma K and Na but did
tion-ect e blood Pressure or hydroelectrolyte distribu-
ted in tarterial walls. Similar treatment of hyper-
ii i i e w o g s corrected the high blood pressure and
eased the Na content of the arterial wall.

(Italian) G.N.Godson

6291. COMPARATIVE STUDIES ON MERCURATED 1,6,8-TRIAZABICYCLO (4.3.0) NONANE-7,9-DIONES AND CHLORMERODRIN. W.B.McKeon jun.: Arch. int. Pharmacodyn., 1963, 143, 181-194 (Sterling-Winthrop Rentschler, New York, U.S.A.) Oral tov*-ac- chloruretic and emetic actions in dogs and 7 T^{1/2} in mice of 1,6,8-triazabicyclo (4.3.0) nonane- Atrendi ?nes are compared with those of chlormerodrin. are q. Ul, incurcial doses *e diuretic and chloruretic actions an- Jlar. Most of the new diones- are less emetic and are less toxic than chlormerodrin. S.E. Smith

6292. OBSERVATIONS ON THE EFFECT OF SPIRONO-J-ACTONE IN OEDEMA ASSOCIATED WITH RENAL DISEASE. LLipman and F.del Greco: Amer. J. med. sci., 1963, 245, 413-420 (Dept. Med., Passavant Mem. Hosp. and Northwestern Univ. Med. Sch., Chicago, m., U.S.A.) The natriuretic and diuretic activity of spironolactone is inversely related to the degree of renal impairment? E.E.Hobbiger

6293. CHLOROTHIAZIDE-INDUCED GOUT AND DIABETES. R.H.Schwab, J.K.Perloff and R.L.Porus: Archi-Jintern. Med., 1963, 111, 465-470 (Dept. Med., Div. Cardiology, Georgetown Univ. Med. Center, 3800 Reservoir Rd., N.W., Washington, D.C., U.S.A.) Chlorothiazide treatment can produce hyperuricaemia and hyperglycaemia. The mechanisms involve

E.E.Hobbiger

6294. SEARCH FOR POTENT HYPOGLYCAEMIC AGENTS. JV. EFFECT OF BIGUANTOES AND mSULW ON GLUCOSE UPTAKE AND GLTCOGEN CONTENT OF

ISOLATED RAT DIAPHRAGM. S.P.Paul and A.N.Bose: Indian J. Physiol. Pharmacol., 1963, 7, 55-58

(Bengal Immunity Res. Inst., Calcutta, India) The results of expt. with 4 biguanides on glucose uptake by isolated diaphragm studies suggested that this type of substance may act by increasing the dissimilation or oxidation of glucose in the tissues. This would contrast with the action of insulin which is held to help the assimilation of glucose in the form of glycogen.

G.F.Blane

6295. DIABETOGENIC ACTION OF SODIUM SELENITE. G.Danon, G.Paulet and M.Cormier: C.R. Soc. Biol., Paris, 1963, 157, 51-54. Fourteen rabbits received i.v. injn. of 0*5 mg. Na selenite/kg. Six animals showed changes in glucose metabolism characteristic of permanent diabetes (10-60 days) while 4 animals showed temporary diabetes (5-10 days).

(French) M. A. Price

6296. THE INFLUENCE OF SODIUM SALICYLATE AND ORINASE [TOLBUTAMIDE] ON BLOOD SUGAR LEVELS IN RATS. R.Gryglewski: Dissert, pharm., 1962, 14, 123-130 (ZaHiad Farmakologii, Polska Akad. Nauk, Krakow, Poland) I.p. administration of aq. soln. of Na-salicylate had no effect upon blood sugar level in healthy rats or those with alloxan diabetes. Injn. of Na salicylate with tolbutamide caused more pronounced hypoglycaemia than tolbutamide only. S.c. injn. of Na salicylate suspension in oil decreased blood sugar level by about 35%.

6297. EFFECT OF TOLBUTAMIDE ON BLOOD FLOW AND METABOLISM OF LIVER IN HEALTHY DOGS. A.KBnig and W.Rautenberg: Z. Ges. exp. Med., 1963, 136,

563-570 (Physiol. Inst., Univ., Greifswald, Germany) In anaesthetised dogs, blood flow in the hepatic veins measured directly was reduced during and for approx. 2 hr. after an i.v. tolbutamide infusion (80 mg./kg. over 2 hr.). During the infusion, O₂ consumption was reduced and arterial glucose concen. fell. Glucose release from the liver was increased as shown by the difference in glucose concn. between hepatic vein and femoral artery. The plasma K-level tended to rise during and after the infusion, with a late rise in K release from the liver.

(German) P.F.Meyer

6298. AZEPINAMIDE THERAPY IN DIABETES. F.C.Wood, jun., W.H.Stimson and R.H.Williams: Acta endocr. Khb., 1963, 42, 432-436 (Med. Dept., Washington Univ. Med. Sch., Seattle, Wash., U.S.A.) Azepinamide, a new sulphonylurea had ability to control blood glucose similar to that of tolbutamide and chlorpropamide. There was no toxicity. Its only advantage over these other drugs was its low plasma half-life of 14 hr.

H.B.Waynfirth

6299. THE USE OF AZEPINAMIDE IN THE MANAGEMENT OF DIABETES MELLITUS, WITH A REPORT OF JAUNDICE AS A COMPLICATION, AND COMMENTS RELATIVE TO THE USE OF ORAL HYPOGLYCAEMIC AGENTS. A.Weinstein, R.Massie and A.B.Scoville: Amer. J. med. Sci., 1963, 245, 432-439 (Diabetic Clinic, Vanderbilt Univ. Sch. Med., Nashville, Tenn., U.S.A.) Azepinamide, a sulphonylurea deriv., is more effective than tolbutamide as an hypoglycaemic agent, but appears to be less safe than the latter as shown by the incidence of jaundice.

E.E.Hobbiger

6300. EFFECT OF GLUCOSE PERFUSIONS ON THE INSULIN ACTIVITY OF SERUM AND ON GLUCOSE ASSIMILATION IN THE NORMAL DOG. R.Bellens, W.Malaisse, V.Conard and J.R.M.Franckson: Arch. int.

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Pharmacodyn. 1963, 143, 277-284 (Expt. Med. Lab., Free Univ. Brussels, Belgium) Insulin secretion in response to one glucose perfusion in dogs did not affect the pancreatic response to a subsequent perfusion. Thus, after a second perfusion, serum insulin activity increased as much as after the first. These two successive insulin secretions caused increases in the coefficient of insulin assimilation. These effects of hyperglycaemia are compared with the response to sulphonamide hypoglycaemic drugs. (French) T.J.Sullivan

6301. ANTAGONISM BETWEEN Na SALICYLATE AND BRADYKININ IN THE RAT. J.Lecomte and J.Troquec Arch. int. Physiol., 1962, 70, 735-737 (Inst. L. Fredericq, Univ. Liège, Belgium) Brief comm. (French) M.E.Nutt

6302. SALICYLATE LEVELS OF RAT ORGANS AFTER PARENTERAL ADMINISTRATION OF RADIOACTIVE SODIUM SALICYLATE. H.Ebergardt: Arch. int. Pharmacodyn., 1963, 143, 205-218 (Univ. Orthopaedic Clinic, Homburg, Saar, Germany) The distribution of carboxy-¹⁴C-Na salicylate is studied in 4 rats. All tissues contain much lower levels than serum because of intense binding by serum albumen. The highest levels are found in liver, kidney, adrenals, heart, lungs and spleen, moderate levels in the adenohypophysis and the lowest in variable areas of the brain. (German) S.E. Smith

6303. THE EFFECT OF SALICYLATE ON PLASMA NON-ESTERIFIED FATTY ACIDS. S.G.Gilgore, W.L. Drew and J.J.Rupp? Amer. J. med. Sci., 1963, 245, 456-458 (Dept. Med., Div. Endocrinol., Jefferson Med. Coll., Philadelphia, Pa., U.S.A.) Results obtained with an i.v. infusion of Na salicylate indicate that the drug has an insulin-like action on carbohydrate metabolism, but unlike insulin raises the plasma level of non-esterified fatty acids. E.E.Hobbiger

6304. ASPIRIN AND GASTROINTESTINAL BLOOD LOSS. J.R.Leonards: Gastroenterology, 1963, 44, 617-619 (Dept. Biochem., Med. Sch., Western Reserve Univ., Cleveland, Ohio, U.S.A.) ⁵⁹Fe and ⁵¹Cr labelled erythrocytes were used to study gastrointestinal bleeding into the gut of human subjects. It was found that aspirin (Bayer) administered at a dosage of 2*56 g./day caused haemorrhage in the gut but that no haemorrhage occurred when sol. aspirin (Alka-Seltzer in citrate buffer) was administered at the same dosage level. D.N.Wheatley

6305. METHOD FOR DETERMINATION OF MICRO-QUANTITIES OF IPRONIAZID AND OTHER NI-ALKYL-N₂-ACYL-HYDRAZINES IN BODY FLUIDS AND TISSUES. J.Reider and M.Roth: Biochem. Pharmacol., 1963, 12, 445-450 (Dept. Expt. Med., F.Hoffman-La Roche and Co. Ltd., Basle, Switzerland) A method for the determination quant. of iproniazid, isocarboxazid and pivaloyl-benzylhydrazine and other similar compounds in all kinds of biol. material was described. It was based on the extraction of the compounds into a butyl acetate-butanol mixture or, for urine only, chlorform and subsequent formation of a coloured formazan by reaction with a tetrazolium salt-reagent. The procedure is relatively simple, reproducible and sufficiently sp. for pharmacokinetic studies of these drugs. L.G.Gillies

6306. DRUG-SPECIFIC LEUCO-AGGLUTININ IN FATAL CASE OF AGRANULOCYTOSIS DUE TO CHLORPROMAZINE. G.C.Hoffman, J.S.Hewlett and F.L.Garzon: J. din. Path., 1963, 16, 232-234 (Cleveland Clinic

Fndn. Clin. Path. Dept., Cleveland, Ohio, U.S.A.) Serum from a case of fatal agranulocytosis due to chlorpromazine caused aggl. of normal human w.b.c. in the presence of chlorpromazine. It was suggested that an immunol. mechanism might be involve[^] in the pathogenesis of chlopromazine-induced agranulocytosis.

J.B.Derbyshire

6307. PHARMACOLOGICAL STUDY OF TRIHYDROXY 2,4,6-PROPIOPHENONE. R.Cahen and A.Boucherle: CR. Soc. Biol., Paris, 1963, 157, 112-116 (Fac. Med. et de Pharm., Grenoble, France) Trihydroxy 2,4,6-propiophenone showed a depressive action on the smooth muscle of certain organs of guinea-pig, rat and mice as shown by *in vivo* and *in vitro* studies. This effect was greater than that of trihydroxy 1,3,5-benzene. The most characteristic action of trihydroxy 2,4,6-propiophenone was an increase in the bile output of dogs. (French)

M.A.Price

6308. ACCUMULATION OF DRUG ANIONS IN GASTRIC MUCOSAL CELLS. B.K.Martin: Nature, Lond., 1963, 198, 896-897 (Nicholas Res. Inst. Ltd., Slough, Bucks-England) It is suggested that during absorption of acidic drugs from the stomach across the pH gradient between the mucosal cell and gastric lumen, damage to the mucosal cells may result from accumulation of the anion. G.M.Lewis

6309. APPLICABILITY OF FERGUSON'S PRINCIPLE AND THE 'SIEVE THEORY' TO NEGATIVE INOTROPISM. L.Molinengo: Arch. int. Pharmacodyn., 1&2, 143, 90-107 (Inst. Pharmacol. and expt. Theraj., Univ. Turin, Italy) Neg. inotropic effects of urethane, benzyl alcohol, benzamide, acetanilide, atropine, quinidine and other drugs are studied using isolated rat ventricular strips. The EDSQ varies within the solubility of the compounds (Ferguson's principle) and the rate of onset of effect with the molecular vol. (Sieve theory). An exception is procainamide, its rate of onset of effect being faster than predicted. (Italian) S.E. Smith

6310. EFFECT OF METHOTREXATE [MTX] AND 'MELPHALAN' [MP] ON THE SURVIVAL OF TUMOUR AND SKIN HOMOGRAFTS. J.P.Glynn, A.R.Bianco and A.Goldin: Nature, Lond., 1963, 198, 1003-1004 (Lab. Chem. Pharmacol., Nat. Cancer Inst., N.I.H., Bethesda, Md., U.S.A.) The fates of DBA/2 leukæmia and skin homografts were compared in BALB/c mice treated with MTX and MP. The results indicated that, even in a system involving minor histocompatibility differences, pretreatment with MTX does not alter homograft immunity. The homograft response to the leukæmia was abrogated by a dose of MTX which prolonged the survival of skin homografts by only 2 days, indicating that a system involving the immune response to a tumour homograft could be a sensitive indicator for detection of weak immune suppression. G.M.Lewis

6311. PROLONGATION OF HOMOGRAFT SURVIVAL IN GUINEA-PIGS TREATED WITH AMETHOPTERIN. M.C.Berenbaum: Nature, Lond., 1963, 198, 606-607 (Surg. Unit, St. Mary's Hosp. Med. Sch., London, England) Survival time of skin homografts in the guinea-pig may be doubled or trebled by i.p. administration of amethopterin at 9 to 12 mg./kg. Doses of 15 mg./kg. were prohibitively toxic. G.M.Lewis

6312. EFFECT OF 3'-AMINO-3'-DEOXYADENOSINE [ADA] AGAINST ASCITIC TUMOURS OF MICE. L.H.Pugh and N.N.Gerben: Cancer Res., 1963, 23,

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640-647 4Inst. Microbiol., Rutgers, New Brunswick, N.J., U.S.A.) I.p. injn. of ADA isolated from *Helminthosporium* sp. no. 215, 24 hr. after S3A ascitic adenocarcinoma implantation, produced significant tumour inhibn. In a group receiving 72 fig./mouse the first death occurred after 2^{1/2} months whereas the median survival time for saline treated control mice was 1 month and all were dead after 34 days. Survival time was also increased in mice bearing Ehrlich ascites tumours. Inhibitory activity was minimal against ascitic Gardner lymphosarcoma and Sarcoma 180. At non-toxic dosages, the compound exhibited more antitumour activity than Puromycin aminonucleoside. ^{B.M.} Stevens

6313. CLINICAL AND PHARMACOLOGICAL STUDIES WITH 5-IODO-2'-DEOXYCYTIDINE [ICDR].

P.Calabresi, W.A.Creasey, W.H.Prusoff and A.D. Welch: Cancer Rp., 1963, 23, 583-592 (Dept. Med., Yale Univ. Sch. Med., New Haven, Conn., U.S.A.) ICDR was administered to 12 patients with advanced neoplastic diseases. 85-98% of the pZapBCDR administered to 4 patients was deaminated. The 5-iodo-2'-deoxyuridine [IUDR] formed was cleaved to 5-iodouracil which was deiodinated yielding I'. ICDR produced stomatitis, hair loss, nail changes and haematopoietic depression in a similar manner to IUDR. One of the 4 Patients receiving [125I]ICDR, in whom sustained blood levels of [125I]IUDR resulted, showed marked regression of a carcinoma of the vulva on 4 occasions. Antineoplastic effects and manifestations of toxicity were comparable to those after [125I]IUDR therapy. Patients in whom [125I]ICDR did not produce adequate blood levels of [125I]IUDR showed neither signs of toxicity nor significant antineoplastic effects. ^{B.M.} Stevens

6314. EFFECTIVENESS OF 2-CHLORO-4^f-4^{'''}-DI-2'-IMIDAZOLIN-2-YL TEREPHTHALANILIDE[piHYDRO-CHLORIDE [NSC-38280]] AND METHOTREXATE [MTX], IN COMBINATION, AGAINST ADVANCED LEUKAEMIA L1210. J-M.Venditti, A.Goldin and L.Kline: Cancer Res., 1963, 23, 593-599 (Lab. Chem. Pharmacol., Nat. Cancer Inst., Bethesda, Md., U.S.A.) At optimum doses, daily treatment with the 2 drugs in combination was approx. 100% more effective than either drug alone in increasing the median w_{TM}^{TM}/TM ?* *ice. Low, relatively ineffective levels of NSC-38280 combined with highly effective levels of MTX gave max. Effectiveness. With this dosage ratio, combination treatment increased the range of doses swing a high degree of therapeutic effectiveness. A marked degree of additivity of antitumour activity with min. additive toxicity towards the host was indicated. ^{B.M.} Stevens

6315. CLINICAL STUDIES WITH VINCERISTINE.

P.P.Carbone, V.Bono, E.Freim and C.O.Brindley: Blood, 1963, 21, 640-647 (Med. Branch Nat. Can. Inst., Bethesda, Md., U.S.A.) Patients with malignant neoplastic diseases, especially lymphoma were given SS_C & tae^e nnftDe its toxicity. Ac^e tolerated *^e and the amf-tumour prop. The tolerated dose was ~0.05 mg./kg. on most patients. Toxic symptoms were >inflined to the neuromuscular system and gastrointestinal tract. Thrombocytosis sometimes occurred. Tumour ^{na} th

6316. VINCERISTINE [VCR] IN THE TREATMENT OF LYMPHOMAS AND LEUKAEMIAS. D.G.Miller and H.D.Diamond: Cancer Res., 1963, 23,

613-621 (Lymphoma Service, Dept. Med., Mem. Hosp., New York, U.S.A.) VCR, an analogue of Vinblastine, isolated from *Vinca rosea* Linn., was given to 35 patients with Hodgkin's disease and other lymphomas and leukaemias. Only patients with Hodgkin's disease showed significant response, 9 of the 23 having temporary remissions lasting at least 1 month. Toxicity, principally neuromuscular, was frequently encountered and was severe enough to require discontinuation of therapy in 50% of patients adequately treated.

B.M. Stevens

6317. ACTION OF 6-MERCAPTOPURINE ON PORPHYRINOGENESIS IN WHITE RAT. A.Gajdos and M.Gajdos-Torok: C.R. Soc. Biol., Paris, 1962, 157, 42-46 (Clin. Med. THotel-Dieu, Paris, France)

Administration of 5-10 mg. 6-mercaptopurine/day to white rats resulted in an increase in porphyrin synthesis. There was an increase in urinary level of 6-amino-laevulinic acid and coproporphyrin and an increase in the liver content of porphobilinogen and 6-aminolaevulinic acid. The purine nucleotide content of r.b.c. decreased with inhibn. of phosphorylation of AMP. (French)

M.A.Price

6318. ANTIMITOTIC CHEMOTHERAPY IN MALIGNANT TUMOUR THERAPY: DIFFERENT ROUTES OF DRUG ADMINISTRATION. M.Sforza, A.Scarduelli and A.Parmegiani: Atti. Acad. med. Lombarda, 1962, 17, 496-501 (Clin. Chirurg., Univ., Milano, Italy)

Dogs with a gastroduodenal resection (Reichel-Polya's method) were given antimitotic agents by intraportal and general routes and also by local application and the effects compared. 20 mg. of triethylene thiophosphoramidate and 7^{1/2} mg. of methyl-bis-(3-chlorethyl)chloride were used. These drugs when administered by the intraportal and general routes caused considerable damage to the bone marrow tissue and frequently induced death. Local application did not have these effects.

(Italian) G.N. Godson

6319. EFFECTS OF PRETREATMENT WITH CARCINOSTATIC AGENTS ON TUMOUR GROWTH AND WHITE BLOOD CELLS. F.A.Schmid, M.M.Schmid and K.Sugiura: Cancer Res., 1963, 23, 607-612 (Div. Expt. Chemotherapy, Sloan-Kettering Inst. Cancer Res., New York, U.S.A.) Good correlation was observed between the degree of lymphopenia caused by 24 hr. pretreatment with cyclophosphamide (cytoxan), triethylene melamine [TEM], N mustard, hydrocortisone acetate, total body X-radiation, X-radiation of chest and hind legs, 6-mercaptopurine, amethopterin, mitomycin C or actinomycin D and the enhancement of growth of i.v. inj. Ehrlich ascites cells. Effects on neutrophils were not correlated with tumour growth. Cyclophosphamide, TEM, X-radiation and hydrocortisone acetate had the greatest effect on lymphocytes and tumour growth. Pretreatment with cyclophosphamide did not enhance pulmonary tumour formation in C3H mice receiving i.v. injn. of isologous tumour cells from spontaneous mammary adenocarcinomas. ^{B.M.} Stevens

6320. CHEMOTHERAPY STUDIES OF MAMMARY TUMOURS OF C3H MICE. G.A.LePage and N.Howard: Cancer Res., 1963, 23, 622-627 (Life Sci. Res., Stanford Res. Inst., Menlo Park, Calif., U.S.A.) Increasing the total no. of thioguanine doses produced toxicity, as measured by body wt. loss and mortality, at a lower total dose. Toxicity was much greater when thioguanine was given every 12 hr. instead of every 24 hr. Responses of spontaneous tumours in ? and early transplant generations of such tumours with an average intermitotic

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time of 5 days, to thioguanine every 24 hr. were greater than those to equiv. doses every 12 hr. Response was correlated with incorporation of [14C]thioguanine into nucleic acids. Spontaneous tumours and transplant generations appeared equally responsive to thioguanine, some spontaneous tumours regressing completely. Responses to azaserine were also examined. B.M.Stevens

6321. INHIBITORY ACTION OF FLAVONOIDS ON MAMMARY CARCINOGENESIS IN MICE. G.Rudali and L.Juliarcfc C.R. Soc. Biol., Paris, 1963, 157, 72-74 (Inst. du Radium, Fondation Curie, Paris, France) 85-90% of ? of strain RIII maintained under continuous reproduction exhibited mammary tumours from the age of 5 months. Administration per os of 1*2 mg. of flavonoid complex inhibited the appearance of secondary tumours. A similar inhibn. was obtained by injn. of lyophilised antihyaluronidase serum.

(French) M. A. Price

6322. POTENTIAL BRONCHODILATORS IN FLAVONOID SERIES. D.Kidd: J. chem. Soc., 1962, 5121-5125 (Edinburgh Pharmaceut. Indust. Ltd., Res. Dept., Edinburgh, Scotland) 3-Amino-4',7-dimethoxyflavanone and -flavone were synthesised. Many variations in the positions of substituents known to give enhanced bronchodilator activity to the flavone molecule were introduced. 7-Amino-4'-methoxyflavone and two new phenolic chloroflavones were prep. Some isoflavone deriv. were also studied. The bronchodilator activities found were higher than that of apigenin and lower than that of khellin. L.G.Gillies

6323. EFFECTS OF NITROGEN MUSTARDS ON INCORPORATION OF AMINO ACIDS INTO PROTEINS OF TUMOURS AND OTHER TISSUES. MUSTARD DERIVATIVE OF SERINE. W.L.Nyhan and E.L.Hoehn-Saric: Biochem. Pharmacol., 1963, 457-465 (Dept. Paediatrics, Johns Hopkins Univ. Sch. Med., Baltimore, Md., U.S.A.) The effects of O-[N-di-(2-chloroethyl)carbamoyl]-DL-serine, a nitrogen-mustard deriv. of serine, on the incorporation of amino acids into proteins were studied in rats bearing the Walker 256 carcinosarcoma. The i.p. injn. of 1500 mg./kg. regularly induced carcinostasis and occasionally produced complete regression of the tumour while producing minimal systemic toxicity. These effects were accompanied by an inhibn. of the incorporation of amino acids into the protein of the tumour. This was greater in the nuclear than in the cytoplasmic proteins suggesting a predominantly antinuclear action. The inhibn. was observed only in the tumour. The results suggested that the compound was acting not as an analogue inhibitor but as an alkylating agent. L. G. Gillies

6324. METABOLISM OF 35s-(1,2-DICHLOROVINYL)-L-CYSTEINE IN RAT. R.F.Derr and M.O.Schultze: Biochem. Pharmacol., 1963, 12, 465-474 (Dept. Agric. Biochem., Univ. Minnesota, Inst. Agric, St. Paul, Minn., U.S.A.) After administration of this compound by stomach tube and by i.p. injn. the major radioactive components in the urine were inorg. SO₄²⁻, an unidentified component, S-(dichlorovinyl)-L-cysteine and its N-acetyl deriv., the last 2 predominating soon after administration and the inorg. SO₄²⁻ being later the only detectable metabolite. The highest concn. of radioactivity was found in the kidney. Heart and liver contained about 25% as much and other organs 10%. The major portion of the radioactivity was associated with the protein fraction of kidney, liver and heart. In blood plasma 80% was bound in non-dialysable form. L.G.Gillies

6325. METABOLISM OF 35s-(1,2-DICHLOROVINYL)-L-CYSTEINE IN CALF. R.F.Derr, M.O.Schultze, N.S. Mizuno, D.D.Joel and J.H.Sautter: Biochem. Pharmacol., 1963, 12, 475-488 (Dept. Agric. Biochem., Coll. Vet. Med., Univ. Minnesota, St. Paul, Minn., U.S.A.) The drug was inj. i.v. into calves to study its metabolism and the possible preferential accumulation of the tracer in haematopoietic tissues. The molecule was attacked rapidly as shown by the fact that, although it disappeared from blood plasma in less than 80 min*, none was found in the urine. There was a high concn. of 35s in the urine, in 9 compounds of which only inorg. SO₄²⁻ was identified. The highest concn. of 35s associated with protein and lipid fractions in urine was found after 40 min. Bile, 20 to 40 min. after injn. of the drug, contained extremely high levels of radioactivity in the form of inorg. SO₄²⁻ and 3 unidentified compounds but not the drug itself. The metabolism of this drug in the calf was different from that in the rat, in keeping with the different biol. response to the drug. L.G.Gillies

6326. MEGLABLASTOSIS PRODUCED BY A CYTOSINE ANTAGONIST. 1-p-D-ARABINOFURANOSYLCYTOSIDE R.W.Talley and V.K.Vaitkericius: Blood, 1963, 21, 352-362 (Oncol. Div., Ford Hosp., Detroit, Mich., U.S.A.) Temporary regression of tumour masses in some patients with lymphosarcoma was produced with cytosine arabinoside. This substance also induced megaloblastic changes in the marrow, with mktotic abnormalities and decreases in the Hb, w.b.c. and platelets in the peripheral blood. H.B.Waynforth

6327. ACTION OF TRYPSIN INHIBITORS ON THE DEVELOPMENT OF LESIONS OF THE OESOPHAGUS, INDUCED IN RAT BY REFLUX. R-Lambert: C.R. Soc Bipl., Paris, 1962, 156, 2076-2079 (Clin. mèd., Hopital Ed.Herriot, Lyon, France) A termino-lateral oesophageal-duodenal anastomosis in rats induced lesions of the oesophagus by reflux of alk. pancreatic secretions. Administration of 1000 U per day Zymofren Specia or 6000 U per day Iniprol Choay, both polypeptidase inhibitors, protected the animal from oesophageal lesions. (French) M.A.Price

6328. INHIBITION OF SYNTHESIS OF RNA IN E. COLI BY THE NARCOTIC DRUG LAEVORPHANOL. E.J.Simon: Nature, Lond., 1963, 198, 794-795 (Dept. Med., New York Univ. Sch. Med., New York, U.S.A.) The morphine analogue laevoiphanol completely inhibits growth of *E.coli* at concn. 10-3M due to inhibn. of RNA synthesis as indicated by die reduction in incorporation of 32p into the acid-insol. fraction. Uptake of thymidine into DNA and leucine into proteins was not affected. G.M.Lewis

6329. STUDIES OF COMPOUNDS WITH ANTICOAGULANT ACTIVITY FROM THE GROUP OF 4-HYDROXYCOUMARIN DERIVATIVES. IV. CONDENSATION PRODUCTS OF 4-HYDROXYCOUMARIN WITH HALOGEN DERIVATIVES OR AROMATIC ALDEHYDES. M.Ecksetin and J.Cwynan Dissert. pharm., 1962, 14, 29-39 (Pracownia Technol. Chem. Srodkow Lecznicyzych, Akad. Med., Krakow, Poland) 4-Hydroxycoumarin deriv.: 3,3-(α -ui- or β -chlorobenzylideno)-bis-4-hydroxycoumarin and 3,3'-(5 β -chloro-5' β -iodofurfurylideno-2 β)>bis-4-hydroxycoumarin showed the anticoagulant prop. Condensation reaction of 4-hydroxycoumarin with some deriv. of aromatic aldehydes was investigated. W.Chmurzyiska

6330. EXPERIMENTAL ANIMAL STUDIES OF SOME COBALT COMPOUNDS AFTER INTRAVENOUS INJECTION. G.Tauberger and O.R.Kummen. Arch. int. Pharmacodyn.. 1963. 143. 219-239 (Pharmacol. Inst., Bonn Univ., Germany) Pharmacological actions of Co dihistidine, C02-EATA and C0Cl₂ are studied in rats and cats, in chloralose-urethane anaesthetised cats. The Co compounds have partly stimulant and partly inhibitory actions in the circulation, heart, and respiration. (German) S.E.Smith
- ⁶³³¹ DISCUSSION OF INTRAVENOUSLY ADMINISTERED CHLORINE (CARRIER FREE) IN THE RHESUS MONKEY. E.A.Daigneau U: Toxicol. appl. Pharm., 1963. 5. 331-343 (Dept. Pharmacol., Univ. Tennessee Med. Unit, Memphis, Tenn., U.S.A.) Y is mainly deposited in bone and organs with phagocytotic activity, and pretreatment of monkeys with zymosan, i.v...has no effect on its blood clearance, distribution and excretion. The distribution of Y « the same in monkeys, rats, dogs and rabbits. E.E.Hobbiger

6332. MECHANISM OF PIPERAZINE-EMESIS IN DOGS. M.T.Peng: Arch. int. Pharmacodyn.. 1963. 143. 173-180 (pept. Physiol. Coll. Med., Nat. Taiwan Univ., Taipei, Taiwan) Administration of piperazine 60-200 mg./kg. i.v. to dogs causes vomiting and diarrhoea. The vomiting is prevented by prior surgical ablation of the trigger-zone or denervation of the gut. S.E.Smith

6333. NEONATAL TETANUS AND PULMONARY COMPLIANCE OF TOTALLY RELAXED INFANT. P.M.Smythe Brit. med. J.. 1963. ^6^571 Child Health. Univ. Capetown. S. Afr. with neonatal tetanus were treated with recants and intermittent pos. artificial respiration (IPPR) with precautions to keep the airway clear. Mortality was reduced from 93ft to 20ft when adequate ventilation was ensured by measuring alveolar pCO₂ by a ^reading method, suggesting that death had been primarily due to respiratory insufficiency. Mean static $c_{\text{TM}}^{\text{TM}}$ infants weighing > 3 kg. was 2.5 ml./cm.²H₂O " « . tracheal p.f compared with a mean of 5 ml/cm. H₂O in spontaneously breathing infants. Compliance varied directly with inspiratory p.. thus < *% minTM" of effective inspiratory pp is important. « In e J^15 J^ compliance fell after prolonged IPPR. it was ^ affected ^ changes in ventilation rate or posture. Use of IPPR in other types of respiratory distress is discussed. M.E.Nutt

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6334. ATROPHY OF RAT TESTIS AS INDEX OF CHEMICAL TOXICITY. W.E.Ribelin Arch. Path., Chicago, 1963, ^75, 229-235 (Environ. Lab., Amer. Cyanamid Agric. Res. Center, N.J., U.S.A.) - S M S S Was - reviewed a fact of drug Testicular atrophy might be used as an index of drug toxicity. R.Mitchell
6335. APPLICATION OF PAPER CHROMATOGRAPHY TO THE TOXICOLOGICAL STUDY OF DRUGS. III. PAPERCHROMATOGRAPHIC BEHAVIOUR OF A FEW BASIC-DRUG'S IN RELATION TO THEIR STRUC-

TURE. J.Ve&erková, J.Solc and K.KScl: J. Chromatography, 1963, 10, 479-492 (Lab. Jun. Tonic and Gerichtliche Chem. Der. Karls-Univ., Prague, Czechoslovakia) Thirty drugs have been studied with regard to their relationships between structure and behaviour to the reverse phase systems petroleum/ethanol-water-ammonia. Rf values are tabulated for 7 such systems containing varying proportions of ethanol to the mobile phases. In general, Rf values increased with increasing ethanol content for tertiary bases but decreased for quaternary bases. Influence of temp. on Rf value was also investigated. (German) P.D.Dawkins

6336. RELATIONS BETWEEN STRUCTURE, METABOLISM AND TOXICITY OF THE 'CYCLODIENE' INSECTICIDES. G.T.Brooks and A.Harrison: Nature, Lond., 1963, 198, 1169-1171 (Biochem. Dept., A.R.C.-Pest Infestation Lab., Slough, Bucks., England) Comparative studies of insecticides suggests that the different toxicities to the housefly of several closely related substances possessing the hexachlorobicycloheptane nucleus in common is due at least in part to the presence of detoxification processes. J. R. Sargent

6337. APPLICATION OF PAPER CHROMATOGRAPHY AND SPECTROPHOTOMETRY FOR DETECTION OF COMPONENTS OF 'AMIDOCIN' IN BIOLOGICAL MATERIAL. F.Borkowski and A.Dluznewska: Dissert. Pharm., 1963, 15, 95-100 (Inst. Eksperyty Sadowych w Krakowie, Krakow, Westerplatte, Poland) Details are given of a method for the determination of the 3 components of 'Amidochin'-pyramidon, quinine and caffeine in biol. material. The isolated drugs were separated by paper chromatography and estimated spectrophotometrically. G.F.Blane

6338. FATAL SUICIDAL POISONING WITH CHLOROQUINE [RESOCHIN, NIVAQINE B]. J.B3umler and M.L.Odin: Arch. Toxicol., 1963, 20, 96-101 (Med. Inst. Univ., Basel, Switzerland) This anti-malarial drug when taken in large doses can lead to death. A method is described for its identification in human organs. Use is made of spectroscopy (u.v. and i.r.) and chromatography (paper and thin layer). (German) I.Cornish

6339. ACUTE POTASSIUM OXALATE POISONING. W.Neugebauen Arch. Toxicol., 1962, 19, 275-277 (Münster i. Westf., Engelstr. 23, Germany) Due to the rarity of attempted suicides with K oxalate, the case of a 63 yr. old patient was thoroughly investigated. He suffered from acute depression and had attempted suicide once before. On swallowing K oxalate (20 g.) he complained of pains in the abdomen, sweated profusely, vomited and lost the use of his limbs. He died in the ambulance approx. 75 min. after taking the poison. A brief discussion on oxalate poisoning is given. (German) I.Cornish

6340. SODIUM CHLORIDE POISONING DUE TO EXCESSIVE INTRAVENOUS ADMINISTRATION. H.G.Cze: A:ch. Toxicol., 1962, 19, 284-292 (Med. Univ., Hamburg-Eppendorf, Germany) For possible therapeutic reasons 80 g. of NaCl in aq. soln. was inj. into a patient. Loss of consciousness resulted, and full facilities were recovered only after 8 days. After 1 yr. the patient still showed signs of the poisoning. (German) I.Cornish

6341. A SUICIDE ATTEMPT WITH VALAMIN [1-ETHYL-NYL CYCLOHEXYL-CARBAMATE] WITH A CONTRIBUTION FOR ITS ELIMINATION AND TREATMENT.

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H.Langecker, G.Neuhaus, K.Ibe and M.Kessel: Arch. Toxicol., 1962, 19, 293-301 (Schering AG, W. Berlin, Germany) A 21 yr. old patient swallowed 40 g. of Valamin and was brought to hospital 14 hr. later. Haemodialysis and standard treatment for barbiturate poisoning led to recovery. A careful chromatographic investigation of body fluids revealed the presence of some unchanged valamin and hydroxylated metabolites. (German) LCornish

6342. SLOW CHRONIC MERCURY POISONING IN DENTAL PRACTICE. S.Preussner, H.-P.Klücking and G.Bast: Arch. Toxicol., 1963, 20, 12-20 (Med. Clinic Univ. Rostock, East Germany) Clinical symptoms of a dentist and his assistant are described. The usual signs of Hg poisoning were missing, but on investigating the surgery, the attn. was found to be contaminated with Hg vapour. This was due to small Hg pools under the floor boards and the prep. of Cu amalgam at elevated temp. Details are also given for the quant. determination of Hg in the urine, and therapeutical treatment for the patients. (German) LCornish

6343. FATAL CYANIDE POISONING OF A CHILD. A.Fiori and M.Marigoc: Arch. Toxicol., 1963, 20, 21-27 (Inst. Med. Legale Univ., Padova, Italy) Cyanide poisoning in children is rare. The post-mortem examination of a 4 yr.-old child is described, death was due to cyanide poisoning ascertained from the presence in the stomach of less than 100 µg.¹⁰ cyanide. The literature is also reviewed; 48 ref. (German) LCornish

6344. THALIDOMIDE: EFFECT UPON PREGNANCY IN THE RHESUS MONKEY. J.F.Lucey and E.Behrman: Science, 1963, 139, 1295-1296 (Dept. Paediatrics, Univ. Vermont Coll. Med., Burlington, Vt., U.S.A.) 50 or 200 mg. thalidomide daily were administered to ♀ rhesus monkeys after mating. There were no signs of pregnancy and it was concluded that thalidomide killed the embryo prior to implantation. G.M.Lewis

6345. INFLUENCE OF INCREASING DOSES OF GLUTETHIMIDE (DORIDEN) ON GESTATION AND FOETAL DEVELOPMENT OF RABBIT. H.Tuchmann-Duplessis and L.Mercier-Parot: CR. Soc. Biol., Paris, 1963, 157, 5-8 (Lab. d'Embryol., Paris, France) In rabbit, a sp. which is particularly sensitive to the teratogenic action of thalidomide, Doriden interrupted gestation but did not induce foetal malformations. 100-400 mg. Doriden/day resulted in 15-30% foetal resorption. With higher doses, 80% resorption occurred but the remaining foeti were normal. (French) M. A. Price

6346. OXYGEN CONSUMPTION OF THE HEART OF THE GUINEA-PIG WITH ACUTE CARBON MONOXIDE INTOXICATION. R.Mole and M.Ferrari: Biochim. appl., 1963, 10, 51-57 (1st. Med. del Lavoro, Univ. Napoli, Italy) The O₂ consumption of the various chambers of the heart of the guinea-pig was measured. These values were reduced by 30% of the normal if the animal was exposed to CO but not if it was exposed to pure N₂. (Italian) J.C.Crawhall

6347. CARBON MONOXIDE CONTENT OF THE BLOOD AND A CLINICAL PICTURE OF INDUSTRIAL CARBON MONOXIDE POISONING. H.Rossmann: Arch. Toxicol., 1962, 19, 345-354 (Badischen Anilin-Soda AG, 67 Ludwigshafen a Rh., Germany) The case histories of 225 patients suffering from occupational CO poisoning are described. Individual patients show varying

degrees of tolerance, depending on age and physical condition. A large no. of objective and subjective tests for ascertaining the poisoning are described and the author is in disagreement with published work on the effect of CO poisoning on blood pressure. (German)

LCornish

6348. HALOTHANE HEPATITIS. W.J.Heidenberg, LToria and J.Cebula: Lancet, 1963, i, 1185-1186 (V.A. Hosp., Bronx, New York, U.S.A.) In a case of hepatitis after halothane anaesthesia delayed symptoms were noted, and the presenting signs were those of pyrexia of unknown origin. All documented cases of this complication, except one from Paris, have been reported from the United States. Although the agent was manufactured solely in Great Britain until approx. 6 months ago and the bulk of clinical trials were performed there, no cases have so far been reported from that country. G.H.Bell

6349. A CASE OF FATAL ORAL CARBON TETRA-CHLORIDE POISONING. LDvořák: Arch. Toxicol., 1963, 20, 72-78 (Path. Anatom. Ustav, Kunz Fac., Hradec Králové, Czechoslovakia) Carbon tetrachloride poisoning usually occurs via inhalation; a case is described when death was due to an oral intake of 10 ml. Besides serious liver damage, other organs also appear to have been affected. The possible role of alcohol, as accelerating death, is discussed. (German)

-LCornish

6350. CARBON TETRACHLORIDE POISONING IN LIVER OF NEWBORN RAT. M.J.R.Dawkins: J. Path. Bact., 1963, 85, 189-196 (Nuffield Inst. for Med. Res., Univ., Oxford, England) S.c. injn. of CCI₄ into newborn Sprague-Dawley albino rats produces no histol. evidence of necrosis, no accumulation of fat and an insignificant rise in serum isocitric dehydrogenase. Max. levels of CCI₄ in liver are similar in newborn and in adult but max. concn. occurs much earlier and falls more rapidly in former. CCI₄ does not modify the post-natal fall in liver glycogen nor the large rise in glucose-6-phosphatase activity. D.Murray

6351. EFFECT OF TREATMENT ON EXPERIMENTAL LIVER CIRRHOSIS IN RATS. IV. EFFECT ON CCI₄-INDUCED CIRRHOSIS OF LIVER EXTRACTS, LIPOCAIC SULPHONAMIDE DERIVATIVES AND CYSTEINE-CONTAINING PREPARATIONS. W.D.Krey, L.Hesse, M.Wirtz, W.Creutzfeld and H.A.Kfhl: Z. Ges. exp. Med., 1963, 136, 535-542 (Med. Univ. Clinic, Freiburg i. Br., Germany) Hepatocellular damage induced in rats by 0.75 ml. CCL⁴/kg. given twice weekly for 12-14 weeks was not prevented by any of the test substances, but the degree of damage appeared to be less in rats treated during the period of CCI₄ intoxication with daily injn. of liver extract or liver hydrolysates. (German)

P.F.Meyer

6352. EFFECT OF ADMINISTRATION OF GLUCURONIC ACID IN RATS TREATED WITH CARBON TETRA-CHLORIDE. V.P.Valame, R.G.Chitre and U.K.Sheth: Arch. int. Pharmacodyn., 1963, 143, 165-172 (Pharmacol. Dept., Seth G.S.Med. Coll., Bombay, India) Acute and chronic liver injury was produced in rats by parenteral administration of carbon tetrachloride. The extent of the injury was estimated by liver function tests and histol. studies. Glucuronic acid, administered prophylactically and during carbon tetrachloride treatment failed to protect the liver. T.J.Sullivan

6353. STIMULATORY EFFECTS OF CHLORDANE ON HEPATIC MICROSOMAL DRUG METABOLISM IN THE

RAT. L.O.Hart, R.W.Shultice and J.R.Fouts *Toxicol. appl. Pharm.*, 1963, 5, 371-386 (Dept. Pharmacol., Coll. Med., State Univ. Iowa, Iowa City, U.S.A.) The halogenated hydrocarbon insecticide chlordane, Biven i.v. to rats, increases the activity of liver microsomes, as assessed by the rates of oxidation of hexobarbitone, N-dealkylation of aminopyrine and oxidation of the ring sulphur of chlorpromazine. The increase can be prevented by concurrent administration of DL-ethionine and is not observed when chlordane is added to microsomes in vitro. E.E.Hobbiger

6354. THE RELATIONSHIP BETWEEN LIVER NECROSIS AND PENTOBARBITAL SLEEPING TIME IN RATS. T.Balazs and H.C.Gricc *Toxicol. appl. PhfTM*, 1963, 5, 387-391 (Food and Drug Labs., Dept. Nat. Health and Welfare, Ottawa, Ont., Canada) Jaundice, as assessed by serum glutamic pyruvic transaminase level and icterus index, and pentobarbitone sleeping are not causally related. The latter is, therefore, unreliable for assessing liver injury in " " ^ ^ g j j j k l r

6355. RADIOMIMETIC AGENTS AND X-RAYS* IN MICE AND AET PROTECTIVENESS. M. Asano, T.T.QdeU, T.P.McDonald and A.C.Upton: A ^ - f * * - f] ^ * ? , 1963, 75, 250-263 (Biol. Div. Oak Ridge Nat. Lab., Oak Ridge, Tenn., U.S.A.) ^ t ^ f f i t ^ effects-of X-Rays, mechlorethamine hydrochloride (HN₂HC1), triethylenemelamine (T.E.M.), busulfan (myleran) and 4M20 (4-p-dimethylamino styrlyl quinohne) * are studied in young adult mice RF/UP and (101 x C3H) FI/Cum. LD₅₀ at 30 days is given for these w o n ; and * e main sites of action given. The effects; o f . * < « J » - Projective agent. 5-(2-amino-ethyl) isothiouronium-Br-HBr[AET] was found to vary when given before drug or X-ray challenge and to potentiate the effect ^ g j ^

6356. NEUROPATHY FOLLOWING EXPOSURE TO ADIMETHYLAMINE SALT OF(2,4-DICHLOROPHOXY)-ACETIC ACID. M.C.Berkley and K.R.Magee: Arch. intern. Med., 1963, 111, 351-352 (Univ. Michigan Med. Center. Univ. Hosp., Dept. Neurol., Ann Arbor, Mich.) t to be attri- D dimethyl- E.E.Hobbiger

amine, is described.

6357. TCOCICRETmOPATHYFOLLOW^G PROLONGED TREATMENT WITH d1-CB-TR ^ ^ METHYL-PHENYL ISOPROPYLAMINE HTOKKHWRJDE (P-1727) IN EXPERIMENTAL ANIMALS. C i ^ r ? a h " £ \ * \ A * j O'Connor, R.A.Yearly and T.Kuwabara: *Toxicol. appl. Pharm.*, 1963, 5, 298-305 (Dept. Pharmacol., Med. Res. Labs Chas Pfizer and Co. Inc., Groton, Conn.) amphetamine and a degeneration of

visual receptors and a pigmentary proliferation in the posterior compartment of the dog's eye on prolonged oral treatment. It is thought that these changes are the consequence of vasoconstriction in retinal and choroidal blood vessels. E.E.Hobbiger

6358. ALTERED FUNCTION IN A10MAL.SINHAL.mG CONJUGATED NIT! Ulrich and J.K.Leng 5. 319 Poli J.S.Dept. Health, O Toluene Animals exposed to concn. of nitro-olefin ^ chlomow & required to produce deaf or gross symptoms of disease show an increase of total

pulmonary flow resistance, which is reversed by atropine, and tidal volumes, and a decrease of respiratory rate and voluntary activity. The data give information on the structure-activity relationship amongst nitro-olefins.

E.E.Hobbiger

6359. CHLORINATED INSECTICIDE CONTENT OF HUMAN FAT IN SOUTHERN ENGLAND. CG.Hunter, J.Robinson and A.Richardson: *Brit. med. J.*, 1963, i, 221*224 (Shell Res. Ltd., Tunstall Lab., Sittingbourne, Kent, England) Analysis of body fat obtained from 131 consecutive necropsies in S. England showed the presence of DDT deriv. equiv. to 2 • 21 p.p.m. of DDT and of HEOD (1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4a, 5,6,7,8,8a-octahydro-exo-1, 4-endo-5,8-dimethanophthalene) equiv. to 0*21 p.p.m. Amount of insecticidal material present compares favourably with that found in W.Germany and more than favourably with that in U.S.A. There are indications that equilibrium levels have been reached, reflecting current exposures.

M.E.Nutt

6360. CORRELATION BETWEEN LIPID CONTENT AND PERCENT MORTALITY OF ALFALFA WEEVIL TO HEPTACHLOR AND MALATHION. S.E.Bennett and C.A.Thomas jun.: *J. econ. Entomol.*, 1963, 56, 239-240 (Dept. Entom., Agric. Exp. Stn., Univ. Tennessee, Tenn., U.S.A.) From 1-7 days old mortality was fairly const, with slight fat increase. Heptachlor and malathion caused less mortality as fat increased from, 10-35 days. The greatest change occurred from 7-14 days:- 9*4-31*4% fat (dry wt.) and 95-30% mortality with heptachlor and 95-75% with malathion, % moisture also decreased. H. W. Spencer

6361. ABSORPTION IN THE LUNG OF DIELDRIN IN THE PRESENCE OF STEAM AND AIR. K.J.Freundt and M.Kiese: *Arch. Toxicol.*, 1962, 19, 313-320 (Pharm. Inst. Univ., Munich, Germany) Rats were made to inhale moist air containing 300, 150 and 75 µg. of dieldrin/1. At least 50% of animals died after 12, 20 and 40 hr. treatment respectively. Their behaviour before death was similar to that shown by rats inj. with a soln. of dieldrin. Precautions are necessary for humans working in a moist atm. containing dieldrin.

(German) LCornish

6362. FATAL ACUTE DIELDRIN POISONING. O.Pribilla: *Arch. Toxicol.*, 1963, 20, 61-71 (Inst. Med. Univ., 23 Kiel, Germany) These are extremely rare. Two cases were thoroughly investigated. After description of the medical symptoms, a new method is outlined for the extraction of dieldrin from human organs. The possible mode of action of the poison on the liver is discussed.

(German) LCornish

6363. COMBINED USE OF RODENTICIDAL DUST AND POISON SOLUTION AGAINST HOUSE-MICE (MUS MUSCULUS L.) INFESTING A FOOD STORE. F.P.Rowe and A.H.J.Chudley: *J. Hyg. Lond.*, 1963, 61, 169-174 (M.A.F.F. Infestation Control Lab., Tolworth, Surrey, England) Boxes containing 1% warfarin dust surrounding a soln. of 0*005% warfarin with 5% sugar were placed in a mouse-infested food store. The mouse population, as determined by test-bating, was reduced by 95% after 5 weeks, and by almost 100% after 20 weeks.

J.B.Derbyshire

6364. TOXICOLOGY OF TOLUENE DHSOCYANATE. D.Henschler, W.Assmann and K.O.Meyer: *Arch. Toxicol.*, 1962, 19, 364-387 (Insi. Pharm. Toxicol., Univ., 87 WUrzburg, Germany) The effect of 2,4- and 2,6-toluene diisocyanate [important industrial chemicals] on rats and guinea-pigs was investigated.

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The mortality rate caused by damage to the respiratory track and lungs is described in detail. Tests were also carried out on human volunteers and the visible signs of poisoning are given. It is concluded that the max. per*missible concn. in an enclosed space is 0*02 p.p.m.

(German) I.Cornish

6365. PERMANENT INJURY AFTER TRI- α -CRESOLPHOSPHATE [TOCP] POISONING. W.Neugebauen: Arch. Toxicol., 1962, 19, 278-283 (Münster i. Westf., Engelstr. 23, Germany) The shortage of edible vegetable oils during the war led to widespread usage of mineral oils containing TOCP. Two cases have been investigated for a period of 15 yr. First symptoms appeared within a week (pain in the abdomen) followed by apparent recovery but nervous disorders and crippling of the limbs finally led to complete incapacitation. No cure is mentioned.

(German) I.Cornish

6366. TOXICITY OF SOME n-ALKYL BROMIDES TO LARVAE OF THE CITRUS NEMATODE. W.Moje: Nature, Lond., 1963, 198, 608-609 (Dept. Plant Pathol., Univ. California, Riverside, Calif., U.S.A.) The toxicity of a series of n-alkyl bromides from n-butyl to n-undecyl was tested against larvae of the citrus nematode. The nematocidal activity was related not only to their bimolecular nucleophilic substitution reactivity, ease of hydrolysis and toxicity of the resulting alcohols, but also to their lipid solubility. G.M.Lewis

6367. PRELIMINARY STUDIES ON THE USE OF SORPATIVE DUSTS FOR THE CONTROL OF THE HUMAN LICE, PHTHIRUS PUBIS (L) AND PREDICULUS HUMANUS CAFITIS DE GEER. LB.Tarshis and R.Blinstrup: Amer. J. trop. Med. Hyg., 1963, 12, 91-95 (Dept. Entomol., Univ. California, Los Angeles, Calif., U.S.A.) An account is given of the use of Dri-Die 67, 2% Dibrom-Dri-Die 67 and 0*05% Pyrethrum-Dri-Die 67 for the control of pubic and head lice. 27 ref. A.A.Zimmerman

6368. PRELIMINARY LABORATORY AND FIELD STUDIES ON THE UTILISATION OF DRI-DIE 67 AND TWO PERCENT DIBROM-DRI-DIE 67 FOR THE CONTROL OF THE WESTERN CONE-NOSED BUG, TRIATOMA PROTRACTA (UHLER). LB.Tarshis: Amer. J. trop. Med. Hyg., 1963, 12, 96-102 (Dept. Entomol., Univ. California, Los Angeles, Calif., U.S.A.) Expt. show that unfed and engorged triatomids are knocked down faster in 2% Dibrom-Dri-Die 67 than in the Dri-Die 67. A combination of both can control infestation and in no way affect humans. A.A.Zimmerman

6369. METHODS OF ALTERING NITROGEN MUSTARD TOXICITY IN DOG. I. SPLEEN AND MESENTERIC ARTERY EXCLUSION. N.Lempert, R.P.Leather and W.B.Scharfman: Blood, 1963, 21, 213-220 (Surg.

Dept., Albany Med. Coll., Albany, N.Y.y U.S.A.) Cross-damping of the splenic vessels prior to injn. of nitrogen mustard into dogs did not improve the mortality rate of these animals. However exclusion of the spleen and small intestine was found to be practical in protecting these organs from the effect of the drug.

H.B.Waynfirth

6370. ACUTE INTRAVENOUS AND INTRAPERITONEAL TOXICITY STUDIES ON SODIUM PENTABORATE DECAHYDRATE AND SODIUM TETRABORATE DECAHYDRATE. O.D.Easterday and H.Hamel: Arch. int. Pharmacodyn., 1963, 143, 144-164 (Med. Res. Center, Brookhaven Nat. Lab., Upton, Long Island, N.Y., U.S.A.) The toxic actions of Na pentaborate (and tetraborate) decahydrate are studied in mice. Simult* administration of D-glucose reduces the lethal effects to both components. Detailed borate/glucose ratios, LD50 and relative potencies are given. S.E. Smith

6371. VOMITING, HYPOTHERMIA, AND RESPIRATORY PARALYSIS DUE TO TETRODOTOXIN (PUFFER FISH POISON) IN THE CAT. H.L.Borison, L.E.McCarthy, W.G.Clark and N.Radhakrishnan: Toxicol. appl. Pharm., 1963, 5, 350-357 (Dept. Pharmacol., Univ. Utah Coll. Med., Salt Lake City, Utah, U.S.A.) Tetrodotoxin, i.v., produces in cats a vomiting response which is abolished by ablation of the medullary emetic chemo-receptor trigger zone. Intraventricular injn. of doses much smaller than those required by the i.v. route followed by volitional paralysis, hypothermia and respiratory failure, while reflexes are unaffected. These effects are attributed to an action on paraventricular structures in the brain stem. E.E.Hobbiger

6372. BOTULINUS TOXIN: EFFECT ON THE C.N.S. OF MAN. H.R.Tylen: Science, 1963, 139, 847-848 (P.B.Brigham Hosp., Boston, Mass., U.S.A.)

Electrical stimm. of multiple peripheral nerves elicited H reflexes in a 61 yr. old patient with botulism. Such reflexes were suggestive of some central release or failure of inhibitory control of a monosynaptic or polysynaptic spinal reflex arc. Botulinus toxin may resemble toxin in inhibiting interneurons at the spinal level. G.M.Lewis

6373. ON VENOM OF LESSER WEEVERFISH, TRACHINUS VIPERA. D.B.Carlisle: J. mar. biol. Ass. U.K., 1962, 42, 155-162 (Anti-locust Res. Cent., 1 Princes Gate, London, England) The weever probably injects 0*5-0*2 mg. dry wt. of venom when it stings. 60% of the venom dry wt. consists of toxic muco-substances (two albumins and an amino-polysaccharide), having a neuro-toxic effect. 1-20 pg./mg. dry wt. of the venom consists of SHT which probably causes the pain of the weever sting. P. J. Baron

GENERAL AND METHODS

6374. THEORETICAL CRITERIA FOR USE OF RELATIVE ORGAN WEIGHTS AND SIMILAR RATIOS IN BIOLOGY.

L.Angervall and E.Carlström: *J. theor. Bid.*, 1963, 4, 254-259 (Dept. Pathol., Univ., Gothenburg, Sweden)

Prerequisites for the legitimate use of the organ wt./body wt. type of ratio in the analysis of biological data are outlined. The errors which may occur through the indiscriminate use of these ratios are discussed and Principles stated for the analysis of differences between organ wt. dependent on body wt.

G.F.Biane

6375. NEW AUTOMATIC DISPOSABLE SYSTEM FOR BLOOD COUNTS AND HAEMOGLOBIN.

M.H.Freundlich and H.W.Gerarde: *Blood*, 1963, 21, 241-242 (Bureau Biol. Res., Rutgers, State Univ., New Brunswick, N.J., U.S.A.)

which uses a self-contained and a pre-filled disposable plastic diln. container. W.b.c., r.b.c., hb and platelet counts can be done on 0.013 ml. blood sample. Correlation with standard techniques was good except for 1

6376. TECRQUE FOR SAMPLING BONE MARROW FROM LIVING MOUSE.

H.I.Pilgurte: *Blood*, 1963, 21, 241-242 (Anat-Dept., Buffalo "iv. Med. Sch., Buffalo, N.Y., U.S.A.)

H.B.Waynfirth

6377. AN ARTERIAL FLOW METER.

A.van de Berg: *Arch. int. Physiol.*, 1963, 71, 95-100 (Inst. Thérapie peptique Expt., Univ. of Liège, Belgium)

M.E.Nutt

(French)

6378. EXTRACORPOREAL CIRCULATION: A DEDICATED FOR QUANTITATIVE STUDY OF THROMBUS FUKMA SKMPEOSWGSSD.

Circus
H.C.Roswell and J.F.Mustard: *Ontario Vet. Coll.*, Guelph, Ontario

od is described which was used in a pig. Blood flowed through a Plastic chamber in which a clot formed was trapped and could be later examined.

K.T.Wilson

6379. ENERGY-ABSORBING MATERIALS FOR THE PREVENTION OF IMPACT INJURY OF THE BRAIN.

F.Girling and E.D.L.Topliff: *Canad. J. Biochem. Physiol.*, 1963, 41, 1207-1213 (Defense Res. Med. Lab., Toronto, Ont., Canada)

A method was developed to quant. evaluate energy-absorbing materials, used in crash helmets, in terms of prevention of impact amount of energy absorbed by to vary inversely with the thickness of the material.

Results obtained supported current concepts of the mechanism of closed-skull brain damage.

A.M.Gibbins

6380. I O 1 » I W P M C IN THE NERVOUS SYSTEM.

S.M.Khanna and C.R.Nobacte: *Acad. Sci.*, 1963, 25, 516-521 (I.B.M. Research Systems Div., Bethesda, MD, U.S.A.)

A computer (IBM 709) has been used to simulate

assembly in order to analyse some parameters derived from the nervous system. A condition for convergent activity is obtained and the phenomenon simulates the sharpening effect observed in the nervous system.

R.H.Kimberlin

6381. FREQUENCY MODULATED STIMULATION, A NEW METHODICAL APPROACH TO DYNAMICS OF PHYSIOLOGICAL AUTONOMIC REGULATIONS.

J.PeftSz: *Arch. int. Physiol.*, 1962, 70, 718-730 (Inst. Physiol., Med. Fac., J.E.Purkinje Univ., Brno, Czechoslovakia) A description of the design and use of a freq. modulated stimulator for estimating freq. response characteristics of physiol. systems. The method has been used to analyse the autonomic neuroeffector systems mediating changes in heart rate and b.p. on stimm. of the rabbit's depressor nerve.

M.E.Nutt

6382. TECHNIQUE FOR FISTULATION OF HEN'S OVIDUCT THROUGH ABDOMINAL WALL, WITH RECOVERY OF OVUM.

A.B.Gilbert and D.G.M.Wood-Gush: *J. Reprod. Fertil.*, 1963, 5, 453-455 (A.R.C. Poultry Res. Centre, King's Buildings, West Mains Rd., Edinburgh, Scotland).

H.E.H.Jones

BODY TEMPERATURE

6383. CALORIGENIC RESPONSE OF COLD-ADAPTED RABBITS TO ADRENALINE AND TO NORADRENALINE.

W.H.Cottle: *Canad. J. Biochem.*, 1963, 41, 1334-1337 (Physiol. Dept., Univ. Alberta, Edmonton, Alta., Canada)

Cold adapted rabbits (-15° to -37°) were compared with control animals (29°-30°) in their reactions to adrenaline and noradrenaline bitartrate soln., made up in 5% glucose, delivered at 5 µg. base/kg, /min. over periods of 5 hr. Cold adapted animals had a higher metabolic rate over the initial hr., a greater response to adrenaline ($P < 0.01$) and noradrenaline infusion ($P = 0.05$) than did control animals, response of the latter to noradrenaline being doubtful. The rectal temp. of all groups rose slightly during tests, and infusion of 5% glucose had no effect in any group.

A.M.Gibbins

6384. THERMOGENIC EFFECTS OF NORADRENALINE IN NEW-BORN AND INFANT KITTENS AND OTHER SMALL MAMMALS. A POSSIBLE HORMONAL MECHANISM IN THE CONTROL OF HEAT PRODUCTION.

R.E.Moore and M.C.Underwood: *J. Physiol.*, Lond., 1963, 168, 290-317 (Dept. Physiol., Royal Free Hosp. Sch. Med., London, England)

O_2 consumption, deep and surface body temp., were measured in kittens. Noradrenaline, but not adrenaline (400 µg./kg. s.c.) was a powerful thermogenic stimulant at 35° environmental temp., but the effect declined with age to zero at 512 g. (or 32 days) by regression calcn., and to approx. equality between the two catecholamines at 26 days of age. The thermogenic response was suppressed progressively by hypo-oxia, the threshold being about 110 mm. Hg pO₂ inspired air, and the suppression being near complete at about 70 mm. Hg pO₂. Noradrenaline, but not adrenaline, was able to reverse metabolic suppression by hexamethonium at 30° environmental temp. Supporting observations on young rabbits and rats are given, and a theory of neonatal control of heat production is postulated.

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SKIN AND BONE

6385. SKIN-SH LEVELS OF MICE. J.A.DiPaolo: Nature, Lond., 1963, 198, 1007-1008 (Roswell Park Mem. Inst., New York Dept. Hlth., Buffalo, N.Y., U.S.A.) Variations in skin sol. -SH levels were observed between different strains of mice, different age groups and at different stages of hair growth. Females showed a higher mean -SH content than males. G.M.Lewis

6386. QUANTITATIVE AND QUALITATIVE CHANGES IN HUMAN EPITHELIUM DURING SENESCENCE. I. NIPPLE EPIDERMIS. A.Meriggi and T.Zavarella: Atti. Acad. Med. Lombarda, 1962, 17, 469-475 (Div. Anat.-Patol., 1st. Nazionale dei Tumori, Milan, Italy) The nipple epidermis was studied in 80 women aged 24-40 yr. and in 80 women aged 65-82 yr. old. With increased age, senility caused a significant reduction in epidermal thickness and in the no. of cell layers. (Italian) G.N.Godson

6387. EFFECT OF Ca AND ANTIDIURETIC HORMONE ON Na TRANSPORT ACROSS FROG SKIN. I. EXAMINATION OF INTERRELATIONSHIPS BETWEEN Ca AND HORMONE. II. SITES AND MECHANISMS OF ACTION. P.F.Curran, F.C. Herrera and W.J.Flanigan: J. gen. Physiol., 1963, 46, 999-1010, 1011-1027 (Inst. Venezolano de Invest. Cient., Caracas, Venezuela) I. Ca added to the soln. bathing the outside of isolated skin reduced net Na transport across the skin while ADH caused an increase. Ck and ADH did not compete but acted independently at 2 different sites located on the same barrier to Na movement in the skin. Ca also reduced Cl⁻ influx across the short-circuited skin while ADH had no effect on Cl^{*} movement.

n. The primary effect of both agents was on the Na permeability of the outward facing membrane of the frog skin cells, as shown by the determination of unidirectional Na fluxes across die 2 faces of the transporting cells. Neither agent appeared to have a direct effect on the active transport system itself. Na permeability of the outer membrane played an important role in controlling the rate of net active Na transport across the skin. K.Jones

6388. EFFECTS OF TEMPERATURE AND METABOLIC INHIBITORS ON THE ACTIVE Na TRANSPORT IN FROG SKIN. T.Takenaka: Jap. J. Physiol., 1963, 13, 208-218 (Dept. Physiol., Tokyo Med. and Dental Univ., Yushima, Bunkyo-ku, Tokyo, Japan) Na transport in frog skin through the low temp. region by measuring the short-circuit current has been studied. Using the double Na labelling method and metabolic inhibitors it is found that between 6° and 20° the short-circuit current is almost equal to the net Na transport at each temp. The temp. coeff. of the short-circuit current changes at approx. 14°. At least 2 mechanisms are concerned with the Na-active transport in frog skin. M.J.Bell

6389. NAIL-GROWTH. W.B.Bean: Arch. intern. Med., 1963, 111, 476-482 (Dept. Med., Coll. Med., State Univ. Iowa, Iowa City, U.S.A.) Measurements of nail growth in a human subject were carried out over a 10 yr. period, covering the ages of 32 to 42.

E.E.Hobbiger

MUSCLE

6390. BIREFRINGENCE OF ISOLATED MUSCLE FIBRES IN TWITCH AND TETANUS. A.Eb^rstein and A.Rosen-falk: Acta physiol. scand., 1963, '57, 144-166 (Neurophysiol. Inst., Univ., Copenhagen, Denmark) During a twitch in single frog muscle fibres birefringence decreased before tension was developed and reached a min. before tension reached a max. Doublerpeak changes in phase difference were not normally observed. The decrease in birefringence was the same in twitch and tetanus. Reasons for this decrease are suggested.

H.B.Waynforth

6391. TOTAL ENERGY PRODUCTION AND PHOSPHOCREATINE HYDROLYSIS IN ISOTONIC TWITCH. F.D.Carlson, DJ.Hardy and D.R.Wilkie: J. gen. Physiol., 1963, 46, 851-882 (Dept. Biophys*, Johns Hopkins Univ., Baltimore, Md., U.S.A.) Studies on the frog's sartorius muscles showed that shortening heat came from some other chem. reaction than phosphocreatine (PC) hydrolysis, or else Hill's equation ($E = A + W + ax$) failed to describe correctly the energy output in a complete cycle of contraction and relaxation. To decide between these possibilities direct measurements of heat and work during a complete cycle were made, and PC breakdown was measured on the same muscles. PC hydrolysis and its associated buffer reactions can account for the total energy output of isometric and isotonic twitches. K.Jones

6392. NATURE OF MUSCLE-RELAXING FACTOR.

I. IMPROVED ASSAY SYSTEM. F.N.Briggs and F.Fucfon. SOME PHYSICOCHEMICAL PROPERTIES.

F.Fuchs and F.N.Briggs: J. gen. Physiol., 1963, 46, 883-891, 893-904 (Dept. Physiol., Univ. Sch. Med., Pittsburgh! Pa., U.S.A.) I. It was possible to inactivate intrinsic granule relaxing factor, as shown by the analysis of die effects of deoxycholate [CD] and benzalkonium chloride [B-Cl] on granule relaxing activity, myofibril and glycerinated fibre responses to ATP, and the sensitivity of these actomyosin-containing systems to relaxing factors. The intrinsic relaxing factor was destroyed by treating actomyosin with 1mM DC or 0.005% B-Cl for 5 min. at room temp.

II. A sol. muscle-relaxing factor [MRF] was found in the homogenates of rabbit skeletal muscle. The relaxing activity was not due to the presence of contaminants, and could be removed or destroyed by charcoal, dialysis, prolonged heating and treatment with the chelating resin, chelex-100. MRF appeared to be similar or the same as die factor formed by the incubation of muscle granule fractions and ATP. The mol. wt. of the active agent was < 4000, as studied by gel filtration. K.Jones

6393. SPECTROPHOTOMETRIC STUDIES ON INTACT MUSCLE. I. COMPONENTS OF RESPIRATORY CHAIN. H. RECOVERY FROM CONTRACTILE ACTIVITY.

F.FJBbsis: J. gen. Physiol., 1963, 46, 905-928, 929-969 (E.R.Johnson Found. Med. Phys., Univ. Pennsylvania Sch. Med., Philadelphia, Pa., U.S.A.)

I. The relative concn. of the respiratory components in various intact skeletal muscles were in agreement with those of mitochondrial prep. of mammalian tissues and of the ones from toad skeletal muscle. The cytochrome b and pyridine nucleotide levels were rather low in the ~ anoxic minus oxygenated difference spectra, their low levels being caused to a certain degree by a partial reduction during the resting steady state.

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H. The effects of various factors on the levels of NAD, cytochrome b, cytochrome f and flavoprotein in intact muscles were studied. Although even limited activity (< 5 twitches) initiated glycolysis as shown by the intracellular pH, the primary control of respiration resided in the ADP concn. rather than in the levels of substrate or inorg. PO₄. ATP appears to be the primary energy donor for muscular contraction.

K.Jones

6394. GLUTAMATE-INDUCED DEPOLARISATION IN CRUSTACEAN MUSCLE. A.Takeuchi and N.Takemoto: Nature, Lond., 1963, 198, 490-491 (Dept. Physiol. Sch. Med., Juntendo Univ., Hongo, Tokyo, Japan) Depolarisation of the membrane of the abductor muscle of the dactyl in the 1st walking leg of the crayfish (*Cerberus*) was produced by electrophoretic application of glutamate to the neuromuscular junction, the glutamate-sensitivite is placed on the outer surface of the membrane.

G.M.Lewis

6395. INFLUENCE OF CALCIUM IONS ON POTASSIUM CONTRACTURE IN AN INSECT LEG MUSCLE. D.J.Aidley: Nature, Lond., 1963, 198, 591-592 (Dept. Zool., Univ., Cambridge, England) Expt. on the mesothoracic extensor tibiae muscle of *Schistocerca gregaria*, showed that the contracture produced by K did not occur in the absence of Ca, Mg, Ba and Mn⁺ - could not substitute for Ca. while Sr, Co and Ni produced small contractures.

C.M.Lewis

6396. CHANGES IN IONIC COMPOSITION AND RESTING AND ACTION POTENTIALS IN FROG SARTORIUS MUSCLE FIBRES MAINTAINED IN VITRO. M.H.Draper, H.Friebel and K.Karzel: J. Physiol., Lond., 1963, 168, 1-21 (Dept. Physiol., Univ., Edinburgh, Scotland) The mean resting potential (RP) of sartorius muscle fibres maintained in frequent intervals was consistently 92 mV at 16°C. L.J.E.M. of less than 0.5 mV. No significant fall in mean RP was observed during periods of up to 8 hr. If careful attention was paid to technique. During tow

the mean membrane potential and water and the mean size of the excitatory junctional potentials of up to 80% and (V) a marked decrease in the effect of applied current indicating increase in membrane conductance.

G.M.Lewis

6398. DISSOCIATION OF CONTRACTION AND STIMULATION OF LACTIC ACID ON SMOOTH MUSCLE UNDER ANAEROBIC CONDITIONS. L.Lundholm and E.Mohme: Lundholm: Acta physiol. scand., 1963, 57, 125-129 (Pharmacol. Dept., Univ., Goteborg, Sweden) In the presence of glucose, the contractile effect of lactic acid production. K stim. the contractile process while it decreased the lactic acid production. K+ had a

more pronounced effect on substrate-depleted arterial muscle than did adrenaline, histamine or Ba.

H.B.Waynfirth

6399. CONTRACTION AND GLYCOGENOLYSIS OF SMOOTH MUSCLE. L.Lundholm and E.Mohme: Lundholm: Acta physiol. scand., 1963, 57, 125-129 (Pharmacol. Dept., Univ., Goteborg, Sweden)

Glycogenolysis in bovine tracheal muscle and mesenteric artery and in rabbit gut was augmented under aerobic conditions of electrical stimm. Carbacholine enhanced glycogen breakdown in tracheal muscle. In anaerobic conditions glycogenolysis did not follow contraction which illustrates a difference between smooth and striped muscle.

H.B.Waynfirth

6400. IS FUNDAMENTAL ELECTRICAL RESPONSE OF SINGLE HEART MUSCLE CELL A SPIKE POTENTIAL?

L.Churney and H.Ohshima: J. gen. Physiol., 1962, 46, 1029-1046 (Dept. Physiol., Louisiana State Univ. Sch. Med., New Orleans, La., U.S.A.) Spike potentials, not plateau forms, were recorded from bundles of

5 to 10 heart fibres of *Amphiuma* and *Necturus*. These spikes failed to overshoot. The plateau form, and this only, was recorded from large tissue masses. Bundles of intermediate size showed an intermingling of spikes and plateau-shaped action potentials. Configuration of the recorded action potential curve is contingent upon the mass and geometry of the tissue impaled by the micro-electrode.

K.Jones

BLOOD

6401. RHEOLOGY OF HUMAN BLOOD, NEAR AND AT ZERO FLOW, EFFECTS OF TEMPERATURE AND HAEMATOCRIT LEVEL. E.W.Merrill, E.R.Gilliland, G.Cokelet, H.Shin, A.Britten and R.E.Wells, jun.: Biophys. J., 1963, 3, 199 (Dept. Chem. Eng., Massachusetts Inst. Technol., Boston, Mass., U.S.A.)

Static normal human blood possesses a distinctive yield stress. When the yield stress is exceeded the same blood has a stress-shear-rate function under creeping flow conditions closely following Casson's model, which implies reversible aggregation of r.b.c. in rouleaux and flow dominated by movement of rouleaux. The yield stress is essentially independent of temp, and its cube root varies linearly with haematocrit value. The dynamic rheological prop. in the creeping flow range are such that the relative viscosity of blood to water is almost independent of temp. Questions raised by these data are discussed, including r.b.c. aggregation promoted by elements in the plasma.

6402. BLOOD VOLUME FOLLOWING HYPOPHYSECTOMY IN MAN. T.Falkheden, B.Sjogren and H.Westling: Acta endocr. Kbh., 1963, 42, 552-563 (Med. Clin., Sahlgrenska Sjukhuset, Goteborg, Sweden) Using 51Cr labelled r.b.c. it was shown that hypophysectomy produced a decrease in r.b.c. vol., total blood vol. and total Hb.

H.B.Waynfirth

6403. PLASMA AND BLOOD VOLUME OF RABBITS.

E.Regoezzi: Z. Ges. exp. Med., 1963, 136, 606-618 (Innere Abt., St3dt. Wenckebach Krkh., Berlin-Tempelhof, Germany) The plasma vol. was

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determined in 28 healthy rabbits with the Evans Blue method and normal values were established. [51cr]r.b.c. were used for determining the plasma vol. in 6 rabbits, and the results were in agreement with the Evans-Blue method. False low values for plasma vol.* were obtained when blood was withdrawn from constricted veins of chilled ears. (German) P.F.Meyer

6404. BLOOD LOSS IN BURNS. E.Topley and J.Frost: J. Path. Bact., 1963, 85, 103-111 (M.R.C. Industr. Injuries and Burns Res. Unit, Accident Hosp., Birmingham, England) Blood outside the active circulation in normal and burned skin of d* albino rats is estimated by measuring the 59Fe content at various periods from 2 hr. to 10 days after i.v. injn. of 59pe-labelled r.b.c. and measuring the blood in active circulation with 51cr-labelled r.b.c. R.b.c. accumulate outside active circulation in burned skin to a marked degree, especially within the first 24 hr. Histol. study of burned skin confirms this. The timing is similar to the average timing of r.b.c. loss from general circulation in selected patients with burns. D.Murray

6405. ANALYSIS OF ERYTHROCYTE MEAN VALUES. K.G.v.Borviczeny. Blut, 1963, 9, 85-95 (Med. Clin., Univ. Freiburg/Br., Germany) A nomogram combining various measurements to give characteristic curves for erythropathies is described.

(German) A. J. Wansbrough

6406. EFFECT OF THYROID HORMONES ON GLUCOSE UPTAKE AND RESPIRATION OF AVIAN RED CELLS IN VITRO. W.Winkelmann: Z. Ges. exp. Med., 1963, 136, 556-562 (Pharmacol. Inst., Justus-Liebig Univ., Giessen, Germany) Chicken r.b.c. were suspended in Krebs-Ringer-NaHCO₃ soln. wMi added glucose or 2-deoxyglucose and incubated. Hexose uptake was calc. by the fall in hexose concn. in the medium. Under aerobic conditions, glucose uptake was greater than uptake of 2-deoxyglucose. Uptake of glucose, but not of 2-deoxyglucose, was doubled in medium containing 1-thyroxine, dl-thyroxine and dl-triiodotyrorine (10-6-10-8 mg./l.). Under anaerobic conditions, there was no uptake of either hexose, and addition of thyroid hormones was ineffective. Both thyroxine and 2,4-DMP increased respiration. (German) P.F.Meyer

6407. FOETAL ERYTHROCYTES IN MATERNAL CIRCULATION. E.S.Brown Brit. med. J., 1963, i, 1000-1001 (N. of Scotland Blood Transfusion Service, Inverness, Scotland) Foetal cells were found in 50% of samples of venous blood obtained within 24 hr. of delivery from 165 women who had normal pregnancy and delivery. Cause of the transplacental leakage is unknown. It is pos. correlated with large placentae and is found less frequently in cases of ABO incompatibility than when ABO groups are compatible. It is not influenced by parity, duration of labour, condition and method of expulsion of placenta or state of the infant at birth. M.E.Nutt

6408. DIABETES MELLITUS AND PERNICIOUS ANAEMIA. G.Arapakis, O.A.A.Bock, D.L.Williams and L.J.Witts: Brit. med. J., 1963, i, 159-161 (Radcliffe Infirmary, Oxford, England) Observations on 100 diabetics suggest that there may be a genuine association between diabetes mellitus and pernicious anaemia. M.E.Nutt

6409. EFFECT OF NORMAL CELLS ON VISCOSITY OF SICKLE-CELL BLOOD. H.Chaplin, jun., R.Anderson,

M.Cassell and G.L.Mullinax: Arch. intern. Med., 1963, 111, 286-294 (Dept. of Preventive Med., Washington Univ. Sch. Med., St. Louis, Mo., U.S.A.) The addition of normal r.b.c. (final concn. 30%) to r.b.c. obtained from a patient with sickle cell anaemia (final concn. 70%) in vitro decreases the abs. no. of sickled cells and thus reduces viscosity, but has no effect on % of patient's cells that will sickle under given conditions of pH and O₂ reduction. The beneficial effect of a partial exchange of sickle cells by normal cells in vivo is reported. E.E.Hobbiger

6410. SICKLE CELL-HAEMOGLOBIN C DISEASE QUANTITATIVE DETERMINATION OF IRON KINETICS AND HAEMOGLOBIN SYNTHESIS. E.R.Movitt, J.F. Mangum and W.R.Porten Blood, 1963, 21, 535-545 (Radioisotope Lab., V.A. Hosp., Oakland, Calif., U.S.A.) Ferrokinetic determinations in patients with sickle cell-HbC disease indicated a haemolytic process in all cases. The mean r.b.c. life span was very short. Hb synthesis was increased five-fold over the normal. In some patients there was much sequestration of r.b.c. in the spleen. H.B.Waynfor*

6411. EFFECT OF AGE OF HUMAN DONOR ON NUMBER & OF HEINZ BODIES PRESENT IN RED BLOOD CELLS AFTER INCUBATION IN VITRO WITH ACETYL-PHENYL HYDRAZINE. F.Quertodi Palo and M.Ciccona^{II} Atti. Acad. med. Lombarda, 1962, 17, 389-391 (Ist. di Patal. Med., Univ., Milano, Italy) The no. of Heinz bodies present in r.b.c. was determined by incubating a blood sample in acetylphenylhydrazine and then staining with Methyl Violet and counting under a microscope. Using 2 groups of human subjects, one < 30 yr. old and one > 70 yr. old, there was a slight increase in the no. of r.b.c. containing 2 or more Heinz bodies, with age. (Italian) G.N.Godson

6412. HAEMOLYSIS AND ERYTHROPOEISIS. I. INFLUENCE OF INTRAPERITONEAL ADMINISTRATION OF WHOLE HAEMOLYSATES ON RECOVERY OF BLED DOGS AS MEASURED BY CHANGES IN TOTAL ERYTHROCYTE VOLUME. L.Sanchez-Medal, J.Labardini and A.Loria: Blood, 1963, 21, 586-593 (Haematol. Dept., Hosp. de Enfermedades de la Nutricion, Mexico, D.F., Mexico) Anaemia was produced in dogs, by bleeding and the r.b.c. production was subsequently measured by 51cr determinations of circulating r.b.c. vol. Treatment of the anaemic dogs consisted of i.p. injn. of haemolysed r.b.c., control animals were given saline. An enhancing effect on the recovery of the dogs from anaemia was observed. H.B.Waynfor*

6413. INFLUENCE OF CHRONIC HYPO-OXIA EQUIVALENT TO 1000-8000 M. ALTITUDE ON ERYTHROPOEISIS IN THE RAT. B.TribukaiG Acta physiol. scand., 1963, 57, 1-25 (Physio*. Dept., Karolinska Sjukhuset, Stockholm, Sweden) The total Hb of rats held under hypoxia equiv. to 1000-8000 m. altitude showed an increase from the lowest to the highest altitude. The limit of survival was reached at 8000 m. after 40 days of hypoxia new levels of total Hb were reached at 6000 m. Haematocrit values are quoted. Blood vol. increased by 60% at 6000 m. but plasma vol. decreased. H.B.Waynfor*

6414. EFFECTS OF THYROID HORMONE, CORTISONE AND ANDROGENS ON BLOOD RETICULOCYTOSIS AND INCORPORATION OF 59pe BY ERYTHROCYTES AND CERTAIN ORGANS IN PROTEIN DEFICIENT RATS.

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- A.Aschkenas C.R. See. Biol., Paris, 1963, 157, 91-95 (H8p. de la Ktis, Paris, France) A study of blood reticulocytosis and incorporation of ^{59}Fe into r.b.c. showed that the inhibit, of erythropoiesis observed in rats during protein deficiency could be partially prevented by cortisone and thyroxine and to a lesser extent by testosterone and 17-ethyl-19-nortestosterone. The hormones increased ^{59}Fe fixation by the bone marrow but cortisone also reduced the retention of ^{59}Fe by the liver.
 (French) M.A.Pine

6415. PROBLEMS AND FINDINGS FROM BONE MARROW BIOPSY IN BLOOD DISEASE. H.Czitoben Blut, 1963, 9, 104-128 (Med. Dept., Kaiserin Elisabeth State Hosp., Vienna, Austria) Review.
 (German) A.J.Wansbrough

6416. MITOTIC INDICES OF HUMAN BONE MARROW CELLS. -E. USE OF MrTOTIC I \wedge TCE FOR ESTIMATION OF TIME PARAMETERS OF $\frac{\text{g}}{\text{g}^2} \cdot \text{A}^{\text{TM}}$ J J^{TM} SERIALLY CONNECTED MULTIPLICATIVE CELLULAR COMPARTMENTS. S.-A.Killmarin, E.P.Cronkite, T.M.Friedner, V.P.Bond and G.Brechen Blood, 1963, 21, 141-165 (Med. Res. Cen. Brookhaven Nat. Lab., Upton, N.Y., U.S.A.) The use of mitotic indices in computations of time parameters in various types of mitotable cell compartments is discussed. For detailed temporal analysis of catenated mitotable compartments, a new parameter, the mean compartment transit time, is introduced.
 H.B.Waynforth

6417. PLASMA CONCENTRATION OF C \wedge R \wedge A \wedge I \wedge O \wedge T \wedge N \wedge COL AND BONE MARROW SUPPRESSION. P.R.McCurdy: Blood, 1963, 21, 363-372 (Med. Dept., Georgetown Univ. Med. Sch., Washington, D.C., U.S.A.) The appearance of reticulocytopenia and of vacuolated marrow blast cells has been correlated with elevated plasma levels and prolonged marrow exposure to free ditonungOT \wedge COL. The latter may act in part as an antimetabolite agent.
 H.B.Waynforth

6418. DIRECT ABO GROUP W TM m J AT W N OF BLOODSTAINS ON A MICRO SCALE BY BATCH PROCEDURE. R.A.Outteridge: Nature, Lond., 1963, 198, 698-699 (Home Office Forensic Sci. Lab., & TM^* , Drive, Harrogate, Yorks., England). G.M.Lewis

^f6419. HAPTOGLOBINS AND TRANSFERRINS IN FORENSIC BLOODSTAINS. B.J.Culliford: Nature, Lond., 1963, 198, 796-797 (Metropolitan ***? f^{TM} New Scotland Yard, London, England). G.M.Lewis

⁶6420. CYTOCHEMICAL STUDIES ON NUCLEAR CHROMATIN OF HUMAN AND A \wedge L \wedge J \wedge O \wedge C TM . W.Laves, G.Falzi and H.Junken: Blut, 1963, 9, 73-85 (Inst. Gerichtl. u. Versicherungsmed., Univ., MOnchen, Germany) Hydrolysis of nuclear substance could be ed to different kinds of neutrophils and their precursors from mophils and lymphatic ptils . using dulysates . Oornase or 0.14M NaCl soln.. the $\text{ef t c t M J w f t}$ Jeing due to differences in nuclear membrane ; fl^{TM} fouah ability.
 (German) A.J.Wansbrough

⁶6421. PHAGOCYTIC ACTIVITY OF W.B.C FROM BLOODS AND FROM DIFFERENT SPECIES OF Eukaryotes. E.Kapitska.
 ^SaSahSSt^A Polska Atad. Nauk Wroclaw, Poland) Differences in phagocytic activity of anulocytes in man and various animal spp. were observed J en SS at the homologous and heterologous sera. The neutrophilic granulocytes showed much higher phagocytic

activity than eosinophilic granulocytes from the same sp. The phagocytic indices of guinea-pig neutrophilic and eosinophilic granulocytes in heterologous sera were low or equal to zero.
 H.Osowiecki

6422. FLOCCULATION OF SHEEP LEUCOCYTES. I. ELECTROPHORETIC STUDIES. D.J.Wilkins and R.H.Ottewill. H. STABILITY STUDIES. D.J.Wilkins, R.H.Ottewill and A.D.Bangham: J. theor. Biol., 1962, 2_f, 165-175, 176-191 (Colloid Sci. Dept., Univ., Cambridge, England) I. Electrophoretic properties of polymorphonuclear leucocytes are investigated as a function of pH and ionic strength. The influence of certain cations on the electrophoretic mobility of the cells was examined. Sp. binding of these ions occurred and the free energies of adsorption evaluated. Adsorption of bovine serum albumin by the cells was measured. The effect of metal ions on these cells was investigated.

II. Combination of stability data with electrophoretic data enables curves of stability ratio against zeta potential to be constructed, and the effective London - van der Waals const. of attraction to be calc. J.A.Dawson

6423. LEUCAPHAERESIS IN MAN. IE. HAEMATOLOGICAL OBSERVATIONS IN PATIENTS WITH LEUKAEMIA AND MYELOID METAPLASIA. H.R.Bierman, G.J. Marshall, K.H.Kelly and R.L.Byrnes: Blood, 1963, 21, 164-182 (Cancer and Blood Res. Inst., Beverly Hills, Los Angeles, Calif., U.S.A.) Patients with leukaemia or myeloid metaplasia were subjected to leucaphaeresis after which a continued decline of peripheral w.b.c. concn. was observed. Pretreatment levels were reached however with in 1 hr. to 22 days after treatment. No changes in marrow population were observed. Evidence showed a lack of replenishment of w.b.c. after leucaphaeresis indicating a block in the transfer of w.b.c. from the tissues of the blood. The platelet count dropped during the treatment returning to normal within 7 hr. to 9 days.
 H.B.Waynforth

6424. ACUTE PROMYELOCYTIC LEUKAEMIA ASSOCIATED WITH HYPOFIBRINOGENAEMIA. R.L.Rosen-thai: Blood, 1963, 21, 495-508 (Haematol. Dept., Hosp. Joint Dis., New York, U.S.A.) The distinctive features of this condition are the presence of abnormal promyelocytic cells in the bone marrow and an unexplained hypofibrinogenaemia. No fibrinolysin could be found. The response to therapy is poor. H.B.Waynforth

6425. NON-SPECIFIC ESTERASE ACTIVITY OF THE MONOCYTE: A FURTHER CONTRIBUTION TO THE MYELOID ORIGIN OF MONOCYTES. D.Bakalos and P.Petropoulos: Blut, 1963, 9, 7-20 (Evangelismos Hosp., Athens, Greece) Monocytes could be distinguished from other leucocytes in peripheral blood by their characteristic non-sp. esterase activity studied with a simplified method. Promyelocytes in haemopoietic tissue were the only precursor cells with corresponding activity, and are considered to be the monocyte precursors.
 AJ.Wansbrough

6426. BRADYKININ AND EOSINOPHILS. R.K.Archer and J.Broome: Nature, Lond., 1963, 198, 893-894 (Equine Res. Sta., Animal Hlth. Trust, Newmarket, Suffolk, England) Oedema produced in horse skin by bradykinin was markedly reduced by superinjn. of an aq. extract of horse eosinophils. Extracts from horse neutrophils and lymphocytes had no effect. Bradykinin produced leucocytosis of subcuticular tissue but never eosinophilia.

PHYSIOLOGY

The role of the eosinophil in the control of local inflammatory response is discussed. G.M.Lewis

6427. MECHANISM OF ACUTE EOSINOPHILIA. J.Bir& Acta physiol. Acad. Sci. hung., 1963, 23, 105-114 (Dept. Urol., Med. Univ., Budapest, Hungary)

In rats, stimuli causing acute eosinophilia raise the no. of eosinophils very considerably if the latter is originally low while the eosinophilia becomes less marked the higher the initial prestimulus eosinophil count and with high initial counts there may even be eosinopenia. Changes in eosinophil counts in response to stimuli are variable and in particular depend on initial levels. The eosinophil changes seem to be due to (a) a direct increase in eosinophils and (b) an inhibn. of eosinopenia the relation between the two actions not being understood.

H.G.Bevan

6428. FURTHER OBSERVATIONS ON PLATELET AGGREGATION INDUCED BY ADP, THROMBIN AND TRIETHYL TIN. J.R.O'Brien: J. clin. Path., 1963, 16, 223-226 (Pathol. Service, Portsmouth, England)

ADP-induced platelet aggregation in human citrated, platelet-rich plasma was inhib. by adenosine, AMP and ATP. Thrombin-induced aggregation was inhibited by adenosine or AMP, but not ATP. Tri-ethyl tin-induced aggregation was inhib. by 5HT or tryptamine.

J.B.Derbyshire

6429. AGGREGATION OF BLOOD PLATELETS.

G.V.Born and M.J.Cross: J. Physiol., Lond., 1963, 168, 178-195 (Dept. Pharmacol., Royal Coll. Surg., Lincoln's Inn Fields, London, England) A turbidimetric method is described for following quant. the aggregation of blood platelets in vitro. The method depends on the decrease in optical density of stirred plasma which occurs when the platelets in it aggregate. When CaCl₂ was added to platelet-rich plasma there was an immediate small increase in optical density. No such increase was observed when CaCl₂ was added to platelet-free plasma. Platelets in citrated human or pig plasma could be made to aggregate sometimes by adding Ca and always by adding ADP. The initial rate of aggregation by added ADP was linearly related to the log of its concn. Platelets which had aggregated in the presence of low concn. of ADP dispersed again after a few min., ifd when ADP was added repeatedly its effectiveness in causing aggregation decreased. The aggregation of platelets in plasma containing Na EDTA required ADP and Ca or Mg. Adenosine and AMP inhib. aggregation by ADP; adenosine was about 10 times more active than AMP. The inhibitory effect increased the longer the time between their addition to plasma and the subsequent addition of ADP. ATP, deoxyadenosine, and purine riboide also inhib. aggregation but much less than adenosine. Adenine, IMP, inosine, guanosine, cytidine and ribose were ineffective.

6430. THROMBELASTOGRAPHIC STUDIES ON THE CONSERVED BLOOD PLATELETS. Z.J.Jopaciuk, B.Kotelba-Witkowska and A.Majda: Pol. Tyg. Lek., 1962, 17, 1537-1543 (Inst. Haematol., Warszawa, Poland)

Thrombelastographic examination by the Harter method of the conserved blood platelets suspended in the platelet-poor plasma showed the highest biol. value of platelets suspended in citrate media and stored at 4°. Lyophilisation, freezing or suspending in gelatin were less efficient. (Polish) E.G.^bicka

6431. EFFECT OF SMOKING ON BLOOD COAGULABILITY AND PLATELET SURVIVAL IN MAN. J.F.Mustard and E.A.Murphy: Brit. med. J., 1963, i, 846-849 (Dept.

Med., Univ., Toronto, Canada) In 7 white d subjects aged 35-72 yr. platelet survival was significantly shorter, and turnover correspondingly greater, during periods of habitual smoking than when they did not smoke at all. Blood coagulation and blood lipid level* showed only minor associated changes. M.E.Nutt

6432. SEPARATION AND PURIFICATION OF CLOTTING FACTORS FROM INBRED MICE. H.Meier, R.C.Allen and W.G.Hoag: Clin. chim. Acta, 1963, '8, 137-140 (R.B.Jackson Mem. Lab., Bar Harbor, Maine, U.S.A.)

A method involving continuous flow electrophoresis and starch gel electrophoresis is described for an improved purification of clotting factors from mice plasma. Short comm. K.Brew

6433. HAEMORRHAGIC THROMBOCYTHAEMIA.

A.T.Webb, F.L.Meyer and E.R.Lonsen: Arch. intern. Med., 1963, 111, 280-285 (Dept. of Pathol., Univ., Loma Linda, Los Angeles, Calif., U.S.A.) A patient with haemorrhagic thrombocythaemia was treated with busulphan (Myleran). This caused a reduction to normal of the concn. of platelets in plasma and alleviation of the haemorrhagic manifestations. E.E.Hobbiger

6434. PURIFICATION OF FACTOR V. B.BlobmSck and M.BlobmSck: Nature, Lond., 1963, 198, 886-887

(Coagulation Res. Lab., Chem. Dept. n, Kafoliuska Inst., Stockholm, Sweden) Procedures fo; the parti* purification of factor V are described. A significant stabilisation of this labile factor was produced by Mg²⁺, Ca²⁺ or Sr²⁺, 0.1M Ca acetate at pH 5.7 giving optimal stabilisation. Other divalent ions, ascorbic acid, cysteine, trypsin inhibitors and e-aminocaproic acid wer< ineffective. G.M.LewU

6435. ACTIVATION OF ANTIHAEMOPHILIC GLOBULIN AND PROACCELERIN BY TRACES OF THRQMBIN IN GENERATION OF INTRINSIC PROTHROMBINASE ACTIVITY. S.I.Rapaport, S.Scheiffnan, M.J.Palch and S.B.Ames: Blood, 1963, 21, 221-236 (Med. Dept., Southern California Univ. Med. Sch., Los Angeles, Calif., U.S.A.) In studies on intrinsic

Glutting In vluo it wad shown that when plasma contains activation product activity, activated anti-haemophilic globulin, activated proaccelerin and free platelet factor-3-like activity, all the reactions required to generate powerful intrinsic prothrombinase activity take place within 12 sec. after recalcification. H.B.Wayforth

6436. ROLE OF CALCIUM IN FIBRIN FORMATION.

P.H.Koppen: Nature, Lond., 1963, 198, 493-494 (Stormont-Vail Hosp., Topeka, Kans., U.S.A.)

The activity of salts of Ca, Ba and Sr in mixtures of clotting factor with plasma or bovine fibrinogen was investigated.

G.M.Lewis

6437. SELECTIVE INACTIVATION O? FIBRIN STABILISING FACTOR [FSF] CONTAMINANT IN FIBRINOGEN.

S.Swigert, J.L.Koppel and J.H.Olwin: Nature, Lond., 1963, 198, 797-798 (Coagulation Res. Lab., Dept.

?T?7 ^esbyterian-St. Lukes Hosp., Chicago, HI., U.S.A.) Mercaptide-forming agents (p-chloromercuri benzoate, Salyrgan^f) inactivate bovine or human serum FSF activity without affecting fibrinogen. The inactivation is reversed by cysteine, glutathione or BAL. By inactivating die FSF and labelling the fibrinogen with fluorescein simult., a product is obtained suitable for quart-assay of FSF activity. G.M.Lewis

PHYSIOLOGY

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P V if [^]MNOGENOPATHY INTRA PARTUM.
^K.Bellen Blut, 1963, 9, 65-73 (Dept. Obstet.
T.Y.O.A? New York Univ, Med > Center» New York,
staoi, ri? • Observations and hypotheses concerning the
cue. A of hypocoagulaemia in various syndromes are dis-
used. Review. (German) A.J.Wansbrough

6439 RIGIN OF BLOOD FIBRINOLYTIC ACTIVITY
^ VEINS AND ITS BEARING ON THE FATE OF
VENOUS THROMBI. R.Chakrabarti, P.M.Birks and
P.K.Fearnley: Lancet, 1963, i, 1288-1290 (Glouces-
un^{er} K.R. R. Ho's P-» Gloucester, England) Expt. on
unobstructed veins exposed at operation indicate that
trauma to the vein wall results in a release of fibrinol-
ytic activity of considerable amount. Non-fibrinolytic
VAL⁵ introduced into isolated segments of exposed
sho^u u level^e Ps considerable fibrinolytic activity in a
sin^l th^{em} i^{**} conjectured that venous thrombosis
th^T ear^y K¹⁶⁸ release of activator which determines
ha^{? a} of the trombus. Observations in 21 patients
fik^e ral led to confirm the a-v. difference in blood-
snⁿ n^olytic activity reported previously, and it is
suggested that this difference may have been due to the
use^c of local anaesthesia for the arterial punctures.

G.H.Bell

6440 EFFECT OF DIET ON FIBRINOLYTIC ACTIVITY
OF BLOOD DURING AND AFTER SURGICAL OPERA-
TION. P.Cagliani and F.Pisani: Atti. Acad. med.
Lombarda, 1962, 17, 480-483 (Clin. Chir. Gen.,
sen^{univ} Milano » Italy) The fibrinolytic activity of
trö^m * as measured in 38 patients maintained on a con-
Inⁿ ed. diet# before and after various surgical treatments.
Patients fed a diet containing a high prop. of animal
f¹ is^l the fibrinolytic activity of the scum w/a leu than
normal and anti-fibrinolytic activity appeared in the
serum. (Italian) G.N.Godson

6441. INVESTIGATIONS OF PLASMINOGEN AND
PLASMIN BY IMMUNOELECTROPHORESIS ON FIBRIN-
AGAR PLATES. DETECTION OF TWO PLASMINOGENS
*N HUMAN SERA. M.Rybak and M.Petakova: Clin.
2¹*m. Aotfl, 1960, 6, 133-137 Clm^h Haematoi. and
Blood Transfusion, Prague, Czechoslovakia) Short
c_omni- K.Brew

6442. CELLULAR LOCALISATION OF PROFIBRINOLYSIN
(PLASMINOGEN). M.L.Barnhart and J.M.Riddle:
ood, 1963, 21, 306-321 (Physiol. Dept., Wayne
State Univ. Med. Coll., Detroit, Mich., U.S.A.)
g^{ne} Realisation of profibrinolysin within the eosinophilic
canules of bone marrow cells was demonstrated by the
orescent Ab technique. The greatest intensity of
luorescence indicating the greatest content of profibrino-
lysin was seen in mature eosinophils. Profibrinolysin is
released into the circulation only when it is needed.
H.B.Waynforth

6443. ANTIGENIC ANALYSIS OF PLASMINOGEN AND
JASMIN. U.Rife, F.Milgrom and S.Shulman: Blood,
^ 3 , 21, 322-334 (Biophysics Lab., Univ. Med. Sch.,
gen^{ouffao}, N.Y., U.S.A.) Antisera to Kline plasmino-
gen were P^{re}P- ^ rabbits. Analysis of the plasminogen
showed that it had 3 distinct components of which one was
thAD^{ical} to rum v-globulin and the other two were in
V^a 'TTglobulin mobility category. One of these latter
was identified as plasminogen. Plasmin showed a similar
pattern except for the absence of the y-globulin consti-
uent. H.B.Waynforth

6444. EXISTENCE AND SIGNIFICANCE OF A REFLEX-
HUMORAL ANTIPLASMIN SYSTEM IN THE ORGANISM.
B.A.Kudrjashov and T.M.Kalishevskaya: Nature, Lond.,
1963, 198, 763-764 (Fac. Biol., State Univ.,
Moscow, U.S.S.R.) Addition of human plasmin to
rabbit blood in vitro retarded coagulation, but when inj.
i.v., the initial retardation was followed in 3-5 min. by
a sharp acceleration of clotting. This 'anti-plasmin'
effect was prevented by bilateral section of the sympathetic
chain at the neck. Expt. on 1 kidney isolated from
the systemic circulation, indicated that in the vascular
bed, there are receptors reacting to a relative excess of
plasmin, and that chemoreception calls forth a protective
reaction of the reflex-humoral type resulting in a sharp
decrease of the blood fibrinolytic activity and an increase
in coagulating potency. G.M.Lewis

6445. METHOD FOR COMPARISON OF ANTIPLASMIN
ACTIVITY OF TWO GROUPS OF BLOOD SERA.

M. Howell: J. clin. Path., 1963, 16, 289-290 (St.
George's Hosp. Haematol. Dept., London, England)
Serum antiplasmin activity was estimated by a clot lysis
method using streptokinase-activated serum euglobulin as
the plasmin source, and human plasma euglobulin as the
fibrinogen source. e-Aminocaproic acid was used to
prevent residual activator activity in the clot.

J.B.Derbyshire

6446. EFFECT OF PYRIDOXAL PHOSPHATE ON BLOOD
COAGULATION AND FIBRINOLYTIC SYSTEM.

K.Yamada, H.Kuzuya, M.Noda, T.Yokoyama,
T.Oguri and S.Hanai: J. Vitaminol., 1962, 8, 262-
267 (Third Dept. Int. Med., Univ. Sch. Med., Showa-
ku, Nagoya, Japan) At high concn. pyridoxal phos-
phate [PAL-PO4] inhibited the coagulation of rabbits'
blood bothan vivo and in vitro. At very low concn. PAJ,
PO4 whom inj. i.v. (ncr*noed th* fibrinolytic activity of
the plasma euglobulin of 3 normal students. Whole
plasmin activity was parallel with the fibrinolytic activity
of plasma euglobulin, suggesting that PAL-PO4 increased
the fibrinolytic activity in vivo too. From absorption
spectra, it was demonstrated that e-aminocaproic acid
combined with PAL-PO4 in vitro. E.Parkinson

6447. ANTITHROMBIC ACTIVITY OF CARRAGEENIN
IN HUMAN RLOOn. W.W.Hawkins and V.O.Tennard:
Canad. J. Biochem., 1963, 41, 1325-1327 (Atlantic
Res. Lab., Nat. Res. Council, Halifax, Nova Scotia,
Canada) Heparin, X-, unfractionated, and H-carrageenin
were added to human plasma, the prothrombin was
thrombin times then being measured for each mixture.
The amounts of anticoagulant, in the above order,
required to double the normal prothrombin time were
3*0, 10*0, 40*0 and 50*0 jg./0.1 ml. plasma. Doubling
of thrombin time was caused by 0*15, 2*5, 7*5 and
15*0 pg. of the respective anticoagulants/0#1 ml. of
plasma. A.M.Gibbins

6448. IMPORTANCE OF SERUM PROTEIN PATTERN
DURING EARLY PHASES OF HEART INFARCTION.

G.Barbi and C.Maggi: Atti. Acad. med. Lombarda,
1962, 17, 418-422 (1st. Ospitalieri di Milano, Italy)
In 275 cases of acute myocardial infarction, the pattern
of serum protein was obtained as early as possible in the
initial phases. The amount of serum albumin decreased
constantly and to such a marked extent that this aspect of
dysproteinaemia must play an important role in infarction.
Electrophoretic analysis showed that in some cases, there
was a grave hyperlipaemia and a great increase in CC2-glo-
bulin. The possibilities of using serum protein changes for
diagnosis and prognosis of infarction are discussed.

(Italian)

G.N.Godson

PHYSIOLOGY

6449. SURFACE CHARACTERISTICS OF DOC' CHYLOMICRA AND SOME LIPID MODELS. G.V.F. Seaman and R.L. Swank: *J. Physiol., Lond.*, 1963, 168, 118-128 (*Physiol.-chem. Inst. Univ. K81n, K81n-Lindenthal, Germany*) The pH-mobility relationships of dog chylomicra and some model fat and oil particles dispersed in physiol. saline are reported. The electrokinetic prop. of plasma treated model particles and the chylomicra are similar. The fractions of whole canine plasma which actively absorb are probably of the α and B globulin type. The mobilities of the chylomicra particularly those obtained after a cod-liver oil meal, increase about 5 hr. after washing. Treatment with canine plasma restores the original electrokinetic prop. of the chylomicra. Chylomicra contain 2-5-5% phospholipid 3-8% cholesterol, those from plasma 5% sugar and 5-6% N, whilst those from chyle contain 0<4-0% sugar and about 0-4% N.

BODY FLUIDS AND ELECTROLYTES

6450. PASSAGE OF CERTAIN SUBSTANCES OUT OF THE CS F. M.Pollay and H.Davson: *Brain*, 1963, 86, 137-150 (Dept. Physiol., Univ. Coll., London, England) By means of the inulin diln. technique in a controlled ventriculocisternal perfusion system, the rate of c.s.f. formation in the rabbit was 0.0088 ml./min. The rapid loss of 1311, CNS" and PAH from the perfusion soln. was investigated suggesting an active process situated in the epithelial cells of the choroid plexuses.

R.H.Kimberlin

6451. EFFECT OF ACUTE HAEMODYNAMIC CHANGES ON C.S.F. PRESSURE. W.Baust, H.Niemczyk and H.Schaefer: *Z. Ges. exp. Med.*, 1963, 136, 619-629 (*Physiol. Inst., Univ., Heidelberg, Germany*)

In anaesthetised cats, c.s.f. pressure and internal jugular venous and arterial pressures were measured; cerebral blood flow was recorded with a calorimetric probe introduced bilaterally into the basal ganglia. Aortic pressure was controlled by varying the pressure inside a windkessel connected with the aorta by T-tube. A rise in cerebral perfusion pressure caused a parallel rise in c.s.f. pressure. Increase in cerebral blood flow without significant rise in pressure after CO₂ breathing caused a rise in c.s.f. and venous pressure. Adrenaline i.v. caused a rise in c.s.f. pressure, but if the rise in arterial pressure was prevented, there was a fall in c.s.f. and venous pressure. ACh caused a rise in c.s.f. and venous pressure if the fall in arterial pressure after ACh was prevented. C.s.f. pressure is determined by the intracranial blood vessel vol. which in turn depends on arterial inflow and venous outflow.

(German) P.F.Meyer

6452. CHANGES IN DISTRIBUTION OF WATER AND ELECTROLYTES IN PLASMA AND OTHER TISSUES IN DOGS WITH PROTRACTED NEPHROGENIC HYPERTENSION. U.Marini, F.Gilardi and R.Beretta: *Atti. Acad. med. Lombarda*, 1962, 17, 263-271 (1st. di Patol. Speciale Med., Univ., Milano, Italy) When lasting arterial hypertension was induced in dogs by constrictive perinephritis (Page's method), the Na⁺, Cl⁻ and H₂O content of the femoral arterial wall tissue increased, the "corrected" Na⁺/Cl⁻ ratio increased and the K⁺ content decreased. These electrolyte changes

were exclusive to the arterial wall and did not occur in the plasma. It is suggested that such ionic changes are due to the hypotonic state of the myoepithelial cells which are responsible for the vasoconstriction.

(Italian) G.N.Godson

6453. EFFECT OF HYPOPHYSECTOMY ON DISTRIBUTION OF WATER AND ELECTROLYTES IN PLASMA AND ARTERIES OF DOGS WITH PROTRACTED NEPHROGENIC HYPERTENSION. F.Gilardi, U.Marini and R.Beretta: *Atti. Acad. med. Lombarda*, 1962, 17, 283-285 (1st. Patol. Spec. Med., Univ., Milano, Italy) In dogs with nephrogenic hypertension, induced for 3 months, by Page's method, the arterial pressure, Na, K, Cl and H₂O content and Na/Cl ratio of the arterial wall tissue remained the same as in animals that had been similarly treated, but simul. hypophysectomised. Thus, pituitary hormones have little influence on the metabolism of this kind of expt; hypertension.

(Italian) G.N.Godson

6454. ALDOSTERONE AND WATER AND SODIUM DISTRIBUTION IN NORMAL AND ADRENALECTOMISED RATS. P.J.Leonard: *J. Endocr.*, 1963, 26, 525-530 (Dept. Med., Univ., Royal Hosp., Sheffield, England)

An increase of intracellular Na, both total and relative concn. in heart tissue, and a decrease of both in abdominal muscle occurred in adrenalectomised rats. Aldosterone reversed these changes although it had no such effect in normal animals. The suggestion is made that total Na and the intracellular concn. in muscle are influenced by the availability of aldosterone and Na.

G.F.Blane

6455. ELECTROLYTE DISTURBANCES SECONDARY TO PROLONGED GLUCOSE INFUSIONS. W.Malaisse, J.R.M.Francckson and V.Conard: *Arch. int. Physiol.*, 1963, 71, 64-72 (Lab. Expt. Med., Free Univ., Brussels, Belgium) Hypertonic glucose (50%) was given lly continuous i.v. infusion, at 3 g./kg./hr. for 4-7 hr. to 6 dogs, wt. 16-25 kg. anaesthetised with Na pentobarbitone. The water diuresis consequent on glycosuria was maintained throughout the period of infusion whatever the degree of dehydration. In the initial phases water diuresis was accompanied by increased urinary loss of K and Na, resulting in hypo-electrolytaemia:water depletion at this stage being confined to the cellular compartment. After 2-3 hr. excretion of ions became min. and independent of urinary vol. Hypokalaemia increased, but plasma Na level returned to its initial value or above secondarily to whole body dehydration.

(French) M.E.Nutt

6456. ACCELERATOR REFLEX IN NORMAL AND DEHYDRATED DOGS. S.Kumar and P.M.Lahiri: *Indian J. Physiol. Pharmacol.*, 1963, 7, 59-62 (Dept. Physiol., King George's Med. Coll., Lucknow, India)

A study was made of the superimposed reflex of opening the mouth, which accelerates the already rapid respiration rate in hyperthermic dogs. Both these responses were suppressed in dehydrated dogs and exaggerated by saline infusion. The suggestion is therefore made that dogs conserve fluids in preference to the maintenance of a normothermic state.

G.F.Blane

6457. SPECIES DIFFERENCES IN THE DERANGEMENT OF MINERAL METABOLISM AFTER ADRENALECTOMY.

T.Fukuda and T.Koyama: *Jap. J. Physiol.*, 1963, 13, 187-195 (Dept. Physiol., Univ. Sch. Med., Chiba, Japan) A spp. difference appears to exist among expt. animals in necessitating Na salts after adrenalectomy. While the necessity of mineralocorticoids in rabbits is limited to emergency cases of enforced Na loss,

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dogs require them for preserving NaCl and NaHCO₃. This difference appears to be related to the degree of development of the renal tubular absorption mechanism for NaCl and NaHCO₃.

M.J.Bell

6458. THEORY OF ELECTRONIC CONDUCTION THROUGH MEMBRANES, AND OF ACTIVE TMN8-PORT OF IONS. BASED ON REDOX TRANSMEMBRANE POTENTIALS. T.L.Jahru J. theor. Biol., 1962, 2, 129-138 (Zool. Dept., California Univ., Los Angeles, Calif., U.S.A.) Modern theories of electron transport in org. compounds should be reconsidered, so as to include electron flow through the lipid subsiances of the membrane. The apparent rapid transport of H, the less rapid transport of Cl, and the movement of Na and Cl in the same direction can be accounted for.

J.A.Dawson

6459. UREA DISTRIBUTION IN BODY AFTER HAEMODIALYSIS. R.Shackman, G.D.Chisholm, A.J.Holden and R.W.Pigott: Brit. med. J., 1962, u. 355-f58 (Postgrad. Med. Sch., London, England) Determinations of intra and extracellular urea concn. in muscle biopsy and plasma samples indicated that haemodialysis may result in intra/extracellular concn. rate > 1, due to delayed diffusion of urea across cell membranes. This finding may explain the development of cerebral oedema during dialysis and its subsequent spontaneous regression, also the accelerated rise in plasma urea concn. on the first post-dialysis day.

M.E.Nutt

RESPIRATION

6460. AN EVALUATION OF MECHANICAL VENTILATING DEVICES. J-D-Elder, jun., Duncalf, L.S. Binder and M.H.Harmel: Anaesthesia, 1963, 24, 95-100 (Dept Anaesthesiol., State Univ. New York, U.S.A.) The ability of 7 ventilators and manual inflation to maintain a const. output with change in compliance has been evaluated in a dummy system. Under conditions of test, the Engström ventilator produced the most const. output.

A.A.Zimmerman

6461. DETECTION OF HALOGENATED HYDROCARBONS IN THE EXPIRED AIR OF HUMAN BEINGS USING THE ELECTRON CAPTURE DETECTOR. R.-D-Stewart, J.D. Swank, C.B.Roberts and H.C.Dodd: Nature, Lond., hem. of detection, breath r several breaths. G.M.Lewis

may be detected in the weeks in the post-exposure period.

6462. AIRWAY RESISTANCE AND PEAK EXPIRATORY FLOW-RATE IN SMOKERS AND NON-SMOKERS. N.Zainel, H.H.Youssef and F.J.Prime: Lancet, 1963, 2, 1237-1238 (Dept. Mea., Inst. for Chest. Brompton Hosp., London, England) Airway resistance was

increased in both smokers and non-smokers. Inhalation of isoprenaline reduced the airway resistance in both groups.

G.H.Bell

6463. EFFECTS OF CIGARETTE SMOKE ON AIRWAY CONDUCTANCE IN SMOKERS AND NON-SMOKERS.

F.W.Lovejoy and L.Dautrebande: Arch. int. Pharmacodyn., 1963, 143, 258-267 (Dept. Med., Univ., Rochester, N.Y., U.S.A.) Inhalation of cigarette smoke by smokers caused mild airway constriction which could be abolished by isoprenaline or atropine aerosols. After these drugs, cigarette smoke did not cause airway constriction. Three out of 5 non-smokers did not have airway constriction, but suffered from syncope and profuse perspiration.

T.J.Sullivan

6464. PRESSURE-VOLUME CURVES IN ISOLATED ATELECTATIC RAT LUNGS AFTER ALUMINIUM OXIDE MICROPARTICLE INHALATION. E.Robillard and Y.Alarie: Canad. J. Biochem. 1963, 41, 1257-1265 (Physiol. Dept., Univ., Montreal, Quebec, Canada) A dilating effect was recorded in the lungs of rats exposed to inhalation of submicronic Al₂O₃ particles, contrasting with the reported constricting effect of this treatment on guinea-pig, dog, cat, and human lungs. Inhalation of fine Al particles before or after inhalation of sympathomimetic aerosol resulted in a more intense dilation. The constricting effect of carbachol was antagonised by prior inhalation of Al₂O₃ dust and enhanced when the order of inhalations was reversed.

A.M.Gibbins

6465. INTERMITTENT DEEP BREATHS AND COMPLIANCE DURING ANAESTHESIA IN MAN.

L.D.Egbert, M.B.Laver and H.H.Bendixen: Anesthesiology, 1963, 24, 57-60 (Anaesthesia Lab., Harvard Med. Sch., Massachusetts Gen. Hosp., Boston, Mass., U.S.A.) A fall in compliance may reflect pulmonary atelectasis. Intermittent passive hyperinflations are suggested as an important prophylactic measure to prevent atelectasis during anaesthesia.

A.A.Zimmerman

6466. ACTION OF ACETALDEHYDE ON CHEMORECEPTORS OF THE CAROTID GLOMUS. N.Joels and E.Neil: J. Physiol., Lond., 1963, 168, 234-237 (Dept. Physiol., Middlesex Hosp. Med. Sch., London, England) Inj. of acetaldehyde into the local circulation of the carotid glomus causes reflex hyperventilation, abolished by cutting the sinus nerve. The drug causes vigorous chemoreceptor impulse activity. In perfusions of the vascularly isolated carotid body with Krebs-Henseleit soln., acetaldehyde also produces chemoreceptor nerve activity which is greatly reduced when the O₂ tension of the perfuse is raised. Similar concn. of formaldehyde do not share this stimulant action. *

6467. DISCHARGE PATTERN RECORDED IN CHEMORECEPTOR AFFERENT FIBRES FROM THE CAT CAROTID BODY WITH NORMAL CIRCULATION AND DURING PERfusion. T.J.Biscoe and A.Taylor: J. Physiol., Lond., 1963, 168, 332-344 (War Dept., C.D.E.E., Porton Down, Nr. Salisbury, England)

Recordings were made of the pattern of discharge of nerve impulses in single chemoreceptor afferent fibres from the carotid body of the cat with the circulation intact and when the body was perfused with Krebs* soln. plus 7.5 g./l. dextran. In the former case the pattern of impulses possessed some prop. of a random process for mean intervals longer than 120 msec.; the distribution for shorter mean intervals was not symmetrical. The impulse pattern with the perfused body had random prop. above 310 msec, and showed significant differences from that recorded with the intact circulation. Impulse initiation in the carotid body may be a random process at all freq. subject to

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restriction in shortness of interval by the refractory period of the nerve endings. *

6468. HYPERCAPNIC STIMULATION OF RESPIRATION.

G.Torelli, A.Pini and G.Vercesi: Atti. Acad. med. Lombarda, 1962, 17, 461-465 (1st. di Fisiol Umana, Univ., Milano, Italy) Administration of 50 mg. i.v. of diethiadone to healthy c? subjects between 18-25 yr. old, increased the hyperventilation induced by 2-83-4*32% CO₂ gas mixtures, but did not have this effect with a 6*5% CO₂ gas mixture. (Italian) G.N.Godson

6469. SINGLE BREATH DIFFUSING CAPACITY AND THE PERMEABILITY OF THE LUNGS OF NORMAL MAN. E.Rosenberg: Canad. J. Biochem., 1963, 41, 1283-1292 (Riysiol. Dept., Fac. Med., Univ., Montreal, Que., Canada) The single breath diffusing capacity for CO, [DLL] and the permeability of the lungs, [K_L] were measured in 6 c'and 2 ? . The test gas consisted of 0*3% CO, 0*3% SF₆ 20% O₂ and the balance N₂-^bL contrary to K which decreased towards a const. value as lung vol. increased, varied with the surface area of the subjects as well as with alveolar vol. The average permeability was 0*0715 ml. CO/sec./ml. alveolar vol. Alveolar vol. calc. from the SF₆ diln., [V_{Plt}] were not measurably different in the cffrom those calc. from max. lung vol., and the evaluation of K and VD was suggested as being a useful diagnostic tool. A.M.Gibbins

6470. DIFFUSION OF GASES FROM ALVEOLUS TO PRECAPILLARY ARTERIES. A.G.Jameson: Science, 1963, 139, 826-828 (Cardiovascular Lab., Presby* terian Hosp., New York, U.S.A.) A cardiac catheter with a Pt electrode just proximal to its tip, 'wedged*' in a branch of the pulmonary artery, was used to demonstrate the appearance of H₂ or O₂ at the tip of the catheter after inhalation of these gases. It is concluded that these gases can diffuse directly from the alveoli through the walls of adjacent pulmonary arteries as large as 2 mm. in diam. Diffusion into arterial walls may play some role in the control of pulmonary circulation through changes produced in vasoconstrictor activity of the pulmonary arteries. G.M.Lewis

6471. EXPERIMENTAL STUDIES ON HYPO-OXAEMIA IN RATS. L.Myszkowski and P.Opaliński: Ginek. pol., 1962, 33, 481-484 (H Klin. Płoznictwa i Chorób Kobiecych, Akad. Med., Warszawa, Poland) Injn. of glucose, niacin or cysteine to rats in state of hypo-oxaemia increased their swimming activity by about 20%. T.Qifbicki (Polish)

6472. HYPO-OXIA, ATELECTASIS AND PULMONARY OEDEMA. J.S.Lance and H.Latta: Arch. Path. Chicago, 1963, 75, 375-377 (Dept. of Path., Sch. of Med., Univ. California, Los Angeles, Calif., U.S.A.) Lung wt. is increased by up to 33% following exposure of rats to 4-5% O₂ for 24 hr. Newborn rats exposed to 3-4% O₂ for 24 hr. showed pulmonary oedema and patchy atelectasis. No evidence of hyaline membrane was found and this could not be produced expt. by intrathoracic injn. of human and rabbit sera. R.Mitchell

6473. PROLONGATION OF SURVIVAL TIME IN ASPHYXIATED IMMATURE FOETAL LAMBS. G.S.Dawes, J.C.Mott, H.J.Shelley and A.Stafford: J. Physiol., Lond., 1963, 168, 43-64 (Nuffield Inst. Med. Res., Univ., Oxford, England) Foetal lambs of 74-92 days gestation, asphyxiated by tying the

umbilical cord, can maintain their b.p. above 10 mm. Hg for 50-60 min. The blood glucose falls to zero and the arterial pH to 6*8 or less. I.v. infusion of glucose together with enough base to prevent the fall in pH produced a two-threefold increase in survival time and reduced the rate of rise of plasma K+. Both these effects were dependent on the maintenance of a high rate of anaerobic glycolysis. Infusion of either glucose or base was ineffective. *

6474. CHANGES IN OXYGEN CONSUMPTION OF NEW-BORN GUINEA-PIGS AND RABBITS ON EXPOSURE TO COLD. G.S.Dawes and G.Mestyám: J. Physiol., Lond., 1963, 168, 22-42 (Nuffield Inst. Med. Res., Oxford, England)

The effects on O₂ consumption were described of exposure to cold (with and without urethane anaesthesia) and of infusion of noradrenaline or adrenaline* Curariform paralysis did not alter the "rise in O₂ consump" tion on cold exposure, provided there was no fall in arterial b.p. The cardiovascular effects of hexamethonium^{f1} may contribute to its action in reducing the metabolic response to cold. *

6475. INITIAL RISE IN OXYGEN CAPACITY OF BLOOD OF RATS SUBJECTED TO HYPO-OXIA. B.Tribukart: Acta physiol. scand., 1963, 57, 90-98 (Physiol. Dept., Karolinska Sjukhuset, Stockholm, Sweden)

In rats submitted to hypo-oxia comparable to 6000 m. altitude, the Hb- and plasma protein concn. increased significantly. The sp. activity of haemin was unchanged. The total Hb also showed an increase.

(German) H. B. Waynfirth

6476. ARTERIAL BLOOD GAS TENSIONS IN ACUTE DISEASE OF THE LOWER RESPIRATORY TRACT IN INFANCY. E.O.R.Reynolds: Brit. med. J., 1963, i, 1192-1195 (St. Thomas's Hosp., London, England)

Arterial pO₂ was low in 12 babies aged 5 weeks to 7 months with acute disease of the lower respiratory tract and in 6 of these there was CO₂ retention. Low pO₂ and high pCO₂ are the consequence of uneven ventilation/ perfusion ratios due to airway obstruction. In most cases cyanosis and respiratory rate are a good guide to degree of hypo-oxia, but can mislead. Arterial pO₂ increased to >100 mm. Hg in all cases after breathing 100% O₂ for 30 min. and there was no clinically significant rise in PCO₂. M.E.Nutt

6477. INFLUENCE OF SIMULTANEOUS, INDEPENDENT CHANGES IN pH AND CARBON DIOXIDE TENSION ON IN VITRO OXYGEN TENSION-SATURATION RELATIONSHIP OF HUMAN BLOOD. N.Naeraa, E.Strange-Petersen and E.Boye: Scand. J. clin. Lab. Invest., 1963, 15, 141-151 (Central Lab. Dept., Kommune-hospitalet, Aarhus, Denmark) Samples of human blood with different artificially induced metabolic acid-base abnormalities were equilibrated with different gas mixtures of known composition (O₂ +CO₂ +N₂) at 4 different pCO₂ and at 2 different pO₂. pH and O₂ satn. were then determined. The expt. procedure was such as to keep other factors affecting the O₂ dissociation curve under strict control. An increase in pCO₂ (apart from the concomitant change in pH) caused a decrease in the O₂ satn. value. This effect was most pronounced at a pH below 7*3 and low pO₂. At a pO₂ of about 90 mm. Hg ft was hardly significant. E. Parkinson

6478. DECOMPRESSION IN ACUTE AND CHRONIC EXPERIMENTS. L.Kenedi, I.R5zsahégyi and V.Fáben: Acta physiol. Acad. Sci. hung., 1963, 23, 199-204

(Hungarian Army Med. Corps, Budapest, Hungary) Guinea-pigs were exposed to 3*3 atm. with rapid decompression after 4 hr., more than half developed severe symptoms or died. 77% showed e.c.g. changes (severe disturbances of conduction, Q waves, inversion of T and "labile" e.c.g.). AH animals showed serious changes in cardiac muscle and the coronary vessels. Shorter periods at pressure produced less changes on decompression although e.c.g. were abnormal. Bubble formation occurred in the arteries and veins of the heart. Animals showed very marked individual differences in their responses but in all surviving animals the e.c.g. returned to ^{JAG}
^{JG} Svan

6479. TESTOSTERONE AND ASTHMA. EjR.Trethewie: Nature; Lond.. 1963. 198. 290 (Dept. Physiol., Univ. of Melbourne, Australia) The sensitivity of the guinea-pig jejunum to histamine was markedly depressed by testosterone but not influenced by . " ^ ^ finding could explain the reduction of incidence of status asthmaticus in /during the sexually active period. G.M.Lewis

HEART

6480. ACTION OF THE PERICARDIUM DbR1KS^^cSTROPHY " " J f * M.Ruckebusch and C.Blaques C-R. 1962. 156. 2082-2084 (Lab. Physiol., Ecole Nat. Veterinaire, Lyon, France) * % " \$? £ 1 ? ° * were subjected to 30 min. n ^ n f ^ ^ /S.S S. Sted week for 2 months. Ablation of the P e ^ in an increase in wt. of the heart with hypertrophy of the heart wall. Left ventricle hypertrophy was " M. A. price 6481. EFFECT OF NaDEFKffINCY ON MEMBRANE ACTIVITY OF FROG'S HEART. R.G.Casteels: Arch. int. Physiol 1962. 70. 599-610 (Lab. Physiol) occurs in of normal if K and nearly n SSSSSSS^ cea. ac tentials lation were obtained in isotonic sucrose containing 4*8 M Na⁺ perfusion fluid. Addition of KC decreased the tissue inexcitability of the action potential was present. It is sug at adrenaline stimulates the cation trans- port n m and increases the Na gradient in the Na deficient soln. M.E.Nutt

6482. MPPHANTSM OF CALCIUM-INDUCED POSITIVE Cl ECT IN ISOLATED MAMMALIAN A' C. L. Sperti: Nature, Lond.. 1963, 198, 792 (Inst. Fisiol. umana, Univ., Padova, Italy) Expt. on the effect of ephedrine, ergotamine and reserpine on the Ca-induced pos. otropic effect in rabbit atria or atria-sj. The nerve prep. indicated that the in vitro J S a o n of ft. trial pacemaker induced by increased concn. of Ca²⁺ is adrenesic in nature. G.M.Lewis

6483. EFFECT OF INCREASED SERUM POTASSIUM IN DIGOXIN CONTENT OF CANINE HEART. P.A.Ebert, L.J. and W.G.Austen: Bull. Johns Hopkins Hosp. 112, 151-154 (Surg. Dept., Johns Hopkins Univ. Med. Sch., Baltimore, Md., U.S.A.)

Elevating serum K from 6*2 to 9*2 mequiv./l. produced a 14% decrease in the radioactivity of the heart of dogs, who had been given [³H]digoxin. It is suggested that an actual loss of glycosides may occur from the myocardium.

H.B.Waynfirth

6484. CARDIOVASCULAR RESPONSES IN 'DIVING*' AND DURING STRAIN STIMULATION IN DUCKS. E.Feigl and B.Folkow: Acta physiol. scand., 1963, 57, 99-110 (Physiol. Dept., Univ. Gtteborg, Sweden) 'Diving*' bradycardia in ducks results from a sp. nervous reflex resulting from submersion of the head. There is a progressive hypercapnia during the asphyxia with an increasing anoxia at this time. Results from brain stim'n. are described.

H.B.Waynfirth

6485. COMPARISON OF ACTION OF OUABAIN ON HEART IN HYPOTHYROID, EUTHYROID AND HYPERTHYROID DOGS. A.Rosen and N.C.Moran: Circular Res., 1963, 12, 479-486 (Dept. Pharmacol., Emory Univ., Atlanta, Ga., U.S.A.) Ouabain increased contractile force in all groups of dogs studied under anaesthesia with open chests. Arrhythmias were produced with smaller doses in euthyroid than in either hypo- or hyperthyroid animals.

R.E.Moore

6486. EFFECT OF CARDIOACCELERATION BY METHYLSCOPOLAMINE NITRATE ON CIRCULATION AT REST AND DURING EXERCISE IN SUPINE POSITION WITH SPECIAL REFERENCE TO STROKE VOLUME. S.Beregarde: Acta physiol. scand., 1963, 57, 61-80 (Clin. Physiol. Dept., Karolinska Sjukhuset, Stockholm, Sweden) After injn. of methylscopolamine nitrate (MSN) the work intensity at pulse rate 170/min. in healthy c? decreased. At rest, after MSN injn. the heart rate increased while the stroke vol. decreased. The latter increased during work however. The duration of the mechanical diastole of the heart both at rest and at work was significantly shorter after MSN. H.B.Waynfirth

6487. ARTIFICIAL PACEMAKER FOR TREATMENT OF ADAMS-STOKES SYNDROME AND SLOW HEART RATE. R.Elmqvist, J.Landegren, S.O.Pettersson, A.Senning and G.William-Olsson: Amer. Heart J., 1963, 65, 731-748 (Dept. Med., Serafimerlasarettet, Stockholm, Sweden) Long-term cardiac pacemaking with an external or an implantable pacemaker was used with good success in 16/18 patients. The authors used relatively large Pt electrodes of 9 mm. diam. which were sewn to the epicardial surface of the heart near the apex. The problems of long-term pacemaking are discussed.

P.F.Meyer

6488. FREQUENCY RESPONSE OF CARDIAC CHRONOTROPIC ACTION OF VAGUS. J.PertSz: Arch. int. Physiol., 1962, 70, 636-650 (Inst. Physiol., Fac. Med., J.E.Purkinj8 Univ., Brno, Czechoslovakia) Rabbits were anaesthetised with urethane and the vagus nerves stim. by rectangular pulses of const. amplitude, but sinusoidal modulating freq. Stimn. elicited oscillatory variations of the heart rate the amplitude and phase shift of which could be precisely estimated. Results were plotted as a freq.-response characteristic and as a Nyquist diagram. Both of these represent the transfer function of the system, where freq. of stimuli to efferent nerve and pacemaker is the input variable and heart rate the output. The system of efferent fibre and pacemaker is comparable to a single time const. element acting with a dead time identical with the latent period. Importance of the findings in relation to control mechanisms in the circulation is discussed. This may be another example of the application of automatic control theory to biol. regulations.

M.E.Nutt

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6489. ACTION OF RESERPINE ON CARDIOACCELERATOR TONE. P.DuchSne-Marullaz and J.Lavarenne:

C.R. Soc Biol., Paris, 1962, 156, 2052-2054 (Lab. de Physiol., Fac de MSd., Clermont-Ferrand, France) I.m. injn. of 0-15 mg. reserpine/kg. during 3 days, decreased the cardioaccelerator tone of the non-anaesthetised dog. There was an increase in the permanent action of cardioinhibitor fibres on cardiac freq. This action was marked in bisterectomised animals. Reserpine increased the freq. of beat of the denervated heart.

(French) M.A.Price

6490. ROLE OF AUTONOMIC AND MYOCARDIAL

FACTORS IN CARDIAC CONTROL. T.A.Bruce, C.B. Chapman, O.Baker and J.N.Fisher: J. clin. Invest., 1963, 42, 721-726 (Dept. Int. Med., Univ. Texas

* Southwestern Med. Sch., Dallas, Tex., U.S.A.)

In anaesthetised dogs the elimination of rate response by denervation does not entirely deprive the left ventricle from responding to exercise. This response, an increase in cardiac output and integrated minute work, appears to be initiated by increased ventricular filling.

M.J.Bell

6491. EVALUATION OF DYE DILUTION AND CARDIOMETRIC METHODS OF CARDIAC OUTPUT ESTIMATION IN DOGS. S.Nath: Indian J. Physiol. Pharmacol., 1963, 7, 29-32 (Dept. Physiol., S.M.S. Med. Coll., Jaipur, India) Simult. determinations of cardiac output were made using the Evans Blue dye diln. method and Henderson's cardiometer. Good agreement was obtained between the two methods.

G.F.Blane

6492. CIRCULATORY STUDIES IN WELL-TRAINED

ATHLETE? AT REST AND DURING HEAVY EXERCISE, WITH SPECIAL REFERENCE TO STROKE VOLUME AND INFLUENCE OF BODY POSITION. S.Bevengarf, A.

A.Holmgren and B.Jonsson: Acta physiol. scand., 1963, 57, 26-50 (Clin. Physiol. Dept., Karolinska Sjukhuset, Stockholm, Sweden) Cardiac output at rest and during work in trained athletes showed the same relation to O₂ uptake as in non-athletes. The output was less in the sitting than in the supine position due to a smaller stroke vol. in both groups. The stroke vol. increased on transition from rest to exercise and more so for this sitting position. The relation between the stroke and blood vol. in athletes at work in the supine position was the same as for non-athletes. In athletes the ventricular filling pressure during exercise was higher than in non-athletes.

H.B.Waynfirth

6493. E.C.G. OBSERVATIONS ON THIAMINE AND

PANTOTHENIC ACID DEFICIENT RATS. N.Valora and A.Fidanza: Quad. Nutr., 1963, 22, 93-105

(1st. di Clinica med. gen., Univ., Roma, Italy) The e.c.g. patterns of thiamine and pantothenic acid deficient rats were slightly different from normal. In pantothenic acid deficient animals there was a noticeable change in the P wave and shortening of the P-Q time. In thiamine deficient animals, after 2-5 weeks of vitamin starvation, bradycardia developed together with a morphol. atypical P deflection, shortening of P-Q time, a broadening of the QRS complex and sometimes a lengthening of the S deflection. In thiamine and pantothenic deficient animals these effects are superimposed.

(Italian) G.N. Godson

6494. E.C.G. NOTCHING IN RATS DEFICIENT IN ESSENTIAL FATTY ACIDS. W.O.Caster and P.Ahn:

Science, 1963, 139, 1213 (Dept. Physiol. Chem., Univ. Minnesota, St. Paul, Minn., U.S.A.) A notch occurring consistently at a point 37% through the QRS

complex of the e.c.g. in the rat was associated with deficiency in essential fatty acids and prevented by addition of small amoants of linoleate, linolenate or arachidonate to the diet.

G.M.Lewis

6495. APEXCARDIOGRAM [A.C.G.] IN NORMAL OLDER

SUBJECTS AND IN PATIENTS WITH ARTERIO-SCLEROTIC HEART DISEASE. EFFECT OF EXERCISE

ON 'A' WAVE. A.Benchimol and E.G.Dimond: Amer. Heart J., 1963, 65, 789-801 (Inst. Cardiopulm. Dis., Scripps Clinic and Res. Foundn., La Jolla, Calif., U.S.A.)

A.c.g. recorded at rest and after exercise

were normal in 64 ageing subjects (range 40-84 yr.) with normal cardiovascular system. In 45 patients with ischaemic heart disease, the a.c.g. was abnormal at rest in 25; in 18, the a.c.g. was abnormal after exercise. Characteristic changes in the a.c.g. were large "a" waves and a prolonged interval between peak of "a" wave to peak of systolic wave. Patients with abnormal a.c.g. had raised pulmonary wedge pressures and raised left ventricular end-diastolic pressures which were further increased after exercise. Cardiac output was normal at rest and responded normally to exercise. Abnormalities in the a.c.g. were more marked in patients with the more severe grades of ischaemic heart disease. It is suggested that the changes in the a.c.g. are due to either increased resistance of the left ventricle to distensibility or incomplete emptying with increased residual left ventricular vol.

P.F.Meyer

6496. TRANSMISSION OF BALLISTOCARDIOGRAPHIC

FORCES TO PLATFORMS MOUNTED ON SPRINGS.

W.Dock: Amer. J. med. Sci., 1963, 245, 449-455

(Dept. Med., State Univ. of New York Downstate Med. Center, Brooklyn, N.Y., U.S.A.) Studies on elderly thin men with large respiratory variations in heights of the systolic waves of the b.c.g. show that when the body lies free on four platforms mounted on springs, so that die ballistic force is transmitted as the shearing force between body and platform, the largest force reaches that under the feet. The effects of restraining the body by a footplate and a shoulder yoke and of body wt. are described.

E.E.Hobbiger

6497. REFLECTED ULTRASOUND IN THE ASSESSMENT OF MITRAL VALVE DISEASE. CRJoyner, jun., J.M.

Reid and J.P.Bond: Circulation, 1963, 27, 503-511

(Univ. Pennsylvania, Philadelphia, Pa., U.S.A.) The ultrasonic reflection pattern was distinctive in pure mitral stenosis, but patients with mitral regurgitation exhibited a normal pattern.

R.S.Duff

6498. E.M. APPEARANCES OF RHEUMATIC LESIONS IN THE LEFT AURICULAR APPENDAGE IN MITRAL

STENOSIS. R.Lannigan and S.Zaki: Nature, Lond., 1963, 198, 898-899 (Dept. Rathol., Univ., Birmingham, England)

E.M. investigations on Aschoff nodes from left auricular appendages removed during mitral valvotomy suggest that the primary damage is endocardial rheumatic lesions is to connective tissue; they do not support the view that Aschoff cells and other constituents are derived from cardiac or smooth muscle.

G.M.Lewis

6499. CARDIAC RESUSCITATION IN 126 MEDICAL PATENTS USING EXTERNAL CARDIAC MASSAGE.

G.A.Klassen, C.Broadhurst, D.L.Peretz and A.L.Johnson: Lancet, 1963, i, 1290-1292 (CardCorresp. Serv., Royal Victoria Hosp., Montreal, Canada). G.H.Bell

6500. BRISKET DISEASE. III. SPONTANEOUS REMISSION OF PULMONARY HYPERTENSION AND RECOVERY FROM HEART FAILURE. H.Kuida, H.H. Hecht. R.L.Lange. A.M.Brown, T.J.Tsagaris and J.L. Thome J. cUn. Invest., 1963, 42, 589-596 (Dept. Int. Med., Univ. Utah Coll. Med., Salt Lake City, Utah, U.S.A.) Haemodynamic observations have been made on 14 calves after recovery from basket disease - an altitude-dependent, pulmonary hypertensive disease occurring primarily in young calves usually during their first summer exposure to high altitude ranges. By means of venous and left ventricular cardiac catheterisation a spontaneous remission from pulmonary hypertension and improvement in overall cardiovascular function has been shown. This study provides a dramatic demonstration of the existence in nature of a spontaneously remitting form of heart failure and so provides a unique expt. model for studies on heart failure. M.J.ueii

CIRCULATORY SYSTEM

6501. ASSESSMENT OF AN INDICATOR-DILUTION TECHNIQUE FOR QUANTITATIVE AORTIC REGURGITATION BY ELECTROMAGNETIC F^METER. D.A.Malooly. D.E.Doiial^H.W.Marshall and E.H.

Wood: Circulat. Res., 1963, 12, 487-50¹ (Mayo Clinic, Rochester, Minn. U.S.A.) and ^{TM 23 TM} was placed around the root of ^{** 0 ^*} and ^{with open chests} intravascular catheters placed in dogs ^{morphine-pento-} and acute aortic valve lesions under ^{in to th} barbital anaesthesia. Dye was inj. ^{calc. from the dye} aorta and sampled from the left ^{ventricle} and femoral aorta and sampled from the left ^{calc. from the dye} S^{regu} Sagree as ^{owmeter measurements} regurgitant fractions below 0.6 ($r = 0.91$, SD = 0.15 l. min.). Above 0.6, variability increased considerably. R.E.Moore

6502. THEORY OF USE OF INDICATORS TO MEASURE BLOOD FLOW AND EX?R? U?EAR/OLUME AND

464-471 Deot Med. Johns Hopkins Univ., Baltimore. Md n's f f A theoretical analysis developing the stance Scic'r & ?& ^?& "!"!*& diffusion by graphically setting out freq. R.E.Moore transit times.

6503. EDDY FORMATION AND TURBULENCE IN FLOWING LIQUIDS. J.E.Meissner and R.F.Rushmer: Circulat. Res., 1963, 12, 455-463 (Dept. Physiol. and Biophys., Univ. Washington Sch. Med., Seattle, Wash., U.S.A.) Transparent models simulating aorta were perfused with colloidal soln. of clay (bentonite). The birefringence was utilised to photograph flow patterns. R.E.Moore

6504. CHANGES IN HYDROELECTROLYTE CONTENT AND SOME PROTEIN COMPONENTS OF FEVER-HYPOTENSION. U.Marini, S.Santa and G.Binaghi: Atti. Acad. med. Lombarda, 1962, 17, 392-398 (Ist. di Patol. Speciale Med., Univ. Milano, Italy) 90 days after the induction of hyper-

tension in dogs by baroceptive deafferentiation, the Na⁺, Cl⁻ H₂O and collagen content of die femoral arterial wall tissue were higher and the elastic content lower than normal. There were no significant differences in the content of these elements in the pulmonary arteries of the hypertensive and control animals. The vascular wall electrolyte changes could be due to the hypertonic state of the myocells and the fibrous protein changes probably contribute to sustain the narrowing of the vascular lumen. (Italian) G.N. Godson

6505. MUCOPOLYSACCHARIDE CONTENT OF FEMORAL AND PULMONARY ARTERIES OF DOGS WITH HYPERTENSION INDUCED BY BAROCEPTIVE DEAFFERENTATION. S.Santambrogio, U.Marini, R.Beretta and G.Binaghi: Atti. Acad. med. Lombarda, 1962, 17, 385-388 (Ist. di Patol. Speciale Med., Univ., Milano, Italy) In 6 dogs with protracted hypertension, 3 months after baroceptive deafferentation, the acid and neutral mucopolysaccharide content of the femoral and pulmonary arterial wall tissue showed no changes. (Italian) G.N. Godson

6506. RELATIONSHIP OF OEDEMATOUS REACTION IN ARTERIES TO ATHEROSCLEROSIS AND THROMBOSIS. T.Shimamoto: J. Atheroscler. Res., 1963, 3, 87-102 (Inst. Cardiovascular Dis., Med. Sch., Med. and Dental Univ., Tokyo, Japan) Attention is redirected in this review to accumulation of oedema fluid in the intima of large arteries as an important factor in the pathogenesis of atheromatous lesions. Substances capable of preventing the oedematous reaction to agents such as cholesterol and adrenaline in rabbits, were also able to prevent expt.-induced thrombosis and atheroma. G.F.Blane

6507. BRAIN STEM MECHANISMS IN REGULATION OF BLOOD PRESSURE IN RABBIT. J.Gutman, Y.Ginath, M.Chaimovitz and F.Bergmann: Arch. int. Physiol., 1962, 70, 583-598 (Hebrew Univ.-Hadassah Med. Sch., Jerusalem, Israel) Stimm. of the brain stem, from hypothalamus to medulla, in conscious rabbits immobilised with succinylcholine (120-240 μ g/min.) showed that rise in b.p. was the most common result of stimm. in all regions. Depressor points were less common and in many cases reaction changed from depressor to pressor on increasing freq. of stimulus, being biphasic at intermediate rates. After administration of Na penta-barbitone many pressor points gave mixed or hypotensive responses, others showed a reduction in the rise of b.p. evoked. The % of mixed + depressor points increased from 17% to 58%. Responses from purely depressor points were never reversed by barbiturate. Vasomotor points are randomly distributed throughout the brain stem with greatest density of depressor elements in the post. medulla. The hypothesis of anat. defined, circumscribed, antagonistic vasomotor centres is untenable. M.E.Nutt

6508. EFFECT OF BRAIN STEM TRANSECTIONS ON BLOOD PRESSURE RESPONSES TO MEDULLARY STIMULATION. J.Gutman, E.Leibowitz and F.Bergmann: Arch. int. Physiol., 1962, 70, 671-681 (Hebrew Univ.-Hadassah Med. Sch., Jerusalem, Israel) Electrical stimm. of the post. medulla of the unanaesthetised rabbit shows diffusely distributed intermingled pressor and depressor points. Transverse sections caudal to the hypothalamus convert most pressor responses into depressor responses, the effect being similar to that of administering barbiturate. Medullary pressor neurones probably act mainly through higher centres in the brain, whereas depressor neurones have mainly descending connections with the spinal cord. M.E.Nutt

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6509. EFFECTS OF CERVICAL SYMPATHETIC TONE ON BLOOD PRESSURE AND UVEAL FLOW AFTER CAROTID OCCLUSION. A.BUI: *Exp. Eye Res.* 1963, 2, 203-209 (Inst. Physiol., Univ., Uppsala, Sweden) The mean b.p. in a femoral artery, a ciliary artery and in a common carotid artery were measured manometrically, and the uveal blood flow was determined by a calorimetric method. With the ipsilateral cervical chain cut occlusion of a common carotid artery increased the femoral pressure by 9 mm. Hg and reduced the ipsilateral ciliary pressure by 46 mm. Hg. Blood flow through the uvea was reduced by 70%. Subsequent electrical stimm. of the ipsilateral cervical sympathetic chain slightly reduced the femoral pressure, and considerably raised the pressure at the origin of the ciliary arteries and the distal part of the ligated carotid artery. The rise in the ciliary b.p. at physiol. stimm. freq. resulted in increased blood flow through the uvea. With the ipsilateral cervical sympathetic chain intact, carotid occlusion gave a tone in the vasoconstrictor fibres similar to that produced by electrical stimm. of the chain at freq. of 0.3-2 impulses/sec. J.Whiting

6510. ABSENCE OF REFLEX CIRCULATORY EFFECTS OF GROUP I AFFERENT FIBRES. Y.Laporte, L.M. Leitner and B.Pages: *C.R. Soc. Biol.*, Paris, 1962, 156, 2130-2133 (Lab. Physiol., Fac. de Méd., Toulouse, France) Repetitive stimm. of lumbar dorsal roots containing group 1 fibres of heparinised and chloralose anaesthetised cats, did not produce reflex circulatory effects in the muscles of the ipsilateral leg. Circulatory changes were measured as variations in venous blood flow. (French) M.A.Price

6511. EFFECT OF CHANGES IN SALT INTAKE ON ARTERIAL PRESSURE AND RENAL FUNCTION IN PARTIALLY NEPHRECTOMISED DOGS. J.B.Langston, A.C.Guyton, B.H.Douglas and P.E.Dorsett: *Circulat. Res.*, 1963, 12, 508-515 (Dept. Physiol., Univ. Missouri Med. Center, Jackson, Mo., U.S.A.) Subtotal nephrectomy (1 kidney) was carried out in 2 stages in dogs. The unanaesthetised animals on a high NaCl intake developed hypertension with concomitant increase in plasma Na⁺ concn. The latter even so was no higher than preparative levels, having fallen post-operatively. R.E.Moore

6512. A VASCULAR ABNORMALITY IN HYPERTENSION. J.Conway: *Circulation*, 1963, 27, 520-529 (Univ. Michigan Med. Center, Ann Arbor, Mich., U.S.A.) In various types of hypertensive subjects a relative increase in the resistance to arterial blood flow in the forearm was demonstrated by procedures leading to max. hyperaemia. The increase in resistance was related to the level of arterial pressure rather than to the duration of the hypertension. The findings are interpreted as evidence of an abnormality of the blood vessels themselves in hypertension, but not necessarily in smooth muscle. R.S.Duff

6513. HAEMODYNAMIC CHANGES IN ADRENALECTOMISED DOGS. M.M.Reidenberg, E.A.Ohler, R.W. Sevy and C.Harakab: *Endocrinology*, 1963, 72, 918-923 (Pharmacol. Dept., Temple Univ. Med. Sch., Philadelphia, Pa., U.S.A.) Dogs, 3 days after adrenalectomy showed consistent decreases in cardiac output, stroke vol. and arterial pressure, with increases in heart rate and peripheral resistance. Dextran infusion reversed these effects. Programmes of steroid therapy all

failed to restore completely the haemodynamic effects of adrenalectomy. H.C. Jones

6514. EFFECT OF ANGIOTENSIN. II. ON SYSTEMIC AND PULMONARY PRESSURE AND ON EXCRETION AND DISTRIBUTION OF HYDROELECTROLYTES IN TISSUES OF DOGS. F.F.Gilardi, U.Marini, R.Beretta and P.Lanucara: *Atti. Acad. med. Lombarda*, 1962, 17, 339-346 (1st. Patol. Spec. Med., Univ., Milano, Italy) Infusion of normal dogs with Angiotensin n induced a rapid increase in systemic arterial pressure, which progressively decreased as the infusion continued. Redistribution of ionic content of the femoral arterial tissue also occurred. No change in pressure of ionic distribution in the wall of the pulmonary artery or in the blood plasma was observed. During infusion, diuresis and excretion of water, Na, K and Cl markedly fell. (Italian) < G.N.Godson

6515. POTENTIATION EFFECT OF ALDOSTERONE AND CORTISONE ON THE VASOCONSTRICITIVE ACTION OF NORADRENALINE ON CONJUNCTIVAL BULBAR VESSELS, IN NORMOTENSIVE AND HYPERTENSIVE PATIENTS. U.Marini, E.Vigorelli and R.Beretta: *Atti. Acad. med. Lombarda*, 1962, 17, 347-354 (1st. Patol. spec. Med., Univ., Milano, Italy) In 15 hypotensive and 15 normotensive patients, topical application of aldosterone (2 drops of a 2% soln.) and hydrocortisone (2 drops of a 0.5% soln.) to the conjunctival sac increased the reactivity of the bulbar conjunctival vessels to noradrenaline (2 drops of a 1:400000 or 1:100000 soln.) of both groups to the same degree. Aldosterone had a slightly greater potentiation than hydrocortisone. (Italian) G.N.Godson

6516. REACTION OF CONJUNCTIVAL BULBAR ARTERIES TO TOPICAL APPLICATION OF NORADRENALINE AND HYPERTENSIN IN NORMAL SUBJECTS AND PATIENTS WITH ESSENTIAL HYPERTENSION. U.Marini, E.Vigorelli and F.F.Gilardi: *Atti. Acad. med. Lombarda*, 1962, 17, 355-360 (1st. Patol. spec. med., Univ. Milano, Italy) In 15 hypotensive patients the vascular reactivity of the bulbar conjunctival vessels to topical application of hypertensin (2 drops of a 1:200000 soln.) and noradrenaline (2 drops of a 1:400000-1:100000 soln.) was greater than in 15 normotensive patients. The vasoconstrictive effect of noradrenaline and hypertensin were similar. (Italian) G.N.Godson

6517. REACTIVITY OF SKIN AND MUSCULAR BLOOD VESSELS TO NORADRENALINE DURING INDUCED RESPIRATORY ACIDOSIS IN CATS. S.Bygdemar: *Nature*, Lond., 1963, 198, 491-492 (Dept. Physiol., Fac. Med., Karolinska Inst., Stockholm, Sweden) During expt. produced acidosis in cats, the overall response of the peripheral blood vessels to noradrenaline decreased much more in the whole leg prep. than in the skinned leg prep. After denervation, the difference was less obvious but still noticeable on ventilation with 20% CO₂ in O₂. These results suggested a marked difference in the change of reactivity between skin and muscular blood vessels during acidosis. G.M.Lewis

6518. CORONARY BLOOD FLOW OF ISOLATED, BEATING RABBITS' HEARTS. W.Gebhard: *Z. Ges. exp. Med.*, 1963, 136, 589-605 (Inst. Animal Physiol. Frankfurt am Main, Germany) Beating rabbits' hearts were suspended in Locke's soln. under conditions which controlled aortic pressure and left atrial filling pressure, and permitted registration of ventricular

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vol. and stroke vol. Coronary outflow was measured by *e outflow from the pulmonary artery. Perfusion was with a blood da. with Locke's soln. Coronary blood flow increased when the hearts recovered from the hypo-oxia caused during manipulation. Coronary blood flow was Proportional to aortic mean pressure. ATP (20 mg.) and Persantin (25 mg.) caused an increase, cortisol a fall in coronary blood flow. (German) r.f.Meyer

6519. AORTIC CARTILAGE PRODUCED BY INTRAMURAL CARRAGEENAN. E.L.McCandlws. J.M. Lehoczky and S.Rodbard: Arch. Path. Chicago. 1963, 75, 507-516 (Univ. Buffalo, PubUc Health Res. Inst. Chronic Disease. U.Y., U.S.A.) Cartilage-like tissue was produced in the thoracic aorta of 8 chickens

nation
of smooth muscle cells to chondrocytes. R.Mitchell

6520. TECHNIQUE FOR VISUALISATION AND PERFUSION OF BRONCHIAL ARTERIES; SUGGESTED CLINICAL AND DIAGNOSTIC APPLICATIONS. Philad., 1963, Mem. Center for J.S.A.)

A on of the thoracic aorta with the aid of a double-balloon, quadruple-lumen wthetqr is.the basis for the visualisation of bronchial arteries and for their infusion with ^ J ^ < 2 E ? : u^ further application of this technique and the possible use » diagnosis is discussed. D.LConneU

6521. HAEMODYNAMIC REGULATING MECHANISM COMPENSATING FOR DECREASED BLOOD SUPPLY TO CEREBRAL CORTEX. G-LMcheduhviU and L.G. Ormotsadze: Physiol. Bohem.. 1963, 12, 100-105 Sci. several pial

Uon,blood flow increased in neighbouring arteries. B.P. fforded in the aorta and the circle of Wilh^s were un- Ranged. The compensatory action of * P** ^ es ^ vented the development of ischaemia g* J.L. Verack rtex.

6522. ANGIOGRAPHIC METHODS OF CHOICE EVALUATION OF STROKE PATIENTS. R.A.Kuhn and H.Kugler. Bull. Johns Hopkins Hosp., 1963, 112, 59-76 Surgery Dept., U.S.A. SSS Sasa -was studied in human patients by retrograde injn. of opaque media through the brachial artery. The only complications that generalised seizures in a very few patients. H.B.Waynfirth Patients is suggested.

6523. MEASUREMENT OF RENAL SHUNTING BLOOD FLOW IN MAN. K.Ito. Nature, Lond., 1963, 198, 105 (Japan) Med., Tohoku Univ. Sch. Med., 1963, 10, 108- Quant. estimation of renal shunted blood flow may be made by a method based on the fact that N₂O is completely removed from the blood by the renal tissue when the N₂O concn. in renal tissue is zero; the extraction ratio of N₂O at the initiation of the sarn. process represents the rate of effective blood flow. This is 108% in normal subjects, but in the terminal stages of chronic glomerular nephritis, nephrosclerosis and chronic pyelonephritis, 8-17%, 7% and 35% respectively of shunted blood was observed. G.M.Lewis

6524. ROLE OF DISTENSION OF VEINS OF PORTAL SYSTEM IN RENAL CIRCULATION. A.Cheruy.

H.Lemarchands, B.Potocki, J.Reynier and M.Tanche: C.R. Soc. Biol., Paris, 1962, 156, 2087-2090 (Lab. de Physiol., Fac. de Med., Grenoble, France)

Occlusion of the portal vein of ffaibarbiturate anaesthetised dogs during interruption of the arterial mesenteric circulation did not result in a decrease in renal vol. Removal of arterial occlusion resulted in an immediate decrease in renal vol. accompanied by a marked decrease in arterial pressure. (French) M. A. Price

6525. NERVOUS AND LOCAL CHEMICAL CONTROL OF PRE-CAPILLARY SPHINCTERS IN SKELETAL MUSCLE AS MEASURED BY CHANGES IN FILTRATION CO-EFFICIENT. A.Cobbald, B.Folkow, LKjellmer and S.Mellanden. Acta physiol. scand.. 1963, 57, 180-192 (Physiol. Dept., Univ., Goteborg, Sweden)

It is shown that vasoconstrictor nerve fibres affect the pre-capillary sphincters. This effect is "overcome" rapidly by Vasodilator metabolites* accumulating when flow in the capillaries is reduced. The filtration coeff. in skeletal muscles tends to rise at any decrease of blood flow or tissue metabolism. H.B.Waynfirth

6526. MEASUREMENT OF CAPILLARY PERMEABILITY IN RAT. R.Charlier, A.Hosslet and L.Canivec Arch,

int. Physiol., 1963, 71, 51-63 (Société Beige de l'Azote et des Produits Chimiques du Marly, Ave. de Béjar, 1, Brussels, Belgium) Capillary permeability has been measured in the rat by injecting Trypan Blue i.p. and measuring the intensity and spread of blue colour from dye leakage, in an area of shaved skin, at different time intervals after local application of CHCl₃. Effect of various agents on capillary permeability can be assayed by giving the substance concerned i.p. just prior to injn. of Trypan Blue and comparing rate of dye leakage with that in control animals. (French) M.E.Nutt

6527. EXPERIMENTAL INVESTIGATION OF VASCULAR FRAGILITY. R.Charlier, A.Hosslet and M.Colot:

Arch. int. Physiol., 1963, 71, 1-45 (SociStS Beige de l'Azote et des Produits Chimiques du Marly, Ave. de Béjar, 1, Brussels, Belgium) Capillary resistance was measured by determining the neg. pressure required to produce petechiae in the skin of the shaved rat. Rats fed a diet deficient in vit. P develop increased capillary fragility. Administration of known factors in vit. P (hesperidine-methyl-chalcone or rutine) decreases fragility. This effect can be measured quant. and a satisfactory do^e/response relationship demonstrated. The method is suitable for assay of substances capable of restoring normal resistance to capillaries made fragile on the P-deficient diet. (French) M.E.Nutt

NERVOUS SYSTEM

6528. REACTION OF VATER-PACINI CORPUSCLES TO CHEMICAL AND PHYSICAL FACTORS ACTING ON SMALL INTESTINE MUCOSA. A.Danysz and M.Malofiejev: Arch. int. Pharmacodyn., 1963, 143, 34-40 (Pharmacol. Dept., Med. Acad., Bialystok, Poland)

Vater-Pacini corpuscles in the mesentery of the cat react to different stimuli acting on the mucosa of the small

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intestine by changing their diam. Catecholamines and temp, changes caused a decrease; ACh, hypertonic saline and raised intraluminal pressure caused an increase in diam.

T.J. Sullivan

6529. CODING MECHANISMS OF ELECTRORECEPTOR FIBRES IN SOME ELECTRIC FISH. S.Hagiwara and H.Morita: *J. Neurophysiol.*, 1963, 26, 552-567 (Zool. Dept., UCLA, Los Angeles, Calif., U.S.A.)

Prop. of electroreceptor were analysed by recording impulse discharge of single lat. line nerve fibres of Staetogenes (electric organ discharge of 40-60 c/s), Gymnotus (40-60 c/s), Eigenmannia (250-400 c/s), and Sternopygus (60-100 c/s). The intensity of the potential field produced by the electric organ pulse is coded by a single lat. line nerve fibre principally by the gradation of no. of impulses in a train produced by each pulse in fishes having a low freq. discharge of the electric organ such as in Staetogenes and Gymnotus. However, in fishes of a high freq. electric organ discharge such as in Eigenmannia the coding is performed by grading the probability of impulse initiation after each pulse of the electric organ. In Sternopygus both mechanisms are operative. Small conducting or dielectric objects in the water just over the receptor respectively suppress or enhance the nerve response and ant. or post, to the receptor area gives rise to the opposite type of responses. The threshold for an imposed electric pulse to produce one nerve impulse is about 10 mV/cm. along the long axis of the fish and is the same for a pulse of any duration above 5 msec in Staetogenes and Gymnotus. The threshold for an imposed a.c. field is about mV/sec. in Eigenmannia is higher when the freq. of a.c. departs far from that of the electric organ discharge. *

6530. EFFECTS OF ACh ON AXONAL CONDUCTION OF LOBSTER NERVE. W.-D.Dettbarn and F.A.Davis: *Biochim. biophys. Acta*, 1963, 66, 397-405 (Dept. Neurol., Coll. Physn. and Surgn., Columbia Univ., New York, U.S.A.) 5×10^{-3} - 10^{-2} M ACh decreased membrane potentials recorded by the "sucrose-gap" technique in walking leg nerve bundles. Simult. recorded action potentials initially showed increased amplitude and prolongation and elevation of the descending phase which appeared oscillatory. Later spike height and effects on the descending phase decreased. Finally conduction was reversibly blocked. 10^{-2} M d, 1-acetyl-g-methylchoiine affected action potentials similarly but decreased membrane potentials only slightly. 0^01 M choline, but not acetate or Br", changed action potentials slightly. 5 mM physostigmine resembled ACh in effect; lower concn. inhib. ACh action. Atropine and tetracaine reversibly blocked conduction and irihib. ACh action. Curare inhib. ACh without blocking conduction. Phospholine and Paraoxan blocked conduction irreversibly. Membrane potential was reversibly decreased 20-30 mV.

B.M.Stevens

6531. SCHWANN CELL AND AXON ELECTRICAL POTENTIAL DIFFERENCES; SQUID NERVE STRUCTURE AND EXCITABLE MEMBRANE LOCATION. R.Villegas, L.Villegas, M.Gimenez and G.M.Villegas: *J. gen. Physiol.*, 1963, 46, 1047-1064 (Dept. Biofis., Inst., Venezolano de Invest. Cient., Caracas, Venezuela) Three p.d. levels were recorded from resting nerve fibres of Sepioteuthis septoldeia impaled from outside to inside. The first p. d. level of -10 to -26 mV was located in the endoneurium cells, the second level of -33 to -46 mV, in the Schwann cell, and the third level of -50 to -65 mV in the axon, as shown

histol. using carmine. When the axon was depolarised n< p.d. change was observed both in the endoneurium cell and the Schwann cell. In all nerve fibres action potentials were registered from the axon only. K.Jones

6532. DEMONSTRATION OF INCREASED PERMEABILITY AS FACTOR IN EFFECT ACh ON ELECTRICAL ACTIVITY OF VENOM-TREATED AXONS. P.Rosenberg and F.C.G.Roskin: *J. gen. Physiol.*, 1963, 46, 1065-1072 (Dept. Neurol., Coll. Physn. and Surgn., Columbia Univ., New York, U.S.A.) The penetration of externally applied [¹⁴C]dimethylcurare, ACh, choline and trimethylamine into the axoplasm was determined in the squid giant axons treated with cottonmouth, rattl* snake or bee venom. The results showed that when ACh and curare, following venom treatment, affected electrical activity, they also penetrated into the axon. Treatments which did not increase penetration were also ineffective in rendering the compounds active. Kjon<

6533. DEPOLARISATION OF CENTRAL TERMINALS OF CUTANEOUS AFFERENT FIBRES. J.C.Eccles, R.F. Schmidt and W.D.Willis: *J. Neurophysiol.*, 1963, 26, 646-861 (Physiol. Dept., Aust. Nat. Univ., Canberra Australia) The depolarising action of cutaneous an muscle afferent volleys on the central terminals of cutaneous fibres has been studied directly by intracellular recording, and also indirectly by testing for increases in excitability as measured by responses to applied current pulses. Group Ia afferent volleys from muscle had no action, but all other medullated afferents from muscle Groups Ib, II and III, regularly had a depolarising actio particularly when applied by brief high freq. bursts, though it was usually smaller than the depolarisation produced by single cutaneous volleys. The dorsal root potentials produced by prolonged tetanisation of cutane nerves, declined from an initial peak to a plateau whid may be as large as SW/o of the peak height, and which continued at a steady level for several sec. These prolonged depolarisations give a continued presynaptic inhi and hence are a very effective neg. feed-back device that operates upon all flexor reflex afferents. •

6534. SPONTANEOUS MINIATURE POTENTIALS IN SPINAL MOTONEURONES. B.Katz and R.MiledL-J. *HiysiOL*, Lond., 1963, 168, 389-422 (Dept. Biophysics, Univ. Coll., London, England) Spontaous subthreshold potentials were recorded intracellularly from motoneurones of the frog's isolated spinal cord. The discharge of spontaneous potentials persists when reflex activity has been abolished by Mg and even after impulse conduction in the cord has been eliminated by excess K. Much of the spontaneous activity normally recorded is independent of impulse bombardment and its origin locally, within synaptic terminals. Amplitu* and time courses of individual spontaneous potentials va greatly; this may depend on cable prop. of dendrites as well as on differences between individual synaptic actions. •

6535. THE EFFECTS OF END-TIDAL CO₂ ON THE V/I CHARGE OF INDIVIDUAL PHRENIC MOTONEURONE. P.K.Gill: *J. Physiol.*, Lond., 1963, 16, 239-257 (Dept. Physiol., Univ. Utah Coll. Med., Salt Lake City, Utah, U.S.A.) Discharge of individual phrenic motoneurones in response to different levels of end-tida CO₂ was examined in decerebrate cats in which the tft X, XI and XII cranial nerves were cut and the spinal c& sectioned at C7-8. Phrenic units Showed different

thresholds for initiation of discharge as end-tidal CO₂ was raised. Further increments of CO₂ increased the no. of impulses per cycle and their average freq. until some max. was reached. The freq. of bursts fell as CO₂ was raised. Recruitment of additional units as well as increase in discharge of units already active determine the increase in total phrenic discharge to increasing levels of end-tidal CO₂. The end-tidal CO₂ associated with initiation of discharge in a phrenic unit, as CO₂ was increased and was usually higher than the end-tidal CO₂ associated with cessation of discharge when the CO₂ was reduced. The relation of these findings to the functional organisation of respiratory neurones is discussed.

6536. PROPERTIES OF PHRENIC MOTONEURONES. P.K.Gilliland and M.Kunos. J. Physiol., Lond., 1963, 168, 258-273 (Dept. Physiol., Univ. of Utah Coll. Med., Salt Lake City, U.S.A.) ^{**} ^{f m} ^{oneutones}
of the cat were studied with intracellular electrode. The antidromic spikes showed an inflection in the rising phase. The duration of the after-hyperpolarisation was comparable with Zt of phasic to ^{*^} ^{%.%%} g5Z~. There was no correlation between the duration of after-hyperpolarisation of phrenic motoneurones and their axonal conduction velocities. There was no evidence that phrenic motoneurones receive recurrent inhibitory actions. The membrane resistance and time const. of phrenic motoneurones were both greater than those for lumbosacral motoneurones. Phrenic motoneurones showed little accommodation to continuous depolarising currents. It was concluded that phrenic motoneurones cannot be grouped with either the phasic or the tonic motoneurones of the lumbosacral cord. *

6537. EXCITATORY AND INHIBITORY ACTIONS ON PHRENIC MOTONEURONES. P.-E.GiU and MjKuno: J. Physiol., Lond., 1963, 168, 274-289 (Dept. Physiol., Univ. Utah, Coll. Med., Salt Lake City, Utah, U.S.A.) Synaptic actions on phrenic motoneurones of the cat were studied with taw^{LST} electrodes. Stimulation of the medulla at about 1 mm. cranial and 2 mm. lat. to the obex produced a P « » 8 [] phrenic motoneurones. Stimulation of the Ae "M^{*}jUa^tabom 2 mm. caudal and 3 mm. lat. to Ae obex PTM" evoked a prolonged IPSP in phrenic motoneurones. Stimulation of the contralateral phrenic nerve evoked IPSP in phrenic motoneurones. It is concluded that phrenic motoneurones are excited by descending impulses from the premotor cortex and inhibited by impulses from the expiratory centre.

6538. TRANSMISSION THROUGH CILIARY GANGLION OF THE CHICK. A.R.Martin and G.Pilar. J. Physiol., Lond., 1963, 168, 568-588. (Dept. Physiol., Univ. Tokyo, Japan) Using cats as subjects, recordings were made of single muscle spindle discharge, muscle tension, and the e.e.g. In the absence of muscle tension change, alterations in spindle discharge were attributable to gamma-motoneurones. Efferent motor activity was transiently depressed, » « - in extensors and extensors, during spontaneous spindle bursts. Pericranial cortex as well as dorsal horn bursa triggered by single pulses to caudate and thalamic nuclei. Low freq. stimm. of caudate and thalamic nuclei, inducing recruiting and augmenting waves, was also accompanied by depression of gamma-motor activity. The depressing effect was freq.-sensitive, reaching its max.

at stimulus freq. approx. 50% and 100% the freq. of spontaneous spindle waves. The magnitude of the depression was also correlated with the amplitudes of spontaneous or triggered spindle bursts. The results were discussed from the viewpoint that both spindle bursts and gamma-motor depression were the expression of a change of activity in an unidentified locus. *

6539. INHIBITION OF DISCHARGES INTO DORSAL AND VENTRAL SPINOCEREBELLAR TRACTS. J.C.Eccles. R.F.Schmidt and W.D.Willis: J. Neurophysiol., 1963, 26, 635-645 (Physiol. Dept., Aust. Nat. Univ., Canberra, Australia) Mass discharges in the dorsal spinocerebellar tract (DSCT) were evoked by Group I muscle volleys and were inhibited for more than 100 msec, by brief repetitive trains of Group I muscle afferent volleys, and also by single cutaneous volleys. The excitability of the presynaptic fibres in the region of DSCT cells showed that there was a primary afferent depolarisation with a similar time course, which is the characteristic test for presynaptic inhibition. Mass discharges in the ventral spinocerebellar tract of the contralateral side were also evoked by Group I muscle afferent volleys and likewise were similarly inhibited, but usually the inhibitory curve was briefer than for the DSCT discharge. Sometimes the inhibition reversed to a late facilitation; otherwise it may have had the characteristic duration of presynaptic inhibition. *

6540. DUAL MODE OF SYNAPTIC TRANSMISSION IN THE AVIAN CILIARY GANGLION. A.R.Martin and G.Pilar: J. Physiol., Lond., 1963, 168, 443-463 (Dept. Physiol., Univ. Utah Coll. Med., Salt Lake City, Utah, U.S.A.) Intracellular records were obtained from both pre- and post-synaptic elements in the isolated ciliary ganglion of the chick. In many ganglion cells the excitatory post-synaptic potential was preceded by a more rapid depolarisation which appeared to be due to electrical coupling between the presynaptic nerve terminals and the post-synaptic cell. This 'coupling potential' was independent of membrane polarisation and was unaffected by (+)-tubocurarine chloride. At resting membrane potential, it usually initiated the action potential. Responses to antidromic stimulation recorded from presynaptic terminals consisted of a similar coupling potential, indicating that the coupling was bi-directional. *

6541. TRANSMISSION THROUGH CILIARY GANGLION OF THE CHICK. A.R.Martin and G.Pilar. J. Physiol., Lond., 1963, 168, 464-475 (Dept. Physiol., Univ. Utah Coll. Med., Salt Lake City, Utah, U.S.A.)

Transmission through the isolated ciliary ganglion of the chick was studied by stimulating and recording from the pre- and post-ganglionic nerves. In preparation, from chicks 3-5 days old, the post-ganglionic response to pre-ganglionic stimulation contained two components. These were conducted at similar velocities but were separated by an interval of 1.6-3.0 msec. The addition of ganglionic blocking agents to the bathing solution abolished only the second component. Post-ganglionic stimulation produced a response in the preganglionic nerve, conducted antidromically through the ganglion. The results were consistent with the hypothesis that at many of the ganglionic synapses, synaptic transmission was due to electrical coupling between pre- and post-synaptic elements. In ganglia from older preparations, the coupling appeared to occur at a greater fraction of the synapses. *

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6542. FIXATION OF EXPERIENCE IN THE RAT SPINAL CORD. T.J.Chamberlain, P.Halick and R.W.Gerard: *J Neurophysiol.*, 1963, 26, 662-673 (Mental Health Res. List., Ann Arbor, Mich., U.S.A.) When an asymmetry in descending physiol. activity is produced by unilat. cerebellar or other lesion, the resulting asymmetrical activity in spinal motor centres is seen in postural asymmetries of the hind legs. High spinal section abolishes the descending nerve impulses and the asymmetry, providing the situation has not persisted in the rat, for 45 min. An asymmetry that has endured over 45 min. remains indefinitely. This 'fixation time' is comparable to that of other learning experiences; and the cord 'engram' is a type of fixing of experience or learning. This prep. is being studied electrically, morphol., and behaviourally, and especially for drug effects on fixation time. •

6543. A SINGLE-NEURONE INVESTIGATION OF SOMATOTOPIC ORGANISATION WITHIN THE CAT'S TRIGEMINAL BRAIN-STEM NUCLEI. LDarian-Smith, R.Proctor and R D.Ryan: *J. Physiol.*, Lond., 1963, 168, 147-157 (Sch. Physiol., Univ. New South Wales, Kensington, N.S.W., Australia) Neurones activated by electrical stimm. of each of 10 sites on the face and tongue of the cat were identified in transverse planes through the ipsilat. brain stem over the rostro-caudal extent of the trigeminal nuclei. Within the main sensory nucleus and nucleus tractus spinalis oralis there was a common pattern of projection approx. an inversion of the face with the circumoral region projection to the dorso-medial quadrant. Receptive fields (for mechanical stimm.) of these units were small. Within nucleus tractus spinalis interpolaris most neurones had large receptive fields, precluding somatotopic organisation. In nucleus tractus spinalis caudalis the projection was similar to that observed rostrally except that the density of projection from different cutaneous regions varied along the rostro-caudal axis.

6544. FUNCTIONAL ORGANISATION IN TRIGEMINAL MAIN SENSORY AND ROSTRAL SPINAL NUCLEI OF THE CAT. LDarian-Smith, G.Phillips and R-D.Ryan: *J. Physiol.*, Lond., 1963, 168, 129-146 (Sch. Physiol., Univ. New South Wales, Kensington, N.S.W., Australia) 99% of neurones excited by electrical stimm. of the ipsilat. lip within the main sensory nucleus, nucleus tractus spinalis oralis, and nucleus tractus spinalis interpolaris [NTSI] also fired on lightly touching the same area of skin. The majority of cells so identified within the main sensory nucleus and nucleus tractus spinalis oralis had an axon projection to the contralat. arcuate nucleus of the thalamus, identified by antidromic discharge of the cell following electrical stimm. of the thalamus. Along the ventro-medial margin of these nuclei neurones were trans-synaptically activated by this stimulus. Cells within NTSI did not have an axon projection to the contralat. arcuate nucleus; they were trans-synaptically excited from this region. Their receptive fields were large and included most of the ipsilat. face. •

6545. ACh SENSITIVITY OF CAT'S MEDULLARY NEURONES. G.C Salmoiragh and F.A.Steinen *J. Neu-ophysiol.*, 1963, 26, 581-597 (Clin. Neuropharmacol. Res. Cente., NIMH, NIH. St. Elizabeths Hosp., Washington, D.C, U.S.A.) The presence of ACh-sensitive neurones in the cat's medulla was demonstrated by means of electrophoretic administration of

chem. substances in the immediate vicinity of individual nerve cells using five-barrelled micropipette electrodes. Of 819 nerve cells tested, 21 • 9% increased and 6•7% decreased their rate of activity during ACh administration. Onset and disappearance of change werft delayed with respect to duration of ACh tests. Response of ACh sensitive nerve cells to ACh was enhanced by electrophoretic administration of physostigmine to the cell and could be blocked by administration of dihydro-8-erythroidine and hexamethonium. Only two of the 34 respiratory nerve cells investigated were ACh sensitive, both were expiratory neurones. Of these, one unit decreased while the other increased its discharge rate during ACh tests. *

6546. EFFECTS OF SUSTAINED PERfusion COOLING OF SUBARACHNOID SPACE. M.S.Albin, RJ.White and C.S.MacCarty: *Anaesthesiology*, 1963, 24, 72-80 (Sect. Neurol. Surg., Mayo Clinic, Rochester, Minn-t U.S.A.) The temp. of the spinal cord in the dog was reduced selectively by perfusion of cold fluid through the subarachnoid space. Sustained cooling of the spinal cord to mean temp, as low as 5•86° and 6•33° had no deleterious effect on the spinal cord of dogs which could be attributed to cold per se. Spinal cords of dogs were maintained at low temp, for 4 hr., without any neurol. sequel* and with little histopathol. evidence of cord damage. AU 5 animals so treated survived the 4 hr. subarachnoid cooling. A.A.Zimmerman

6547. ANTIDROMIC ACTIVATION OF NEURONES OF RETICULAR FORMATION OF BRAIN STEM. F.Magni and W.D.Willis: *Nature*, Lond., 1963, 198, 592-594 (Inst. Fisiol. Umana Univ. Pisa, Italy) In adult cats from which the cerebellum was removed by suction, reticular neurones could be identified, by intracellular recording techniques, after antidromic activation. Some cells were found to send axons both rostrally and caudally* G.M.Lewis

6548. ANALYSIS OF INHIBITORY INFLUENCE OF BULBAR RETICULAR FORMATION UPON SUDOMOTOR ACTIVITY. T.Yokota, A.Sato and B.Fujimori: *Jap. J. Physiol.*, 1963, 13, 145-154 (Dept. Physiol., Hokkaido Univ. Sch. Med., Sapporo, Japan)

Response patterns of skin potential due to brain stimm. in cats immobilised with Flaxedil showed inhibitory response marked with increase in strength, pulse duration and freq., elicited from the bulbar ventromedial reticular formation. In parts of the medulla surrounding the inhibitory area inhibitory response was evoked at high freq. Analysis of post-inhibitory rebound following bulbar stimm. revealed that there existed an optimum duration of brain stimm. which causes a max. of rebound.

MJ.Bell

6549. INHIBITION OF SYMPATHETIC ACTIVITY BY STIMULATION OF LIMBIC SYSTEM. T.Yokota, A.Sato and B.Fujimori: *Jap. J. Physiol.*, 1963, 13, 138-144 (Dept. Physiol., Hokkaido Univ. Sch. Med., Sapporo, Japan) Vasomotor and sudomotor activities were investigated by recording b.p. and skin potential on bilaterally vagotomised cats. Results suggest that the limbic system areas involved are divided into two groups * the hippocampus-fornix, stimm. inhibiting both vaso- and sudomotor activities, and the amygdala and lat. pre*optic area, stimm. affecting sudomotor activity only. These results show that as far as sympathetic inhibbn. is concerned, effects of brain stimm. are not always diffusely observed on some effector organs. MJ.Bell

6550. SOME FUNCTIONS OF THE SUPERIOR OLIVARY COMPLEX IN AUDITORY INTENSITY DISCRIMINATION. G.L.Fisher and J.M.Harrison: *J. comp. Neurol.*, 1962, 119, 269-279 (*Psychol. Lab., Boston Univ., Boston, Mass., U.S.A.*) Complete bilat. destruction of the accessory superior olive and/or the nucleus of the "apezoid body had no material effect on the auditory discriminative threshold. Extensive bilat. damage to all components of the superior olivary complex raised the auditory discriminative threshold to values between 58 and 100 decibels, about the same as by cutting the acoustic nerve. The dorsal acoustic pathway does not appear to have any function in auditory intensity discrimination, nor did the region of origin of the ohvo-cochlear tract. G.M.Lewis

6551. NEUROPHYSIOLOGICAL INVESTIGATIONS OF THE BAT, MYOTIS LUCIFUGUS, STIMULATED BY FREQUENCY MODULATED ACOUSTICAL PULSE. A.D.Grinnell and J.J.G.McCue: *Nature, Lond.*, 1963, 198, 453-455 (*Harvard Univ., Cambridge, Mass., U.S.A.*) Neural responses to freq. modulated [FM] pulses were investigated in *M. lucifugus* by means of electrodes in the post. colliculus. Segments of the pulse were separated by const. freq. [CF] segments bating 0<5 msec, or longer, separate evoked potentials were evoked. Responses to passage through a particular frequency were noted. The presence of units preferentially sensitive to either CF or FM pulses was indicated. FM was more effective than CF in evoking potentials and facilitated response to pulses following at short intervals. Two potential could be elicited even when 2 pulses overlapped. G.M.Lewis

6552. FINE STRUCTURE OF TAPETUM CELLULOSUM. C.Pedlen *Exp. Eye Res.*, 1963, 2, 189-195 (*Dept. Anat., Inst. Ophthalmol., London, England*) This paper reports detailed observations on the fine organisation of the tapetal cell in the cat. describes some Ganglion structures produced by immersion fixation of varying tonicity and discusses their relevance. Mechanism of tapetal reflection. J.Whiting

6553. PLASMA CORTICOSTEROIDS: CHANGES IN CONCENTRATION AFTER STIMULATION OF HIPPOCAMPUS AND AMYGDALA. A.J.Mandell, L.F. Chapman, R.W.Rand and R.D.Walter: *Science*, 1963, 139, 124 (*Neuropsychiatric Inst., Calif., U.S.A.*) Electrical stimulation of the hippocampus and amygdala was followed by elevation of plasma corticosteroids. Hippocampal stimulation resulted in a decreased corticosteroid level, followed in 2 instances by a secondary elevation. These results support the view that the hippocampus and amygdala of the brain are closely related to the adrenal stress response mechanism. O.M.Lewis

6554. HIPPOCAMPUS OF THE BRAIN. I. INHIBITION IN HIPPOCAMPUS WITH IDENTIFICATION OF THE INHIBITORY CELL AND ITS APSES. P.Andersen, J.C.Eccles and Y. Yamada: *Ultrastructure of Hippocampal Axo-Somatic Synapses*. T.W.Blackstad and P.R.Flood: *Nature, Lond.*, 1963, 198, 540-542, 542-543 (*Dept. of Anatomy, Australian Nat. Univ., Canberra, Australia*) In anaesthetised cats in which the neocortex had been sucked away to expose the hippocampal formation, recordings were made with microelectrodes from the commissural, septal and fissural areas. Large inhibitory postsynaptic

potentials of long duration were produced and the inhibitory pathway identified. It is suggested that the basket cells receive excitatory synapses from axon collaterals of pyramidal cells and form inhibitory synaptic endings on the somas of pyramidal cells.

II. ULTRASTRUCTURE OF AXO-SOMATIC JUNCTIONS IN THE HIPPOCAMPUS OF GUINEA-PIGS AND RATS. E.M. in section stained with uranyl acetate or PbO. G.M.Lewis

6555. HIPPOCAMPUS AS SITE OF ORIGIN OF SEIZURE DISCHARGE PRODUCED BY TUBOCURARINE ACTING FROM THE CEREBRAL VENTRICLES. W.Feldberg and K.Fleischhauer: *J. Physiol., Lond.*, 1963, 168, 435-442 (*Nat. Inst. Med. Res., Mill Hill, London, England*) The electrical activity of the occipital cortex, amygdala and hippocampus is recorded monopolarly, in cats anaesthetised with chloralose or pentobarbitone Na whilst tubocurarine is perfused from one, and artificial c.s.f. from the other lat. ventricle to aqueduct. The abnormal discharge recorded in the cortical e.e.g. under this condition originates in the hippocampus, where it appears first; it then spreads to the ipsilateral occipital cortex. There is little spread to the contralateral cortex. The abnormal discharge in the amygdala which appears last of all is also explained by spread of the hippocampal discharge. The abnormal discharge in the hippocampal lead is of opposite polarity to that in the cortical and amygdaloid leads.

6556. RESPONSES OF MITRAL CELLS TO STIMULATION OF THE LATERAL OLFACTORY TRACT IN THE RABBIT. C.G.Phillips, T.P.S.Powell and G.M.Shepherd: *J. Physiol., Lond.*, 1963, 168, 65-88 (*Dept. of Physiology, Univ., Oxford, England*) Mitral cells in the olfactory bulbs of anaesthetised rabbits have been localised by a physiol. method and identified by their antidromic responses to lat. olfactory tract volleys. "Giant spikes", with prop, similar to those of motoneurones, have been obtained with extracellular micropipette recordings. Weak volleys, below threshold for a mitral cell axon, often exert a long-lasting blockage of subsequent antidromic invasion into that cell, and intracellular recordings show a corresponding hyperpolarisation of the cell membrane. It is suggested that the blockage is mediated by polysynaptic intrabulbar neuronal systems.

6557. RESPONSES OF MITRAL CELLS TO OLFACTORY NERVE VOLLEYS IN THE RABBIT. G.M. Shepherd: *J. Physiol., Lond.*, 1963, 168, 89-100 (*Physiol. Lab., Univ., Oxford, England*) "Giant" extracellular spikes have been recorded extracellularly with micropipettes from identified mitral cells in the olfactory bulbs of anaesthetised rabbits. They respond singly to each volley in an olfactory nerve rootlet, with prop, of synaptic excitation similar to those in motoneurones. Conditioning volleys, too weak to activate a mitral cell, sometimes produce a long-lasting blockage of testing antidromic impulses. This blockage closely resembles that which follows conditioning volleys in the lat. olfactory tract. It is concluded that common intrabulbar pathways ending on mitral secondary dendrites are involved.

6558. NEURONAL SYSTEMS CONTROLLING MITRAL CELL EXCITABILITY. G.M.Shepherd: *J. Physiol., Lond.*, 1963, 168, 101-117 (*Physiol. Lab., Univ., Oxford, England*) In anaesthetised rabbits, olfactory nerve volleys elicit extracellularly-recorded spikes in units which have been localised in the olfactory bulb by a physiol. method. The responses of presumed glomerular short-axon cells range from single spikes to high-freq.

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bursts. Presumed tufted cells respond singly to a volley in either olfactory nerves or lat. olfactory tract. Presumed granule cells respond singly or repetitively to these volleys. It is concluded that axon collaterals of mitral cells excite granule cells and tufted cells, and that these cells depress mitral cell excitability. The physiol. results largely confirm the anat. pathways proposed by Cajal, and provide evidence for the excitatory or inhibitory nature of the connections.

6559. OLFACTORY BULB RESPONSE TO ANTIDROMIC OLFACTORY TRACT STIMULATION IN RABBIT.

J.OchL Jap. J. Physiol., 1963, 13, 113-128 (Dept. Physiol., Kyoto Prefectural Univ. Med., Kyoto, Japan) Typical tract response consisted in the shallower layers of an initial pos.-neg.-spike, a second ieg. component and a slow neg. wave; in the deeper layers the 2 early components were followed by an initial neg. sp?ke and , slow pos. wave, while the slow neg. wave increased in size. The deep initial sp?ke v/a* a.i. i.r.; idromic volley in mitral cell axons and became through the mitral cell bodies the shallower initial pos.-neg. spike propagated at about 0'5 m./sec towards the apical dendrites. The second neg. component was shown - by the effects of asphyxia, local curarisation, and behaviour to repetitive stimn. of the ant. commissure and olfactory tract - to be due to basal dendrite activities activated synaptically through recurrent axon collaterals of the mitral cells. The deep slow pos. wave was the condensed source of the second neg. component of the whole bulb cortex and the slow neg. wave was due to activity of interval granular cells.

M.J.Bell

6560. DISTRIBUTION OF ACETYLCHOLINE IN BRAIN DURING VARIOUS STATES OF ACTIVITY.

M.Kurokawa, Y.Machiyama and M.Kato: J. Neurochem., 1963, 10, 341-348 (Inst. Brain Res. and Dept. Neuropsych., Med. Fac, Tokyo Univ., Japan) Over 50% of the 20 μ jimoles ACh/g. fresh wt. mouse brain homogenised in O'32M sucrose-essene was found in the 22500 £ 20 min. residue. Resuspension of the pellet in 0'032M sucrose-essene caused partial solubilisation of ACh referred to as 'labile' ACh. Labile ACh was higher in a convulsive strain of mouse although bound ACh was normal. Evidence is presented which suggests that changes in total ACh values during convulsion and anaesthesia are due 'o changes in 'labile' ACh only.

R.Woodman

6561. RAPID CHANGES IN CREATINE [CP] AND ADENOSINE PHOSPHATES OF CEREBRAL CORTEX SLICES ON ELECTRICAL STIMULATION WITH SPECIAL REFERENCE TO EFFECT OF ETHANOL [ET].

H.Wallgren: J. Neurochem., 1963, 10, 349-362 (Res. Lab., State Alcohol Monopoly (Alko) Helsinki, Finland) A new and cheaper apparatus for the electrical stimm. of cerebral slices in Warburg vessels is described with an automatic device for rapid injn. of fixing fluid at a preset time into the flasks. Using rat brain adenosine phosphates were unaffected by stimm. or 0^04% ET. CN* (5mM) plus μ -chloromercuribenzoate [PCMB] at 2mM produced a sharp fall in ATP after 90 sec. exposure but AMP and ADP rose slightly. Stimn. increased this loss. CP fell at 1250 μ jimoles/g. fresh wt./hr. between 2 and 4 sec. stimn. and recovered from a 7 sec. stimn. period at 270 μ jimoles/g./hr. 04 μ f_y ET halved the role of fall but recovery was unaffected. CP was depressed by CN" and PCMB. Sp. activity of the terminal phosphate of AT 32p attained by metabolic turnover of H₂³PO₄" was depressed by stimn. but this could be prevented by ET

R.Woodman

6562. CHARACTERISTICS REQUIRED IN ELECTRICAL PULSES OF RECTANGULAR TIME-VOLTAGE RELATIONSHIPS FOR METABOLIC CHANGE AND ION MOVEMENTS IN MAMMALIAN CEREBRAL TISSUES.

H.McIlwain and Pjoanny: J. Neurochem., 1963, 10, 313-323 (Biochem. Dept., Inst. Psych. Maudsley Hosp., London, England) The loss of K+, gain in intracellular Na+and increased respiration of guinea-pig cerebral slices in response to pulses began at applied

potentials of 1-2V and were max. at 7 $\frac{1}{2}$ V. -Response increased to a max. with pulse duration from 0'03 to 0'4 msec, and with freq. from 2 to 30 c/s. Rates of K+and Na⁺ changes were equiv. only up to 5 c/s when respiratory responses were half max. Respiratory response v/as diminished with 30 μ M chlorpromazine, 500 μ M phenobarbitone and 65 μ M tetrahydroaminoacridine. 2 pM protoveratrone A increased respiratory response at 2 c/s but not at 20 c/s. No effects were observed with 1 and 3mM trimethadione, pitressin(0'4 or 2 U/ml.), oxytocin (1 and 5 U/ml*), or a certain uterine muscle stimulant.

R.Woodman

6563. EXPERIMENTAL EXAMINATIONS OF BRAIN TISSUE SWELLING. P.Gabryek Pozn. Towarzy. Przyjac. nauk. Wydz. lek., 1962, 23, 5-87 (Zaklad Anat. Patol., Akad. Med., Poznaf, Poland)

A characteristic morphol. swelling syndrome was described in the mouse, cat or monkey brains with expt. induced swelling. (Polish)

T.QlgbicW

6564. CORTICAL STEADY POTENTIAL CHANGES: EXTRACELLULAR MICROELECTRODE INVESTIGATIONS. C.-L.Li and G.-C.Salmoiragh; Nature, Lond., 1963, 198, 858-859 (Nat. Inst. Hlth., Bethesda, Md., U.S.A.)

Cortical steady potential recorded in cats from the surface showed localised and neg. shifts following direct cortical, transcallosal or thalamic stimn., but recordings from the depth of the somatosensory cortex showed no clear relation to changes at the surface or to discharge activity of cortical nerve cells.

G.M.Lewis

6565. INTRACELLULAR POTENTIALS OF CORTICAL NEURONES DURING FOCAL EPILEPTOGENIC DISCHARGES. E.S.Goldensohn and D.P.Purpura: Science, 1963, 139, 840-842 (Dept. Neurol., Coll. Phys. and Surg., Columbia Univ., New York, U.S.A.) Focal e.e.g. discharges in lesions of cat cortex induced by freezing are associated with prolonged membrane depolarisations and hyperpolarisations in neurones located & various depths in the lesion sites. Transmembrane potential changes have prop. similar to those of post-synaptic potentials. The temporal relationship between intracellular potentials and paroxysmal discharges indicates that the latter are extracellularly recorded summations of synchronously developing depolarisations and hyperpolarisations in complex synaptic organisations of neurones.

G.M.Lewis

6566. EFFECT OF EXTRACTS FROM URINE OF SCHIZOPHRENIC PATIENTS ON EVOKED CORTICAL RESPONSES IN THE RAT. G.A.German and D.Kemali: Nature, Lond., 1963, 198, 791-792 (Dept. Physiol., Univ. Aberdeen, Scotland) Extracts from the urine of

schizophrenic patients in contact with the exposed cerebrf cortex of the rat significantly increased the amplitude of evoked responses to electrical somatic stimn. Urine frofl normal persons produced a slight and transient increase & amplitude of the responses. The results are in agreement with previous observations on the effect of sera from schizophrenics.

G.M.Lewis

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6567. CAROTID AFFERENTATION AND HIGHER NERVOUS ACTIVITY. I. ACTIVATION OF HIGHER NERVOUS CENTRES BY CAROTID AFFERENTATION. G.Adam, E.Markel, O.Donath, A^Kovacs and A.Nagy. Acta physiol. A^d! Sci. hung.. 1963. 23. 143-153 (Inst. Physiol., Med. Univ.. Budapest, Hungary) In dogs and cats, inborn acute and chronic *expt.* stretching *e walls of the carotid sinus caused <**MCtfinstic Ganges in the cortical electrical activity and strychnine Potentials. The changes are of the form of a typical arousal reaction. H.G.Bevan

6568. PHOTOSENSITIVE WAVES IN THE CATⁱs
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 Inst Univ. Tokyo, Japan)
 The au the condition of appearance
 and electrophysiol. characteristics of 3-7 sec. photo-
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after insertion of the depth electrodes, and could be abruptly blocked by illumination. Study with an o. of

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 bilat. opao nerve cutdna abolished them. M J.Bell

6569. ELECTBOPHTSIOUXSKALmyESTIGimONSOF S.
 111 (Dept.
 Neurophysiol., Charles U...., ...ue, Czechoslovakia) Recordings were made from various sites on the head surface of newborn babies (full and premature) in response to stimn. with intense IS source (6.5 joules) applied at freq. between 0.1-5 hr. after birth, but occurred in all cases in the first hr. of life. Occipital responses different to th. found in Fatigue of wave 2 occurring waves was noted. Latency of the effect is heater for premature than for full-term bab Jj^uVerack

6570. CHANGES IN OmCEVOCTDPOTENTIALS DURING CONDITIONING AND THEIR RELATION TO CONDITIONAL STARTLE FACTION. F.KIMberg and E.Grastyan: Acta physiol Acad. Sci. hung.. 1963. 23 115-135 (Inst. Physiol., Med. Univ., fees, Hunga)

- light stim if ed
 the reaction there was general motor inn. ed
 cortical electrical tonus and increase of the late surface
 waves of die evoked potential human nonsp. e.g.
 H.G.Bevan

- irradiation
 Probably plays an important role in the int of
 the cond. *and it's one of the earliest somatic condi-*
*tions, TGU, TGU ** H.G.Bevan
 tional manifestations.

- 6571 - E.E.G. CHANGES A?J. ER PROLONGED SENSORY AND PERCEPTUAL DEPRIVATION. J.P.Zubek and G.Welch: Science, 1963, 139, 1209-1210 (Dept. of Psychol., Univ. Manitoba, Winnipeg, Man., Canada)
 ^ sycnoi., Univ. Mamtooa, W^U and white noise

- J freq. than did the same period of <>*TM? G.M.Lewis
 ice.

6572. AUDITORY PATHWAY OF THE EPILEPTIC WALTZING MOUSE. I. A COMPARISON OF THE ACOUSTIC PATHWAYS OF THE NORMAL MOUSE WITH THOSE OF THE TOTALLY DEAF EPILEPTIC WALTZER. M.D.Ross: J. comp. Neurol., 1962, 119, 317-339 (Dept. Anat., Med. Center, Univ. Michigan, Ann Arbor, Mich., U.S.A.) In deaf, epileptic waltzer mice, there is a lack of organisation in the acoustic centres, and atrophy of the ventral cochlear nuclei. Older epileptic waltzers evidently become deaf due to degenerative changes throughout the entire auditory system, particularly in the primary acoustic nuclei. G.M.Lewis

6573. FUNCTIONAL SIGNIFICANCE OF RECRUITING POTENTIAL MECHANISM WHEN USED AS CONDITIONAL STIMULUS FOR ELABORATION OF AVOID-ANCE REFLEX. E.GrastaySn, G.T.Sakhiulina and L.AngySru Acta physiol. Acad. Sci. hung., 1963, 23, 155-167 (Inst. Physiol., Med. Univ., PScs, Hungary) Stimn. of the thalamus in cats which elicits recruiting potentials can be used for conditioning. It appears however that the essential factor involved is the after effect of the stimn. rather than stimn. per se. In cond. refl. with const. latencies it is possible to show that stimn. itself had a direct inhibitory effect on the cond. refl. H.G.Bevan

6574. REVERSIBLE SECTION OF THE BRAIN BY A WALL OF COLD. R.Byck and P.Dirilit Science, 1963, 139, 1216-1218 (Clin. Neuropharmacol. Res. Center, Nat. Inst. Mental Hlth., St. Elizabeth's Hosp., Washington, U.S.A.) A fork constructed of stainless steel hollow tubing may be chronically implanted in the cat's brain. When cooling fluid is pumped through the fork, a reversible plane lesion is formed. By this method functional parts of the c.n.s. may be analysed in unanaesthetised animals. G.M.Lewis

6575. PENETRATION OF LIGHT INTO BRAIN OF MAMMALS. W.F.Ganong, M.D.Shepherd, J-R-Wall, E.E.Vanbrunt and M.T.Clegg: Endocrinology, 1963, 72, 962-963 (Physiol. Dept., California Univ., San Francisco Med. Cen., San Francisco, Calif., U.S.A.) A light sensitive photo voltaic cell has been implanted in the hypothalamus and temporal lobe of sheep and dogs and in the hypothalamus of a rabbit and a rat. The amount of light entering the brain was found to be inversely proportional to animal size. H.C.Jones

SENSE ORGANS

6576. IMBIBITION PRESSURE OF CORNEAL STROMA. B.O.Hedbys, S.Michima and D.M.Maurice: Exp. Eye Res., 1963, 2, 99-111 (Corneal Res. Unit., Dept. Clin. Eye Res., Inst. Biol. and Med. Sci., Retina Found., Boston, Mass., U.S.A.) A fine saline-filled cannula connected to a manometer of very low vol. displacement and leakage is introduced into an excised corneal stroma. A neg. pressure is recorded equal to the swelling pressure of the tissue at all values of its hydration. Cannulation of the cornea of a living rabbit results in a neg. pressure which, allowing for intraocular pressure, corresponds to the swelling pressure of the excised tissue. Thus the stroma has a tendency to swell in vivo which must be countered by an active transport mechanism

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located in the limiting layers of the cornea. Only a fraction of the imbibition pressure can arise from osmotic forces, the remainder probably arising from internal structural forces required to maintain the transparency of the tissue.

J. Whiting

6577. CORNEAL RESISTANCE TO FLOW OF WATER AFTER ENZYMIC DIGESTION. B.O.Hedbys: *Exp. Eye Res.*, 1963, 2, 112-121 (Corneal Res. Unit, Dept. Clin. Eye Res., Inst. Biol. and Med. Sci., Retina Foundn., Boston, Mass., U.S.A.) The resistance of the corneal stroma to the flow of water has been studied. A method previously described for measuring the flow of water across the stroma was employed. To evaluate the role of the interfibrillar substance in the resistance, the flow conductivity was determined in stroma gradually digested with testicular hyaluronidase or trypsin. A considerable increase in flow conductivity was observed and could be related to a reduced polysaccharide content. The expt. support the assumption that polysaccharides constitute an important factor in the corneal resistance to the flow of water. The possibility that the non-collagenous proteins also are important cannot be excluded.

J.Whiting

6578. NEW METHOD FOR DETERMINATION OF SWELLING PRESSURE OF CORNEAL STROMA IN VITRO. B.O.Hedbys and C.H.Dohlmaier: *Exp. Eye Res.*, 1963, 2, 122-129 (Corneal Res. Unit, Dept. Clin. Eye Res., Inst. Biol. and Med. Sci., Retina Foundn., Boston, Mass., U.S.A.) A new method for determining the swelling pressure of the corneal stroma and sclera has been developed. A tissue button of any degree of hydration is placed between two glass filters, the upper movable and connected to a capacitance transducer, the lower fixed. The force produced by slight swelling when the tissue is in contact with 0.9% NaCl is recorded. The transducer restricts the swelling, therefore a steady force is rapidly reached. Sheep, rabbit and human corneal stroma and sclera were used over a wide range of hydration. The swelling pressure of normal corneal stroma was about 60 mm. Hg and that of normal sclera was about 17 mm. Hg. The swelling pressure of the sclera showed greater dependence on hydration than did that of the corneal stroma.

J.Whiting

6579. ELASTIC PROPERTIES OF LENS. Y.Kikkawa and T.Sato: *Exp. Eye Res.*, 1963, 2, 210-215 (2nd Dept. Physiol., Univ., Osaka, Japan) The visco-elastic prop. of the cryst. lens have been studied with the use of a mechano-electric transducer. Applications of an external force to the lens caused rapid deformation followed by a second phase of further deformation. On removal of the force, a rapid partial reversal of the deformation occurred and was followed by gradual restoration; complete recovery was not achieved. It was also found that the lens capsule has true elasticity, whereas the lens substance has plastic prop.

J.Whiting

6580. ADRENAL CORTEX AND AQUEOUS HUMOUR DYNAMICS. E.Linnerand P.J.Wistrand: *Exp. Eye Res.*, 1963, 2, 148-159 (Dept. Ophthalmol., Univ., Gothenburg, Sweden) The intraocular pressure was recorded manometrically or tonometrically in anaesthetised and unanaesthetised rabbits. Facility of aq. humour outflow was measured by an in vivo perfusion technique and by tonography. The rate of aq. humour flow was calc. from direct measurement of intraocular pressure, episcleral venous pressure and facility of outflow. Bilat.

adrenalectomy lowered the intraocular pressure by decreasing the aq. production, but hardly affected the facility of outflow and episcleral venous pressure. There was no significant correlation between the degree of reduction of flow or pressure and the concn. of Na, K, and Cl⁻ in venous plasma. Systemic administration of corticosteroids over both short and long periods did not influence the resistance to outflow or significantly restore the pressure and flow in adrenalectomised animals. No correlation of the eye parameters with plasma-electrolytes was found.

J.Whiting

6581. CONSENSUAL INTRAOCULAR PRESSURE CHANGES RESULTING FROM UNILATERAL EXTRAOCULAR MUSCLE CONTRACTION. N.Krishna and S.Y.Botelho: *Exp. Eye Res.*, 1963, 2, 173-181 (Dept. Ophthalmol., Graduate Sch. Med., Univ. Pennsylvania, Philadelphia, Pa., U.S.A.) Direct stimn. of one lat. rectus muscle produced an increase in ipsilat. intraocular pressure and changes in the contralat. intraocular pressure, which were both independent of changes in respiration and systemic arterial pressure. The magnitude and type of consensual response varied and were not correlated with either the increase in ipsilat. muscle tension or ipsilat. intraocular pressure. Evidence is presented to support the hypothesis that the consensual response is neurogenic. The adequate stimulus for the reflex appeared to be increased tension produced by contraction of an attendant increase in * ipsilat. intraocular pressure, suggesting the receptors lie at or near the junction of the muscle and sclera and respond more readily to changes in tension rather than in length. The afferent pathway appeared to be other than the sixth cranial nerve and the efferent pathway was not somatic.

J.Whiting

6582. REFRACTION OF PREMATURE BABIES' EYES. M.V.Graham and O.P.Gray: *Brit. med. J.*, 1963, i, 1452-1454 (Welsh Nat. Sch. Med., Cardiff, Wales) Cycloplegia was obtained by instillation of 0.05% hyoscine and retinoscopy performed in 150 premature and 98 full term babies. Moderate hypermetropia was the rule in the full term group whereas premature infants showed a tendency to low myopia or emmetropia. There was no relationship between the refractory state of premature infants and the duration of their exposure to O₂ not > 38% in incubators.

M.E.Nutt

6583. QUANTAL ABSORPTION AND ELECTRORETINOGRAM. T.P.Williams: *Nature*, Lond., 1963, 198, 964-965 (Psychol. Dept., Brown Univ., Providence, R.I., U.S.A.) The hypothesis is presented that the individual electrical responses in the retina are related to the individual acts of quantal absorption. A mathematical model is constructed which calculates the distribution of absorbed quanta over a group of receptors and also relates the no. of quanta in each outer segment to discrete increments of electrical response, the summation of which is taken to be the overall e.r.g. response. The model is used to calculate both a- and b-wave magnitude as functions of input density.

J.R.Sargent

6584. INDEPENDENCE AND INTERDEPENDENCE IN ON AND OFF VISUAL STIMULI. R-H.Peckham, W.H.Hart and J.K.Peckham: *Vision Res.*, 1963, 3, 187-188 (Eye Res. Foundn., Bethesda, Md., U.S.A.) The ON and OFF responses have been considered previously to be phases of a single stimulus, but different effects are observed especially in the study of e.r.g. Other workers have shown that spike discharges occur separately for ON and

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OFF. The results of the authors' geometrical analysis of Photopic frog e.r.g. are described, and from these records they conclude that the ON-continuing-OFF stimulus complex is quite different from the OFF-continuing-ON complex. They further conclude that the ON and OFF instants each represent a discrete stimulus.

Flicker* stimn. is described in terms of the hypothesis, the advantages of which are stated. J.Whiting

6585. EFFECT OF LOCAL LIGHT ON DIFFUSE OFF-RESPONSE OF EXCISED FROG RETINA. G.Kiebel and J.H.Jacobson: Vision Res., 1963, 3, 131-134 (Dept. Res., New York Eye and Ear Infirmary, U.S.A.)

The OFF-response to diffuse light of the excised retina of *Bana pipie* recorded by a 250 μ Pt-Ir electrode on receptor side and a Ag plate electrode covering the vitreous side, receptor side placed upward toward the air. The electrical response to a diffuse light going off was "eg., receptor relative to vitreous side. If a local light of greater intensity than the diffuse light is applied to the retina in the region of the Pt electrode, at the time the diffuse light is turned off the electrical response of the retina is now pos. receptor relative to vitreous side. Changes in this effect with changes in intensity of local and diffuse lights have been observed. The significance of this effect is discussed. J. Whiting

6586. OSCILLATORY POTENTIAL IN ELECTRORETINOGRAM. D.Yonemura, Y.Masuda and M.Hatta: Jap. J. Physiol., 1963, 13, 128-137 (Dept. Ophthalmol., Sch. Med. Univ., Kanazawa, Japan) A no. of vertebrates (cat, rabbit, guinea-pig, Pigeon, chicken, tortoise, frog and lamprey) were studied. Special ref. is made to multiple wavelet! which are comparable with the oscillator⁷pSteUal in the human e.r.g. These wavelets were superimposed on the slow waves and spaced at nearly 1 S T S with little ref. to the intensity of light. Evidence suggests that the oscillatory Potential *h* located in or near the bipolar cell layer and that it may actually be a distinct component. M.J.I.

6587. INTERACTION OF X-RAYS AND LIGHT IN PRODUCTION OF ELECTRORETINOGRAM. C.S.Bachofer and S.E.Wittry: Exp. Eye Res., 1963, 2, 141-147 (Dept. Biol., Univ. N.Y.U. N.Y., U.S.A.) E.r.g. in response to single flashes « X-rays and

ability of the retina to respond to short stimulus. The retina recovered compicixjr i»" *")J" echoes of X-r V at different freq. of summ. Thuadaptation.

Flashes of X-rays delivered to the retina during adaptation.

The pattern[^] adaptation was different in these situations, but in both the retina was incapable of adapting. Efficient adaptation to produce an e.r.g. of max[^] amplitude under these conditions.

6588. CONTACT SUCTION FOR ELECTRORETINOGRAPHY. J.SvXrsk and J.Peregin: Vision Res., 1963,

Inst. Physiol., Králové, Czechoslovakia contact electrode for e.r.g. purposes has been designed consisting of a plate of the bulb 6 mm. in diam., which clings to the bulb. Suction of the examined eye when pressure has been produced by means

eye dropper. The device permits simult. e.r.g. records from both eyes; it is well tolerated and has proved useful in clinical trials. J. Whiting

6589. EFFECTS OF GLUCOSE AND OXYGEN DEPRIVATION ON FUNCTION OF ISOLATED MAMMALIAN RETINA. A.Ames, m and B.S.Gurian: J. Neurophysiol., 1963, 26, 617-634 (Massachusetts Gen. Hosp., Boston, Mass., U.S.A.) Light-evoked compound action

potentials were recorded from the optic nerve of isolated rabbit retina, maintained at 3(f. The evoked potentials disappeared after 4 min. of anoxia, but when O₂ was resupplied recovery was rapid and complete even after 60 min. deprivations. Without glucose, response amplitude fell to 40% in 4 min. and to 0% in 60 min.; about 66% of the initial amplitude was recoverable after 60 min. deprivations. Recovery after simult. deprivation of O₂ and glucose was markedly delayed but finally as complete as after deprivation of glucose alone. Elevating the temp. 7° reduced by threefold the duration of the combined deprivation that could be reversibly sustained. Effects of reducing O₂ and glucose to intermediate levels and of adding other nutrients were also examined.

6590. OSCILLATORY POTENTIALS IN VISUAL SYSTEM OF CATS AND MONKEYS. R.W.Doty and D.S.Kimura: J. Physiol., Lond., 1963, 168, 205-218 (Center Brain Res., Univ., Rochester, N.Y., U.S.A.) Retinal

ganglion cells discharge in grouped bursts at rhythms of 50-160 groups per sec. following or during a brief, brilliant flash. Stimn. of the optic nerve can block a grouped burst, but does not reset the rhythm. It can also elicit a moderate degree of rhythmic burst activity in the retina of cats unanaesthetised following midpontine pre-trigeminal transection of the brain stem. The grouped activity is recorded from the optic tract or nerve as a sinusoidal potential. In unanaesthetised monkeys with permanently implanted electrodes the rhythm is preserved to the level of the striate cortex. Under light barbiturate anaesthesia continuous sinusoidal rhythms at 3-30/sec. sometimes appear in the optic tract after several sec. of darkness.

6591. ELECTRORETINOGRAM OF THE SQUIRREL MONKEY. G.H.Jacobs, A.E.Jones and R.L.de Valois: J. comp. physiol. Psychol., 1963, 56, 405-409 (Indiana Univ., Ind., U.S.A.) E.r.g. recordings from squirrel monkeys of responses to monochromatic light showed basically the same characteristic wave form as the human e.r.g., except that x-wave components were found. Demonstration of a Purkinje shift showed differentiation of the scotopic and photopic components. J.R.Broome

6592. EFFECTS OF ETHYL ALCOHOL ON EVOKED POTENTIAL OF HUMAN EYE. H.Ikeda: Vision Res., 1963, 3, 155-169 (Dept. Expt. Ophthalmol., Inst. Ophthalmol., Judd St., London, England) The effect of ethyl alcohol on the human e.r.g. was studied. The amplitude of the Jb-wave evoked by a single flash under a state of complete dark-adaptation was increased, both the rise and recovery times were slowed, and no change in the amplitude of the ji-wave was observed after administration of alcohol. The amplitude of the t-wave decreased in the flicker e.r.g., and the e.r.g. fusion freq. was lowered. The observed effects indicate that the eye influenced by alcohol is highly sensitive to light, but so slow in response that it is incapable of following a rapidly repetitive stimulus. These effects are essentially similar to dark-adaptation. The effects appear to occur in the

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neural layer of the retina. It is suggested that a change in neural organisation similar to that occurring in dark-adaptation can be expected to occur with alcohol, the change appearing to be an increase in summative mechanism of the receptor neurones at the bipolar cells*

J. Whiting

6593. CRITICAL FUSION FREQUENCY IN DIURNAL AND NOCTURNAL RETINA OF VERTEBRATES.

G.P.M.Horsten and J.E.Winkelmarc Arch. int. Physiol., 1962, 70, 660-670 (Lab. Gen. Physiol., Catholic Univ. of Nijmegen, Netherlands)

E.r.g. dark adaptation curves of squirrel and hedgehog confirm the histol. evidence that the retinae are pure 'cone' and pure 'rod'* respectively. In 10 squirrels critical fusion freq. (CCF) for the diurnal retina was 30 to >103/sec.; in 12 hedgehogs it was 30/sec. or less. E.r.g. CCF can thus be used to distinguish between rod and cone systems. M.E.Nuit

6594. ELECTRICAL RESPONSE OF THE ENucleATED VERTEBRATE EYE TO ILLUMINATION. J.Francois

Arch. int. Physiol., 1963, 71, 93-94 (Dept. Ophthalmol., Univ., Ghent, Belgium) Brief comm.

M.E.Nutt

6595. A CONE PIGMENT IN THE PROTANOPE.

W. A. H. Rush ton; J. Physiol., Lond., 1963, 168, 345-359 (Physiol. Lab., Univ., Cambridge, England)

The method of reflection densitometry was applied to the fovea of protanopes (red-blind dichromats), since in these subjects only one sensitive pigment is found and the analysis is consequently easier. Details of the apparatus and its application are given. Prelim. investigation shows that the foveal pigment so measured bleaches in the light and regenerates in the dark in the manner to be expected of the cone pigment. Only one pigment is present, for bleaching either by red light or blue-green results in the same difference spectrum. This photo-sensitive pigment is the visual pigment by means of which the protanope judges brightness, for lights of various wavelengths matched by the protanope as to brightness were found all to bleach the pigment with equal efficacy. This protanope cone pigment has its max. sensitivity at 540 mji, it is probably the 'green pigment*' of the Young-Helmholtz 3-colour theory, and hence it is named •Chlorolabe* (=green catching). •

6596. DENSITY OF CHLOROLABE IN FOVEAL CONES OF THE PROTANOPE. W.A.H.Rushton: J. Risiol., Lond., 1963, 168, 360-373 (Physiol. Lab., Univ., Cambridge, England)

A double differential densitometry technique was devised to estimate the true density of a visual pigment in the cone by its self-screening. This was applied to the foveal cones of protanopes where only one pigment, chlorolabe, is detectable. Its density was about 0.15 which is similar to that of rhodopsin in rods. It is probable that both rods and cones absorb about 10% of the light incident upon the cornea with wavelengths corresponding to peak absorption. A nomogram is given to convert densitometer measurements into true values of chlorolabe density. •

6597. CONE PIGMENT KINETICS IN THE PROTANOPE.

W.A.H.Rushton: J. Physiol., Lond., 1963, 168, 374-388 (Physiol. Lab., Univ., Cambridge, England)

The level of cone pigment (chlorolabe) on the protanope's fovea was measured in bleaching and regeneration by the technique of retinal densitometry, and the readings converted into density of chlorolabe by the appropriate nomogram. The bleaching rate was proportional to light intensity and pigment concn. (as it is in rhodopsin soln.) and the photosensitivity was about 8 times as great as it is

in soln. The rate of the regeneration process w#s measured both in darkness and in various strong lights and depended upon the amount of pigment still bleached, but not upon the presence of light. Bleaching and regeneration are independent processes and a very general equation is derived which describes the kinetics with no arbitrary const. The visual dark-adaptation curve plotted as log threshold against time fits the time course of regeneration so that cone log threshold is linear with the amount of chlorolabe present as rod log threshold is with rhodopsin. The high photosensitivity of chlorolabe is attributed to orientation of the mol. in cone structure and to funnelling of light from the wide inner into the narrow outer segment of the cones. •

6598. OPTOKINETIC NYSTAGMUS AND ITS INTERACTION WITH CENTRAL NYSTAGMUS. F.Bergmann, M.Chaimovitz, J.Gutman and S.ZelJg: J. Physiol., Lond., 1963, 168, 318-331 (Dept. Pharmacol., Hebrew Univ.-Hadassah Med. Sch., Jerusalem, Israel)

Central nystagmus was evoked by electrical stimm. of the nystagmogenic area in the diencephalon of the rabbit, medial to the lat. geniculate body. Optokinetic nystagmus was elicited by a rotating drum, equipped inside with black stripes on a white background. The optokinetic response increases with the angular velocity of the drum, until a max. rate is reached. Beyond the max., the response declines again to vanish at the optokinetic fision limit. Optokinetic stimm. activates central nystagmus irrespective of the relative direction of the two responses. Enhancement of central by optokinetic nystagmus is observed even beyond the optokinetic fusion limit, but decreases at still higher angular velocities to reach finally the 'optokinetic activation limit'. Optokinetic fusion cannot be a consequence of failure of the retina to follow very rapid stimm. by moving objects, but must be ascribed to a central inhibitory process. •

6599. VISUAL PERCEPTION OF SIZE AND DISTANCE.

W.C.Gogel: Vision Res., 1963, 3, 101-120 (Civil Aeromed. Res. Inst., Federal Aviation Agency, Oklahoma City, Okla., U.S.A.)

The concept of egocentric localisation has been a central assumption in attempts to understand visual perceptions in a three dimensional environment. This assumption is rejected in favour of the assertion that relative retinal events are the only events which can be stimuli for perceptions. These events are organised by a factor termed the adjacency principle, which states that the apparent size or position of any object in the field of view is determined by whatever size or distance cues occur between it and adjacent objects. Some evidence for the adjacency principle is discussed and some consequences of the principle are considered.

J. Whiting

6600. INDUCTIVE BRIGHTNESS DEPRESSION AS

INFLUENCED BY CONFIGURATIONAL CONDITIONS. H.W.Horeman: Vision Res., 1963, 3, 121-130 (Inst. voor Perceptie Onderzoek, Eindhoven, Netherlands)

Inductive brightness depression has been described using different configurations of the stimulating fields. Using a haploscopic brightness-matching technique, expt. were performed to establish the influence of the luminances and of the configurations of the stimulating fields. Four configurations were tested and compared, one of which had not previously been studied. It can be concluded that: (1) the configuration in which the test field is completely enclosed by a ring-shaped inducing field results in contr-st effects impairing the brightness judgment/brightness

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hatching becomes ambiguous where effects such as opposite contrasts occur, when there is a wide separation between the 2 fields to be matched; (2) the amount of 4e inductive effect is greatly influenced by the extent ^ which the inducing field encloses the test field. . . .

J.Whiting

601. INFORMATION AND CONTROL IN THE VISUAL SYSTEM. R.W.Ditchburn: *Nature*, Lond., 15X3, 138, 630-632 (Dept. Physics, Univ., Reading, Berke., England) A lecture. 13 ref. G.M.Lewis

602. PILOT STUDY OF VERSION MOVEMENTS OF EYES IN CEREBRAL PLASIED AND OTHER CHILDREN. M.LJ.Abercrombie, J.R.Davies and B-Shakel: *Vision Res.*, 1963, 3, 135^153 (Paediatric Res. Unit, Guy's Hospital MS Sh., LondonC England) /ye movements were recorded during simple saccadic and pursuit movement tasks. Success in performing * V * ^ ! ! £ L W " scored objectively and the cerebral paki^ children were at least 50ft worse than the 'normals' . P * * 1 " *** , levels tended to be related to chronological age and was strongly correlated with mental age. Performance on the saccadic task was well correlated with that on, 4e pursuit ^k among the normal children, but the cerebral palsied children were less consistent and four were very discrepant, some implications of the findings are ^{df} < j < e L J.Whiting

603. ACOUSTIC AND NON-ACOUSTIC FACTORS MODIFYING MIDDLE-EAR MUSCLE ACTIVITY IN WAKING CATS. P.W.Carmel and A.Stare: *J. Neurophysiol.*, 1963, 26, 598-616 (Lab. Neurobiol.. Nat.

M.J.
acc
cochlear round window responses and decBwrnggann of the tensor tympani and stapedius muscles. Effects of interriSfo^STeffereTafferent.and ^{ral connections of the middle-ear reflex have been...
Middle-ear steady sound muscles occur in associat...
ing prolonged e middle-ear y movements and sound bra-

W>n. Middle-ear muscles are involved in functions other than protection against acoustic trauma.

604. EFFECT OF SALT ON SUGAR RESPONSE.
Physiol. scand.,
sterinahogs-
of 0.5M sucrose
of a dog after
the latter
Prior application of sucrose or
depressed the response of the chorda tympani to the mixture. Salt was shown to depress entirely the response of single 'sugar' fibres to sucrose and to partially depress the response of 'sugar-salt' fibres to the mixture. H.B.Waynfirth

DIGESTIVE SYSTEM

605. MORPHOLOGICAL CHANGES IN THE MANDIBULAR GLANDS OF CASTRATED MALE RABBITS IN RELATION TO HORMONAL STIMULATION. C.Zearot: *Cad. med. Lombarda, Univ., Milano,* 1962, 17, 441-446 (Clin. ...)

Italy) Castrated rats (24) were treated with 10 mg. of testosterone (i.m.) or 12.5 mg. of progesterone (i.m.) or with an extract from 2 g. of prehypophysis (i.m.) or 10 mg. progesterone (i.p.) and changes in the histology of various glands studied. Modifications in the mandibular glands, such as a development of an irregular eosinophilia and an enlargement of the nuclei with testosterone and progesterone, were more marked than in the parotid glands. No appreciable changes were observed in the glands in animals treated with pituitary extracts. (Italian) G.N.Godson

606. RELEASE OF SUBSTANCE P ON NERVOUS AND ELECTRICAL STIMULATION OF FROG'S STOMACH MUSCLE. I.Singh: *Arch. int. Pharmacodyn.*, 1963, 143, 138-143 (Physiol. Dept., Med. Coll., Agra, India) Electrical or nervous stimm. of frog's stomach caused release of substance P, which appears to be partly responsible for the mechanical response of the muscle to nervous stimm. T.J.Sullivan

607. GASTRIC SECRETION AND BLOOD FLOW IN THE ANAESTHETISED DOG. J.D.Cumming, A.L.Haigh, E.H.L.Harries and M.E.NutC J. Physiol., Lond., 1963, 168, 219-233 (Dept. Physiol., Univ., Birmingham, England) A method for studying simult. the rate of gastric blood flow and gastric secretion in the anaesthetised dog is described. Lv. infusions of histamine acid phosphate which produced secretion of acid by the stomach did not significantly alter the rate of gastric blood flow. Infusions of 1-adrenaline tartrate increased the rate of gastric blood flow significantly but had very variable effects upon the rate of histamine induced acid secretion. I.v. infusions of 1-noradrenaline tartrate caused a significant decrease in both the rate of gastric blood flow and histamine induced acid secretion. No correlation was found between the rate of gastric blood flow and acid secretion. *

608. EFFECT OF PORTACAVAL SHUNTING ON GASTRIC SECRETION IN CIRRHOTIC DOGS. M.F.Hein, W.Silen, J.Skillman and H.A.Harper: *Gastroenterology*, 1963, 44, 637-641 (Dept. Surgery, Univ. California Med. Center, San Francisco, Calif., U.S.A.) After CCI4 and alcohol treatment of dogs, portacaval shunt was performed. The resulting gastric hypersecretion was increased by some 200 to 500%. The liver bypass transposition itself did not induce greater hepatic injury. D.N.Wheatley

609. COMPARISON OF HISTALOG AND HISTAMINE AS STIMULANTS FOR MAXIMAL GASTRIC SECRETION IN HUMAN SUBJECTS AND IN DOGS. S.Ward, LE. Gillespie, E.P.Passaro and M.L.Grossmire: *Gastroenterology*, 1963, 44, 620-626 (Dept. Med., Univ. California Med. Center, Los Angeles, Calif., U.S.A.) Studies on man and dogs with Histalog (3-g-aminoethyl pyrazole dihydrochloride) at doses of 50, 100 and 200 mg. s.c. showed a comparison with the effect of 0.04 mg. histamine acid phosphate administered s.c. also in their ability to induce gastric secretion. Doses of 100 and 200 mg. Histalog were more effective than a 50 mg. dose. Compared with histamine, Histalog caused a more prolonged stimn. of gastric secretion at these dose levels. D.N.Wheatley

610. TRANSMURAL POTENTIAL DIFFERENCE, SHORT CIRCUIT CURRENT AND SODIUM TRANSPORT IN ISOLATED RABBIT ILEUM. S.G.Schultz and R.Zalusky: *Nature*, Lond., 1963, 198, 894-895 (Bionucleonics Dept., Brooks A.F.Base, Tex., U.S.A.) Evidence is

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presented to support the hypothesis that the absorption of NaCl across the small intestine occurs by the active transport of Na followed passively by an equiv. of Cl".

G.M.Lewis

6611. INTESTINAL ABSORPTION OF AMINO ACIDS IN RATS. I. INFLUENCE OF FASTING ON ABSORPTION OF GLYCINE. G.Peres, M.Buclon and D.Carruge: C.R. Soc. Biol., Paris, 1962, 156, 2080-2081 (Lab. Physiol., Fac. Sci., Lyon, France) In normal rats deprived for 48-96 hr. of solid food there was no significant variation in the intestinal absorption of glycine after introduction of 2 ml. 0[#]25M glycine into the intestine. (French) M. A. Price

6612. LOCATION OF FUNCTION IN INTESTINAL EPITHELIAL CELL IN RELATION TO CARBOHYDRATE ABSORPTION. H.Newey P.A.Sanford and D.H.Smyth: J. Physiol., Lond., 1963, 168, 423-434 (Physiol. Lab., Univ. Sheffield, England) A study was made of the effects of glucose and maltose on fluid transfer by the rat intestine in vitro. Phlorrhizin inhib. fluid transfer when glucose or maltose was initially present on the mucosal side and when maltose was initially present on the serosal side, but not when glucose was initially present on the serosal side. The results are explained by postulating three zones in the epithelial cell in order from the luminal border (1) maltase activity, (2) phlorrhizin-sensitive glucose entry mechanism, (3) glucose-dependent fluid transfer mechanism. For this type of relative localisation of cellular function the term functional topography is suggested. *

6613. GLUCOSE AND FRUCTOSE ABSORPTION IN UNANESTHETISED DOG. W.CShoemaker, H.M. Yanof, L.N.Turk, m and T.H.Wilson: Gastroenterology, 1963, 44, 654-663 (Dept. Surg. Res., M.Reese Hosp., Chicago, 111., U.S.A.) By means of catheters installed in dogs in their portal veins, hepatic veins and splenic arteries, the absorption and distribution of glucose and fructose was followed after 50 g. per os. For 1 hr. after administration sugar absorption was high and mainly as free sugar in the portal blood (77%). Glucose absorption was associated with an increased lactic acid production by the gut. The release of glucose from the liver was decreased. Fructose absorption appeared in the blood plasma as 42% ketose and the rest as glucose.

D.N.Wheatley

6614. ABSORPTION OF GLUCOSE AND (+)-XYLOSE FROM DIFFERENT PARTS OF SMALL INTESTINE OF RAT IN VITRO. LSkSla, V.KujalovS and E.SegovS: Physiol. Bohem., 1963, 12, 112-117 (Inst. Human Nutr., Prague, Czechoslovakia) A method is outlined by which the active uptake of materials into the intestine can be measured. This involved the inversion and later ligation of the intestine in several different regions, followed by incubation in medium containing glucose or (+)-xylose. Little glucose transfer was found to occur in the distal part of the intestine of rats, with max. uptake occurring in the middle region. (+)-xylose is taken up at virtually the same rate over the whole length of the intestine with die exception of the last fifth. Glucose transport is affected by changes in the bathing medium, though lowering of the O₂ tension had no effect upon the uptake in the last fifth of the gut.

M.S.Laverack

6615. EFFECT OF INCUBATION MEDIUM ON ACTIVE TRANSPORT OF GLUCOSE BY SMALL INTESTINE OF RATINVTRO. LSkSla, V.KujalovS, E.SegovS, V-Hramadbfva and H.YaYrinkfiY3: Physiol. Bohem., 1963, 12, 118-123 (Inst. Human Nutrition, Prague,

Czechoslovakia) Uptake of glucose by the intestine of the rat was affected by the composition of the bathing medium. The rate of uptake was greatest in Robinson's medium, followed by Krebs phosphate and Krebs bicarbonate. Lactic acid production was lowest in Robinsons fluid. The protein, Na and K content of the intestine wall was not changed by bathing in different media. The transport of L-tyrosine was not altered by change of composition of the medium. M.S.Laverack

6616. ABSORPTION OF IRON FROM HUMAN LARGE INTESTINE. Y.Ohkawara, M.Bamba, LNakai, S.Kinka and M.Masuda: Gastroenterology, 1963, 44, 611-614 (Dept. Int. Med., Kyoto Prefectural Univ. Med., Kyoto, Japan) 59pe studies have been used to show that Fe uptake can occur in the large intestine from FeCl₂ and FeC₁₂ enemas. Fe 2 was absorbed more efficiently than Fe³⁺. Patients fed normal diets without enemas had Fe²⁺ in their faeces, suggesting that Fe can pass through the gut in the bivalent form. It was further found that feeding diets with Fe²⁺ present resulted in detectable Fe³⁺ in the faeces also. D.N.Wheatley

6617. INTESTINAL ABSORPTION OF BILE PIGMENTS. I. ENTEROHEPATIC CIRCULATION OF BILIRUBIN IN THE RAT. R.Lester and R.Schmid: J. clin. Invest., 1963, 42, 736-746 (Thorndike Mem. Lab., Boston City Hosp., Boston, Mass., U.S.A.) InSpragufi-Dawley rats provided with an external biliary fistula intestinal absorption of unconjugated and conjugated [14c]bilirubin occurred. Considerable amounts of labelled pigment appeared in the bilej biliary excretion greatly exceeding urinary excretion. Using isolated intestinal loops of Gunn rats with intact blood supply absorption of bilirubin was demonstrated throughout the small and large intestine after intraduodenal administration, but although unconjugated [14c]bilirubin was absorbed unaltered it appeared that the coiyugate form must first be hydrolysed-

M.J.Bell

6618. INTESTINAL REABSORPTION OF UNCONJUGATED BILIRUBIN: A POSSIBLE CONTRIBUTING FACTOR IN NEONATAL JAUNDICE. R. Brodersen and L. S. Hermann: Lancet, 1963, i, 1242 (Dept. Biochem., Univ., Copenhagen, Denmark). G.H.Bell

6619. INHIBITION OF PERISTALSIS IN GUINEA-PIG ILEUM BY STEROIDS AND ALLIED SUBSTANCES.

M.L.Sharma and R.S.Grewal: Indian J. Physiol. Pharmacol., 1963, 7, 22-28 (Med. Coll., Nagpur, India) The following substances, listed in order of decreasing potency, were found to depress peristalsis and inhibit longitudinal movements in the Trendelenburg prep.: stilboestrol, ouabain, ethisterone, cortisone, Na taurocholate and vit. D. Stilboestrol also caused blockade of the superior cervical ganglion in the cat without affecting directly the adrenergic nerve endings. It is suggested that an effect on intestinal ganglia may be responsible for the observed block of peristalsis.

G.F.Blane

662 P ^ w CORRELATION BETWEEN ACTION OF ADENOSINETRIPHOSPHORIC ACID AND ACETYLCHOLINE ON ISOLATED SMALL INTESTINE OF RABBIT. H.Krysick* DocztaO: Dissert, pharm., 1962, 14, 1-11 (Zahfet FarmakoL Inst. Lek&w, Warszawa, Poland) ATP f

creased (proportionally to its concn.) the contractions of the isolated rabbit small intestine induced by ACh or ??9fe: T⁺ effect of adenosine and AME was less pronounced than that of ATP. (Polish) W.C murzyn**

6621. HYPERTROPHIC AND HYPERPLASTIC CHANGES IN ALIMENTARY CANAL OF LACTATING RAT. B.F.Fell, K.A.Smith and R.M.Campbell: *h Path. Bact.*, 1963, 85, 179-188 (Rowett Res. Inst., Burn, Aberdeen, Scotland) ^{1, H o o f t e r rats,} ^{e increase ff wt., size} ^{limentary canal. A decline} ^{occurs after weaning. The changes effect especially the} ^{small intestine and caecum where there is hypertrophy of} ^{all coats with ease in height o epithelium} ^{2 changes are} ^{being hypert. i and hyperplas} ^{lactating} ^{with increasing} ^{coincident with increasing food intake £ *£} ^{rat. Parturition fails to initiate these changes D.Murray} ^{D.Mur}

LIVER AND BILE

6622. SOME ASPECTS OF CHEMICAL AND CELLULAR COMPOSITION OF RAT UVB. J. Bhargava: *Life Sci.*, 1963, 1, ax* <> £ note. Res. Lab., Hyderabad, India) Prelim. K.Jones
6623. USE OF A SOLUTION OF PLANT EXTRACTS IN DEMONSTRATION OF CHOLECYSTIC ACTIVITY BY CHOLECYSTOGRAPHY. A.Limentani and F.Costa: ^{nd P.M.} ^{egior} ^{17, 489-495} ^{no, Italy)} When a mixture of plant extracts containing in g. Menta Piperita, 0.18275, Ocimum basilicum 0.56950, Caly- Caudatus floridus, 0.46750, Ononis spinosa, 0.65875, Pyscidea erythrina, 0.09775, Corydalis formosa, 0.57375, alk. soln., 85-45 and glycerin 12.00 is given orally to human subjects, the cholecystogram, is increased in density. This observation may be of great diagnostic use. G.N.Godson (Italian)
6624. MODIFICATIONS IN PHOSPHORUS CONSTITUENTS OF LIVER AND PANCREAS IN RATS RECEIVING INJECTION OF ETHANOL. F.Decloitre and R.Lowy: *C.R. Soc. Biol., Paris*, 1963, 157, 46-51 (Inst. Nat. d'Hygiène, Paris, France) Rats received i.p. injn. of 2-3 g. ethanol/kg. 1 hr. before sacrifice. Compared with injn. 0.85% NaCl there was an increase in nucleotides and RNA liver of rats receiving 2 g. kg. There was no increase in total P compounds of the liver. M.A.Price (French)

KIDNEY AND URINE

- * * • L^APH FORMATION IN JIGEADNEY AFTER ^ ^ URETERAL OBSTRUCTION. M.Pa^A Apt. Med. Szilagyi: *Szeged*, 1963, 19, 1-38 (Acad. Sci., Budapest, Hungary) Lymph production was studied after ureteral obstruction in Jigs with intact or absent renal function. The findings discussed in terms of the role of the kidney lymph circulation with G.F.Blane ** role of urine osmolarity. (German)

6626. REPLACING URETER DEFECTS BY USE OF POLY-CHLORIDE VINYL PROSTHESIS. W.Twardosz: *Pozn. Towarzy. Przyjac. nauk, Wydz. lek.*, 1962, 22, 295-341 (I Klin. Chirurg. Akad. Med., Poznan, Poland) A polyvinyl tube replacing part of ureter in dogs was not resorbed remaining patent and elastic 341 days after operation. Inulin and PAH clearance was not disturbed and no increase of plasma urea, uric acid, creatinine, P and K level was observed. The results were confirmed by (Polish) T.qfbicki

6627. STRUCTURE OF KIDNEY IN RELATION TO AGE AND DIET IN WHITE RATS DURING THE WEANING PERIOD. J.M.N.Boss, H.DlouhS, M.Kraus and J.Kfetek: *J. Physiol., Lond.*, 1963, 168, 196-204 (Physiol. Dept., Univ., Bristol, England) Between 11 and 23 days of age, when weaning normally begins, the loops of Henle differentiate, the spaces between them become reduced with the disappearance of loose connective tissue, the vasa recta become as densely distributed as in the adult, and the outer medullary stripe, consisting of the second segments of prox. tubules, forms. The cortex loses the nephrogenic zone in the same period. Since this is the time at which the kidney first responds to ADH by making a cone, urine, the medullary changes are consonant with the countercurrent hypothesis. Forced weaning at 14 days, raised salt intake and a high-fat diet do not affect these changes.

6628. EFFECT OF OESTROGENS ON KIDNEY WEIGHT IN MICE. M.B.Shimkin, P.M.Shimkin and H.B.Ander: *vorts. J. nat. Cancer Inst.*, 1963, 30, 135-141 (Nat. Cancer Inst., Bethesda, Md., U.S.A.) In intact cf. oestrogens produce a rapid decrease in kidney wt., expressed either as abs. wt. or as a ratio of body wt., the effect is seen after continuous or single treatment, but not when oestrogen is given intermittently.

- J.G.Bennette
6629. OBSERVATIONS ON FUNCTION OF A TRANS-PLANTED KIDNEY. J.B.Dossetor, R.O.Morgen and J.C.Beck: *Canad. J. Biochem.*, 1963, 41, 1409-1422 (McGill Univ. Clinic, Royal Victoria Hosp., Montreal, Canada) The transplanted kidney functioned well during the first 24 hr. after implantation, but suffered decrease in function during the second and third days followed by subsequent gradual improvement. During the first 24 hr. osmotic diuresis occurred, with release of Na and Cl, in the presence of an antidiuretic stimulus. Azotaemia returned during the fourth week after operation, causing osmotic diuresis with increased urine vol., Na and Cl excretion, and rapid wt loss. Secondary hyperparathyroidism of chronic uraemia was believed to have been detected. Data relating to the diurnal rhythm of electrolyte excretion are presented.

A.M.Gibbins

6630. ADULT TOLERANCE INDUCED BY 6-METHYL MERCAPTOPURINE TO A CANINE RENAL HOMOGRAFT. C.F.Zukoski and J.M.Callaway: *Nature, Lond.*, 1963, 198, 706-707 (Surg. Service, V.A.Hosp., Nashville, Tenn., U.S.A.) Renal homotransplants in dogs were rejected at an average of 15 days. In 9 dogs treated with 6-methylmercaptopurine orally (10 mg./kg. for 2 days, 5 for 4 days, and 2-5 thereafter) the grafts survived an average 34 days in 8 of the dogs, but in the 9th, the dog remained alive for 570 days with the drug, and more than 372 days after withdrawal of the drug. There was no evidence of homograft rejection and it was considered that in this case, adult tolerance had been achieved.

G.M.Lewis

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6631. EFFECT OF MINERALOCORTICOID AND OF ACTH ON GRANULARITY OF JUXTAGLOMERULAR CELLS. F.W.Dunihue, M.Bloomfield and B.Machanic: *Endocrinology*, 1963, 72, 963-966 (Univ. Vermont Med. Coll., Burlington, Vt., U.S.A.) The mean juxtaglomerular granular cell indices of rats varied inversely with the mineralocorticoid level and were unaffected by ACTH. ACTH potentiated the action of the mineralocorticoids.
H.C.Jones

6632. RENAL FUNCTION IN ACUTE ISCHAEMIA OF THE [HIND] LIMBS. J.Hryniwiecki: *Pozn. Towarzy. Przyjac. nauk. Wydz. lek.*, 1962, 23, 117-142 (El Klin. Chir., Akad. Med., Poznań, Poland) Ligation of the proximal section of the abdominal aorta caused total paresis of hind legs and death in few days. The decreased excretion of urine was associated with the lowered clearance of Na, PAH, endogenous creatinine and K. Microscopic examination of kidney showed anaemic state of glomeruli, local necrosis of tubules and congestion of liver. (Polish) T.qlfbicki

6633. RENAL FUNCTION FOLLOWING HYPOPHYSECTOMY IN MAN. T.Falkheden: *Acta endocr. Khb.*, 1963, 42, 571-590 (Med. Clinic II, Sahlgrenska Sjukhuset, Göteborg, Sweden) In hypophysectomised patients, the GFR and renal plasma flow [RPF] as measured by clearances of inulin and PAH were much less than in normal subjects. Although thyroid therapy increased the GFR and RPF, preoperative levels were never reached. Hypophysectomy also decreased the max. rat^{**} of tubular excretion of PAH.
H.B.Waynfirth
V.

6634. ION MOVEMENTS AND OXYGEN CONSUMPTION IN KIDNEY CORTEX SLICES. R.Whittam and J.S. Willis: *J. Physiol.*, Lond., 1963, 168, 158-177 (Dept. Biochem., Univ., Oxford, England) The interrelationship between O₂ consumption and active cation transport in incubated slices of rabbit-kidney cortex was studied by determining the effects of ouabain and Na on K uptake and O₂ consumption. Ouabain inhibits K-uptake and Na⁺ stimulates it; each agent produces a parallel and proportional effect on the QO₂. The rates of net uptake or loss of K are proportional to the associated change in O₂ consumption. The results indicate that, above a basal level, O₂ consumption of kidney slices is controlled by the rate of Na and K transport. •

6635. KINETICS OF AMINO ACID TRANSPORT, INCORPORATION INTO PROTEIN AND OXIDATION IN KIDNEY CORTEX SLICES. L-E.Rosenberg, M.Berman and S. Segal: *Biochim. biophys. Acta*, 1963, 71, 664-675 (Metab. Serv., Nat. Cancer Inst., Bethesda, Md., U.S.A.) Using inulin and a-aminoisobutyric acid [AABA] amino acid uptake in rat kidney was characterised by a 3 compartment 'parallel' model representing the medium, extracellular space and intracellular space. Influx and efflux rate const. were calc. DNP and incubation at 27° affected the rates of influx and efflux of AABA for the intracellular space. Kinetic studies with glycine and L-lysine indicated that equilibration of exogenous amino acid with the intracellular pool need not occur before incorporation into protein. Kinetics of ¹⁴CO₂ evolution from L-[14C]lysine indicated that the rate of amino acid oxidation reflected the build up of the intracellular lysine pool.
B.M.Stevens

6636. EFFECT OF PHLORRIZIN ON AMINO ACID TRANSPORT IN RAT KIDNEY SLICES. S.Segal, A.Blair and L.E. Rosenberg: *Biochim. biophys. Acta*, 1963, 71, 676-687 (Clin. Endocrinol. Branch, Nat. Inst. Arthritis and Metabolic Dis., Bethesda, Md., U.S.A.).

Phlorrizin was shown to have r.o effect on the affinity of the carrier sites for amino acids but to inhibit the efflux of amino acids from the intracellular fluid, possibly by increasing their intracellular binding. Incorporation of amino acids into protein was decreased by phlorrizin; amino acid oxidation was increased. B.M.Stevens

6637. EFFECT OF MASSIVE NaHCO₃ INFUSION ON RENAL FUNCTION. G.S.Kanten: *Canad. J. Biochem.*, 1963, 41, 1399-1408 (Physiol. Dept., Albany Med. Coll., Albany, New York, U.S.A.) Twelve anaesthetised dogs were i.v. inj. with a max. load of 50 g. NaHCO₃ over a period of 4 hr. at 2⁵5 Fiequiv./min. Plasma K fell from 3⁸-2⁷ mequiv./l. and plasma Na increased from 144⁴-170⁸ mequiv./l. with max. NaHCO₃ loading. There was no apparent acute detrimental renal effect, and no depression of GFR or renal plasma flow, although the pH increased from 7³2 to 7⁶1. No significant effect was seen on b.p., haematocrit, filtration fraction, heart rate, or rectal temp. Urine flow and pH increased with higher loading rates and concn.
A.M.Gibbins

6638. URINE TITRATABLE ACIDITY AND NH₃-EXCRETION DURING HYPOTHERMIA. G.S.Kanten: *Canad. J. Biochem.*, 1963, 41, 1201-1206 (Physiol. Dept., Albany Med. Coll., Albany, New York, U.S.A.)

H excretion by the kidneys of anaesthetised hypothermic dogs was measured as the sum of total titratable acid and NH₃ excreted during a const. saline infusion of 2 ml./min. Anaerobic arterial pH fell from 7⁴1 to 7²7 at 27°, but urinary pH remained at approx. 6⁸. Total titratable acid excretion fell from 0⁰11 to 0⁰005 mequiv./min. at 27°. It was suggested, therefore, that the renal acidification mechanism was temp. dependent as excess H⁺ had not been excreted. NH₃ excretion, after a mild increase from 0⁰008 mequiv./min., fell to 0⁰006 mequiv./min. at 27°.
A.M.Gibbins

6639. ACUTE RENAL CONSERVATION OF SODIUM IN HYPERTENSION. S.Papper, L.N.Sporn, R.G.Lancaster and C.A.Vaamonde: *Arch. intern. Med.*, 1963, 111, 439-442 (Dept. Med., Univ. New Mexico Sch. Med., 2211 Lomas Blvd., Albuquerque, N.Mex., U.S.A.) No evidence for any limitation in the ability to conserve Na in the absence of a Na-load could be found in hypertensive patients with an exaggerated natriuresis following acute salt administration. The tests employed were change in posture, cuffing of the thighs and ingestion of 2 mg. 9a-fluorohydrocortisone.

6640. INSTIGATION OF ACTION OF ALIX)STERONE 9JJ PERFUSED CAT KIDNEY BY URETERIC STOP-FLOW ANALYSIS. T.de Lima and M.F.Lockot: *Arch. int. Physiol.*, 1963, 71, 83-92 (Chelsea Coll. Technol., London, England) Stop-flow methods indicate that the supranormal excretion of Na and water from cat kidneys perfused with blood from headless or hypophysectomised donors results from impaired proximal reabsorption of Na. Distal Na reabsorption proceeds normally. Aldosterone in blood from headless animals further depresses proximal Na reabsorption and produces an overall diuresis and loss of Na. Aldosterone in blood from intact animals increases both distal and water-linked

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Proximal Na reabsorption, thus producing an antidiuretic effect. Oxytocin enhances the effect of aldosterone in blood from intact donors. It converts the diuretic action of aldosterone in blood from headless donors into an antidiuretic one by sensitising proximal segments to the Na and water retaining action of aldosterone. M.E.Nutt

6641. PROXIMAL RENAL TUBULAR TRANSPORT OF α-OXOGLUTARIC ACID. P.Vishwakarma: Canad. J. Biochem., 1963, 41, 1099-1104 (Dept. Pharmacol., Fac. Med., Queen's Univ., Kingston, Ont., Canada) α-Oxoglutaric acid transport along the renal tubule in the dog was studied by the stop-flow method during infusion of Na α-oxoglutarate. The acid was excreted by a combined process of glomerular filtration and tubular reabsorption, the latter being confined to the prox. tubule. No tubular secretion was seen in any part of the nephron. The concn. gradient between the plasma and extracellular fluid was favourable to the uptake of the acid by the cell. It is suggested that there is active reabsorption of α-oxo-glutarate in the proximal tubule from the lumen into the cell, and active transfer of the acid from the blood into the cell. A.M.Gibbins

6642. COMPARATIVE EFFECTS OF SOME M₁ ANALOGUES ON RENAL REABSORPTION OF GLUCOSE. D.F.Diedrich: Biochim. biophys. Acta, 1963, 71, 109-116 (Med. Fac. of

a na of coside related to phlorizin on renal reabsorption in the dog were examined. Conclusions were drawn as to the critical structure and geometrical conformation of the inhibitor molecule and the nature and position of the membrane receptor site to which the TM bound. B.M.St.

6643. URINARY EXCRETION OF TRYPTOPHAN-RICH PRE-ALBUMIN AFTER STRENuous PHYSICAL EFFORT. J.Poortmans: Life Sci., 1963, 5, 334-336 (Semse d'Etudes, test. Nat. de l'Educ. Phys. et des Sports, Bruxelles, Belgium).

ENDOCRINE GLANDS

6644. REACTION OF HYPOTHALAMIC-NEUROHYPOTHALAMIC SYSTEM OF RATS TO CORTISONE AND ACTH. E-LZubkova-Mikhaflova: Dokl. Akad. Nauk SSSR, 1962, 144, 2452. Increased concn. of cortisone in the rat & the SL dorsal septal nucleus of the neurohypothalamus, whereas: A decrease in the lobe of secretory substance. C. ain dep. diff. noted between the paraventricular and supraoptic nuclei. B.J.Cooper (Russian)

6645. CEREBRAL INVOLVEMENT IN INHIBITION OF ACTH SECRETION BY HYDROCORTISONE. J.M.Davidson and S.F. Rosen: Endocrinology, 1963, 72, 936-946 (Dept. Dis., Hadassah Univ. Hosp., Jerusalem, Israel) In rats of crystalline hydrocortisone acetate in the median eminence and anteromedial hypothalamus resulted in the abolition of compensatory adrenal hypertrophy following unilat. adrenalectomy. The remaining adrenal atrophied and the ventral prostate wt. decreased. H.C.Jones

6646. NEURAL CONTROL OF ACTH SECRETION: EFFECT OF ACUTE DECEREBRATION IN RAT. K.Matsuda, J.W.Kendall, jun., C.Duyck and M.A. Greco: Endocrinology, 1963, 72, 845-852 (Endoc. Div., Med. Dept., Oregon Univ. Med. Sch., Portland, Ore., U.S.A.) Removal of the cerebral cortex and subadjacent brain in the rat did not lead to an increase in plasma corticosterone concn. The median eminence, stalk, and pituitary appeared to be necessary for pituitary adrenocortical activation. H.C.Jones

6647. CORTICOTROPHIN-RELEASING ACTIVITY OF SYNTHETIC NEUROHYPOPHYSAL HORMONES AND SOME RELATED PEPTIDES. W.Doeppner, E.Sturmer and B.Berde: Endocrinology, 1963, 72, 897-902 (Pharmacol. Lab., Sandoz Ltd., Basle, Switzerland) A comparative study has been made of the corticotrophin-releasing, pressor, antidiuretic and oxytocic activities of the neurohypophyseal hormones and some synthetic analogues and homologues in rats. The corticotrophin-releasing activity correlated well with the pressor activity of the naturally occurring hormones but not for the synthetic analogues. H.C.Jones

6648. PITUITARY-ACTH RESPONSE TO METOPIRONE AND ENDOTOXIN ADMINISTRATION IN DOG. J.E.Plager, G. A.Bray and J.E.Jackson: Endocrinology, 1963, 72, 876-883 (Med. Dept., Univ. Rochester, Rochester, N.Y., U.S.A.) Expt. on the rate of adrenal production of cortisol and 11-deoxycortisol in dogs during ACTH and metopirone administration that the plasma level of 11-deoxycortisol reflected its adrenal production rate. The plasma level of cortisone did not reflect the adrenal cortisone production rate. Endotoxin was a more effective stimulus of ACTH release than metopirone. H.C.Jones

6649. STATISTICAL EVALUATION OF EFFECT OF ACTH STIMULATION ON PATIENTS WITH CUSHING'S SYNDROME AND HIRSUTISM. R.Litta-Modignani, D.Gelli and G.Cecchetti: Atti. Acad. med. Lombarda, 1962, 17, 290-298 (1st. di Clin. Med., Univ., Milano, Italy) In 15 hirsute and 7 Cushing's syndrome [CS] patients, the 17-KS, 17-OHCS and pregnanediol excretion were estimated by Callow's, Silber's and Klopper's methods respectively. Under basal conditions the pregnanediol and 17-KS were high in the hirsute and CS patients and the 17-OHCS high in CS and normal and hirsute patients. After ACTH stimm. the 17-KS excretion was high in both hirsute and CS patients and the pregnanediol normal in all cases except for a slight increase in hirsute patients at the end of stimm. suggesting delayed metabolism. (Italian) G.N. Godson

6650. EFFECTS OF ADRENAL ENUCLEATION AND OF SPIRONOLACTONE SC-8109 ON GRANULARITY OF RAT JUXTAGLOMERULAR CELLS. F.W.Dunihue, W.Van B.Robertson and B.Machanic: Endocrinology, 1963, 72, 859-864 (Anat. Dept., Univ. Vermont Med. Coll., Burlington, Vt., U.S.A.) The granular cell index of the juxtaglomerular cells was determined at intervals after uninephrectomy, unilateradrenalectomy, and enucleation of the remaining adrenal in rats drinking 1% saline. A transient rise followed by a reduction in the index was seen, which appeared to be produced by an ACTH dependent hormone secreted by the generating adrenal. H.C.Jones

PHYSIOLOGY

6651. INFLUENCE OF CHRONIC HEAT EXPOSURE ON ADRENOCORTICAL SECRETION. S.Iton and Y.Nishimura: Jap. J. Physiol., 1963, 13, 182-186 (Dept. Physiol., Hokkaido Univ. Sch. Med., Sapporo, Japan) With chronic heat exposure in rats there was a lowered adrenal response to exogenous ACTH in both normal and hypophysectomised animals. This may be related to the decreased secretion of thyroid hormone also found in rats kept at 32°. MJ.Bell

6652. EFFECTS OF ALTERATIONS OF PLASMA SODIUM AND POTASSIUM CONCENTRATION ON ALDOSTERONE SECRETION. J.O.Davis, J.Urquhart and J.T. Higgins: J. clin. Invest., 1963, 42, 597-609 (Lab. Kidney and Electrolyte Metab., Nat. Heart Inst., Bethesda, Md.^f U.S.A.) In hypophysectomised dogs K directly effects aldosterone secretion: increasing K either by i.v. infusion or by a high K diet augmenting aldosterone production. An increase in the secretion of aldosterone also occurred with a lowering of plasma Na. After removal of kidneys the K effect still occurred suggesting a direct influence of K on the adrenal cortex. Further evidence for this was obtained when infusion of KC1 and K₂SO₄ into the arterial supply of isolated adrenals gave increased aldosterone secretion. MJ.Bell

6653. ALDOSTERONE AND ELECTROLYTES DURING VACCINATION SHOCK. M.Perrini, N.Piliego and L.Pinta Biochim. appl., 1963, 10, 24-33 (1st. Clin. Med. Generale e Terapia, Univ., Bari, Italy)

Urinary aldosterone levels increased 4-fold in patients suffering hypersensitivity reactions from Brucella Ag and in patients with typhoid fever. Urinary Na excretion doubled in that period but K remained unchanged.

(Italian) J.&Crawhall

6654. ADRENAL CORTICAL FUNCTION IN BENIGN ESSENTIAL HYPERTENSION. A.Vermeulen and M.Van der Straeten: J. clin. Endocr., 1963, 23, 574 (Med. Clin. State Univ., Ghent, Belgium) No significant difference could be shown between controls and hypertensive subjects in the daily excretion of cortisol, corticosterone or in the free or conjugated Porter-Silber chromogens. The excretion of pregnanetriol and pregnanediol was depressed in the hypertensives.

G.F.Blane

6655. SEASONAL ADJUSTMENTS IN CAPTURED WILD NORWAY RATS. III. PRODUCTION OF ADRENAL STEROIDS IN VITRO. J.S.Willmen Canad. J. Biochem., 1963, 41, 1147-1153 (Animal Res. Inst., Dept. Agric., Ottawa, Canada) The in vitro adrenal steroid secretion of wild Norway rats (Rattus norvegicus), of both sexes, captured during the winter differed in quantity, but not in quality, from that of similar rats captured during the summer. There was no evident seasonal effect on adrenal wt., merely on rate of secretion, the predominant steroid secreted being corticosterone. This seasonal adjustment was similar to that of caged white rats exposed to natural winter and summer conditions, but differed from that of rats cold-acclimated in the laboratory, these having lower than normal adrenal activity.

A.M.Gibbins

6656. EXCRETION OF ALDOSTERONE AND SODIUM AND POTASSIUM AFTER LARGE DAILY DOSES OF PROGESTERONE. G.Stark and H.Kossmann: Acta endocr. Khb., 1963, 42, 537-551 (Univ.-frauenklinik, Mainz, Germany) Daily injn. of progesterone (200 mg.) were given i.v. to pregnant women. The patients' NaCl intake was kept const, during this time. Only in 1/3 of the patients did this treatment produce

higher aldosterone excretion and in only a few cases was a Na diuresis observed. (German) H.B.Wayforth

6657. STUDY OF VARIOUS INDICES OF ADRENOCORTICAL ACTIVITY DURING 23 HAYS AT HIGH ALTITUDE. P.C.B.Mackinnon, M.E.Monk-Jones and K.Fotherby: J. Endocr., 1963, 26, 555-566 (Dept. Anat., Royal Free Hosp. Sch. Med., London, England)

The study was made on 4 men and 3 women who ascended rapidly from sea level and remained for 23 days on Mont Blanc at 4333 m. The subjectively recorded responses of lassitude, nausea and vomiting which occurred over the first few days were accompanied by a rise in urinary 17-OHCS, fall in circulating eosinophils, and a rise in palmar sweat index which was taken as an assessment of emotional activity. Minor changes took place in the excretion pattern of 17-oxysteroids but pregnanetriol and pregnanediol levels remained steady. All these indices of stress began to approach the sea level control values within 5 days. G.F.Blane

6658. EFFECT OF PROLONGED TREATMENT WITH HUMAN CHORIONIC GONADOTROPHIN HCG ON ENDOGENOUS STEROID HORMONE METABOLISM OF PHYSICALLY AND MENTALLY RETARDED BOYS.

M.Reiss, J.Hillman and R-H.Davis: J. clin. Endocr., 1963, 23, 11 (Neuro-Endocrine Res. Unit, Willowbrook State Sch., Staten Island, N.Y., U.S.A.) -The influence of HCG on excretion of 17-KS and 17-OHCS of 42 mentally and physically retarded boys between the ag⁸ of 8 and 15 yr. was studied. The HCG treatment resulted in an increased amount of the steroid metabolites appearing in the urine and the appearance of a normal pattern of diurnal activity in the excretion rate which was absent before treatment. G.F.Blane

6659. DETERMINATION OF URINARY 17-KETOGENIC STEROIDS BY MEANS OF SODIUM METAPERIODATE OXIDATION. E.R.Rutherford and D.H.Nelson: J. clin. Endocr., 1963, 23, 533 (Dept. Med., Univ. S. California, Los Angeles, Calif., U.S.A.) Marked improvement in reproducibility and avoidance of procedural difficulties associated with the bismuthate methods is claimed for the technique described. G.F.Blane

6660. EXCRETORY FORMS OF CORTISOL, CORTISONE, CORTICOSTERONE AND 11-DEHYDROCORTISONE IN HUMAN URINES. J.R.Pasqualini and M.F.Jayle:

C.R. Soc. Biol., Paris, 1963, 157, 96-99. After administration of cortisol and corticosterone, 21-cortisol sulphate and 21-corticosterone sulphate were identified in human urine. The major part of corticosterone and dehydrocorticosterone was excreted in the form of sulphate esters. Cortisone and cortisol appeared in three fractions: free, sulphate esters and glucuronates.

(French) M.A.Price

6661. PATTERN OF EXCRETION OF URINARY HORMONES RELATED TO CORTISOL OR CORTICOSTERONE AFTER THE ADMINISTRATION OF ACTH.

J.R.Pasqualini: Bull. Soc. Chim. biol., Paris, 1963, 45, 277-300 (Lab. Chim.-Biol., Fac. Méd., 45, rue des Sts, -Pères, Paris, France) The distribution of cortisol, corticosterone and their metabolites between *e unconjugated, ester sulphate and glucuronide fractions in human urine after ACTH stimn. were studied. Corticosterone and 11-dehydrocorticosterone were found mainly in the ester sulphate fractions, whereas cortisol and cortisone were identified in all these fractions.. 46% of the unreduced hormones were in the ester sulphate fraction,

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whereas the reduced metabolites were in the glucuronate fraction. After administration of ACTH the corticosterone metabolites were only 30% of the amount of cortisol metabolites. (French) J.C.Crawhall

6662. URINARY EXCRETION OF 17-HYDROXY-20-OXO-20-METHYL STEROIDS IN NORMAL WOMEN AND IN WOMEN WITH ALTERED ANDROGEN EXCRETION. J.Zander, G.Schroder, B.Walter and R.Borth: -Acta endocr. Kbh., 1963, 42, 321-8*

(Univ.frauenklinik, Köln, Germany) In healthy women the excretion rate of 17-hydroxy-20-oxo-20-methyl steroids measured by the method of Appleby and Norymberski is below 100 ($\mu\text{g}/\text{day}$) at puberty rising to 300 μg . at 30 yr. and falling at ≈ 30 "KWUMi. A b" * excretion rate which can be controlled wrt cortisone is seen in women with congenital adrenocortical hyperplasia. Hirsute women and those with die Stein-Leventhal syndrome have normal excretion^{aau}. H.B.Waynforth

6663. OCCURRENCE OF DEHYDROISOANDROSTERONE GLUCURONOSIDE IN NORMAL HUMAN URINE.

P-K.Siteri, R.L.Vande Wiele and S-Lieberman: J. clin. Endocr., 1963, 23, 588 (Dept. Obstet., Coll. Phys. and Surg., Columbia Univ., New York, U.S.A.)

The isolation of dehydroisoandrosterone glucuronoside from human urine is described. Isotope studies showed *at the urinary sulphate is derived not only from dehydroisoandrosterone but from the sulphate >**•*** appears to be secreted by the adrenals. G.F.Biane

6664. SUPRARENAL FACTORS CONDITIONING RESISTANCE TO HISTAMINE POISONING IN RAT.

ID. EFFECT OF ANTI-PERTUSSIS VACCINATION ON SUPRARENAL MEDULLA. $\Delta^{\text{comt}} \frac{\text{nd}}{\text{A.C.}} \frac{\text{ion}}{\text{tg}}$ Fossion: Arch. int. Physiol., 1962, 70, 651-659. Adrenaline content of rat suprarenal* decreased slightly during the first 48 hr. after vaccination with Haemophilus suis. Vaccination increases the sensitivity of rats to the histamine action of histamine and cystamine and depletion of the adrenaline content of the adrenals is abolished in vaccinated animals than in controls. Vacen. of histamine, direct stimm. of adrenaline secretion on injn. small doses out sensitivity of peripheral blood vessels to suprarenal of adrenaline and histamine is unchanged. Alteration specific? Jgdillary function does not seem to be altered specifically by H. pertussis vaccn. (French) M.E.Nutt

6665. URINARY EL^INATIO^ CATECHOLAMINES IN RAT DURING EXPERIMENTAL HYPERTENSION INDUCED BY HYDROXYCORTICOSTERONE. CMasse and M.L.Chollet: C.R. Soc. BtoL. Paris, 1962, 2102-2104 (Lab. de Pathol. méd., Fac. de Med. Nancy, France) Unilat. nephrectomised rat received in Jn. of 45 mg. DOCA during 1 month. During the first week there was a slight increase in total $\text{M.M.J.C.}^{\text{catechol}}$ ajinette compared with control nephrectomised rat. In the second week there was no difference between the urinary catecholamines of the 2 groups. MA>Price

6666. URINARY CATECHOLAMINES IN HYDROXYMANDELIC ACID IN TENSION. P.Lanucara, U.Marini and F.F.Gimidi: Atti. Acad. med. Lombarda, 1962, 369-3/Z

(list, patol. spec, med., univ. TO...) Italy) The urinal excretion of 3-methoxy-4-uyu.**,-acid, an important metabolite of adrenaline, in hypertensive patients was within the normal limits. Tim

result does not, however, rule out the author's hypothesis that the adrenergic and neurohormonal system, including noradrenaline, are involved in hypertension, as title actual vascular changes only occur in limited areas.

(Italian) G.N. Godson

6667. URINARY ELIMINATION OF 3-METHOXY, 4-HYDROXYMANDELIC ACID AFTER INFUSION OF NORADRENALINE AND ADRENALINE IN HUMAN SUBJECTS. P.Lanucara, U.Marini, F.F.Gimidi and R.Beretta: Atti. Acad. med. Lombarda, 1962, 17, 373-377 (1st. patol. spec, med., Univ., Milano, Italy)

The urinary recovery of 3-methoxy, 4-hydroxy-mandelic acid [HMA] was studied in two groups of normal subjects, one hr. after infusion of 1-noradrenaline bitartrate and 1-adrenaline bitartrate, respectively. The urinary recovery of HMA was 33 and 38% respectively of the administered steroid dose and the increased HMA excretion lasted for 24 hr. and return to normal within 48 hr.

(Italian) G.N.Godson

6668. HORMONES AND RELATED SUBSTANCES IN LYMPH LEAVING FOUR ENDOCRINE GLANDS - TESTIS, OVARY, ADRENAL AND THYROID. P.M.Daniel, M.M. Gale and O.E.Pratt: Lancet, 1963, i, 1232-1234

(Dept. Neuropathol., Inst. Psychiatry, Maudsley Hosp., London, England) Hormones are carried away from testis, ovary, adrenal, and thyroid by the lymphatics which drain them, as well as by the veins. In the testicular, ovarian, and adrenal lymph, the quantity of hormone was higher than it was in the peripheral-blood plasma leaving the gland. In the thyroid lymph, the level of radioactivity of the org. compounds (and even of that proportion of it present as thyroxine) was much higher than it was in the plasma from thyroid-venous blood or peripheral-venous blood. G.H.Bell,

6669. ISOLATED PANCREATIC ISLETS OF MAMMALS.

I. PEPTIDASE ACTIVITY IN NORMAL AND OBESE-HYPERGLYCAEMIC MICE. C.Hellerstrom and B.Hellman: Acta endocr. Kbh., 1963, 42, 615-624 (Histol. Dept., Univ., Uppsala, Sweden) Microtitrimetric assays for dipeptidase showed that there was much activity of the enzyme in endocrine and exocrine pancreas of normal mice; the activity was greater in the latter. In obese-hyperglycaemic mice with free access to food, the islets of Langerhans had a greater activity than in normal animals. An explanation for this is suggested. Histochemical studies for leucine aminopeptidase were carried out.

H.B.Waynforth

6670. EFFECT OF THYROID ADMINISTRATION ON PANCREATIC AMYLASE ACTIVITY OF HYPOPHYSECTOMISED AND INTACT RATS. M.O.Maykut, M.T. Nishikawara and R.E.Haisu: Canad. J. Biochem., 1963, 41, 1373-1379 (Physiol. Dept., Univ., Toronto, Ont., Canada)

Administration of desiccated thyroid gland to hypophysectomised rats prevented the marked atrophy of the pancreas which was consistently observed following hypophysectomy. Thyroid feeding at 2 dose levels led to a significant increase in the pancreatic amylase activity of hypophysectomised rats, and, except for the activity per unit of body wt., this was significantly lower than that in untreated, intact controls. Thyroid administration in intact rats results in a decrease in the pancreatic amylase activity.

A.M.Gibbins

6671. COMPARISON OF EXPERIMENTALLY INDUCED

AND NATURALLY OCCURRING SENSITIVITY TO LEUCINE HYPOGLYCAEMIA. R.F.Knopf, S.S.Fajans, J.C.Floyd and J.W.Conn: J. clin. Endocr., 1963, 23,

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579 (Dept. Int. Med., Univ. Michigan, Ann Arbor, Mich., U.S.A.) A series of amino acids as well as the first 2 metabolites of L-leucine, OL-ketoisocaproate and isovalerate, were given to sulphonylurea pretreated normal healthy subjects. Of the amino acids only iso-leucine produced any hypoglycaemia comparable to that seen after administration of leucine. The metabolite - OL-ketoisocaproate - was also partially effective but probably by virtue of its transamination to leucine *in vivo*. Leucine itself is responsible for the known release of insulin under these conditions. G.F.Blane

6672. INVESTIGATION OF INSULIN-LIKE ACTIVITY IN HUMAN SERUM AFTER ORAL ADMINISTRATION OF GLUCOSE TO ELUCIDATE PANCREATIC FUNCTION. H.Daweke: *Acta endocr. Kbh.*, 1963, 42, 437-452 (Med. Klinik, Akad., Dusseldorf, Germany) The insulin-like activities (ILA) in serum before and after oral administration of glucose was studied using the method of [$1-14\text{C}$]glucose oxidation to 14CO_2 on the rat epididymal adipose tissue. Mean fasting values in maturity-onset diabetes were below normal and in insulin-requiring diabetes above normal. After glucose, the values in maturity-onset diabetes rose but to a much lower level than that in normal subjects while the blood sugar level was markedly greater. In the other type of diabetes the ILA decreased but the blood sugar rose greatly. Severity of pancreatic disease which is inversely proportional to the index of insulin reserve was indicated for insulin-requiring diabetes in which the reserve was very low. (German) H.B.Waynforth

6673. CARDIAC INFARCTION AND INSULIN ANTAGONISM. J.Vallance-Owen and W-L Ashton: *Lancet*, 1963, i, 1226-1228 (Dept. Med., King's Coll. Hosp., London, England) Nineteen out of 28 unselected patients with cardiac infarction, compared with 6/28 controls matched for age and sex, have increased antagonism to insulin associated with their plasma-albumin. This same abnormality is found in essential diabetics, including prediabetics, and many consanguineous relatives of diabetic patients. G.H.Bell

6674. CHEMOCYTOLGY OF PARATHYROID GLANDS OF RAT AFTER BILATERAL NEPHRECTOMY. J.Hara, K.Yamada and T.Hotta: *Z. Zellforsch.*, 1963, 59, 804-819 (Dept. Anat., Univ. Sch. Med., Nagoya, Japan) The chemocytol. aspects of the parathyroid gland of bilaterally nephrectomised rats were examined in specimen taken at 3 postoperative periods to examine the development of the glandular cell hyperfunction. The parathyroid cells contained 2 types of protein granules as demonstrated by the dihydroxy-dinaphthyl-disulphide [DDD]diazo blue B and the hydroxy-naphtholic acid hydrazide [HNAH]diazo blue B methods. Both the DDD diazo blue B and the HNAH diazo blue B reactive granules increase in no. as well as in stainability in the parenchymal cells at 12-24 hr. after the operation. Glycogen granules disappear almost completely 12 hr. after the bilat. nephrectomy but reappear later on; the amount of pyronin stainable cytoplasmic RNA and the activity of alk. phosphatase increase after 12-24 hr. after the operation. J.E.Linder

6675. NEUROSECRETION ON THE HYPOPHYSO-THALAMUS SYSTEM IN GUINEA-PIGS UNDER INFLUENCE OF ACETATE CL-TOCOPHEROL. K.Miftkiewski and M.Kozik: *Pozn. Towarzy. Przyjac. nauk. Wydz. lek.*, 1962, 22, 131-162 (Zaklad histol.

Prawicpowej i Embriol. Akad. Med., Poznań, Poland) *Histochem. examination of hypophysio-thalamus system in guinea-pigs receiving 30 mg./kg. daily doses of a-tocopherol acetate for 5, 10 or 15 days showed irreversible destruction of neurocytes. Neurosecretion is gradually < decreased in the neurocytes of the supra-optic and peri-ventricular nuclei and neurosecretin is accumulated in the middle part of hypophysis. A pos. PA-Schiff reaction after prolonged administration of a-tocopherol acetate extended to the peripheral zone of neuroplasma, nucleus wall and the cell nucleus.* (Polish) T.G. Lipicki

6676. MECHANISM OF REGRESSION¹ OF DIABETES INSIPIDUS AFTER PITUITARY STALK LESIONS IN RATS. K.Kovács, M.A.D.Svid and F.A.László: *Acta med. Acad. Sci. hung.*, 1963, 19, 95-108 (1st. Dept. of Med., Univ. Med. Sch., Szeged, Hungary) The polyuria which developed in rats after pituitary stalk section was found to regress. One to 2 months after operation urine production was not significantly greater than that of unoperated controls. There was no evidence that the secretion of ADH in these animals had been resumed and the cessation of polyuria is attributed largely to reduction in glomerular filtration, possibly as a consequence of the reduced activity of the pituitary-adrenal axis. G.F.Blane

6677. PITUITARY GLAND AND IRON ABSORPTION. B.F.Chow, S.D.J.Yeh and H.Eberspaecher: *Endocrinology*, 1963, 72, 871-875 (Biochem. Dept., Sch. Hygiene and Public Hlth., Johns Hopkins Univ., Baltimore, Md., U.S.A.) Hypophsectomy, but not adrenalectomy or thyroidectomy resulted in impaired ^{59}Fe absorption in rats. Administration of crude pituitary extract, but not ACTH, TSH or GH resulted in improved Fe absorption. H.C.Jones

6678. EFFECTS OF OESTRADIOL ON PITUITARY ADRENAL FUNCTION IN MALE AND FEMALE RATS. J.LKitay: *Endocrinology*, 1963, 72, 947-954 (Med. Dept., Univ. Virginia Med. Sch., Charlottesville, Va., U.S.A.) Injn. of polyoestradiol phosphate increased the pituitary wt. in <? and ? rats. Pituitary ACTF, and RNA increased in ?, and pituitary RNA and DNA increased in <?. Oestradiol reversed the sex differences in adrenal secretion and peripheral metabolism of corticosterone. H.C.Jones

6679. DIRECT MAMMOTROPHIC EFFECT OF PITUITARY HOMOGRAFT IN RATS. T.L.Dao and D.Gawlalec: *Endocrinology*, 1963, 72, 884-892 (Roswell Park Mf Inst., Buffalo, N.Y., U.S.A.) S.c. pituitary graft in rats had a direct mammotrophic effect, independent of the presence or absence of pituitary or ovaries *in situ*. H.C.Jones

6680. EFFECT OF RABBIT ANTISERUM TO SHEEP PITUITARY INTERSTITIAL CELL STIMULATING HORMONE IN ADULT FEMALE RATS. G.Bourdel and C.H.Li: *Acta endocr. Kbh.*, 1963, 42, 473-479 (Hormone Res. Lab., Univ., California, Berkeley, Calif., U.S.A.) Antiserum to sheep ICSH counteracted endogenous ICSH in ? rats. It prevents the occurrence of oestrus if given 36 hr. before ovulation. The ovaries, uterus and vaginae became atrophied. H.B.Waynforth

6681. EFFECT OF VARIOUS HORMONES UPON RESPONSIVENESS OF HYPOPHSECTOMISED RAT TO DOCA IMPLANTATION. R.J.Girerd and C.L.Rassaer: *Acta endocr. Kbh.*, 1963, 42, 337-347 (Warner-Lambert

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Res. Inst.. Morris Plains, N.J.. U.S.A.) Pituitary extracts induced a b.p. elevation in DOCA implanted hypophysectomised rats sensitised by unilat. nephrectomy, comparable to that present in normal DOCA-implanted sensitised rats Hypophysectomy and ACTH treatment increased DOCA-induced polydipsia while vasopressin reduced it. The absence of the pituitary prevented renal and cardiac pathol. changes which occur on treatment with DOCA to normal animals but its absence did not Prevent the production of vascular lesions.

H.B.Waynforth

6682. HYPOPHYSECTOMY IN PREGNANT RATS.

L.Angerrall and P.M.Lundin: *Acta endocr. Kbh.*, 1963, 42, 591-600 (Path. Dept., Univ. GSteborg, Sweden) Hypophysectomy of pregnant rats causes a decrease in the birth wt. of the foetuses. The foetuses also showed hypoplastic thyroids, pancreatic islets and gonads at birth.

H.B. Waynforth

6683. MELANOCYTE STIMULATING HORMONES [MSH] FROM SHEEP PITUITARY GLANDS. T.H.Lee, A.B.

Lerner and V.Buettner-Janusch: *Biochim. biophys. Acta*, 1963, 71, 706-709 (Section of Dermatol.. Dept. Med., Yale Univ. Sch. Med., New Haven, Conn.. U.S.A.) Ovine a-MSH had the same amino acid sequence as a-MSH from other animals. Three varieties of ovine 0-MSH were studied; 1 appeared to be identical with bovine 0-MSH.

B.M.Stevens

6684. BIOCHEMICAL STUDIES ON DWARFISM, HYPOGONADISM AND ANAEMIA. A.S.Prasad, A.Miale,

Z.Farid, H.H.Sandstead, A.R.Schulert and W.J.Darby: *Arch. Intern. Med.*, 1963, 111, 407-428 (Vanderbilt Univ. Sch. Med., Nashville, Tenn., U.S.A.) The Patients concerned had a Zn and Fe deficiency attributed to nutritional defects and parasite-induced blood loss. It is thought that their growth retardation, hypogonadism and partial adrenal hypofunction might arise from a hypo-function of the ant. pituitary, probably conditioned by Zn deficiency.

E.E.Hobbiger

6685. CIRCULATING THYROID HORMONES IN THYROTOXICOSIS. M.L.Wellby, B.S.Hetzell and B.F.Good:

Brit. med. J., 1963, i, 439-442 (Dept. Med., Univ., Adelaide, S. Australia) The plasma pattern of I-containing amino acids was compared in normal and thyrotoxic subjects using paper chromatography of plasma ^tracts. Findings indicate that the excess thyroid secretion may be produced by stimn. by TSH.

M.E.Nutt

6686. ALL IN THYROXINE TREATED HYPO-

WTSCSSSAT ASSENSITIVE CRITERION FOR GROWTH HORMONE ACTIVITY. C.J.A.de Groot[†] *Acta endocr. Kbh.*, 1963, 42, 423-431 O^rm***. D^e £ - Boerhaavekwartier Univ., Leiden, Netherlands) J^te Elected according to tail length were hy^phycsectomised and given growth hormone and thyroxine daily for 3 weeks. Additional growth caused by growth hormone, K^v^w^i^v^n^ distinguished from the standard growth caused frAgTM alone.

H.B.Waynforth

6687. EFFECT OF CORTISONE ON ^TE OF 1311 EARLY AFTER ITS UPTAKE BY RAT THYROID. A^s - " " TM «

J.R.Scranton and J.W.Turner: *Endocrinology*, 1963, 72, 914-917 (Anat. Dept., State Univ., Iowa City,

Iowa, USA) Mn^Af. T^Af^

giysectomised and intact rats resulted in facilitation of %roidal org. binding of MH recently after its Wf

H. Jones

6688. EFFECT OF BILATERAL ABLATION OF HABENULAR NUCLEUS ON THYROID FUNCTION IN ALBINO RAT. K.Matsuda: *Endocrinology*, 1963, 72, 972-973 (Med. Dept., Univ. Oregon Med. Sch., Portland, Ore., U.S.A.) Bilat. electrolytic destruction of the habenular nucleus in cf rats did not significantly alter the rate of 1311 secretion from the thyroid.

H.C.Jones

6689. THYROID AUTOGRaFTS IN HYPOPHYSECTOMIZED AND IN THYROXINE TREATED RATS.

E.D.Williams and I.Doniach: *J. Endocr.*, 1963, 26, 479-488 (Baron Inst., Pathol., London Hosp., London, England)

Lobes of thyroid gland autotransplanted s.c. to the ant. abdominal wall took* well both in hypophysectomised animals and in animals in which the TSH production had been suppressed by administration of exogenous thyroxine. It appeared from autoradiographic studies that the rapid reparative growth in the transplants was accompanied by an increased org. binding of I compared to that seen in the undisturbed thyroid tissue of the neck. It is suggested that in the graft, stimuli to thyroid growth other than TSH may lead to a concomitant increase in thyroid function.

G.F.Blane

6690. THYROID FUNCTION AND IODINE METABOLISM

IN IODINE-INDUCED HYPOTHYROIDISM. M.T.Harrison, W.D.Alexander and R.McG.Harden: *Lancet*, 1963, i, 1238-1241 (Univ. Dept. Med., Gardiner Inst., Western Infirmary, Glasgow, Scotland)

Four patients with I-induced goitre and hypothyroidism were studied. In all of them the uptake of 1311 by the thyroid gland was not normally suppressed after triiodothyronine, indicating abnormal pituitary-thyroid control. In each case I uptake was high during the period of ingestion, owing to ? abnormally high thyroid clearance and to high levels of plasma-inorg. I When I was discontinued I uptake and plasma-inorg. I fell rapidly, but the thyroid clearance increased still further.

G.H.Bell

6691. ACTION OF PITUITARY TSH ON THE INORGANIC PHOSPHORUS OF THYROID TISSUE IN VITRO.

N.Freinkel: *Nature, Lond.*, 1963, 198, 889-891 (Thorndike Mem. Lab., Boston City Hosp., Boston, Mass., U.S.A.) In sheep thyroid slices, addition of purified pituitary TSH caused a rise in inorg. PO4,

presumably due to activation of thyroidal phosphatases; this parallels the stimn. of O2 consumption and glucose assimilation.

G.M.Lewis

6692. EFFECT OF TSH ON IN VIVO IODINE BINDING IN THYROID SUBCELLULAR FRACTIONS. V.Pantić and R.Ekholm: *Nature, Lond.*, 1963, 198, 903-905

(Dept. Anat., Univ., Gothenburg, Sweden) In guinea-pigs inj. with NaI311 single and repeated doses of TSH increased the protein-bound 1311 content of both micro-sornal-postmicrosomal and supernatant fractions in the thyroid gland.

G.M.Lewis

6693. INTRACARDIAC LOCALISATION OF THYROID HORMONES IN RAT. E.Gravina, A.Tomaselli,

L.Covelli and J.Roche: *C.R. Soc. Biol.*, Paris, 1963, 157, 67-68 (Inst. General Pathol., Univ., Naples, Italy) Inj. of [131I]3,5,3-triiodo-L-thyronine in rat resulted in localisation of radioactivity in the region under the endocardium which contained the Purkinje fibres. L-thyroxine was evenly distributed throughout the myocardium while 3,5,3-triiodothyroacetic acid became localised in a narrow band beneath the epicardium.

(French)

M.A.Price

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6694. OCCURRENCE OF LYMPHOMA IN PATIENTS WITH LONG-STANDING HYPERTHYROIDISM. J.E.Ultmann, G.A.Hyman and B.Colden: *Blood*, 1963, 21, 282-297 (Med. Dept., Columbia Univ., Columbia, U.S.A.) It is suggested that hyperthyroidism stimulates and hypothyroidism inhibits lymphoid structures and that the former promotes tumour growth in animals; also that prolonged hyperthyroidism may contribute to the development of lymphomas or allied disorders in man.

H.B.Waynforth

6695. METHOD FOR IODINE-131 CONVERSION RATIO UTILISING THE PLASMA INORGANIC IODINE-131 FRACTION. H.Oyamada and E.L.Pentz: *J. clin. Path.*, 1963, 16, 244-247 (Chicago Wesley Mem. Hosp., Chicago, Ill., U.S.A.) 1011 conversion ratios were measured by utilising the inorg. 131i counts in plasma 24 hr. after oral administration of NaI311. The method depended on pptn. of 131I by AgNO₃ and was useful in low conversion ratios because it eliminated the error due to background fluctuations when low protein-bound 131I counts occur. It was confirmed that low conversion ratios frequently occur in euthyroid patients. J.B.Derbyshire

6696. SURVEY OF THYROID ENLARGEMENT IN TWO GENERAL PRACTICES IN GT. BRITAIN. R.Kilpatrick, J.S.Milen, M.Ruchbrooke, E.S.B.Wilson and G.M. Wilson: *Brit. med. J.*, 1963, i, 29-33 (Dept. Pharmacol. and Therapeut., Univ., Sheffield, England)

In Sheffield 12% of men and 25% of women in a general practice had visible thyroid glands. Corresponding values in Ormiston, Scotland, were 0·3% and 4·2%. Thyroid enlargement in Sheffield was commonest between 10 and 49 yr. and declined after 50 yr. in both sexes. In Ormiston incidence rose gradually with increasing age. Examination of mothers, daughters and sisters gave some evidence of familial incidence. Incidence was not increased by childbearing. Prevalence of goitre was not significantly less in women who had spent their first 20 yr. outside Sheffield and had subsequently lived there for several yr. Incidence of thyrotoxicosis and treatment for thyroid disorders was much greater in Sheffield than in Ormiston.

M.E.Nutt

6697. MYASTHENIA GRAVIS: A GUIDE FOR ANESTHESIOLOGISTS. F.F.Foldes and P.G.McNall: *Anesthesiology*, 1962, 23, 837-872 (Myasthenia Gravis Clinic of Western Pennsylvania, Pa., U.S.A.) A review. 299 ref. A.A.Zimmerman

REPRODUCTION AND GONADS

6698. DIFFERENTIAL EFFECTS OF PERMANENT HYPOTHALAMIC LESIONS ON REPRODUCTION AND LACTATION IN RATS. R.L.W.Averill and H.D.Purves: *J. Endocr.*, 1963, 26, 463-477 (Endocr. Res. Dept., Otago Univ. Med. Sch., Dunedin, New Zealand)

The subsequent reproductive and lactational performances of rats with thermal hypothalamic lesions made at the time of puberty are described. Large bilat. ant. lesions were associated with failure of lactogenesis while mating and gestation in these animals remained unaffected.

G.F.Blane

6699. INTRAPERITONEAL FOREIGN BODY* EFFECT ON PREGNANCY IN RAT. L.L.Doyle and A.J.Margolis: *Science*, 1963, 139, 833-834 (Dept. Obstetrics,

Univ. California Sch. Med., San Francisco, Calif. U.S.A.) A silk suture placed in the lumen of one uterine horn before mating prevented pregnancy in that horn by interfering with implantation. It did not interfere with fertilisation or tubal transport of ova nor induce a decidual reaction. " G.M.Lewis

6700. A SEROLOGICAL PREGNANCY TEST. III.

S.Kaivola, U.Kirstala and E.Axelom: *Acta endocr. Kbh.*, 1963, 42, 395-402 (State Serum Inst., Helsinki Finland) Highly purified chorionic gonadotrophin [HCG] has been used in the prep. of antisera and in the coating of r.b.c. and this has resulted in an improvement in the determination of HCG in urine by the haemagglutin. inhibn. method. Gel diffusion tests have been carried out in order to clarify the immunol. nature of the HCG used.

H.B.Waynforth

6701. PREGNANCY DIAGNOSIS BY ONE-STAGE PASSIVE HAEMAGGLUTINATION INHIBITION

METHOD. AJ.Fulthorpe, J.A.C.Parke, J.E.Tovey and J.C.Monckton: *Brit. med. J.*, 1963, i, 1049-1054 (Wellcome Res. Lab., Beckenham, Kent, England)

Haemagglutin. of sheep cells sensitised to human chorionic gonadotrophin [HCG], and agglutinated by rabbit antisera to HCG, is inhib. by HCG present in pregnancy urine. Of 126 clinically confirmed pregnancies 124 were pos. by this test and all of 211 urine samples from non-pregnant controls, aged 17-54 yr. were neg. Tests were made on 388 samples also tested by the toad test and in 380 of these the tests were in agreement. In 12 of the remaining the toad test was pos. and haemagglutin. inhibn. neg., 7 of the 12 subsequently proved to be pregnant. The 26 remaining tests were pos. to haemagglutin. and neg. to the toad test, 23 of these patients were pregnant and 3 untraced. Assuming that results of tests which agree are correct the overall accuracy is 98·2% for haemagglutin. and 92·8% for the toad test. Quant. assay of the urine samples by haemagglutin. did not agree with bioassay, possibly due to differing proportions of hormonally and immunol. active HCG in the samples, or to interference by non-sp. Ag and Ab. HCG rendered biol. inactive by treatment with KIO₃ retained its capacity to combine " i * Ab.

M.E.Nutt

6702. DIAGNOSIS OF PREGNANCY IN MARES BY AN IMMUNOLOGICAL METHOD. M.Wide and L.Wide:

Nature, Lond., 1963, 198, 1017-1018 (Dept of Obstetrics, Akad. Sjukhuset, Univ., Uppsala, Sweden) Sera from pregnant mares containing elevated levels of ?¹³¹I? trophobin inhibn* an "88¹³¹* reaction between formalinised sheep r.b.c. coated with pregnant mare serum gona-¹³¹I trophobin and rabbit antiserum. G.M.Lewi*

6703. THERMAL CHANGES IN NORMAL MENSTRUAL CYCLE. J.Marshall: *Brit. med. J.*, 1963, i, 102-104 (Inst. NeuroL, Queen Sq., London, England) Basal temp. was recorded during 11?4 menstrual cycles by 155 healthy fertile women. Of these 20 were anovulatory, 10 upset by illness, 15 inadequately recorded and 1088 showed the rise of temp. associated with ovulation.

Commonest time for the rise was 13 days before menstrua-^{tion}, but variation was wide. Time from rise to menstruation increased slightly with increased length of cycle.

M.E.Nutt*

6704. EFFECT OF MENSTRUATION ON SIMPLE REACTION AND MOVEMENT TIME. W.R.Pierson and

A.Lockhart: *Brit. med. J.*, 1963, i, 796-797 (Univ. S.California, Los Angeles, Calif., U.S.A.) There was no significant difference in reaction time and speed

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of arm movement, or in die relation of me one to the other, in 25 nulliparous women 2 days before and 2, 8 and 18 days after the onset of menstruation. Accident Proneness and decreased efficiency in the premenstrual and menstrual phases of the cycle probably result from inattention due to discomfort and external distractions.

M.E.Nutt

6705. EFFECT OF GONADOTROPHIC HORMONES ON YOUNG RAT OVARIAS GROWN IN ORGAN CULTURE.

D.Pavlic, J. Endocr., 1963, 26, 531-538 (Strange-ways Res. Lab., Cambridge, England) In ovaries explanted with and cultured in proximity to ant. P₂uitaries there was evidence of stimn. in the proliferation of follicular and stromal cells and formation of an increased no. of large follicles. The same effects couU, not be obtained by addition of pure FSH or 'Gestyl'. The former, caused only the disappearance of the oocytes from growing and from primordial follicles. Factors released from the ant. pituitary graft other than FSH, such as ACTH and TSH, may have influenced the response of *e trans-Planted target tissue. G.F.Blane

6706. OVULATION, IMPLANTATION AND FOETAL SEX S S r o S THE UGANDA KOB. A. Stolks, Nature, Lond., 1963, 198, 606 (Dept. Histol., Free Univ., AmJérdam, Nennerlands) In Adepoto kob, the young appear to be always contained in the ngr urering horn, whether ovulation occurred from the left or the right, horn. Foetal' sex ratio was 1:1. G.M.uewis

6707. DEVELOPMENT OF OVARY OT^T.m. EFFECT OF GONADOTROPHINS ON GLUTAMIC-OXALACETIC TRANSAMINASE. B.Eckstein and H.-haia Acta endocr. Khb., 1963, 42, 389-394 (Zool. Dept.. Hebrew Univ., Jerusalem, Israel) The 8^{re}«est res-Ponse of the rat ovarian and uterine glutamic-oxascetic transaminase (GOT) activity fo Pregnancy jmare serum

increased, the activity in the L.... was not mediated via the pituitary. H.B.Waynfirth

6708. EFFECT OF SERUM GONADOTROPHJJ ON DEHYDROGENASES OF CITRIC ACID CYCLE INOVARYOF Kbh.,

dehydrogenases in greatly enhanced &sstBB^krⁿ. citric rats is gonadotro hins. succinic p No effect is observed on the WOjof dehydrogenase. H.B.Waynfirth

6709. INDUCTION OF OVULATION BY SMALL DOSES OF TESTOSTERONE CTCWHEXANE PROPIONATE. A DELAYED-ACTION LUTEINISING AN DROGEN. P.Simom J. Reprod. Fertil., 1963, 5, 465 ^.Jones

6710. SUPEROVULATION AND RELATED PHENOMENA S BEF COW. B S IULATORY RESPONSES S FOLLOWING PRE S LARES SERUM [PMS] AND HUMAN CHI GONADOTROPHIN [HCG] INJECTIONS Hafez, T.Sugie and L.Gordon. II. EFFECT OF OESTROGEN ADMINISTRATION ON

*h*ch the corpora lutea had been enucleated as in the

normal ovary of the same cow. When the corpus luteum was incompletely expressed fewer follicles developed. No advantage was obtained by giving the injn. earlier than the 16th day after oestrus or by giving the total dose over a no. of days. Response was greater in animals that underwent corpus luteum enucleation than in those that remained intact. The total no. of follicles developed was greater with 5000 I.U. than with 3000 I.U. and there was also an increase in % of luteinised and haemorrhagic follicles. There was no consistent relationship between the fertilisation rate and the no. of ovulations.

II. When 20 mg. oestradiol-17⁸ was inj. after 3000 I.U. PMS a greater no. of follicles developed than in untreated cows or cows given PMS alone. The oestrogen appears to augment the output of endogenous gonadotrophin.

H.E.H.Jones

6711. STIMULATION OF GLYCOLYTIC ACTIVITY OF RAT CORPUS LUTEUM TISSUE BY LUTEINISING HORMONE. D.T.Armstrong, Endocrinology, 1963,

72, 908-913 (Biol. Res. Lab., Harvard Sch. Dental Med., Boston, Mass., U.S.A.) Rat luteinised ovary tissue metabolised a large % of C labelled glucose to lactic acid. The rate of lactic acid formation increased with the medium glucose concn. LH treatment in vivo stim. lactic acid formation and it was more effective in * anaerobic than aerobic incubation conditions.

H.C.Jones

6712. CORPUS LUTEUM-PITUITARY RELATIONSHIPS INDUCTION OF PSEUDOPREGNANCY IN RAT 3Y PROGESTERONE. I.Rothschild and R. Schubert:

Endocrinology, 1963, 72, 969-972 (Dept. Obstet. and Gynec., Western Res. Univ. Med. Sch., Cleveland, Ohio, U.S.^AT) Rats inj. with progesterone showed the largest # of pseudopregnancies when inj. during oestrous, end the lowest % when the injn. was given during prooestrous. Injn. during dioestrous gave intermediate results.

H.C.Jones

6713. BIOLOGICAL ACTIVITY IN VITRO OF GONADOTROPHIC HORMONES, m. EFFECT OF INCUBATION TEMPERATURE ON STEROID METABOLISM OF CORPUS LUTEUM OF RAT. IV. SYNERGISTIC ACTION OF PROLACTIN AND CHORIONIC GONADOTROPHIN ON RAT CORPUS LUTEUM. D.Gospodarowicz and J.Legauet-Demare: Acta. endocr. Khb., 1963, 42, 498-508, 509-513 (Biochem. Lab., Curie Fndn.,

26 Rue d*Ulm, Paris, France) m. Variations in temp, greatly affected die incorporation of [14C]acetate into progesterone and androstenedione. Cyclic and pseudo-pregnant corpora lutea studied at different temp, also showed differences. These suggest that the synthesis of die two steroids is by different pathways.

IV. Incorporation of [14C]acetate into cholesterol of normal rat corpora lutea was enhanced only by simult. addition of chorionic gonadotrophin (HCG) and lactogenic hormone (LTH) to the culture medium. However HCG alone also enhanced incorporation in pseudopregnancy corpora lutea. LTH by itself was ineffective.

(French) H.B.Waynfirth

6714. CAPACITATION OF RABBIT SPERMATOZOA IN FALLOPIAN TUBE AND IN UTERUS. C.E.Adams and M.C.Chang: J. exp. Zool., 1962, 151, 159-165 (Worcester Foundn. for Expt. Biol., Shrewsbury, Mass., U.S.A.) 79 sexually mature crossbred does were used in this study. By laparotomy at exact intervals, varying from 6 hr. before i.v. injn. of 30 I.U. LH to 14 hr. after, semen were introduced into the left Fallopian tube and the right uterine horn, or into both uterine horns, or whole and dil. semen was deposited into the Fallopian tubes. Eggs

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collected 22-40 hr. following ovulation were examined for evidence of fertilisation. Deposition of semen into the uterus 10 hr. or less before ovulation promoted a higher level of fertilisation than did similar deposition into the Fallopian tubes. Tubal insemination from 6 hr. before to 45 min. after LH injn. resulted in 93[#]2% of the eggs being fertilised. The proportion of eggs fertilised decreased from 69% to zero when insemination took place from 3-12 hr. after LH injn.

R.J.Walker

6715. EFFECT OF DELAYED MATING ON FERTILISATION IN THE RABBIT. C.E.Adams and M.C.Chang; *J. exp. Zool.*, 1962, 151, 155-158 (A.R.C. Unit of Reproductive Physiol., Univ., Cambridge, England) Female rabbits inj. i.v. with 25 I.U. LH were mated at exact intervals varying from 8-14 hr. with fertile c? 25-40 hr. after injn., ova were removed from the Fallopian tubes and examined for evidence of fertilisation. When mating occurred 8-12 hr. following the injn., 87-100% of the eggs recovered were fertile. After 12 hr. the proportion fell rapidly until at 14 hr. it was zero. The results are discussed in relation to the fertilisable life of the egg, sperm capacitation, and embryonic development.

R.J.Walker

6716. DYNAMICS OF DEVELOPMENT OF MORPHOLOGICAL LESIONS AND HISTOCHEMICAL ALTERATIONS OF UTERUS IN COURSE OF PREGNANCY AND Puerperium. Vin. NUCLEIC ACIDS AND PROTEINS. Z.Torzecki: *Ginek. pol.*, 1962, 33, 507-518 (Zaklad Anat. Patol., Akad. Med., Jlodz, Poland) The amount of DNA in the uterine muscle increased during first days of pregnancy, then declined and increased again between the 5th and 10th-day after puerperium. (Polish).- *Webicki

6717. ACTION OF OESTROGENS AND PROGESTERONE ON UTERINE EPITHELIAL MITOSIS IN ORGAN CULTURE. J.Everett: *Nature*, Lond., 1963, 198, 896 (Dept. Anat., Charing Cross Hosp. Med. Sch., London, England) Uterine horns of foetal guinea-pigs in which glands had not developed were grown in organ culture. The no. of mitoses was significantly depressed by addition of progesterone to the medium, oestrone or oestradiol had no effect.

G.M.Lewis

6718. UTEROTROPHIC ACTIVITY IN HUMAN EjACULATE. J.Rabock and K.Rezabek: *J. clin. Endocr.*, 1963, 23, 28 (Sexological Inst., Charles Univ., Prague, Czechoslovakia) The uterotrophic activity in semen collected from men with a variety of somato-sexual disturbances was assayed on spayed ♀ rats. Activity equiv. to 2-5 fig. oestradiol monobenzoate/1. of semen was found in most groups studied, with a tendency towards higher values in bilaterally cryptorchid subjects. It is postulated that the testicular oestrogens originate in the Leydig cells.

G. Blane

6719. EFFECT OF HISTAMINE AND SHT IN STIMULATING PHOSPHORYLASE ACTIVITY IN RAT UTERUS. S.I.Leonard: *Endocrinology*, 1963, 72, 865-870 (Zool. Dept., Cornell Univ., Ithaca, N.Y., U.S.A.) Lp. injn. of histamine resulted in increased active phosphorylase per total uterine wt. in the uterus of spayed rats, and oestradiol given s.c had the same effect. Intrauterine histamine showed results the same as control injn. SHT did not affect uterine phosphorylase activity. Antihistamines antagonised the effects of oestradiol on uterine phosphorylase.

H.C.Jones

6720. EXTRAUTERINE RECIRCULATION OF IODINE-131 FROM THE YOUNG TO MOTHER IN RATS. M.Samel, A.Caputa and L.StruhSrová: *Nature*, Lond*, 1963, 198, 489 (Czechoslovak Acad. Sci., Endocrinol. Inst., SAV, Bratislava, Czechoslovakia) Suckling rats were inj. i.p. with 131I. After suckling, the mother was transferred to uninj. young; 131I was then detected in the stomach, serum and thyroid gland of the young. A rapid recirculation of materials in the urine of the young therefore occurs through the mother's milk. -Digestion of urine of immature animals by their mothers must maintain their internal environment in a manner similar to that occurring in intrauterine life.

G.M.Lewis

6721. INFILTRATION OF LEUCOCYTES INTO UTERINE LUMEN OF GOLDEN HAMSTER DURING OESTROUS CYCLE AND FOLLOWING MATING. R.Yanagimachi and M.C.Chang; *J. Reprod. FertU.*, 1963, 5, 391-398 (Worcester Fndn. for Expt. Biol., Shrewsbury, Mass., U.S.A.) In the unmated hamster the highest no. of leucocytes (308000) in one horn of the uterus appeared soon after oestrus. After mating the highest no. (1497000) appeared 12 to 14 hr. after mating, i.e., 6 hr. earlier than in the unmated 2. The quicker infiltration with leucocytes is due to the presence of semen and spermatozoa in the uterus. Rapid disappearance of spermatozoa from the uterus the day after mating is due to both phagocytic activity of leucocytes and drainage through the cervix.

H.E.H.Jones

6722. PERIOD OF SENSITIVITY OF ENDOMETRIUM TO TRAUMA INDUCED EXPERIMENTAL DECIDUA IN THE GOLDEN HAMSTER DURING EXPERIMENTAL LUTEAL PHASE. J.C.Czyba, M.Chiris and P.Dubois: *C.R. Soc. Biol.*, Paris, 1962, 156, 2074-2076 (Lab. d'Histo., Fac. de Méd., Lyon, France) Bilat. ovariectomised hamsters received injn. of 2 mg. progesterone per day. Expt. decidua could be induced by piercing the uterus with a wire during the 1st to 12th day of the luteal phase. (French) M. A. Price

6723. MECHANISM OF DECIDUALISATION. IV. SYNTHETIC PROCESSES IN DECIDUALISING UTERUS. M.C.Shelesnyak and L.Tic: *Acta endocr. Khb.*, 1963, 42, 465-472 (Biol. Reproduction, Weizmann Inst. Sci* Rehovoth, Israel) During decidualisation produced by systemic means, there is an increase of protein, RNA and DNA content of the rat uterus. High values for these and the uterine wet wt. were found at pro-oestrous and during days 4 and 5 of the w.b.c. phase of pseudopregnancy.

H.B.Waynfirth

6724. EFFECT OF PROGESTATIONAL STAGE OF ENDOMETRIUM ON IMPLANTATION, FOETAL SURVIVAL AND FOETAL SIZE IN THE RABBIT, ORYCTOLAGUS CUNICULUS. E.S.E.Hafez: *J. exp. Zool.*, 1962, 151# 217-226 (Dept. Animal Sci., Washington State Univ. Pullman, Wash., U.S.A.) "Embryos of a known developmental stage were transferred from donor to recipient rabbits at different progestational stages of the endometrium. If the development of the embryo and the endometrium is slightly asynchronous, implantation occurs but if synchronisation is severe e.g. 2 days, then implantation is inhibited, or may fail altogether. Embryonic survival is not favoured when the development of the ova was ahead of uterine development of the recipient. In a second series of expt. it was found that the cervical end <> the endometrium was as favourable as the tubal end for the survival of embryos." R.J.Walker

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6725 *Vx?TF^RINE PATHOLOGY IN BOVINE INFERTILITY.* M-Dawson: J. Reprod. Fertil., 1963, 5, 399-409

(M.M. of Agric. Vet. Invest. Service. Hadstock. of ^{hormone} cows showed that in 59 cases the uterus appeared abnormal, in 25 of these cases and 73 others the sites of ^{uterine} glands were marked by masses of infiltrating leucocytes. Another 13 cases showed cystic development of ^{ovarian} glands, in addition to the normal infi-^lation. These were found in association with pus. Service-^{interval} length suggested that the cows with a normal uterus had a superior capacity to sustain a pregnancy.

6726 *H.* E.H.Jones

INHIBITION OF OXYTOCIN INDUCED LABOUR IN RABBITS WITH VARIOUS GESTAGENS. F.Fuchs and F.Kock: Acta endocr. Kbh., 1963, 42, 403-411 (Ynaec. Dept., Kommunehosp., Copenhagen, Denmark) The ability of several gestagens to inhibit labour with oxytocin in 30 day old rabbits was as follows: 6a-methyl-17a-acetoxypregnesterone [Mestesterone = 6-dehydroretroprogesterone, 17a-piortestosterone and allyloestrenol were ineffective.

H.B.Waynfirth

6727. IMMUNOFLUORESCENT STUDY OF SECRETION OF HUMAN AMNIOTIC FLUID. J.Salmon, R.Lambotte and V.Smolian Arch. int. Physiol., 1962, 70, 731-34 (Univ. Liege. Belgium) Breif comm.

6728 *w (French)* M.E.Nutt

**** MAMMOGENIC EFFECTS OF METHANDROSTENOLONE IN CASTRATED RATS.* K.Ahren, A.Arvidsson and A.Hjalmarsson: Acta endocr. Kbh., 1963, 42, 601-604 (f^yolo Dept., Univ., Gfleborg. Sweden) Androstenolone was inj. into gonadectomised rats and the mammary glands and sex organs was assessed. A dose-response relationship was observed between the drug and the response of the seminal vesicles and levator ani muscle of the rat, the latter organ being more sensitive. The effect of the drug indicated that it possessed oestrogenic activity, of which caused lobule-alveolar development and growth of the ducts of the mammary glands.

H.B.Waynfirth

6729. PLASMA PROGESTERONE CONCENTRATION AFTER REMOVAL OF THE CORPUS LUTEUM IN THE FEMALE. J.A.McCracken: Nature, Lond., 1963, 198, 507-508 (Univ. Glasgow, Vet. Hosp., Bearsden, Glasgow, Scotland) Removal of the corpus luteum of cows per vaginum on day 12 of the oestrous cycle caused an initial rapid fall in progesterone level followed by a more gradual decline. Similar results were obtained after ovariectomy.

G.M. Lewis

6730. FAILURE OF PROGESTERONE TO PROLONG PREGNANCY IN THE GUINEA-PIG. M.X.Zarrow, N.C. Anderson jun. and M.R.Callantine: Nature, Lond., 1963, 198, 690-692 (Dept. Biol. Sci., Purdue Univ., Lafayette, Ind. U.S.A.) Injn. of ovariectomised female guinea-pigs with 4-20 mg. progesterone or 4 mg. rovera s.c. after the 55th day of pregnancy failed to prolong gestation time. Addition of 0.4-4 pg. oestrogen to 4 mg. progesterone was also ineffective in prolonging gestation. Systemic Progesterone level clearly has little effect on uterine motility and the hormone may be effective only locally in the myometrium.

G.M.Lewis

6731. PSEUDOPREGNANCY IN RAT FROM BRIEF TREATMENT WITH PROGESTERONE* EFFECT OF ISOLATION.

J.W.Everett: Nature, Lond., 1963, 198, 695-696 (Dept. Anat., Duke Univ. Sch. Med., Durham, N.C., U.S.A.) S.c. injn. of 10 mg. progesterone into rats on the day of oestrous induced pseudopregnancy in 70% of 4-day cyclic rats when subjected to daily vaginal lavage and not isolated from other 2. When similar animals were isolated without vaginal lavage, only between 10-40% became pseudopregnant. Most rats with 5-day cycle became pseudopregnant in either circumstance. G.M.Lewis

6732. PROGESTERONE AND ACCOMPLISHMENT OF PARTURITION IN SHEEP. L.Ph.Bengtsson and B.M. Schofield: J. Reprod. Fertil., 1963, 5, 425-433 (Riysiol. Dept., Royal Vet. Coll., London, England)

The time and course of pregnancy were unaffected in sheep given daily injn. of 2.5 mg. and 10 mg. 6a-methyl-17a-hydroxy progesterone acetate [6-MAP] and 10 and 40 mg. progesterone for 14 days starting 1 week before the expected date of delivery. In the following season 25 and 40 mg. 6-MAP, and 80 and 160 mg. progesterone were given daily and a high proportion of pregnancies was affected, with a higher mortality of lambs delivered than in the control group. In all cases of delayed parturition die lambs died in utero, though foetal death was not considered to be due to post-maturity. The results are discussed and it is suggested that placental progesterone in the ewe is not replaceable by systemic progesterone.

H.E.H.Jones

6733. PREGNANCY MAINTAINING EFFECT OF SYNTHETIC PROGESTOGENS IN RAT. G.K.Suchowsky: Acta endocrin^bh., 1963, 42, 533-536 (Schering AG, West Berlin, Germany) Ten steroids were tested for their pregnancy-maintaining effect in spayed pregnant rats and some of these the progestogen-oestrogen ratio for maintenance was determined.

H.B.Waynfirth

6734. OESTRIOL METABOLISM IN PREVIALE HUMAN FOETUS. G.Mikhaie, N.Wiqqvist and E.Diczfalusi: Acta endocr. Kbh., 1963, 42, 319-332 (Hormone Lab., Dept. Women's Dis., Karolinska Sjukhuset, Stockholm, Sweden) [16-14c]Oestriol inj. into

human foetuses at about the 20th week of gestation was found in the different organs almost entirely in a conjugated form. This was identified as oestriol-3-sulphate. Small amounts of a glucosiduronate and sulpho-glucosiduronate and an unknown metabolite were also detected in liver, gut and blood.

H.B.Waynfirth

6735. CONCENTRATION OF OESTRONE, 17-OESTRADIOL AND OESTRIOL IN UMBILICAL ARTERIES AND VEINS. W.Schild, K.SchQrholz and A.Seukeic: Z. Ges. exp. Med., 1963, 136, 552-555 (Frauenklinik and Physiol.-Chem. Inst., Med. Acad., Dflseldorf, Germany) Determination of oestrogens in the umbilical vessels of neonates showed that the arteries had a lower concn. of oestrone and probably also of 17@-oestradiol than the veins.

P.F.Meyer

6736. EFFECT OF OESTRIOLS ON PLASMA LIPOID LEVELS. M.Julesz, M.B.FrShlich, L.K.liszlo, LT6th, G.Szepessy and M.A.David: Acta med. Acad. Sci. hung., 1963, 19, 161-168 (1st Med. Clinic, Univ., Szeged, Hungary) Oestriol administration to 6 women with a variety of clinical conditions resulted in a significant fall in the serum a-lipoprotein with a rise in the 3-fraction. The role of oestrogens in affecting systems other than genital structures is emphasised.

(German)

G.F.Blane

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6737. ASSAY OF PROLACTIN BASED ON DIRECT EFFECT OF THIS HORMONE ON CELLS OF CORPUS LUTEUM. O.L.Wolthuis: *Acta endocr. Khb.*, 1963, 42, 364-379 (Pharmacol. Dept., Boeraavekwartier Univ., Leiden, Netherlands) The method is based on the reduction of the no. of corpus luteum cell nuclei, produced by the injn. of prolactin into hypophysectomised immature rats treated with high doses of HCG and pregnant mares serum. Correlation between the dose and the response is discussed as is also the practicability of the test. H.B.Waynforth

6738. NEW PROLACTIN ASSAY METHOD. SOME EXPERIMENTS WHICH PROVIDE ARGUMENTS FOR ITS SPECIFICITY. O.L.Wolthuis: *Acta endocr. Khb.*, 1963, 42, 380-388 (Pharmacol. Dept., Boerhaavekwartier Univ., Leiden, Netherlands) It is shown that in a new prolactin assay method based on the reduction of the no. of rat corpus luteum cell nuclei induced by prolactin, no interference was obtained by administration of other pituitary hormones or by oestrogens. Growth hormone, ACTH, TSH, LH and FSH did not influence the result produced by the injn. of prolactin and it is concluded that the method is sp. for prolactin. H.B.Waynforth

6739. EFFECT OF URINARY GONADOTROPHIN INHIBITOR ON MOUSE UTERINE RESPONSE TO VARIOUS GONADOTROPHINS. W.Futterweit, S.A.Margolis, L.J.Soffer and R.I.Dorfman: *Endocrinology*, 1963, 72, 903-907 (Worcester Fndn. Expt. Biol., Shrewsbury, Mass., U.S.A.) Urinary gonadotrophin-inhibiting material prevented the action of LH on ventral prostate in the immature rat intact and hypophysectomised rat, as well as on the uterus of the immature mouse. It did not inhibit the action of testosterone on the ventral prostate of the castrated rat nor inhibit the action of FSH. H.C.Jones

6740. BIOLOGICAL ASSAY OF LUTEINISING HORMONE BY OVARIAN HYPERAEMIA METHOD OF ELLIS: AN EVALUATION. A.F.Parlow and L.E.Reichert jun.: *Endocrinology*, 1963, 72, 955-961 (Physiol. Dept., Div. Basic Hlth. Sci., Emory Univ., Atlanta, Ga., U.S.A.) An evaluation of the biol. assay of LH by the ovarian hyperaemia method has been made with 101 assays using 5000 animals. The index of precision and mean % of standard error has been calc. The presence of FSH interfered with the assays. H.C.Jones

6741. URINARY EXCRETION OF OESTRONE IN SOW AFTER ADMINISTRATION OF OESTRADIOL-17 β . T.Lunaas: *Acta endocr. Khb.*, 1963, 42, 314-318 (Reproductive Physiol. and Path. Dept., Veterinary Coll., Oslo, Norway) Oestrone was identified by the method of Brown as the main urinary metabolite after i.m. injn. of oestradiol-17 β into the sow. The implication of these findings is discussed. H.B.Waynforth

6742. EFFECT OF OESTRADIOL BENZOATE TREATMENT IN NEWBORN MALE RAT. F.A.Kincl, A.Folch Pi and L.Herrera Lasso: *Endocrinology*, 1963, 72, 966-968 (Res. Lab., Syntex, S.A. Mexico, D.F., Mexico) A single injn. of oestradiol benzoate to 5-day cT rats produced infertility, inhibn. of spermatogenesis and atrophy of accessory sex tissue*. H.C.Jones

6743. SEMINAL DEGENERATION IN RAM AND ITS RELATION TO TEMPERATURE OF SCROTUM.

G.R.Moule and G.M.H.Waites: *J. Reprod. Fertil.*, 1963, 5, 435-448 (I.C.Ross Animal Res. Lab., C.S.L.R.O., P.O.Box 144, Parramatta, N.S.W., Australia) Semen of decreased quality containing abnormal spermatozoa was obtained from rams 13 to 21 days after they had been exposed to temp. of 40 $^{\circ}$ 5 $^{\circ}$. The change varied in severity and duration and was related to the temp, rise of the scrotum during exposure and not to changes in rectal or flankskin temp. The concn. and total content of fructose in the semen of the treated rams also started to rise 13 to 21 days after exposure. When the scrotum was kept cooled by water at 1ST throughout the period of exposure to a temp. of 40 $^{\circ}$ 5 $^{\circ}$ abnormalities of semen were not obtained. It was concluded that the efficiency of the heat-dissipating prop. of the scrotum alone determined the magnitude of the adverse effects of short periods of exposure to high temp, on the quality of semen produced by rams. H.E.H.Jones

6744. RELATION BETWEEN FRUCTOSE CONTENT OF SEMEN AND FERTILITY IN MAN. C.Schirren: *J. Reprod. Fertil.*, 1963, 5, 349-360 (Univ.-Haut-klinik-Pdliklinik, Martinistraße 52, Hamburg, Germany) Fructolysis of human semen is only seen in the presence of normal spermatozoa. Abs. fructose concn. in semen was inversely proportional to the no. of spermatozoa. Values below 1200 pg. fructose/ml. were considered to be abnormal and due to inflamma&iop of the seminal vesicles or to androgen deficiency. The fructose concn. was diminished following abstinence of more than 8 days. Patients with normospermia with postpubescent interstitial cell insufficiency* are infertile but after treat*ment with methyltestosterone or chorionic gonadotrophin became fertile and fructose values normal. H.E.H.Jones

6745. ESTIMATION FROM OPTICAL DENSITY OF DRY WEIGHT AND NUMBERS OF SPERM IN SUSPENSIONS OF FOWL SPERMATOZOA AND THE ZOO [OXYGEN UPTAKE PER 108 SPERMATOZOA PER HOUR] - QO2 RELATIONSHIP. G.V.Quicke and B.R.Tulloch: *S. Afr. J. agric. Sci.*, 1963, 6, 135-140 (Fac. Agric., Univ. Natal, Pietermaritzburg, S. Africa). I.A.B.S.

6746. STUDIES ON ARTIFICIAL CRYPTORCHIDISM: MORPHOLOGICAL AND QUANTITATIVE CHANGES IN SERTOLI CELLS OF RAT TESTIS. E.J.Clegg; J.Endocr. 1963, 26, 567-574 (Dept. Anat., Univ., Liverpool, England) Removal of the testis from the scrotum to the abdominal cavity of the adult rat results in degenera^{li} chan^ges of the spermatogonia and spermatocytes while there is a corresponding increase in the no. of Sertoli cells. Microscopic evaluation and studies confirmed their phagocytic nature. It is suggested that the Sertoli cells may be involved in the phagocytosis of the cells of the germinal epitheliuni. G.F.Blane

6747. EFFECTS OF CASTRATION ON MITOCHONDRIA OF RAT VENTRAL PROSTATE. J.C.Edelman, H.Brend^{le} & A.W.Zorgniotti and P.M.Edelman: *Endocrinology* 1963, 72, 853-858 (Biochem. Dept., New York Univ. Med. Cen., New York, U.S.A.) Castration resulted in a decrease in the no. of mitochondria in the cells of rat prostate glands. The enzyme activity of isolated prostatic mitochondria was not different from that of intact rats. H.C.Jones

PHYSIOLOGY OF BEHAVIOUR

6748. VISUAL DEPTH DISCRIMINATION IN DAY-OLD CHICKS. P.G.Shinkman: J. comp. OT». «ycnol., 1963, 56, 41CT-414 (Upiv. Michigan. Mich., U.S.A.) Dark-reared, day-old chicks tested in a visual cliff, immediately after receiving various treatments exhibited unlearned visual depth discrimination. Cues Provided by focusing are critical for this discrimination; binocular and motion parallax are not. J.K.woome
6749. SALINE SOLUTION PREFERENCE IN THE RAT: FURTHER DEMONSTRATIONS. J.L.FaUc and J.F.Titlebaum: J. comp. physiol. PsychoL. 1963, 56, *JTM 342 (Dept. Nutr.f Harvard Sch. Public Health. Mass., U.S.A.) Rats were given a brief-exposure preference test under water-deprivation and non-deprivation conditions, consecutive-fluids, and *laintarifto&iKTM* tests. The results failed to support the hypothesis that the rat's preference for hypotonic and isotonic sodium chloride soln. hSStopwed bB *° K 2J? Physiol. 'water-signal' generated by these --- J.R.Broome

EXPERIMENTAL PSYCHOLOGY

6750. IMPRINTING: EFFECTS OF PAINFUL STIMULUS TioN%PoS SVOLWWING RESPONSE. J^Kovach and E.H.Hess J. comp. ^*f/f f¹ 1 . 56. Three con- di diff. sities frequencies, when administered to chicks durin the im- pri ag. magnitute. At earlier ages and with moderate amounts they facili- tated following. J.R.Broome

6751. SOME OBSERVATIONS ON THE DEPRESSION EFFECT. R.CGonzalez. H.Gleitman and M-E. Bbtenuu: J. comp. physiol. PsychoL, 1962, 55, 578-581 (BrynMawrCoUege, BrynMawr, U^A)

EXW. were performed to • « ^ eff b c * f f S S Sement {Magnitude and abruptness of < * ^ » S rats. The level on the so-called depression effect with the mag effect was found to be transient. v an W with the mag nitude at the step, and absent for gradual changes. J.Scholes

6752. VARIATION IN ENVIRONMENTAL COMPLEXITY AND BRAIN MEASURES. M.R.Rosenzweig, D.Krech, E.L.Bennett and J.F.Zolman: J. comp. physiol. PsychoL, 1962, 55, 1092-1095 (Univ. California, Berkeley, Calif., U.S.A.) Rats which were isolated for 33 days after weaning and then exposed for 48 days to a complex environment were compared with littermates isolated for 81 days or maintained in the enriched environment for 81 days. Cortical and subcortical measure- "en of *suVwV7otal activity of f. * oUJ J- ml f. activity of cholinesterase showed the e-fTM * ^ Mediate experience to have intermediate w n ^ ^ ^

6753. BEHAVIOURAL DIFFERENCES BETWEEN MUANT AND NON-MUTANT MICE. v ^ ^ ? e r-t g f S. S. and M.Blumenfield: J. comp. Physiol. PsychoL. 1963, 56, 290-293 (R.B.Jackson Mem. Lab., Bar

Harbor, Maine, U.S.A.) Four strains of mice, each having 2 kinds differing only in one gene, were tested on several behavioural measures. Significant differences between the mutant and non-mutant genotypes were found in the Hairless and Pintail strains, but none between the Short-ear or Tale-ear strains. J.R.Broome

6754. EFFECT OF EARLY EXPERIENCE UPON THE FORMATION OF ENVIRONMENTAL PREFERENCES IN RATS. R.A.Soskin: J. comp. physiol. PsychoL. 1963, 56, 303-306 (Washington Univ., Wash., U.S.A.)

Rats were subjected to const, mild vibration at the ages of 1-21, 22-43 or 44-65 days. No group preferred vibration to a stable environment. Animals raised in a vibrating environment, however, showed less tendency to avoid vibration than controls. J.R.Broome

6755. EFFECTS OF INFANTILE STIMULATION AND AGE UPON BEHAVIOUR. V.H.Denenberg and S.A. Smith: J. comp. physiol. PsychoL, 1963, 56, 307-312 (Purdue Univ., Lafayette, Ind., U.S.A.) Rats received either shock or handling on days 11-20 of life, and a control group was not disturbed. The non-handled controls were less active in the open field and had a higher defaecation rate than the 2 expt. groups throughout the age range studied. J.R.Broome

6756. MATERNAL EMOTIONALITY, MULTIPLE MOTHERING, AND EMOTIONALITY IN MATURITY. D.R.Ottinger, V.H.Denenberg and M.W.Stephens: J. comp. physiol. PsychoL, 1963, 56, 313-317 (Purdue Univ., Lafayette, Ind., U.S.A.) The open-field behaviop of rats showed that offspring emotionality is directly related to both prenatal and postnatal emotionality of the mothers. Multiple mothering (mother rotated between her own litter and one foster litter) significantly increased offspring emotionality. J.R.Broome

6757. TRANSFER BETWEEN HABITS BASED ON SHOCK AND THIRST. H.Babb: J. comp. physiol. PsychoL, 1963, 56, 318-323 (Hobart and William Smith Coll Colleges, Geneva, N.Y., U.S.A.) Rats were run in a straight alley on thirst motivation, shock motivation or on successive combinations of these conditions, and were then extinguished half on and half not on thirst drive. Extinction data indicated incomplete summation in transferring from shock to thirst or from thirst to shock. Transfer from shock to thirst training produced a general inhibn. of running speed. J.R.Broome

6758. GENETIC AND ONTOGENETIC DETERMINANTS OF ADULT BEHAVIOUR IN THE RAT. S.Levine and P.L.Broadhurst: J. comp. physiol. PsychoL, 1963, 56, 423-428 (Inst. Psychiatry, Univ. London, England)

Rates of the Maudsley Reactive and Non-reactive strains, selected for emotional defaecation, were subjected to infantile stimm. Tests for open-field behaviour and conditioned avoidance learning showed that both heredity and environment had significant effects; the open-field tests showed that infantile stimm. caused a significant decrease in emotionality. J.R.Broome

6759. EFFECTS OF DEPRIVATION SCHEDULE AND REWARD MAGNITUDE ON ACQUISITION AND EXTINCTION PERFORMANCE. W.B.Pavlik and W.F. Reynolds: J. comp. physiol. PsychoL. 1963, 56, 452-455 (Rutgers Univ., N.J., U.S.A.) Rats were trained in a runway under 2 conditions of food deprivation combined factorially with 2 levels of reward magnitude.

ANIMAL BEHAVIOUR

Both deprivation time and reward magnitude were found to have significant effects on asymptotic running speed and running speed during extinction, and these effects are statistically independent.

J.R.Broome

6760. EFFECT OF FOOD DEPRIVATION UPON THE RAT'S BEHAVIOUR IN ITS HOME CAGE. R.C.Bolles: *J. comp. physiol. Psychol.*, 1963, 56, 456-460 (Hollins Coll., Va., U.S.A.) The activity in their home cages of rats deprived for 12 days was compared with their own ad lib. baseline activity and that of a control group maintained on ad lib. food and water. The hungry animals showed significantly more activity on the last 4 deprivation days only, but this effect appears to be due to conditioning.

J.R.Broome

6761. GENETIC VARIATION IN A MEASURE OF AVOIDANCE LEARNING IN SWINE. R.L.Willham, D.F.Cox and G.G.Karas: *J. comp. physiol. Psychol.*, 1963, 56, 294-297 (Iowa State Univ., Iowa, U.S.A.) Measurement of the no. of avoidance responses made by pigs in the third set of 10 trials showed that nearly 50% of the variance among pigs belonging to relatively homogeneous groups was attributable to additively genetic causes.

J.R.Broome

6762. RESPONSE SHIFT LEARNING SET IN RHESUS MONKEYS. W.L.Brown and A.A.McDowell: *J. comp. physiol. Psychol.*, 1963, 56, 335-336 (Univ. Texas, Austin, Tex., U.S.A.) Rhesus monkeys were trained on object-quality discrimination problems. Response to either of two stimulus objects was rewarded on the initial trial of each problem, and response to die 'c'Mect not responded to on the initial trial was rewarded on the second trial. The results indicated that rhesus taonkeys can acquire a 'response shift learning set*.

J.R.Broome

6763. DISCRIMINATION LEARNING-SET PERFORMANCE UNDER INTERMITTENT AND SECONDARY REINFORCEMENT. R.E.Bowman: *J. comp. physiol. Psychol.*, 1963, 56, 429-434 (Univ. Wisconsin, Madison, Wis., U.S.A.) The latencies and % of correct responses of rhesus monkeys were measured at reward % of 100:0, 75:0, 50:0 and 25:0 on discrimination learning-set problems, both in the presence and absence of secondary reinforcing stimuli. Latencies increased significantly at the 2 lower reward %. The % of correct responses decreased with decline in reward % below 75:0.

J.R.Broome

6764. LEARNING-SET FORMATION AND DISCRIMINATION REVERSAL: LEARNING PROBLEMS TO CRITERION IN THE SQUIRREL MONKEY. D.M.Rumbaugh and J.A. McQueeney: *J. comp. physiol. Psychol.*, 1963, 56, 435-439 (San Diego State Coll., San Diego, Calif., U.S.A.) The development of learning-set [LS] and discrimination reversal [DR] were studied in squirrel monkeys (Saimiri sciurea) by training them to a criterion on each problem of a series. Rapid development and high level performance in both LS and DR were observed.

J.R.Broome

6765. MASSING AND WITHIN-DELAY POSITION AS FACTORS IN DELAYED-RESPONSE PERFORMANCE. H.Gleitman, W.A.Wilson, jun., M.M.Herman and Rta.Rescorla: *J. comp. physiol. Psychol.*, 1963, 56, 445-451 (Swarthmore Coll., Swarthmore, Pa., U.S.A.) The performance of rhesus monkeys tested on delayed response was poorer when the trials were massed than when they were widely spaced. A series of long delay durations led to poorer performance on

subsequent trials than a series of short delay durations. It is concluded that the deleterious effect of massing is due to the frustrating effect of previous long delays.

J.R.Broome

SPECIES STUDIES

6766. SOCIAL ORGANISATION AND TERRITORIAL BEHAVIOUR IN THE WILD HOUSE MOUSE (MUS MUSCULUS L.). P.Crowcroft and F-P.Rowe: *Proc. zool.-Soc., Lond.*, 1963, 140, 517-531 (Infest. Cont. Lab., Min. Agric., Tolworth, Surbiton, Surrey, England) The social organisation of colonies of the house mouse are described. It has been shown that aggressive behaviour is used in territory defence. The fighting is almost exclusively between the ♂ but pregnant ♀ also fight.

D.N.Wheatley

6767. SOCIAL BEHAVIOUR AND MOVEMENT OF RATS. D.C.Drummond: *Ann. appl. Biol.*, 1963, 51, 343-345. A small sample of moving rats was trapped and a study of burrow structure was made. There were indications that ♂ rats move more often than ♀.

J.R*Cocbbain

6768. EFFECTS OF ENVIRONMENTAL RESTRICTION UPON THE CHIMPANZEE'S RESPONSIVENESS IN NOVEL SITUATIONS. E-W.Menzel, R.K.Davenport, jun. and C.M.Rogers: *J. comp. physiol. Psychol.*, 1963, 56, 329-334 (Yerkes Lab. Primate Biol., Orange Park, Fla., U.S.A.) The behaviour of several groups of restricted and wild-born chimpanzees in an unfamiliar room was observed*. The wild-born animals differed from the restricted ones in postural behaviour, locomotion, climbing, manipulation, self-directed responses, vocalisation, and the patterning and temporal trend of activity.

J.R.Broome

6769. DIFFERENTIAL RESPONSES OF CHIMPANZEES TO SOCIAL STIMULATION. W.A-Mason, J.H.Hollis and L.G.Sharpe: *J. comp. physiol. Psychol.*, 1962, 55, 1105-1110 (Yerkes Lab. Primate Biol., Orange Park, Fla., U.S.A.) The responses of both lab.-reared and wild born young chimpanzees to various forms of social stimn. including play, petting, grooming and being groomed, presented by a stimulus-person acting in accordance with a pre-determined role were investigated. It was found that sp. forms of social stimn. similar to those commonly occurring in chimpanzee social interactions have definite and differential rewarding effects.

J.R.Broome

GENERAL

6770. MATERNAL BEHAVIOUR IN THE DOMESTIC HEN: THE ROLE OF PRETEST RESTRICTION OF MOVEMENT. R-A.Maien *J. comp. physiol. Psychol.*, 1963, 56, 350-356 (Kansas State Univ., Kan., U.S.A.) Pretest restriction of movement of broody hens while the chicks were unrestricted resulted in indiscriminate brooding when the hens were released. Restriction of both hens and chicks resulted in longer periods of

of cues emanating from familiar chicks produce tenance of broodiness regardless of prior conditions leading to MATERNAL BEHAVIOUR. THE DOMESTIC HEN: THE ROLE OF PHYSICAL CONTACT

R A Maien J. comp. physiol. 1963 357-361 (Kansas State Univ, M) I u - ; Elation of hen anaesthetising confinement in separate cages air

contactual ventral surface to eliminate contact cues development of broodiness, main-
tained by similar Broome

^{rf} STUDY OF IMPRINTING IN BIRDS

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1963| 88| 333.346 (Dept, h ^ y i | Montana State
c u zeman, Mon UtStA) ReyeWi 38 ^
contact rt**^ rf ^ j, R, B 100 m e

CYTOLOGY

CELL STRUCTURE AND CYTOCHEMISTRY

6773. SUBMICROSCOPIC CHANGES IN PENETRATING SPERMATOZOOON OF RABBIT R.Hadek: J. ultrastructure Res., 1963, 18, 161-169 (Anat. Dept., Stritch Med. Sch., Loyola Univ., Chicago, IL, U.S.A.)

Penetration changes of mature rabbit spermatozoa could not be induced by *in vitro* incubation with freshly shed ova or with oviducal washings. While passing through the zona pellucida, the spermatozoon loses its cell membrane and its head cap. Before reaching the vitelline membrane it also loses its cytoplasm and the 'apical body*' becomes elongated. H.B.Waynforth

6774. SUBMICROSCOPIC STUDY ON CORTICAL GRANULES IN RABBIT OVUM. R.Hadek: J. ultrastructure Res., 1963, 8, 170-175 (Anat. Dept., Stritch Med. Sch., Loyola Univ., Chicago, IL, U.S.A.)

Round granules were observed in the rabbit ovum just prior to ovulation. These increased if fertilisation did not occur. The granules were mainly confined to the cortex of the egg. H-B.Waynforth

6775. FINE STRUCTURE OF GERM CELLS AND SERTOLI CELLS DURING THE CYCLE OF THE SEMINIFEROUS EPITHELIUM IN THE RAT. J.BrOkemann: Z. Zellforsch., 1963, 59, 820-850 (Dept. Anat., Univ. Kiel, Germany) The fine morphology of germ cells and of Sertoli cells was examined in testicular material obtained from 8 mature albino rats and the 2c Interrelationship to die cycle of the seminiferous epithelium investigated. The cycle could be divided into 2 phases; the nuclear material of the developing spermatids condenses and changes; changes also occur in the acrosome cap. Lipid droplets in the Sertoli cells increase rapidly during the first phase whilst numerous inclusion bodies resembling lysosomes are present during the 2nd phase. Steroid hormone production during the first phase and phagocytosis of residual bodies by Sertoli cells are discussed. J.E.Linder

6776. LIPID GRANULES OF UTERINE EPITHELIUM IN SPAYED MOUSE. K-Fuxe and O-Nilsson: J. ultrastructure Res., 1963, 8, 379-390 (Anat. Dept., Karolinska Inst., Stockholm, Sweden) Three types of lipid granules were demonstrated by fluorescence microscopy, histochem. and E.M. (a) Dark bodies, found mainly in the base of the cell; (b) membrane-surrounded bodies; and (c) dense bodies found in the apical part of the cell. These granules may contain phospholipids. H.B.Waynforth

6777. E.M. OBSERVATIONS OF NUCLEAR REMNANTS IN HORNY CELLS OF FEATHERS. W.J.Schmidt and H.Ruska: Z. Zellforsch., 1963, 59, 700-707 (Zool. Inst., Univ. Giessen, Germany) Nuclear remnants could be seen in cross sections through lipochrome-containing feathers of a pheasant. Their outline is irregular due to the drying effects at the termination of the development of the feather. Nuclear contents may be either homogeneous or granular. (German) J-E.Linder

6778. ON NUCLEAR STRUCTURE IN THE VENTRAL NERVE CORD OF THE LEECH HIRUDO MEDICINALIS. E.G. Gray and R-W.Guillery: Z. Zellforsch., 1963, 59, 738-745 (Dept Anat., Univ. College, London, England) A thick lamina which is lining the inside envelope of the large neuroglial cells and nerve cells of the ganglia, is described. It is similar to a membrane

which had been reported by earlier workers in the amoeba. This lamina has openings which are opposite the nuclear pores. J.E.Linder

6779. FURTHER EXAMINATIONS OF THE FINE STRUCTURE OF THE NEUROSECRETORY CELLS IN THE NUCLEUS SUPRAOPTICUS OF GECKO JAPONICUS. M.Murakami: Z. Zellforsch., 1963, 59, 684-699 (Anat. Inst., Kurume Univ., Kurume, Japan)

Neurosecretory granules are osmophilic and are found together with other types of osmophilic granules in the Golgi zone of the perikaryon. In order to distinguish these neurosecretory granules from the other osmophilic granules, the neurosecretory cells of the nucleus supraopticus were examined after injn. with histamine. The author describes three different types of granules; the granules of type 1 increase in no. whilst those of type 3 decrease in animals inj. with histamine*

(German) J.E.Linder

6780. CORRELATED LIGHT AND ELECTRON MICROSCOPE STUDY ON PECTEN OCULI OF DOMESTIC FOWL(GALLUS DOMESTICUS). A.R.Seaman and H.Storm: Exp. Eye Res., 1963, 2, 163-172 (Dept. Surg., Sinai Hosp., Inc., Baltimore, Md., U.S.A.)

Comparisons and contrasts are made to relate th^ authors E.M. observations with those of Tanaka. Marked changes in the ultrafine morphology of the membrane system of the pectineal endothelial cell are caused by a reduction in intraocular pressure. The ultrafine morphology of the membrane systems of the endothelial cells of the pectineal capillaries suggests a device for increasing cell surface and a probable concern in active fluid transport. J.Whiting

6781. E.M. STUDIES ON SALIVARY GLAND CELLS. I. NUCLEUS OF BRADYSIA MYCORMUS FREY (SCIARIDAE) WITH SPECIAL REFERENCE TO NUCLEOLUS. JJacob and J.L.Sirlire J. cell Biol., 1963, 17, 153-165 (Inst. Animal Genet., Univ. Edinburgh, Scotland) The origin, development and later transformations of the nucleoli were studied in electron micrographs of OsO₄-fixed glands embedded in methacrylate or Araldite. Elementary nucleoli consisting of aggregations of a few paired 40A fibrils and 150A particles appear within the chr. bands. These become detached and coalesce, forming dense particles of nucleolar material at the chr. surface. The fully-formed nucleoli have a dual structure with a narrow dense periphery and a broader, less-dense internum which disappears in later stages. P.Barlow

6782. E.M. OBSERVATIONS ON THE SALIVARY GLAND OF THE COCKROACH PERiplaneta americana. R.G.Kessel and H.W.Beams: Z. Zellforsch., 1963, 59, 857-877 (Dept. Zool., State Univ. Iowa, Iowa City, Iowa, U.S.A.) The fine-structure of the secretory tissue and of the duct system were examined; 2 montfiol-distinct cell types are described. The possible interrelation between structural features and function is discussed* J.E.Linder

6783. LAMPBRUSH CHROMOSOMES OF RANA CYANOPHYCTIS. M.D.L-Srivastava and A.N.Bhatnagan Cytologia, 1962, 27, 60-71 (Zool. Dept., Allahabad Univ., India) Frog oocyte lampbrush chr. were studied by phase contrast microscopy, and some stages in their development to metaphase-I bivalents followed. Problems concerning the nature of the chromomeres, chiasmata and loops are discussed in the light of some of these observations. C-A.Stace

6784. SIZE OF CELLULOSE MICROFIBRIL. J-R-Colvire
J. cell Biol., 1963, 17, 105-109 (Div. Appl. Biol.,
Nat. Res Council, Ottawa, Canada) Microfibrils
were produced in drops on Formovar fibres from cells of
AcetohactPr vyiinnm stored in phosphate-citrate buffer
«pHd «6. Shadow photographs were compared with
direct photographs of microfibrils parallel to and Perpen-
dicular to the direction of shadowing using silver-stained
and unstained segments. No evidence of metal layers
being deposited during shadowing was found. The lat.
width of 150-200A and not of 30A appears to be correct.

P. Barrow

6785. FINE STRUCTURE OF ROOT CELLS OF PHASEOLUS

VULGARIS STRUCTURE OF MERISTEMATIC
CELLS. ON-Sun: Cytologia. I⁹⁶²₃, 2⁷, 2⁰⁴₁₂^m
(Sch. Med., St. Louis Univ., Mo u's A' 2' Sf* i¹⁸¹_m
showed the typical cell membrane, plasmodesmata,
endoplasmic reticulum with ribosome-like particles.
Golgi apparatus, mitochondria, prokaryotes, amyloplasts.
membraneless ibid-bodies and nuclei with a &TM|
double membrane and a dense nucleolus. C • A. Stace

6786. GRANA AS STRUCTURAL UNITS IN CHLORO- PLASTS OF MESOPHYLL OF NICOTIANA RUSTICA

ture Res., 1963, 8, 122-143 (Bot. Dept.,
California, Davis, Calif., U.S.A.) Grana are com-
posed of discs which are contiguous and share common
partitions. This can be illustrated in e
Plastids are treated in various ways. T
of the grana are shown to be all alike.
branes are apparently not necessary to structure of
*egrana. After V^W & cation the partitions have an
3 5 ed S " SUCIE and A thicker than after
H.B. Waynfirth

6787. GOLGI APPARATUS AND CELL PLATE FORMA-

Univ. Texas, Austin, Tex., U.
2% KMnO₄-fixed root cells of Zea mays, L show telophase
cells in which cell plate formation is associated with
partially oriented Golgi, from the cisternae of which
there appear numerous small vesicles. The secretion
vesicles of the Golgi have been identified with newly-
formed cell walls. P. Barrow

6788. OBSERVATION ON FUNCTIONING OF GOLGI
APPARATUS. H.H. Mollenhauer and W.G. Whaley:
J. cell Biol., 1963, 17, 222-225 (E.M. Lab., Univ.
Texas, Austin, Tex., U.S.A.) In the outer root-cap
cells of maize the membrane-bounded vesicles of the
Golgi sec: plasma mem-
brane. Fe
acnw die 'rack' of clstetnae »nd the nature, separated
v «Iclej move dnomk thc«ytopUJin P. Barrow

6789. FINE-STRUCTURE OF CELL BOUNDARY OF BLUE-
GREEN ALGA ANACYSTIS MONTANA. P. Echlin:
J. cell Biol., 1963, 17, 212-213 (Dept. Bot., Univ.
Cambridge, England) 6% glutaraldehyde-fixed
material exhibited a cell boundary of 3 layers. Convolu-
tions of 400-800A on the outer cell layer were spaced
evenly around the cell periphery. These may represent
a structural li between the outer rane and the cell
separate mucous sheath lying ie the cell
boundary or they may be connected with the synthesis of
the cell envelope. P. Barrow

6790. STRUCTURE AND FUNCTIONS OF BIOLOGICAL
MEMBRANES. J.L. Kavanau: Nature, Lond., 1963,
198, 525-530 (Dept. Zool., Univ. California, Los
Angeles, Calif., U.S.A.) A discussion of recent
evidence on the structure of biol. membranes and its
implications for membrane-associated phenomena such
as contraction, expansion, growth and degrowth,
coalescence and fragmentation of membrane-encapsulated
organelles, impulse conduction, active transport and
facilitated diffusion. 55 ref. G.M. Lewis

6791. E.M. OF PERMSELECTIVE MEMBRANES.

F.de K5r5sy: Nature, Lond., 1963, 198, 882-883
(Negev Inst. Arid Zone Res., Beersheba, Israel).

G.M. Lewis

6792. HISTOTOPOGRAPHIC AND CYTOLOGICAL
STUDIES OF THE EMBRYONIC MEMBRANES OF THE
GUINEA-PIG. G-Petry and W. Kiffler: Z. Zellforsch.,
1963, 59, 625-662 (Anat. Inst., Univ. Marburg a.d.
Lahn, Germany) Histotopographic, cytol. and E.M.
techniques revealed the existence of structural differences
in the various regions of the amnion and yolk-sac. The
differences in the development of cytoplasmic structures
as seen with the E.M. are regarded as an expression of
their different functional stages. (German) J.E. Linder

6793. QUANTITATIVE ASPECTS OF ISOLATION OF
NUCLEOLI OF THE WALKER CARCINOSARCOMA AND
LIVER OF THE RAT. M-Muramatsu, K. Smetana and
H. Busch: Cancer Res., 1963, 23, 510-518 (Dept.
Pharmacol., Baylor Univ. Coll. Med., Houston, Tex.,
U.S.A.) NK&ti were sonicated at 2° after initial
tissue homogenisation in 0*25M sucrose containing
0*0033M C-AJ12. The vol. was maintained at 20 ml.
Destruction of more than 99.8% of nuclei required 25-40
sec. The sonicate was centrifuged at 2500 x g for 5 min.
and rehomogenised in 0*88M sucrose. Nucleoli were
sedimented by 15 min. at 800 x g for tumour and 1000
x g for liver. Repetition of the last step gave a prep.
95-99% pure by direct particle counts. The prep. was
further purified with DNase I or 2M NaCl. Tumour
nuclei purified with DNase contained an average of 1*8
x 10⁻⁶ pg. of RNA and 16*1 x 10⁻⁶ jig. of protein/nucleo-
lus. Liver nucleoli had 17% of these amounts of RNA and
protein. RNA made up approx. 10% of the dry wt. of
nucleoli from either tissue. B.M. Stevens

6794. EFFECT OF INFLAMMATORY PROCESS ON
NUCLEUS NUMBER, DNA CONTENT AND DRY
WEIGHT OF MOUSE LIVER CELLS. R. Rigler, jun.:
Exp. Cell Res., 1963, 30, 160-170 (Inst. Cell Res.
Genet., Karolinska Inst., Stockholm, Sweden)

Non-sp. inflammation produced by s.c. injn. of a buffered
NaOH soln. resulted in an increase of binucleate cells in
the mouse liver. At the same time, higher DNA classes
increased, the increase being correlated with the forma-
tion of binucleate cells. The freq.-distribution of dry wt.
of the liver cells exhibited 2 freq. maxima with a relation
of 1:2 during the entire expt* period. With increase of
die no* of binucleate cells, an increase of the higher dry
wt. class occurred.

(German, English summary) K. Jones

6795. DNA CONSTANCY IN HETEROCHROMATIN OF
GLYPTOTENDIPES. H.-G. Keyk: Exp. Cell Res.,
1963, 30, 245-247 (Max-Planck-Inst. Meeresbiol.,
Abt. H. Bauer, TQbingen, Germany). Prelim, note*
(German) K.Jones

6796. MORPHOLOGICAL AND CYTOCHEMICAL STUDIES
ON CYTOPLASMIC INCLUSIONS OF INTESTINAL

CYTOLOGY

GOBLET CELLS OF RATS WITH PARTICULAR REFERENCE TO PHYSIOLOGY OF MUCINOGENESIS.
 K.C.Kanwar. *Cytologia*, 1962, 27, 233-247 (Dept. Zool., Panjab Univ., Chandigarh, India) Mucus secretion by goblet cells of rat intestine was studied by various cytochem- procedures. Early on, the phospholipoproteinous mitochondria are very conspicuous as long filaments which 'almost fill' the supranuclear zone and each have a distinct terminal granule*. Later the latter separate from the mitochondria and increase in size and no., while the mitochondria disappear. The granules become vacuolated, and in them mucinogenesis occurs. Cytochem. tests showed the mucus to be muco-poly-saccharide. The mucous bodies migrate towards the theca, coalesce to form large droplets, and are ultimately released by thecal rupture. Golgi-like bodies were not seen. CA.Stace

6797. CYTOCHEMICAL INVESTIGATIONS ON THE BALBIANI RINGS OF THE FOURTH SALIVARY GLAND CHROMOSOME OF CHIRONOMUS TENTANS. L.Vogt-Kühne and L.Carlson: *Chromosoma*, Berlin, 1963, 14, 186-194 (Inst. Zellforsch- und Genet., Karolinska Inst., Stockholm, Sweden) The nucleic acid concn. of the 2. Balbiani ring was determined with the aid of an u.v. microspectrophotometer and a microinterferometer. In larvae subjected to a cold shock there was a doubling of the dry wt. and an approx threefold increase in the nucleic acid concn. in the Balbiani ring.

(German) S.A.Henderson
6798. BARR BODIES AND NUCLEAR SIZE IN CULTURED HUMAN FIBROBLASTS. U-Mittwoch: *Nature*, Lond., 1963, 198, 975-977 (Galton Lab., Univ. Coll., London, England) Nuclei with Barr bodies were, on average, smaller than those without. It is suggested that the Barr body appears at telophase, disappears during DNA replication when the nucleus is at max. size, then reforms after replication. G.M.Lewis

6799. SEX CHROMATIN OF INTERPHASE NUCLEI IN PLATYRRHINE MONKEYS. M-M-Beath and K.Benirschke: *Cytologia*, 1962, 27, 1-10 (Dept. Pathol., Dartmouth Med. Sch., Hanover, N.H., U.S.A.) Tissues of various organs of 31 monkeys of 5 different spp. were fixed, sectioned, stained and examined for evidence of interphase chromatin, which was found underlying the nuclear membrane, in ? only. In most nuclei the chromatin was in the form of a single plano-convex body, and recognisable at all embryonic stages, but in one animal some nuclei possessed two bodies. The origin of the sex chromatin mass and of its abnormal duplication is discussed. C - A. Stace

NUCLEO-CYTOPLASMIC RELATIONS

6800. TRANSFER OF NUCLEOLAR MATERIAL TO CYTOPLASM OF CITRUS CELLS. H.A.Kordan and L.Morgenstern: *Exp. Cell Res.*, 1963, 30, 98-105 (Dept. Surg., Cedars Lebanon Hosp., Los Angeles, Calif., U.S.A.) Marked cytoplasmic and nuclear transformations were observed in citrus tissue growing *in vitro* and *in vivo*, resulting in the transfer of nuclear material, in die form of discrete packets, to the cytoplasm. The cytoplasmic transformations were responsible

for the transfer of the nuclear material to the cytoplasm, the structures involved in the transfer mechanism being suggestive of a Golgi complex. K.Jones

6801. CHROMOSOMAL AND EMBRYOLOGICAL ANALYSES OF NUCLEAR CHANGES OCCURRING IN EMBRYOS DERIVED FROM TRANSFERS OF NUCLEI BETWEEN RANA PIPiens AND R. SYLVATICA. S.Hennen: *Develop. Biol.*, 1963, 6, 133-183 (Inst. Cancer Res., Philadelphia, Pa., U.S.A.) Diploid *pipiens* nuclei were allowed to undergo 10-12 divisions in *sylvatica* cytoplasm and were then transferred back to enucleated *pipiens* eggs. Subsequent development of these back-transfer embryos is compared with that of nuclear transfer controls and nuclear transfer hybrids. The occurrence of abnormalities in the no. and type of chr. in transfer-hybrid and back-transfer embryos is reported and discussed. J.W.S.Harris

NUCLEAR AND CELL DIVISION

6802. CYTOLOGY AND KINETICS OF SPERMATOGENESIS IN RABBIT. E.E.Swierstra and R.HiFoote: *J. Reprod. Fertil.*, 1963, 5, 309-324 (Dept. Animal Husbandry, Cornell Univ., Ithaca, N.Y., U.S.A.) The development of the seminiferous epithelial cells was divided into 8 stages on the basis of the shape of the spermatid nucleus, the location of the spermatids and spermatozoa in relation to the basement membrane, the presence of meiotic figures and the release of spermatozoa from the lumen. These 8 stages were present as 27 • 7, 13*4, 7-3, 11-0, 4*1, 15-7, 12-2 and 8*6% of the cell population. It was estimated that only 3*1 spermatids were produced from each primary spermatocyte, suggesting considerable degeneration of spermatogenic cells during the 2 maturation divisions. H-E.HJones

6803. MEIOTIC PARTHENOGENESIS AND HETEROCHROMATINISATION IN A SOFT SCALE, PULVINARIACOCCOIDAE(HOMOPTERA). U.Nur. *Chromosoma*, Berlin, 1963, 14, 123-139 (Genet. Dept., Univ. California, Berkeley, Calif., U.S.A.) Meiotic parthenogenesis of a type not previously described was found. After meiosis the egg pronucleus divides and the 2 haploid products fuse to restore the diploid chr. no. Some of the embryos possessed a heterochromatic chr. set, characteristic of cf, which were apparently produced parthenogenetically.

G. A. Henderson

6804. TRIVALENT FORMATION IN MULTIPLE TRISOMICS OF CLARKIA UNGUICULATA. F.OVasek: *Amer. J. Bot.*, 1963, 50, 244-247 (Piv- Life Sci., Univ. California, Riverside, Calif., U.S.A.) A series of multiple trisomics, ranging from $2n+1$ to $2n+7$, was scored for univalents and trivalents at 1st metaphase. The mean no. of trivalents/cell/extrachr. was calc. The trivalent freq. fell into 2 classes, indicating that the cytol. differences between triploids and single trisomics may be based on a threshold effect. A comparison with data from other genera suggested that the observed increase in trivalent formation/extrachr. may be associated with an increase in chiasma freq. T-H.Thomas

6805. MITOTIC RATE OF SPONTAOTOUS MAMMARY GLAND'ADENOCARCINOMA IN C³ " / " * ^ ^ F.D-Bertalanffy: Nature. Lond., 1963, 198, 496-497 (Dept: Anat.. Univ. Manitoba, WMW*^ Canada) Using a colchicine technique, the doubling time was found to be 8'5 JJays. G.M.Lewis

6806. KINETICS OF EPIDERMAL CELL POPULATION OF THE HAIRLESS MOUSE- A.Skjaegg^{tad}: Acta path.

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activity of the epidermis during the following 10 days
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strong support to previous calcn-which were based on studies of mitotic counts and mitotic rates^{J. Friedmann}

6807. 14C- AND 3H-THYMIDINE DOUBLE[^] LABELLING TECHNIQUE IN STUDY^{i ^ 1 * S} RATION IN RADESCANTIA^{if J. E.W. Ser and Quastler Exp. J} 1963, 30, 8-22 (Biol. Dept. Brook Nat. Lab., Upton, N.Y., U.S.A.) A technique using both [14C]- and [3H]thymidine for determining the duration of the nuclear cycle and its subdivision is described. The normal nuclear cycle was estimated by this method in T. paludosa root-tips. The cycle at 21° was G₁, 1 hr.; M, 3 hr.; S, 10⁵ hr.; a total of 17 hr. General applications of this technique are also discussed. K.Jones

6808. MITOTIC ACTIVITY AND RESPIRATION IN THE EXCISED PEA ROOT MERISTEM. P.A.Van Dreal and G.B.Wilson: Caryologia, 1962, 15, 421-433 (Dept. Bot., Michigan State Univ., East Lansing, Mich., U.S.A.) Various carbon sources were compared with glucose for mitotic activity and O₂ uptake. The effects of S_{MS}_{SS}_S : inhibitors and of using [1-14C]-glucose were also studied. Results require a certain amount to indicate that the mensteliⁱ takes place. J.L.Batten level of O₂ uptake before M * " " 0.8" of mitosis does not affect O₂ uptake.

6809. OBSERVATIONS ON CELL GROWTH, MITOSIS, S BASIDIOPOLUS RANARUM. 1963, 17, 123-152 (Dept.

Bacteriol., Univ. W. Ontario, London, Ont., Canada) Phase contrast studies of cells grown in agar medium in Petri dish and slide cultures were correlated with sections of fixed, stained cultures. Mitosis of this single-nucleus

a temporary cytoplasm and a cell wall. The decrease in the growth rate of the cell is formed from a large no. of small chr. are present. Thus ungnⁱ physiol. observations on the cell duplication cycle and meⁱ gy of mitosis.

6810. CORRELATED LIGHT AND E-M-STUDY^E NUGLEOLAR MATERIAL[^] J. S. S. I. Vicia faba and Anat.. Pathol. and Anat.. Quebec, Canada, 1963: J-cell for root-tips were O for light microscopy. The structurally distinct com-

ponents consisting of fibrils of 60-100 Å diam., and 150Å granules which persist during prophase and disperse throughout the nucleolar cavity at nucleolar disintegration forming a spindle after nuclear membrane disruption. The next nucleolus appears to be derived from a fibrillar-granular material which collects in the interchromosomal spaces during early and mid telophase. P. Barrow

6811. OBSERVATIONS ON DICENTRICS IN LIVING CELLS. A.Bajen Chromosoma. Berlin, 1963, 14, 18-30 (Plant Physiol. Lab., Jagellonian Univ., Cracow, Poland) Using time-lapse cinematography the anaphase behaviour of dicentric chr. and chromatids was followed in irradiated endosperm cells of Haemanthus katherina. Interlocking dicentrics can break through one another and rejoin almost immediately. Inactivation of one of the two centromeres may also take place.

S.A.Henderson

6812. INDUCTION OF TRIPLOIDY BY HYDROSTATIC PRESSURE IN THE LEOPARD FROG, RANA PIPIENS.

S.Dasgupta: J. exp. Zool., 1962, 151, 105-121 (Dept. Zool., Univ. Indiana, Bloomington, Ind., U.S.A.) Triploid embryos can be produced by subjecting eggs of R.pipiens to hydrostatic pressure of 5000 lb./in² for 6 min. The highest freq. of triploidy occurring when pressure was applied 5 min. after die eggs had been inseminated at 21° when in the metaphase stage of the second meiotic division. 85% of the embryos which developed normally were triploids. Anaphase movements were inhib. in eggs shocked in the metaphase. It is suggested that the metaphase spindle is highly susceptible to hydrostatic pressure. Sensitivity to hydrostatic pressure decreases as anaphase movements ^{?re} in progress. R.J.Walker

EFFECTS OF RADIATION AND CHEMICAL AGENTS

6813. EFFECTS OF IONISING RADIATION ON THE APICAL MERISTEM CELLS OF AVENA STERILIS (2n = 42). G.Martinoli and L.Bagnoli: Caryologia, 1962, 15, 327-333 (Inst. Bot., Univ. Pisa, Italy)

In root-tips treated with X-ray doses varying from 100 to 500 r, several aberrations were found, in particular, damages in spindle formation, chr. bridges, lagging chr., ring chr. and stickiness. (Italian) J.L.Batten

6814. QUIESCENT CENTRE IN ROOT MERISTEMS OF VICIA FABA AND ITS BEHAVIOUR AFTER ACUTE X-IRRADIATION AND CHRONIC Y-IRRADIATION.

F.A.L-Clowes and E.J.Halb Radiat. Bot., 1963, 3, 45-53 (Bot. Sch., Univ. Oxford, England) After acute X-irradiation using a dose of 360 rad. the rate of mitosis in the quiescent centre reached a max. value after it had reached a min. value in the surrounding meristematic cells. The effect of 14 days of continuous irradiation using a 60co source at 2.28 rad/hr. was similar to that of the acute dose. J.R.Broome

6815. RADIOPROTECTIVE EFFECT OF CYSTEINE, AET [S,2-AMINOETHYLISOTHIOURONIUM BROMIDE HYDROBROMIDE] AND CYSTAMINE ON CHROMOSOME DAMAGE IN ALLIUM CEPA ROOT TIPS.

H.Dalen and R.Oftebroc Radiat. Bot., 1963, 3, 59-65 (Norsk Hydro's Inst. Cancer Res., Oslo, Norway)

The temporary depression of mitotic activity produced by

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X-irradiation with 150, 300 and 600 r was measured by the no. of anaphases per root-tip. Pretreatment with 5×10^{-6} M cysteine led to a reduction of 53% in chr. damage, 5×10^{-6} M AET to a reduction of 35%. $2 \times 5 \times 10^{-6}$ M cystamine was inactive. J.R.Broome

6816. CHROMOSOME STUDY OF RADIATION SENSITISATION BY 5-BROMODEOXYURIDINE. C.E.Somers and R.M.Humphrey: *Exp. Cell Res.*, 1963, 30, 208-217 (Sect. Cytol., Univ. Tuxas M.D.Anderson Hosp., Houston, Tex., U.S.A.) Max. radiation sensitivity of bromodeoxyuridine [BUDR]-treated and untreated cell populations was found in metaphase cells sampled at the first mitosis following irradiation as studied using mammalian cells grown in vitro. A non-random distribution of chromatid breaks was found in chr. no. 1 of Chinese hamster cells treated with BUDR prior to irradiation. A cell-line, derived from strain L of the mouse, resistant to BUDR did not show max. radiosensitivity. K.Jones

6817. PRODUCTION OF CHROMATID ABERRATIONS BY 5-FLUORODEOXYURIDINE [FUDR] ALONE AND IN COMBINATION WITH X-RAYS AND 8-ETHOXYSACCAFEINE. B-A.Kihlman: *Caryologia*, 1962, 15, 261-277 (Inst. Physiol. Bot., Univ. Uppsala, Sweden)

Cell divisions, with aberrations of gaps and chromatid breaks, appeared in lat. root tips of *Vicia faba* about 3 hr. after immersion of roots in soln. of FUDR in concn. of 0.5M or higher FUDR concn. which produced chr. breakage also inhib. mitosis. The effects of temp., pH and post-treatments with thymidine or J¹⁴romodeoxyuridine were studied. When X-irradiation "rjs combined with FUDR treatment, aberrations increased, ^>ut when 8-ethoxysaccafeine was combined aberrations were reduced. J.L.Batten

6818. RADIOMIMETIC EFFECTS OF NITROGEN MUSTARD ON MULTIPLICATION OF GUINEA-PIG CELL STRAIN. L.Spanio and A.G.Lewis: *Caryologia*, 1962, 15, 551-568 (Inst. Zool. e Anat. Comp., Univ. Padova, Italy) Growth curves give evidence of the inhibn. of cell multiplication which increases with increasing doses until inhibn. is complete. These results are confirmed by a drop in the mitotic index observed in similarly treated cultures. Nuclear damage and giant cell formation which follow treatment were studied. The effects of treatment are compared with those produced by X-irradiation. (Italian) J.L.Batten

6819. CHROMOSOME BREAKAGE IN Vicia faba BY LASIOCARPINE AND MONOCROTALINE. S.Avanzi: *Caryologia*, 1962, 15, 351-356 (Comitato nazionale Energia Nucleare, Roma, Italy) There are no differences in chr. breaking activity between lasiocarpine and monocrotaline-treated lat. root-tips. *V. faba* is more sensitive than *Allium cepa* to the cytol. effect of monocrotaline. The radiomimetic effect of monocrotaline is temp. dependent. J.L.Batten

6820. EFFECT OF COBALT, NICKEL AND IRON ON MITOSIS IN THE ROOTS OF THE BROAD BEAN (Vicia faba). L.Komczynski, H.Nowak and L.Rejniatek: *Nature*, Lond., 1963, 198, 1016-1017 (Dept. Pathol. Anat., Bialystok Med. Acad., Bialystok, Poland) Roots were exposed to soln. of salts of Fe, Co and Ni at concn. 0.1-0.0001%. Fe, at 0.1 and 0.01% caused some inhibn. of growth. Co and Ni stim. growth,

producing pathol. changes in the cell nuclei and causing disturbances in cell division. G.M.Lewis

6821. GERMINABILITY, SEEDLING GROWTH AND FREQUENCY OF CHROMOSOMAL ABERRATIONS IN RELATION TO SEED AGE IN WHEATS. V.N.Ronchi and G.Martini: *Caryologia*, 1962, 15, 293-302 (Inst. Genet., Univ. Pisa, Italy) Germination tests were carried out on *Triticum vulgare* seeds and aberrant anaphases in seedling root-tips were recorded. The freq. of chr. structural changes increases, and seed germinability decreases, with age and observations suggest that a chern. mutagen is responsible. (Italian) J.L. Batten

6822. THE EFFECTS OF WATER-IMMERSION ON THE MEIOTIC DIVISION AND CHROMOSOMES IN TRILLIUM KAMTSCHATICUM. R.Ohno and S.Takehisa: *Bot. Mag. Tokyo*, 1963, 75, 28-31 (Bot. Inst., Hokkaido Univ., Sapporo, Japan) The effects of immersing flower buds in the meiotic late-prophase or metaphase I in tap water at different temp., for varying periods were examined. During immersion meiosis did not proceed, but afterwards the first meiotic division was slower than in the controls. At 25° the immersion also resulted in an increase in the aberrations in telophase I* (Japanese, English summary) N.J.Pinfield

6823. LOCALISATION OF NUCLEI IN BLASTOMERES OF THE EGG OF ARTEMIA SALINA. EFFECT OF 0-MERCAPTOETHANOL [ME] AND DITHIODIGLYCOL [DG] ON THIS LOCALISATION. J.Fautrez and N.Fautrez-Firlefyn: *Develop. Biol.*, 1963, 6, 250-261 (Lab. Anat. Humaine et. Comp., Univ. Gand, Belgium) Both substances blocked mitosis during segmentation. ME produced a diminution in the degree of adhesion between blastomeres, an increase in perinuclear plasm and, after prolonged treatment a migration of nuclei towards the external surface. DG also increased perinuclear plasm but separation of blastomeres was incomplete and the nuclei remained close together. (French) J.W.S.Harris

6824. NUCLEOLAR 'CAPS' - A MORPHOLOGIC ENTITY PRODUCED BY THE CARCINOGEN 4-NITROQUINOLINE N-OXIDE. R.C.Reynolds, P.O'B.Montgomery and D.H.Karney: *Cancer Res.*, 1963, 23, 535-538 (Dept. Pathol., Univ. Texas S.W.Med. Sch., Dallas, Tex., U.S.A.) Histol. stains, E.M. and time lapse motion pictures of phase contrast microscopic images of living cells showed that in Chang liver cells the carcinogen produced a progressive decrease in nucleolar size, fusion of nucleoli and separation of the pars amorphata and the nucleoloneme to produce 2 types of nucleolar 'caps'. B.M.Stevens

6825. EFFECT OF TERRAMYCIN ON THE FINE STRUCTURE OF HeLa CELL MITOCHONDRIA. L.J.Journey and M.N.Goldstein: *Cancer Res.*, 1963, 23, 551-554 (Dept. Expt. Biol., Roswell Park Mem. Inst., Buffalo, N.Y., U.S.A.) Bright field and fluorescent microscopy showed that terramycin added to culture media was rapidly and sp. bound to mitochondria. At low concn. no morphol. changes were noted, but at 100 μ g/ml. or higher concn. mitochondria became distended and rounded up. E.M. indicated vacuolation, compression of the cristae and reduplication of mitochondrial membranes. With 300 μ g/ml. no normal mitochondria were found and other cytoplasmic elements degenerated. 1000 μ g/ml. was lethal for all cells. B.M.Stevens

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6826. STRUCTURE AND FUNCTION OF SEX CHROMOSOMES IN MAN. M-D-Hayward: *Cytologia*, 1962, 27, 30-42 (Dept. Genet., Univ. Birmingham, England) A review of various sex-determining systems is presented with special ref. to man, which falls closer to the Melandrium-type than to the *Drosophila*-type. Ref. is made to studies of genotypes with abnormal complements of sex chr. and to intersex and other unusual phenotypes. Studies on the cytomorphology of the X and Y chr. are described, and the extent of differential and pairing segments and the possibility of the occurrence of crossing-over between them. J.R.A. Stace

6827. PR OR LONG ARM O FAMILIES. J.Lindsten, M.Fraccaro, D.Bekos, K.KtaJ, H.P. Klinger and R.Lufe Ann. hum. Genet., 1963, 26, 383-405 (Dept. Endocrin- and Metabolic Karolinska Hosp., Stockholm, Sweden) A cyt. study of 5 human showed iso-chr. for the long arm of f^* & f^{**} . The phenotypes and karyotypes are described. Tte origin of the iso-chr. may be meiotic and paternal. One family provides evidence that the loci of the Xg blood group system and the green colour blindness are located on the short arm of the X chr. J.L.Batten

6828. A LONG Y CHROMOSOME IN MAN. S.Makino, M.Sasaki, K.Sada and T-Kajii: *Chromosoma*, Berlin, 1963, 14, 154-161 (Zool. Dept., Hokkaido Univ., Sapporo, Japan) An unusually long Y chr. was found in individuals and was not always associated with an abnormal phenotype. A.H. Henderson

6829. 45/XOTURNER'S SYNDROME IN THE NEWBORN: REPORT OF TWO CASES. J. clin. Endocr., 1963, Children, Toronto, Canada) Tissue obtained post mortem showed the 45/XO chr. pattern in the bone. S.A. Henderson

6830. NUCLEAR SBC OF EMBRYONIC OTIS.

...mal sex chr. complements. ?<>; X^{O} & X^{T} & X^{F} & X^{M} produced by errors of mitosis at or soon after Nutt inception of the tumour.

***31. TRANSL(X:ATCN AND TRISOMIC MONGOL** Ann.

umv. co.Ji., Lonaon, ... f owed that the elder of ... nongol of the trar Ration and that the younger was a i the translocation standard trisomic type. E-M- * > > < > - hr. to have an unusual centromere structure. B.U.Littm

***32. SPONTANEOUS TRANSLOCATION IN CELLS.** J. Genet., 1963, 26,

London, England) the mother of

Fibroblast tissue cultures were made J. Ellis and observed in

the 2 Penrose one ceU line which rflay throw some light on

described by Delhanty and Shapiro (1962) and by Gustavson et al. (1962)- J.L.Batten

6833. ANALYSIS OF CHROMOSOME PATTERNS IN ABNORMAL CELL. D.E.Barton and F.N.David: Ann. hum. Genet., 1963, 26, 347-348 (Univ. Coll., London, England) A mathematical analysis of chr. patterns in human cells not containing 23 pairs is given. The criteria described, in which the distances apart of homologous chr. pairs observed in different mitotic figures are standardised by a function of distances between all pairs, are suggested as appropriate for testing the hypothesis of the randomness of position of the two chr. of the homologous pair with respect to each other. J.L.Batten

6834. NUMERICAL ANALYSIS OF CHROMOSOME PATTERNS. D.E.Barton, F.N.David and M.Merrington: Ann. hum. Genet., 1963, 26, 349-353 (Univ. Coll., London, England) Barton and David's methods for analysis of chr. patterns of human cells were applied to photographs of different cells in mitosis. The results showed that elements of homologous pairs for abnormal cells and normal o* cells could be randomly arranged with respect to one another, whereas those for V cells are probably not, and that those in the cf cell may be more variable in their distance apart than those in the Y cell. J.L. Batten

6835. CHROMOSOMAL STUDY IN PATIENTS WITH CYSTS OF THE JAW, MULTIPLE NEVOID BASAL CELL CARCINOMATA AND BIFID RIB SYNDROME. J.J.Yunis and R.J.Gorlin: *Chromosoma*, Berlin, 1963, 14, 146-153 (Univ. Minnesota Hosp., Minneapolis, Minn., U.&ft.) In a patient with multiple abnormalities ifSe arm of chr. no. 1 was unusually long in an otherwise normal complement. However, four close relatives also showed this chr. anomaly with no manifestation of the syndrome. S.A.Henderson

6836. CHROMOSOMES IN NORMAL, PRENEOPLASTIC AND NEOPLASTIC TISSUES OF THE MAMMARY GLANDS OF C3H/Crgl FEMALE MICE. M.R.Banerjee and K.B.DeOme: *Cancer Res.*, 1963, 23, 546-550 (Dept. Zool., Univ. California, Berkeley, Calif., U.S.A.) Normal mammary lobules, precancerous primary hyperplastic alveolar nodules, nodule outgrowths under various transplanted conditions and mammary tumours produced by these outgrowths were mostly diploid, with no detectable structural aberrations. Occasionally aneuploid modal chr. no. were observed in nodule outgrowths and tumours derived therefrom. No correlation of outgrowths and their tumours with regard to aneuploid chr. pattern was found. B.M.Stevens

6837. MAMMALIAN CHROMOSOMES IN VITRO. ON MARKER CHROMOSOMES AND CHROMOSOMAL POLYMORPHISM OF STRAIN L-P59. G.K.Manna: *Cytologia*, 1962, 27, 43-48 (Dept. Zool., Univ. Kalyani, W. Bengal, India) Almost every cell of this strain of mouse tissue had a different karyotype, characterised by the presence or absence of various dicentrics and other markers. The chr. no. varied from 57 to 71- CA.Stace

6838. GYNOGENETIC DIPLOIDS OF MUTANT LEOPARD FROGS. E.P.Volpe and S.Dasgupta: *J. exp. Zool.*, 1962, 151, 287-301 (Dept. Zool., Newcomb Coll., Tulane Univ., New Orleans, La., U.S.A.) Gynogenetic diploid leopard frogs w're obtained by activating eggs of *Rana pipiens* with sperm from *Scaphiopus holbrookii*.

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then subjecting the activated eggs to heat shock. The heat treatment inhibits the second meiotic division while the foreign sperm do not participate in the developmental process. These diploid embryos appear normal during gastrulation and neurulation. Following tailbud formation, abnormalities range from severe retardation in growth and conspicuous defects to those with no obvious defects. None the less, the majority perish. Of the 17 which successfully metarrophosed, 11 were S and 6 were Δ . The metamorphosed gynogenetic diploids display spotting patterns which indicate that chromatid exchange occurred between the major burnsi locus and the centromere. Since the freq. of chromatid exchange is great, it is concluded that the burnsi locus is far removed from the centromere.

R. J. Walker

6839. THE SALIVARY GLAND CHROMOSOMES OF DROSOPHILA HYDEI STURTEVANT. H.D.Berendes: Chromosoma, Berlin, 1963, 14, 195-206 (Genet. Lab., Univ- Leiden, Netherlands) A cytol. map of the salivary gland chr. is presented together with other cytol. observations, which include the description of 3 X-ray-induced rearrangements. Two of the linkage groups are attributed to definite chr. S. A. Henderson

6840. ALTERNATION OF GENERATIONS IN A COCOLITHOPHORID, CRICOSPHAERA CARTERAE (BRAARUD AND FAGERL) BRAARUD. D.G.Rayns: J. mar. biol. Ass. U.K., 1962, 42, 481-484 (Lab., Citadel Hill, Plymouth, England) Nuclear division is similar to that found in higher plants. There is a chromosomal alternation of generations correspond! to the morphol. alternation. The motile phase is $2n = 2^2 - ^2$, the non-motile phase $n = 21 \pm 1$. Sfc P.J. Baron

6841. CYTOGENETICS OF THE GRASSHOPPER MORABA SCURRA. Vm. A COMPLEX SPONTANEOUS TRANSLOCATION. M.J.D.White: Chromosoma, Berlin, 1963, 14, 140-145 (Zool. Dept., Univ. Melbourne, Australia) One individual was heterozygous for a complex translocation involving breaks in 4 different non-homologous chr. S.A.Henderson

6842. KARYOTYPE STUDIES IN TWO CYPRINIDS. R.P.Nayyan Cytologia, 1962, 27, 229-231 (Dept. Zool., Univ. Delhi, India) The 2 fishes Labeo gnnus and L. dero both had $2n = 54$ and $n = 27$, all the chr. being rod-like acrocentrics. As in other groups the chr. evolution in Cyprinids can be explained by fusion of some chr. to form V-chr., which accounts for such karyotypes as $2n = 50$ (46 rods +4Vs) which are known in other genera. C.A.Stace

6843. STUDIES OF MEIOSIS IN ORYZA SPECIES, WITH SPECIAL REFERENCE TO SECONDARY ASSOCIATION. Chao-Hwa HIB Cytologia, 1962, 27, 285-295 (Coll. Agric, Chung-Hsing Univ., Taichung, Taiwan) Nine Oryza taxa (8 diploid, 1 allotetraploid) were studied with respect to secondary association of the meiotic bivalents, of which there are 12 in the diploids. Bivalents were single, paired or in threes, but in all 8 diploids the max. association was 3 pairs plus 2 triplets, and the configuration of the tetraploid could be explained on the same basis. This is thought to indicate ancestral polyploidy in the diploid members of Oryza. C.A.Stace

6844. OBSERVATIONS ON SOMATIC AND MEIOTIC CHROMOSOMES OF ORYZA SPECIES. J.Bouharmon C Cytologia, 1962, 27, 258-275 (Inst. Carnoy, Louvain,

Belgium) Chr. no. of 10 spp. of Oryza agreed with previous counts of the genus in having $2n = 24$ or 48*. Meiosis is regular in the diploid spp. and, although some secondary association of bivalents was seen, it was considered that sufficient evidence of a basic chr. no. under 12 was absent. The tetraploids appeared to be allopolyploids since only 0-4 quadrivalents appeared. In diploids there are 2 pairs of nucleolar chr., and the single nucleolus divides by budding in pachytene. C.A.Stace

6845. NATURAL HYBRIDIZATION BETWEEN AEGILOPS SHARONENSIS AND A. LONGISSIMA: MORPHOLOGIC AND CYTOLOGICAL STUDY. H-Ankori and D.Zohar) Cytologia, 1962, 27, 314-324 (Dept. Bot., Hebrew Univ., Jerusalem, Israel) Anderson hybrid indices and pictorial scatter diagrams demonstrated the presence of hybrid swarms between A. sharicensis and A. longissima only in areas of disturbed ground, where introgression occurred. The 2 spp. differ by a reciprocal translocation and the identification of hybrids by the presence of translocation heterozygotes agreed with that by morphol. methods. Artificial F₁ and F₂ hybrids resembled the wild hybrids. C. A.Stad

6846. VARIABILITY IN LENGTH AND ARM RATIO OF PACHYTENE CHROMOSOMES OF CORN. M.P.Maguire Cytologia, 1962, 27, 248-257 (Genet. Fndn-, Univ. Texas, Austin, Tex., U.S.A.) The arm lengths of all chr. of 271 pachytene microsporocytes were measured in 31 related Zea plants which contained varying amount of Tripsacum chr. material due to ancestral hybridisation Results indicated that variability of arm length and arm ratio was due both to a const. variability per unit length of arm and to a characteristic variability of each chr. regardless of length. The presence of Tripsacum chr. material did not alter the variability pattern of the genome. C.A.Stace

6847. CHROMOSOME NUMBERS IN ONCIDIUM ALLIANCE. Y.Sinota Cytologia, 1962, 27, 306-313 (Dept. Biol., International Christian Univ., Mitaka, Tokyo, Japan) Somatic chr. no. in 15 genera and 1* hybrids of 14 genus combinations of this group of orchids were determined, involving about 140 taxa. About 24 different no. were found, in addition to the hybrid no. which were usually averages of those of the 2 parents. Most of the no. could be explained on the basic no. 5 an' 7. Some karyotypes were analysed. C.A.Stace

6848. STUDIES ON SUPERNUMARY CHROMOSOMES IN THE GENUS DACTYLIS. S.S.Shalu Chromosoma, Berlin, 1963, 14, 162-185 (Genet. Dept., Univ. California, Davis, Calif., U.S.A.) Some population of D. glomerata (subsp. lusitanica) possessed supernumerary chr. These were relatively small, somatically stable, heterochromatic and submetacentric. At meiosis they commonly formed bivalents and multivalents. One individual was asynaptic. Data on supernumerary chiasma freq., and their effect on morphol. characters and pollen fertility were examined. S. A. Henderson

6849. EVIDENCE OF RELATIONSHIP BETWEEN EXTRA DIMINUTIVE CHROMOSOMES IN GEOGRAPHICALLY REMOTE RACES OF OENOTHERA. R.E.Cleland and B.B.Hyde: Amer. J. Bot., 1963, 50, 179-185 (Dept. Bot., Univ. Indiana, Bloomington, Ind., U.S.A.) Extra diminutive chr. found in 2 Calif. races of (VhoookgJ are able to synapse with each other and to form ch israt This suggests a partial homology and that they arise from

CYTOLOGY

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a common source. Two alternate hypotheses for their origin are suggested.

T.H. Thomas

6850. CYTOTAXONOMY OF CIRSIUM MUTICUM, CIRSIUM DISCOLOR AND CIRSIUM ALTISSIMUM. JyFrankton and R.J.Moore: Canad. J. Bot., 1963, 41, 13-84 (Plant Res. Inst., Canada Dept. of Agric., Ottawa, Canada) The morphol. and cytol. evolution of C. muticum, C. discolor (both $2n = 20$) and C. altissimum ($2n = 18$) is discussed. Extra chr., possibly to be considered as accessories, were found in C. muticum and C. discolor. A.Meany

6851. CYTOTAXONOMIC STUDIES ON TWO CULTIVATED SPECIES AND WILD RELATIVES IN GENUS ECHINOCHLOA. T.Yabuna: Cytologia, 1962, 27, 296-305 (Coll. Agric., Univ. Osaka Prefecture, ^{SA-1st Japan}) Four strains of wild E. crus-galli 2 of E. colona arri 5 of cultivated plants E. frumentacea. [^] U had regular meiosis with 27 bivalents. F1 hybrids between E. crus-galli and Indian cultivated E. frumentacea and between E. crus-galli and Sino-Japanese cultivated E. crus-galli had irregular meiosis with 27 bivalents; all [^] combinations (including Indian x Sino-Japanese E. frumentacea) had irregular meiosis. It is concluded that Indian E. frumentacea has been derived from E. colona, and Sino-Japanese E. frumentacea (which is renamed E. utilis) from E. crus-galli. CA.Stace

6851* TKE GENUS COLLINSIA. XIX. NEW GENOMES FROM TWO FERTILE INTERSPECIFIC HYBRIDS. I.S.Dhillon and E.D.Campbell: Cytologia, 1962, 27, 181-197 (Dept. Bot., Univ. Hong Kong) The fertile hybr. [^] C. mids C. corymbosa x C. tinctoria and C. corymbosa x gave [^] C. corymbosa x [^] C. tinctoria interchange complex of six chr. F2 and F3 individuals with bivalents. Two lines of the former hybrid had a new genome like that of C. multicolor, one of the latter with a new genome like [^] C. heteropteris. and the others or the latter had a genome resembling that of either of the parents. More [^] these new lines behaved the same in crosses with Parental or non-parental spp. as did the spp. whose genomes they resembled. The origin of the new lines is unknown, but their significance is discussed.

CA.Stace

8053 CYTOGENETICAL STUDIES IN GENUS CITRUS. V. EVOLUTION IN GENUS CITRUS. S.S.Raghuvanshi: Cytologia, 1962, 27, 172-188 (Dept. Bot., Lucknow Univ., India) 25 taxa of Citrus ($2n = 18$) were studied. Abnormalities such as anaphase bridges (inversion), multivalents (translocations), univalents, double pollen restitution nuclei, polyploidy and binucleate pollen mother cells were found, and these, although often [^] present in some parts of the plants are important because commercial propagation is mostly effected. Setatively, the cur. aberrations, as well as hybridity [^] Sene mutations, are thus more important than polypliody in Citrus evolution, although the former would not normally persist. Nucellar embryony is also important.

CA.Stace

68- CHROMOSOMES OF SOME SPECIES OF AGAPANTHUS. H.P.Riley and D.Mukerjee: Cytologia, 1962, 27, 325-332 (Dept. Bot., Univ. Kentucky, Lexington, U.S.A.) Karyotypes of 7 taxa of Agapanthus ($2n = 29$, 30 or 32) are fully described. Two extra and 2 supernumerary chr.

CA.Stace

6855. CYTOLOGICAL STUDY OF INDUCED APOSPORY IN FERNS. C.Takahashi: Cytologia, 1962, 27, 79-96

(Biol. Lab., Nagoya Univ., Japan) Apospory was induced in Pteridium by culturing detached early leaves of young sporophytes. Very clearly defined diploid prothallial outgrowths appeared from all parts. These gave rise, by syngamy, to tetraploid sporophytes, apogamy not occurring. From these, tetraploid prothalli could be obtained by induced apospory, although these have only (/sex organs. The differences between haploid and diploid prothalli are numerous only at the cellular level, but tetraploid sporophytes differed from diploid ones in many macroscopic as well as microscopic features. These differences are described and discussed.

6856. NUCLEAR CYTOLOGY OF SPAEROLEA ANNULINA AND ITS BEARING ON THE SYSTEMATIC POSITION OF SPAEROLEA. Y-S-R-K.Sarma: Cytologia, 1962, 27, 72-78 (Dept. Bot., Banaras Hindu Univ., Varanasi, India) Mitosis was followed in S. annulina var. annulina and var. crassisepta, and the chr. no. found to be 16. One or 2 satellite chr. are present. Gamete formation does not appear to be preceded by meiosis. Cytol. evidence suggests that this genus is closest to the Ulotrichales. CA.Stace

TECHNIQUES

6857- NEW APPARATUS, VIVOTOME, TO OBTAIN THIN SECTIONS FROM FRESH MATERIALS. S.Taraa: Cytologia, 1962, 27, 25-29 (Biol. Sect., Tokyo Woman's Christian Coll., Suginami, Tokyo, Japan) A simple microtome using glass blades is described by which thin sections of living animal tissue may be obtained.

CA.Stace

6858. ESTIMATION OF NUCLEAR RATIOS DIRECTLY FROM HETEROKARYOTIC MYCELIA ON SCHIZOPHYLLUM. P.J.Snider: Amer. J. Bot., 1963, 50, 255-262 (Dept. Bot., Univ. California, Berkeley, Calif., U.S.A.) The principles used to analyse nuclear ratios with macerated mycelia are similar in part to those of classic methods utilising spore suspensions, but some distinctive features are evident in this method. It is simple and probably suitable for the simult. comparison of ratios in mycelium and spores. The technique was combined with others to devise a test suggesting whether random or non-random spacial distributions of nuclei exist in heterokaryons with disparate ratios. Numerous applications in fungi seems probable.

T.H.Thomas

6859. CONSIDERATIONS OF SOME BIOLOGICAL FACTORS OF ANOMALIES WHICH ARISE FROM CYTOPHOTOMETRIC DATA. G.Gerzefc¹: Caryologia, 1962, 15, 507-514 (Inst. Anat. Comp., Univ. Pavia, Italy) Iversen's method for analysis of cytophotometric data of Feulgen-stained nuclei yields evidence of some anomalies of nuclear behaviour. The sum of biol. factors involved is Analysed and this supports the value of cytophotometric measurements. (Italian) J.L. Batten

CYTOTOLOGY

8860. PROTEIN DROPLETS, ESPECIALLY GELATIN, HAEMOGLOBIN AND HISTONE, AS MICROSCOPIC STANDARDS FOR QUANTITATION OF CYTOCHEMICAL REACTIONS. J.W.Kelly and L.Carlson: *Exp. Cell Res.*, 1963, 30, 106-124 (Inst. Med- CellRes., Karolinska Inst., Stockholm, Sweden) Two methods for marking microscopic protein droplets using small transfer rods or emul-

sions, and a method based on protein films were studied*. Protein models were studied by X-ray absorption, interference and microspectrophotometry, and excellent dye-binding curves were obtained in gelatin, Hb and histone*. No significant observations were made to indicate that protein models would not be suitable standards for quant, studies of cytochem. reactions. vjones

MICRO-ORGANISMS

6861. LOCALISATION OF P2 PROPHAGE IN TWO STRAINS OF E. COLI B.Kelly: Virology, 1963, 19, 32-39 (Microbiol. Genet. Dept., Karolinska Inst., Stockholm, Sweden) In K-12 strains, prophage P2 may occupy at least 2 different locations but does not show the strong location preference that it shows in C strains. One of the prophage locations in K-12 appears to be allelic with location H in *E. coli* C. No prophage location in K-12 allelic with the preferred location in C has been detected. J.G.Bennette

6862. AFFINITY OF P2 rd 1 FOR PROPHAGE SITES ON CHROMOSOME OF E. COLI STRAIN C E.Six: Virology, 1963, 19, 375-387 (Microbiol. Dept., Iowa State Univ., Iowa City, Iowa, U.S.A.) Evidence is presented that there is a difference in the lysogenisation pattern of P2 rd 1 phages depending on the lysogenic donor strain used as source of the phage. P2 rd 1 from donor C (P2 rd 1) has a strong preference for establishing as prophage at site I of recipient cells; P2 E₁ from donor C (P2 rd 1) shows neither this preference for site I nor a comparable preference for site II.

J.G.Bennette

6863. MAPPING OF GALACTOSE GENES OF E. COLI BY TRANSDUCTION WITH PHAGE PI J.Adler and A.D.Kaiser: Virology, 1963, 19, 117-126 (Biochem. Dept., Wisconsin Univ., Madison, Wis., U.S.A.) The order of 15 galactose-neg. mutants of *J^coL* has been studied by means of 3-point crosses carried out with transduction by PI phage. Prophage 82 was used as a closely linked marker. The galactose-neg. mutants are jointly transduced with prophage 82 by PI so that their linkage to each other and to prophage 82 is confirmed. A recombinant between the phages 82 and 1 has been prep. and characterised. This phage, called 82 hybrid, has the immunity specificity of 82 but the host range of 1. J.G.Bennette

6864. MUTANTS OF PHAGE T4 WITH INCREASED SENSITIVITY TO ULTRAVIOLET W.Harm: Virology, 1963, 19, 66-71 (Genet. Inst., Cologne Univ., Germany) Expt. on the isolation and u.v. sensitivity of mutants, on genetic crosses, photoreactivation and multiplicity reactivation are described. The mutants were obtained by treatment of phage T4 with nitrous acid. J.G.Bennette

6865. DENSITY MUTANTS OF PHAGE T5 R-Hertel, L-Marchi and K.Mullen: Virology, 1962, 18, 576-581 (Biol. Sci. Div., Purdue Univ., Lafayette, Ind., U.S.A.) Mutational density changes in phage T5 are correlated with changes in temp., sensitivity. Genetic recombination occurs between density markers and a plaque-type marker, but not between pairs of density mutants. No phenotypic fixing of density characters has been found. J.G.Bennette

6866. EFFECTS OF NITROUS ACID ON TRANSDUCTION BY SALMONELLA PHAGE P22 J.Adye: Virology, 1962, 18, 627-632 (Biol. Dept., Johns Hopkins Univ., Baltimore Md., U.S.A.) P22 suspension were treated with HNO₂ and mutations were produced in *Salmonella*. Genetic fragments within free transducing particles. The majority of the 32 histidine mutants produced showed incomplete genetic blocks. Phage inactivation and abortive transductions decreased exponentially with single-hit kinetics during treatment with HNO₂. The no. of com-

plete transductions increased with short HNO₂ treatments and then decreased exponentially. The rate of inactivation of complete transductions was lower when a single-site was used as recipient than when a multi-site mutant was used. HNO₂ treatment caused an exponential decrease in the freq. of joint transduction of 2 histidine markers, the rate of decrease of which being proportional to the map distance separating the 2 markers. From the rates of linkage disruption and the inactivation rates for complete transduction, the 8 linked *Salmonella* histidine genes were estimated as comprising a segment of DNA with a size of about 13000 nucleotide pairs.

J.G.Bennette

6867. EFFECTS OF ULTRAVIOLET LIGHT ON TRANSDUCING PHAGE P22 R.Benzinger and P.E.Hartman: Virology, 1962, 18, 614-626 (Biol. Dept., Johns Hopkins Univ., Baltimore, Md., U.S.A.) Evidence is presented that a single u.v. hit on an abortively transducing element enables it to form a complete transduction, i.e. to undergo recombination with the chr. of recipient bacteria*. During the conversion of abortive transductions to complete ones, jointly transduced markers become less tightly linked. The rate of linkage disruption is proportional to the genetic map distance between linked markers and allows an estimate to be made for the physical size of the histidine (*his*) region of the *Salmonella* chr. A second estimate of the size of this region is obtained from the fact that the rate of inactivation of complete transductions are proportional to die sizes of the genetic defects in the recipients. The coding ratio for the *his* region is about 3 nucleotide pairs per amino acid intie 8 proteins whose structure it controls. J.G.Bennette

6868. REQUIREMENT FOR PROTEIN SYNTHESIS IN TRANSDUCTION H.Reiter and E.P.Goldschmid: Virology, 1962, 18, 633-642 (U.S. Army Chem. Corps, FortDetrick, Frederick, Md., U.S.A.)

Transduction freq. is tenfold higher when infection of *Salmonella typhimurium* LT2 is carried out in a minimal medium plus amino acids than in minimal medium alone. Transductions are lost rapidly in the absence of amino acids*. Methods for preventing this transduction decay are described. Transduction fixation, a second reaction, depends on the presence of amino acids and is inhib. by chloramphenicol. Fixation eliminates the requirement for further nutritional supplementation. Since the establishment of abortive transductions parallels that of complete transductions, it is probable that the amino acid dependent processes occur before the integration of the transducing material into die bacterial genome.

J.G.Bennette

6869. GENETIC RECOMBINATION BETWEEN PHAGES S13 AND (8X174) E.S.Tessman and R.Slesser: Virology, 1963, 19, 239-240 (Biol. Dept., Purdue Univ., West Lafayette, Ind., U.S.A.) Prelim, comm.

J.G.Bennette

6870. MICROBIAL GENETICS: RETROSPECT AND PROSPECT G.Pontecorvo: Proc roy. Soc. B, 1963, 158, 1-23 (Dept. Genet., Univ. Glasgow, Scotland)

A lecture. 72 ref.

G.M.Lewis

PLANT

6871. SOLID STEM: RADIATION INDUCED MUTATION IN TRITICUM DURUM DESF. A.Bozzini and S.Avanzb

GENETICS

Caryologia, 1962, 15, 525-535 (Comitato Naz. Energia Nucleare, Roma, Italy) Data are presented on the inheritance and culm anatomy of a solid stem mutant induced in *T. durum* Capelli by X-irradiation. Cytogenetic information suggests that this neutralised the action of a gene for hollow stem, epistatic, only when homozygous, on one or more genes inducing stem solidness.

J.L. Batten

6872. RADIATION GENETICS IN WHEAT. VIII. THE RELATIVE BIOLOGICAL EFFECTIVENESS [RBE] OF HEAVY PARTICLES FROM 10B (N.d.)⁷Li REACTION FOR CYTOGENETIC EFFECTS IN EINKORN WHEAT. S.Matsumura, S.Kondo and T.Mabuchi: Radiat. Bot., 1963, 3, 29-40 (Nat. Inst. Genet., Misima, Japan)

Wheat seeds were irradiated with a plus ⁷Li recoil nuclei from thermal neutron capture by ¹⁰B. The effects produced by the heavy particles from boron capture were estimated by subtracting the thermal neutron effect on seeds soaked in pure water from those found for seeds soaked in aq. soln. with different concn. of borax and compared with the effects of γ -rays under the same soaking conditions. The RBE values obtained for chr. aberrations in pollen mother cells and for chlorophyll mutations were 23 ± 10 and 29 ± 10 respectively.

J.R.Broome

6873. MUTAGENIC ACTION OF ETHYL METHANE-SULPHONATE IN MAIZE. M.G.Neuffer and G.Ficson Science, 1963, 139, 1296-1297 (Dept. Field Crops, Univ. Missouri, Columbia, Mo., U.S.A.) Pollen of corn plants carrying 3 closely-linked genes (g g Sh2) on chr. 3 were treated by ethyl methanesulphonate. Numerous chr. aberrations were produced with u.v. and X-rays, including some discrete genetic changes.

[^]G.M.Lewis

(3874. ROLE OF THE GENOTYPE IN CONTROLLING ACCUMULATION OF STRONTIUM-89 BY PLANTS. D.C.Rasmussen, L.H.Smith and W.M.Myers: Nature, Lond., 1963, 198, 1008 (Dept. Agronomy, Univ. Minnesota, St. Paul, Minn., U.S.A.) Expt. with 6 varieties of barley and wheat differing in accumulation of 89Sr in the grain indicated that this difference was subject to significant genotypic control as was also accumulation in stems and leaves.

G.M.Lewis

6875. SOLUBLE CARBOHYDRATE CONTENT OF VARIETIES OF TETRAPLOID RYE GRASS. J.W.Dent and D.T.Aldrich: Nature, Lond., 1963, 198, 905 (Nat. Inst. Agric. Bot., Cambridge, England) Sol. carbohydrate content of tetraploid ryegrasses expressed as a % of dry wt. was consistently higher than that of the diploid.

G.M.Lewis

ANIMAL

6876. PROPERTIES OF A SOMATIC HYBRID BETWEEN MOUSE CELLS WITH DIFFERENT GENOTYPES. D.Gershon and L.Sachs: Nature, Lond., 1963, 198, 912-913 (Sect. Genet., Weizmann Inst. Sci., Rehovoth, Israel) A new somatic hybrid is described between strain L cells derived from s.c. tissue of C3H mouse and a polyoma-induced mammary tumour MT1 originating in a SWR mouse; the hybrid had a different karyotype and growth morphology from both parent cells. The hybrid

cells would not grow in C3H or SWR cells, but grew in the Fi hybrid, showing that they contain histocompatibility Ag from both parents.

G.M.Lewis

6877. NEW ALLOTYPIC SPECIFICITY IN THE MOUSE (MuA2). S.Dubiski and B.Cinader: Canad. J. Biochem. 1963, 41, 1311-1315 (Div. Biol., Cancer Inst., Univ. Toronto, Ont., Canada) A new allotypic specificity (MuA2) was obtained by immunisation of mice (BALB/c strain) with serum (from C57BL/6J x C3H/HeN mice) incorporated in Freund's adjuvant or with micro-organism coated with Ab (raised in C57BL/6J x C3H/HeN mice). Allotypic specificity MuA2 was found in C57BL/6J, C57BL/10J, and SJL/J, as well as in some non-inbred 'Swiss' mice. This allotypic specificity was also found in all hybrids which had one of the 3 above mentioned strains in their parentage.

A.M.Gibbins

6878. MA/My STRAIN OF MARSH ALBINO MOUSE. W.S.Murray: J. nat. Cancer Inst., 1963, 30, 605-610 (R.B.Jackson Mem. Lab., Bar Harbor, Maine, U.S.A.) Data on treated and untreated MA/My show that this strain is highly susceptible to the virus-like mammary tumour inciter or milk agent, yet apparently carries none of it. This characteristic has been acquired without expt. manipulation.

J.G.Bennette

6879. CELLULAR NATURE OF GENETIC SUSCEPTIBILITY TO VIRUS. M.Kantoch, A.Warwick and F-B.Bang: I. exp. Med., 1963, 117, 781-798 (Pathobiol. Dept., Sch. Hyg. and Public Hlth., Johns Hopkins Univ., Baltimore, Md., U.S.A.) Both PRI mice and their macrophages in culture were susceptible to mouse hepatitis virus, while C3H mice and their macrophages were resistant. All Fi macrophages and some back-cross cell cultures were susceptible. Segregation of susceptibility occurred in the first back-cross generation, one-quarter of the mice being shown to be susceptible. About 50% of the back-cross mice had the genetic capacity to transmit susceptibility. These results suggest either that there are 2 genes for susceptibility involved, or that a single dominant gene, incompletely expressed, may be responsible. Resistant cells were made susceptible by ingestion of a large heat-stable particle in extracts of susceptible macrophages. The nature of this factor has been discussed.

H. E. H.Jones

6880. GENETIC CONTROL OF A GUINEA-PIG SERUM FACTOR TOWARD WHICH NATURAL DELAYED ISO-HYPERSENSITIVITY OCCURS. J.R.Battisto: Nature, Lond., 1963, 198, 598-599 (Dept. Microbiol., A.Einstein Coll. Mcd., New York, U.S.A.) Interbreeding expt. between the homozygous guinea-pig strain Wright xm and the heterozygous Hartley strain, showed that the presence of 'serum factor' is controlled by an autosomal dominant gene.

G.M.Lewis

6881. STUDIES ON THE EXPRESSION OF LETHAL HEREDITARY FACTORS IN THE EMBRYO OF DROSOPHILA. VI. ON THE LETHAL EFFECTS DUE TO HYPOPOLOIDY AND HYPERPOLOIDY OF CHROMOSOMES IN XXY AND TRANSLOCATION STRAINS OF *D. MELANOGASTER*. T.Imaizumi: Cytologia, 1962, 27, 212-228 (Inst. Zool., Univ. Kyoto, Japan) The types of lethality caused by various degrees of hypoploidy and hyperploidy in *D. melanogaster* was studied in detail. A strain with XXY and 2 translocations and one with one translocation were used initially. Death occurs at successively later stages, for instance, in embryos

with no X chr., with loss of an arm of chr. II or E1, and with duplication of the same arms. The behaviour of aneuploids and flies with duplications and deficiencies was sometimes paralleled by mutated flies with no visible abnormalities, which were perhaps genetic mutants or minutely deficient. Results of the relevant genetic expt. are fully documented. (French) CA.Stace

6882. O-EBONY UTILISATION OF EBONY AND NON-EBONY DROSOPHILA MELANOGASTER. M.E.Jacobs and K.K.Brubaker: Science, 1963, 139, 1282-1263 (E.Mennonite Coll., Harrisonburg, Va., U.S.A.)

9-[14c]Alanine was inj. into newly-formed ? pupae. Homozygous ebony deposited less I^*C in pupal sheaths, deposited more in adult body extracts and wings, and decarboxylated and oxidised O-alanine to excrete $14CO_2$ faster than did non-ebony homozygotes. Heterozygotes were intermediate in all these activities. G.M.Lewis

6883. PENETRANCE OF THE GENE FOR DIELDRIN RESISTANCE IN ANOPHELES ALBIMANUS WIEDEMANN. L.E.Rozeboom: Amer. J. trop. Med. Hyg., 1963, 12, 249-253 (Dept. Pathobiol, Johns Hopkins Univ. Sch. Hyg. and Public Health, Baltimore, Md., U.S.A.) Selection of successive generations of a dieldrin-resistant strain by exposure to dieldrin-impregnated papers resulted in a rapid increase in freq. of the dominant gene for resistance. This gene is estimated to be 100% penetrant in the heterozygous and homozygous resistant mosquitoes. In addition to the single dominant gene, there appeared to be also a selection for ancillary genes conferring additional resistance. There was no loss in the freq. of the single dominant gene for resistance in the parent colony after about 3 yr. of laboratory rearing without selection pressure. A. A. Zimmerman

6884. AN EFFORT TO PRODUCE LICE RESISTANT TO DDT SOAP. H.Nagaj: Przegl. epidem., 1962, 16, 467-471 (Wojewódzka Stacja Sanitarno-Epidemiologiczna, Kraków, Poland) Lice were treated with DDT soaps in various concn. An induced resistance to DDT disappeared in the 9th generation. (Polish) M.Korbec W

HUMAN

6885. SOCIAL DIFFERENCES IN THE DISTRIBUTION OF THE ABO-, MN-, AND Rh FACTORS. H.Walter: Blut, 1963, 9, 1-7 (Anthropol. Inst., Univ. Mainz, Germany) Although no differences were found in M and N distribution in children of working class and other backgrounds in Westphalia, significant differences were found for the ABO and Rh systems. Social and historical effects were postulated, and the significance for study of gene distributions in populations emphasised.

(German) AJ.Wansbrough

6886. HEREDITARY PERSISTENCE OF FOETAL HAEMOGLOBIN: STUDY OF 79 AFFECTED PERSONS IN 15 NEGRO FAMILIES IN BALTIMORE. CLConley, DJ. Weatherall, S.N.Richardson, M.K.Shepard and S.Charache: Blood, 1963, 21, 261-281 (Med. Dept., Johns Hopkins Hosp., Baltimore, Md., U.S.A.) Hereditary persistence of foetal Hb is caused by a mutant gene that inhibits synthesis of Hb A and A2. Alkalidistant Hb is produced and neither anaemia nor hypo-

chromia of die r.b.c. occurs. It is again suggested that function of the loci of the 3 and 6-chains of globin is suppressed. Heterozygotes of the anomaly have a high concn. of Hb F in the r.b.c with uniform r.b.c distribution of the foetal Hb. H.B.Waynfirth

6887. DISTRIBUTION OF SICKLE-CELL Hb IN SAUDI ARABIA. H.Lehmann, G-Marjanian and A.E.Mourant: Nature, Lond., 1963, 198, 492-493 (St. Bartholomew's Hosp., London, England) The freq. of sickle cell Hb in different populations of Saudi Arabia is thought to be related to the incidence of malaria. G.M.Lewis

6888. SECOND AND THIRD ABNORMAL Hb IN NORFOLK. R.G.Hunstman, M.Hall, H.Lehmann and B.K.Sukumarax: Brit. med. J., 1963, i, 720-722 (St. Bartholomew's Hosp., London, England) A survey of 1000 unrelated inhabitants in Norfolk failed to reveal any further examples of Hb Norfolk. Two other abnormal hb were discovered in English families; Hb GaNorfolk had its mutational change in the a-chain and Hb D_g Norfolk in the 6-chain. M.E.Nutt

6889. HAEMOGLOBIN TYPES IN GREEK POPULATIONS. N.A.Barnicot, A.C.Allison, B.S.Blumberg, G.Deliyannis, C.Krimbas and A.Ballas: Ann. hum. Genet., 1963, 26, 229-236 (Dept. Anth., Univ. Coll., London, England) The incidence of abnormal Hb genes was investigated in various populations. The low incidence of Hb H inclusion bodies observed confirms previous findings that detectable a-thalassaemia is much less common than P-thalassaemia in Greece. In regions where the sickle/cell gene freq. is high the freq. of thalassaemia /low and vice versa. High freq. of abnormal Hb are found only in regions that were formerly intensely malarious. J.L. Batten

6890. DEFICIENCY OF GLUCOSE 6-PHOSPHATE DEHYDROGENASE [G6PD] IN GREEK POPULATIONS. A.C.Allison, B-A-Askonas, N.A. Barnicot, B.S.Blumberg and C.Krimbas: Ann. hum. Genet., 1963, 26, 237-244 (Nat. Inst. Med. Res., London, England) R.b.c. G6PD was measured on samples from cf. High proportions of enzyme-deficient subjects were found in some regions. The incidence of enzyme deficiency shows a pos. correlation with the incidence of abnormal Hb genes. J.L.Batten

6891. THEORETICAL EVIDENCE FOR AUTOSOMAL MODIFYING GENE PAIR IN GLUCOSE 6-PHOSPHATE DEHYDROGENASE [G6PD>DEFICIENT FAMILIES. J.E.Bowman and S.Maynard-Smith: Ann. hum. Genet., 1963, 26, 213-218 (Gallon Lab., Univ. Coll., London, England) Various G6PD-deficient pedigrees violating classical patterns of sex-linked inheritance are reviewed. Anomalous phenotypes observed in these families may result from epistatic reactions between the effects of abnormal sex-linked genes or gene and an autosomal pair. J.L.Batten

6892. DATA FOR X-MAPPING CALCULATIONS, ISRAELI FAMILIES TESTED FOR Xg, G6PD [GLUCOSE 6-PHOSPHATE DEHYDROGENASE] AND FOR COLOUR VISION. A.Adam, C.Sheba, R.Sanger, R.R.Race, P.Tippett, J.Hamper, J.Gavin and D.J.Finney: Ann. hum. Genet., 1963, 26, 187-194 (Govt. Hcsp., Tel Hashomer, Israel) Tests were made for the r.b.c. Ag Xg^a on Israeli families of various communities with G6PD members. The results show linkage between Xg and G6PD

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and the recombination freq. is estimated. Some of the families had colour vision abnormalities and results from these suggest the order $X\text{fr}$ G6 PD_r cy on the chr.

J.L.Batten

6893. FAMILIAL HYPOHAPTOGLOBINAEMIA.

GENETICALLY DETERMINED TRAIT SEGREGATING FROM GLUCOSE 6-PHOSPHATE DEHYDROGENASE [G6PD] DEFICIENCY. A.Gottlieb, N.Wisch and J.Ross: Blood, 1963, 21, 129-140 (Haematol. Dept., Mount Sinai Hosp., New York, U.S.A.) A family is presented with an inherited deficiency of G6PD and serum haptoglobin. More evidence is given for the hypothesis that modification of the Hp₂ allele is responsible for the low levels of haptoglobin observed. H.B.Waynforth

6894. NEW HAPTOGLOBIN ALLELES: A PREDICTION CONFIRMED. W.E. Nance and O. Smithies: Nature, Lond., 1963, 198, 869-879 (Dept. Med. Genet., Univ. Wisconsin, U.S.A.) Two unusual types of Hp₂ haptoglobin alleles have been detected by starch-gel STelectrophoretic analysis of human sera. These alleles are considered to be the Hp^{FF} and Hp^{2ss} genes which were previously predicted on theoretical grounds. J.R.Sargent

6895 HAPTOGLOBIN TYPES IN BRAZILIAN NEGROES. C.V.Tondo, C.Mundt and F.M.Salzano: Ann. hum. Genet., 1963, 26, 325-331 (Dept. Genet., Inst. Sci. Nat., Univ. do Rio Grande do Sul, Porto Alegre, Brazil) Studies on haptoglobin types of Negroes and Whites show that the incidence of gene H^E increases as the no. of genes for darker pigmentation and other negroid features increases. A difference in haik^Elobin freq. was observed between individuals undergoing net⁺th treatment and healthy ones. ^ J-L. Batten

6896. INCIDENCE OF THE BLOOD GROUP ANTIGEN Dia IN THE TUSCARORA INDIANS OF NORTH AMERICA. J.F.Mohn, R.M.Lambert and C.M. Zmijewski: Nature, Lond., 1963, 198, 697-698 (Dept. Bacteriol., Sch. Med., St. Univ. New York, Buffalo, U.S.A.) An incidence of 11*3% Difaf individuals among the Tuscaroras of Western New York is the highest yet reported for Indians of N. America. G.M.Lewis

6897. INFLUENCE OF RACE AND PHENOTYPE ON ERYTHROCYTE D ANTIGEN STUDIED BY IODINE-101 LABELLED ANTI-D. A.E.Barnes and R.S.Farn: Blood, 1963, 21, 429-446 (Med. Dept., Univ. Pittsburgh, Pa., U.S.A.) A method for the prep. of 131I-labelled anti-D eluates sp. for the D Ag by adsorption and elution from intact D pos. r.b.c. is presented. R.b.c. D Ag determinations of Negroes indicated a heterogeneity of quant. D Ag reactivity consistent with previous 131I-labelled anti-D studies. The r.b.c. D Ag reactivity was enhanced by the E Ag in negro blood. H.B.Waynforth

6898. A 'NEW' ANTIBODY ANTI-Lu^a*Lu^b AND TWO FURTHER EXAMPLES OF THE GENOTYPES Lu^{a-a-b-}. J.Darnborough, R.Firth, C.M.Giles, K.L.G.Goldsmith and M.N.Crawford: Nature, Lond., 1963, 198, 796 (Nat. Blood Transfusion Serv., Sheffield, Yorkshire, England) G.M.Lewis

6899. A NEW TRANSFERRIN IN NEW GUINEA. L.Y.C.Lai: Nature, Lond., 1963, 198, 589 (Dept. ZooL, Univ. W. Australia) Another transferrin of the B series has been detected by vertical starch gel electrophoresis in the serum of a man from New Guinea; the brother and sister were heterozygous, and mother homozygous for the new factor. G.M.Lewis

6900. GENETICAL STUDIES ON NEW VARIANT OF SERUM CHOLINESTERASE DETECTED BY ELECTROPHORESIS. H.Harris, D-A.Hopkinson, E.B.Robson and M.Whittaker: Ann. hum. Genet., 1963, 26, 359-3-12 (M.R.C. Hum. Biochem. Genet. Res. Unit, King's Coll., London, England) Britons and Tristan da

Cunha islanders were tested for the presence of the zone C5 with prop. of serum cholinesterase by electrophoresis. b^2 Jo of the former and ll^2 Jo of the latter were C5+. Studies on relatives of some of these suggest that C5+ individuals may be heterozygous for a gene determining the formation of the component. J.L.Batten

6901. PROBABLE RELATIONSHIP BETWEEN PTC [PHENYLTHIOCARBAMIDE] SENSIBILITY AND Rh FACTOR. E.Messeri: Caryologia, 1962, 15, 545-550 (Inst. di Physiol. Generale dell' Univ., Messina, Italy) From a study on 100 individuals it seems possible that an autosomic linkage between PTC insensibility and Rh blood factor occurs. Probably a physiol. relation between the 2 factors exists. (Italian) J.L.Batten

6902. SEX DIFFERENCES IN TASTING PTC [PHENYLTHIOCARBAMIDE]. A.Leguebe: Life Sci., 1963, No. 5, 337-342 (Inst. Royal Sci. natur. de Belgique, Bruxelles, Belgium) Prelim. note. K.Jones

6903. TASTE SENSITIVITY AND ENDEMIC GOITRE IN ISRAEL. N. Brand: Ann. hum. Genet., 1963, 26, <321-324 (Worker's Sick Fund, Clin. Stat. DAN, Upper Galilee, Israel) Taste thresholds for phenylthiourea were measured in children and adolescents and the incidence of non-toxic nodular goitre among them was investigated. The results suggest that non-tasters may be somewhat more susceptible to the development of nodular goitre than tasters. J.L.Batten

6904. HEREDITARY FACTOR IN ARTERIAL BLOOD PRESSURE. W.E.Miall and P.D.Oldham: Brit. med. J., 1963, i, 75-80 (Llandough Hosp., Penarth, Glam., Wales) Population studies in Rhondda Fach and the Vale of Glamorgan showed that single gene inheritance may be important in determining arterial blood pressure in a very small fraction of the community. In the majority of the population a regression of 0.287 for systolic and 0.224 for diastolic p. best expresses the resemblance of 1st-degree relatives, leaving 55-77% of systolic and 70-87% of diastolic variance to be explained by environmental factors. M.E.Nutt

6905. MONGOLISM AND TURNER'S SYNDROME IN THE SAME SIBSHIP. A.W.Johnston and J.K.Petrakis: Ann. hum. Genet., 1963, 26, 407-413 (Johns Hopkins Hosp., Baltimore, Md., U.S.A.) A family is described which contains a boy with Down's syndrome and a girl with Turner's syndrome. The significance of 2 aneuploid patients in the same family is discussed and comparisons made with other families suggest that in certain families the l^2f^1 , a^5 , l^1h^3 hered. Predisposition to non-disjunction, probably due to an abnormal gene. J.L.Batten

6906. FfS3F^{AL} ORIGIN OF SEX CHROMOSOMES IN XO AND XXY KARYOTYPES IN MAN. G.R.Fraser: Ann. hum. Genet., 1963, 26, 297-304 (Div. Med., i-b⁺V, \wedge Wash^{ung}i^{on}-Se^{*}ttle, Wash., U.S.A.) Max. likelihood methods are described whereby studies of segregation at sex-linked loci may be used to determine the xx^+ -contribution of the parents to individuals of the XO and XXY karyotype. J.L.Batten

6907. SEX-LINKED DEAF-MUTISM. B.W.Richards: Ann. hum. Genet., 1963, 26, 195-199 (St. Lawrence's Hosp., Caterham, Surrey, England) A family containing 6 deaf-mute children in 4 different sibships shows maternal transmission. The disease may be due to a sex-linked recessive gene but sex limitation cannot be excluded. J.L.Batten

6908. FACTORIAL ANALYSIS OF SEX-RATIO DATA. COMMENT ON TWO PAPERS BY EDWARDS. RG.Beilharz: Ann. hum. Genet., 1963, 26, 355-358 (Artificial Stock Breeding Centre, Berry, N.S.W., Australia) Renkonen's data (1956), used by Edwards (1961), are re-interpreted. It is contended that they are readily explained on the assumption that genetic variation in 'sex ratio' exists and that a psychol. process of family planning has occurred so that a consideration of other biol. factors is unnecessary. J.L.Batten

6909. PARENT-CHILD CORRELATIONS FOR BODY MEASUREMENTS OF CHILDREN BETWEEN AGES OF ONE MONTH AND SEVEN YEARS. J-M. Tanner and WJ.Israelson: Ann. hum. Genet., 1963, 26, 245-259 (Dept. Growth and Development, Inst. Child Health, Univ. London, England) Various body measurements

were made on children at intervals from one month to 7 yr. and on their parents. The conclusion is drawn that there are sex-controlled genes affecting physique operating before puberty. J.L.Batten

6910. FAMILIAL HYPOGONADOTROPHIC EUNUCHOIDISM WITH CEREBELLAR ATAXIA. R.Volpe, W-S. Metzler and M.W.Johnson: J. clin. Endocr., 1963, 23, 107 (Dept. Med., Univ. Toronto, Ont., Canada) In the 2 brothers examined the chr. picture appeared normal. Details are given of the clinical condition and it is concluded that the disease could be due to either multiple gene linkage or a single mutant gene. G.F.Blane

6911. FAMILIAL AGGREGATION OF LUNG CANCER IN HUMANS. G.K.Tokutata and A-M.Lilienfeld: J. nat. Cancer Inst., 1963, 30, 289-312 (Publ. Hlth. and Hyg. Sch., Johns Hopkins Univ., Baltimore Md., U.S.A.) A statistical study is presented from which it is concluded that genetic factors may play a role in die etiology of lung cancer, in addition to environmental factors such as cigarette smoking. There was a significant excess in the lung cancer mortality among proband relatives that could not be accounted for by age, sex, generation, or smoking factors. J.G.Bennette

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WATER RELATIONS

6912. CUTICLE STRUCTURE AND WATER RELATIONS OF PINE NEEDLES. L.Leyton and B.E.Juniper: Nature, Lond., 1963, 198, 770-771 (Dept. Forestry, Univ. Oxford, England) An area at the base of Scots pine needles, which is permeable to water, allows absorption of dew. The dew is channeled down the needles which are covered with water-impermeable waxy cuticle. G.M.Lewis
6913. STUDIES ON THE STOMATAL TRANSPERSION FROM THE LEAF SURFACE. I EXPERIMENTAL RESEARCH. Q. THEORETICAL CONSIDERATION. S.Murata: Bot. Mag. Tokyo, 1962, 75, 391-400, 473-482 (Meteorological Res- Inst-, Kyoto Univ., Kyoto, Japan) (Japanese, English summary) N.J.Pinfield
6914. WATER CONTENT OF COLEUS BLUMEI BENTH. 'GOLDEN BEDDER' UNDER DIFFERENT CONDITIONS. M.A.Duperrex: CR. Acad. Sci., Paris, 1962, 225, 3, 558-560. When *Coleus blumei* plants were cultivated in both acid and alk. soils, in wet and sat. soils, with or without the addition of nutritive salts, it was shown that the proportion of water they contained was almost always the same. (French) J.M.Thomas

PERMEABILITY AND SOLUTE UPTAKE

6915. EFFECT OF POTASSIUM, CALCIUM, AND MAGNESIUM IONS ON THE PROTOPLASMIC STREAMING IN ACETABULARIA CALYCULUS. T.Satos Bot. Mag. Tokyo, 1962, 75, 384-390 (Dept. Biol., Fac Sci., Univ. Osaka, Japan) Changes in protoplasmic streaming in stalks of *A. calyculus* were investigated in different concn. of K, Ca and Mg in the external medium. The effects of additional Ca and Mg on the morphological character of the cytoplasm were also examined. N.J.Pinfield
6916. CATION AND GLUCOSE TRANSPORT IN ONION EPIDERMIS. R.T.Jackson and H.D.Browne J. cell, comp. Physiol., 1963, 61, 215-221 (Dept. Biol. Sci., Loyola Univ. South, New Orleans, La., U.S.A.) Onion epidermis actively transports glucose with a QIO of 2²16 in a centrifugal direction. K and Na can move through the membrane in both directions but the movement is mainly centripetal. The flow of Na was about 15% that of K. G.M.Lewis

6917. POTASSIUM AVAILABILITY TO PLANTS. D.J.Eagle: Nature, Lond., 1963, 198, 558-560 (Min. Agric, Nat. Agric- Advisory Serv., Wolverhampton, Staffs., England) It is suggested that the availability of soil K to plants depends on the K-releasing potential of soil minerals and the cation exchange capacity of the soil. G.M.Lewis
6918. OSMOTIC ADJUSTMENT OF PLANTS TO SALINE MEDIA. H. DYNAMIC PHASE. L.Bernstein: Amer. J. Bot., 1963, 50, 360-370 (U.S. Salinity Lab., Riverside, Calif., U.S.A.) The time-course of osmotic adjustment in bean and pepper plants to increased salinity of the medium was determined by periodic sampling of plants

following salt additions to the medium. Bean plants adjusted to 1 atm. osmotic pressure increase within one day, root adjustment occurred mainly at night and leaves and stems mainly in the daytime. Osmotic pressure increased by about the same amount in both spp. Added NaCl caused increased concn. of K in leaves and stems which were more or less replaced by more slowly absorbed ions. In roots, Na uptake predominated if Na salts were added, but K uptake was important on the Cad2 treatment. T.H.Thomas

6919. UPTAKE BY THE ROOT AND SUBSEQUENT DISTRIBUTION WITHIN THE POTATO PLANT OF STRONTIUM-89 LEACHED FROM THE FOLIAGE. R.A.Mecklenburg and H*B.Tukey, jun.: Nature, Lond., 1963, 198, 562-563 (Dept. Floriculture, Cornell Univ., Ithaca, N.Y., U.S.A.) ⁸⁹Sr deposited on potato foliage is accumulated in underground tubers from foliar leaching and root absorption rather than via basipetal transport from the foliage. G.M.Lewis
6920. OXALATES AND IONIC EQUILIBRIA IN AUSTRALIAN SALT-BUSHES (ATRIPLEX). B.Osmond: Nature, Lond., 1963, 198, 503-504 (Dept. Bot., Univ. New England, Armidale, N.S.W., Australia) Levels of oxalate in the leaves of 15 spp. of *Atriplex*, *Bassia*, *Kochia* and *Rhagodia* were investigated under various expt. conditions in soln. culture. It was concluded that oxalates have an important physiol. function in ionic balance and their synthesis may be geared to the same processes as are involved in inorg. ion accumulation. G.M.Lewis

NUTRIENT RELATIONS

6921. INVESTIGATION ON THE INFLUENCE OF FERTILISERS ON THE OCCURRENCE OF MYCORRHIZA IN CUCURBITA PEPO. J.tfanowska: Acta microbiol. pol., 1962, 11, 349-358 (Zalzfad Ekologii Rolniczej, Ptfawy, Poland) The possession of an endotrophic mycorrhiza by *C. pepo* is not necessary when plants grow on soils with sufficient amounts of nutrients, but may be beneficial in non-fertilised soils or in soils fertilised exclusively with mineral fertilisers. (Polish) M.Korbecki
6922. THE EFFECT OF POTASSIUM ON THE GROWTH OF SUGAR-BEET PLANTS INFECTED WITH BEET YELLOWS VIRUS. M.Warchtfowa and J.Bazant: Acta microbiol. pol., 1962, 11, 359-362 (Instytut Uprawy, Nawozenia i Gleboznawstwa, Ptfawy, Pbland) The increase of K fertilisation up to 2000 mg. of K₂O per pot may enhance the root yield of sugar beet plants infected with beet yellows virus¹ ID the level reached by healthy plants receiving 1000 mg. of K₂O per pot. No difference in chlorophyll a content was noted but the amount of chlorophyll b in infected plants receiving 100 mg. of K₂O per pot was half that of healthy plants. The extension of infection in plants grown on K deficient media or media containing 500 mg. K₂O per pot was small and the yield was the same as in control healthy Pk^{nts}. (Polish) M.Korbecki

6923. EFFECTS OF DIFFERENT LEVELS OF ZINC AND H₂gJg₂S ON THE GROWTH OF SSBTE^NEAN CLOVER (TRIFOLIUM SUBTERRANEUM L.).

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C-RMillikaiK Aust. J. agile Res., 1963, 14, 180-205
 (Biol. Branch, Victorian Dept. Agric, Burnley,
 Australia) Differences in Zn deficiency symptoms
 are described for a no. of varieties in water culture.
 These symptoms bore no relationship to Zn concn. Highly
 significant Zn x P interactions were recorded. The criti-
 cal Zn level was found to depend on age of plant and
 PO₄ level. Results suggest that Zn is essential to utilisa-
 tion of PO₄ by the plant.
 R.L.Weston

6924. THE COBALT REQUIREMENT OF SUBTERRANEAN CLOVER IN THE FIELD- P.G.Ozanne, E.A.N.Greenwood and T.C.Shaw: Aust. J. agric Res., 1963, 14, 39-50 (Div. Plant Ind., CS.I-R.O., Western Australian Reg. Lab., Nedlands, Australia) Expt. were performed on soils containing only 0*022 and 0*019 p.p.m. Co in the 0-4 in. layer. Increases of 30% were obtained in response to dressings of 2 and 10 oz. CoSQi.7H2p/acre. where a dressing of salts containing Cr, N_x, V, W, Al and I had no effect. N content of clover was increased in all cases by applications of Co, but where adequate N was applied there was no response to Co. Growth of clover was reduced when Co contents fell below 0*04 P-P-m. Less than 0.55% of applied Co was taken up by the pasture although Co was not leached downwards. R.L.Weston

6925. CADMIUM: UPTAKE BY VEGETABLES FROM SUPERPHOSPHATE IN SOIL. H-A.Schroeder and J.J. S E T s d, Z S * 1963, 140, 819-820 (Brattleboro Retreat, Brattleboro, Vt., U.S.A.) Superphosphate fertiliser contained 7.25 p.p.m. cadmium which was absorbed by vegetables. Four out of 5 types of grain, usually containing Cd did not absorb it from unfertilised soil poor in this element. G.M.Lewu

6926. INFLUENCE OF VITAMIN B12 ON THE SIZE AND GROWTH OF EUGLENA GRACILIS. S.E.Stein J.B. Weiss, D.Causeley and P.Bush: J- Protozool., 1962, 9, 336-339 (Dept. Path., Harvard Med. Sen., Children's Hosp. Med. Center, Boston, Mass..U-S-A.) The effect of a wide range of vit. B12 concn. on the size and growth of B₁₂ de_s the Flying Spot Partic

iatteff » » was inversely proportional. generation times Gigantism and prolongation of the vitamin from the resulted from the depletion of the R.J. Walker culture medium.

6927. LABORATORY CULTURE OF DACRYOMYCES DELIQUESCENS(DUBY). I-H-Jg* N*g"i £.j.* 1963, 198, 907 (Handsworth New Rd. Boys Sen., Birmingham, England). G.M.Lewis

6928. TRACE ELEMENT REQUIREMENTS OF GLOEO-SPORIUM FRUCTIGENUM F. CHROMOGENUM* G.J.M.A.Gorten S. Aft, J. agric Sci., 1963, 6, 117-124 (Plant Protection'Res. to*, ^Tatoria, S. Africa) Fe, Zn and Mn were essential for optimum & ovn_h. nd Cu was found essential for the teTMoVTM?JTM*_d quan_tries. Pigmentation but was required in much smaller L.A.B.S.

3929. DEVELOPMENT AND NUTRITION OF A NEW SPECIES OF THRAUSTOCYTA; S.^Idstein. Amer. J. Bot., 1963, 50, 271-87 (Dept. Biol. Brooklyn Coll., Brooklyn, N-Y., U.S.A.) ^Tme lire - cycles of 2 lower Phycomyces; in sea-wate^J1JJTM*_d *re are described and compared ^*TM*j&tZ^!nd a nutrient media. Both fungi were obUgately manne and

stenohaline. NaCl in culture was not replaceable by KC1, but omission of KC1 resulted in reduced yields. Neither organism assimilated N in die form of KNO₃ or (NH₄)₂SO₄. Optimal harvests were obtained with glutamate as the source of N and with C supplied as glucose, maltose, sol. starch, or cellobiose. T.H.Thomas

PHOTOSYNTHESIS AND PHOTOSYNTHETIC PIGMENTS

6930. FORMATION AND FUNCTION OF SOLUBLE PROTEINS IN CHLOROPLASTS. R.M.Smillie: Canad. J. Bot., 1963, 41, 123-154 (Biol. Dept., Brookhaven Nat. Lab., Upton, N.Y., U.S.A.) Symposium on protein metabolism of the Canadian Society of Plant Physiologists, 1962. A.Meany

6931. ISOLATION AND COMPOSITION OF CHLOROPLASTS AND ETIOLATED PLASTIDS FROM CORN SEEDLINGS. G.M.Orth and D-C.Cornwelb Biochim-biophys. Acta, 1963, 71, 734-736 (Dept. Physiol. Chen., Ohio State Univ., Columbus, Ohio, U.S.A.) The ^{io} composition of chloroplasts isolated by a differential p gradient scheme was compared with that of chloroplasts isolated by differential centrifugation alone and that of etiolated plastids isolated by the same differential p gradient method... - B.M.Stevens

6932. CHLOROPHYLL b SYNTHESIS BY GREEN PLANTS IN DARK. A.A.ShylyTand E.M.Stanishevskia: Dokl. Akad. Nauk, 1962, 144, 226-229. Observations ON plants in the dark showed that they synthesised labelled chlorophyll b, with depression of the amount of 14C in chlorophyll a (Russian) BJ.Cooper

6933. CHLOROPHYLL a APPEARANCE IN THE DARK IN HIGHER PLANTS: ANALYTICAL NOTES. D.W.Kupke and J.L.Huntington: Science, 1963, 140, 49-51 (Dept. Biochem., Sch. Med., Univ. Virginia, Charlottesville, Va., U.S.A.) The ratio of chlorophyll a to chlorophyll j₂ in bush bean plants was determined during growth under varying conditions of light and darkness, using chromatographic separation techniques prior to spectroscopy. It was concluded that chlorophyll a arises from chlorophyll b during dark growth of the leaves. G.M.Lewis

6934. E.M. STUDIES ON PLASTID DEVELOPMENT IN VARIEGATED LEAVES OF LIRIOPE PLATYPHYLLA f. VARIEGATA. I. THE NORMAL GREEN CHLOROPLAST. H. ALBICATE PLASTID. S.Murakami: Cytologia, 1962, 27, 49-59, 140-150 (Bot. Inst., Tokyo Univ. Educn., Otsuka, Tokyo* Japan) I. Young leaves contain small amyloid proplastids with a few vesicles whose development in green parts of the leaves was followed. The starch vacuoles disappear and the vesicles increase in no. and aggregate to form a dense 'prolamellar body' of crystal-lattice-like appearance, from which the granum and intergranum lamellae later grow, probably by vesicular coalescence. After the lamellae fill the chloroplast the grana begin to differentiate.

II. Albicate plastids were similar to normal ones when very young, with starch granules, small osmophilic granules and minute vesicles. As in the normal plastids die vesicles aggregate to form a prolamellar body, although

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they are much less regularly orientated and the lamellae which develop by vesicular coalescence are much less abundant and soon cease growth. Mature albicate plastids often still possess large vacuoles and may be classed into 3 types according to the abundance and distribution of chlorophyll. Lamellae are sparse and unorganised.

C.A-Stace

6935. SUBMICROSCOPIC STRUCTURE AND DEVELOPMENT OF CHLOROPLASTS OF FUNARIA HYGROMERICA AND BRYUM SP. S.N.Surc: *Cytologia*, 1962, 27, 333-342 (Sch. Med., St. Louis Univ., St. Louis, Mo., U.S.A.) The chloroplasts consist of ellipsoidal bodies with a dense surface membrane and internal double lamellae arranged in grana which are connected by stromal lamellae. Proplastids contain vesicles which fuse to give rise to lamellae which later organise into grana, but a cryst. structure as seen in some other plants was not observed. Osmophilic (lipid) globules occur throughout development.

C.A-Stace

6936. THE PLASTID SYSTEM OF NORMAL AND BLEACHED EUGLENA GRACILIS. A.Gibor and S.Granick: *J. Protozool.*, 1962, 9, 327-334

(Rockefeller Inst., New York, U.S.A.) The plastid system of 'normal' *E. gracilis* strain Z was very unstable, 1-2% of cells cultured under normal conditions being found to have lost spontaneously the capacity to green on further culturing. Cells treated with streptomycin, heat or u.v all lost the capacity to green on further culturing, though these bleached cells all possessed organelles identified as proplastids. When grown in standard media, the proplastids of some bleached cells were able to synthesise porphyrins while others could only do so when supplied with 6-aminolaevulinic acid. Normal cells grown in darkness possessed proplastids similar to those of the bleached cells. These proplastids when exposed to light enlarged and greened. Continuous light induced a plastid system composed of an interconnected system of tubules while those cells maintained on 12 hr. light and 12 hr. dark had plastids detached from one another.

R.J.Walker

RESPIRATION

6937. EFFECT OF ASCORBIC ACID AND DEHYDRO-ASCORBIC ACID ON ANAEROBIC RESPIRATION OF THE SEED OF NELUMBO NUCIFERA. K.Toyoda: *Bot. Mag. Tokyo*, 1963, 76, 41-47 (Kugenuma, Fujisawashi, Japan) The seed of *N. nucifera* was shown to liberate more gas in ascorbic acid soln. than in water, while dehydroascorbic acid causes even greater gas evolution. This is interpreted as an effect on respiration. The ratio of ascorbic acid to dehydroascorbic acid was observed to decrease on maturation, but increases again on germination. Homogenates of the seed behaved in the same way as the intact seeds. The *Nelumbo* plumule was shown to contain large amounts of dehydroascorbic acid and also some ascorbic acid. It is concluded that these conditions are favourable for the germination and respiration of the plant in water.

N.J.Pinfield

METABOLISM

6938. ON THE DISTRIBUTION IN VARIOUS PLANTS OF CHLOROPLAST PHENOLOXIDASES. Y.Mino and S.Hattori: *Bot. Mag. Tokyo*, 1963, 76, 1-5 (Dept. Bot., Fac Sci., Univ. Tokyo, Hongo, Tokyo, Japan)

The occurrence of the chloroplast phenoloxidases, di-phenolase, monophenolase and laccase in a large no. of plant spp. was investigated. It was shown that their distribution varied even between spp. of the same family, and also appeared to be independent of terrestrial/oraquatic habit. No correlation between the occurrence of these enzymes and systematic position of the plants has yet been established.

N.J.Pinfield

6939. STUDIES ON REDUCTION OF TETRAZOLIUM SALT BY PLANT TISSUES. I. REDUCTION OF TTC BY PLANT TISSUE HOMOGENATE, WITH SPECIAL REFERENCE TO ITS RELATION TO PLANT AGE AND CYANIDE EFFECT. E. EFFECT OF PLASMOLYSIS ON REDUCTION OF TTC IN PLANT CELL. S.Sata: *Cytologia*, 1962, 27, 97-105, 158-171 (Bot. Inst., Univ. Tokyo, Japan)

I. The reduction of 2,3,5-tri phenyltetrazolium chloride [TTC] by homogenates of *Phaseolus* seedlings and seeds was compared and the effects of time, age of seedling, age of homogenate and various additives studied. Seedling homogenate began to, lose its activity after a time, but this was prevented by the addition of hypertonic sucrose. Studies on the effects of succinate, malonate, oxaloacetate and cyanide indicated that TTC reduction is brought about by succinic dehydrogenase. The effect of the various additives varied with the age of the seedlings.

n. Reduction of TTC by *Phaseolus* embryos was followed colorimetrically under various conditions of plasmolysis. Results differed according to the type of plasmolyticum. Sucrose and maltose were strong inhibitors of the reaction even when hypotonic, while glucose was weaker and only inhibited when hypertonic. Urea and certain alcohols strongly accelerated the reaction in tissue, probably due to increased permeability, but were inhibitors in homogenates. Plasmolysis due to inorg. salts produced very varied effects, mostly dependent upon the anion. These results are discussed in relation to the enzyme site.

C.A.Stace

6940. DEVELOPMENTAL AND RIPENING PROCESSES IN GRAPES OF VITIS. G.Geisler and F.Radlen: *Ber. dtsch. bot. Ges.*, 1963, 76, 112-119 (Forsch. Rebenzuchtung Geilweilerhof, Siebeldingen über Landau/Pfalz, Germany)

Measurements of respiration, photosynthesis, sugar content and acid content were made from 10 days after flowering till harvest. There is first a transition phase during which the rates of respiration and photosynthesis fall steeply, then a ripening phase during which org. acid content first increases, then falls, and sugar content increases. Finally comes a post-ripening phase, marked by stoppage of photosynthesis and steady acidity, though sugar still increases. The photosynthesis in the grapes is far too low to account for the sugar and acid accumulation.

(German) H.-Opik

6941. iJSSPSSJ¹ THE PHYSIOLOGY OF LICHENS.

IV. CARBOHYDRATES IN PELTIGERA POLYDACTYLA AND THE UTILISATION OF ABSORBED GLUCOSE.

D.C.Smith: *New Phytol.*, 1963, 62, 205-216 (Dept. Ague., Univ. Oxford, England) The alcohol sol. and ^{mo}-carbohydrates in *P. Polydactyla* were investigated and the utilisation of glucose absorbed by the lichen in

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24 hr. was followed. No free glucose was detected in discs fed with labelled glucose. There were no qual. differences between carbohydrate of the 'algal zone' and medulla. The role of mannitol in the metabolism of *P. polydactyla* is possibly that of a storage carbohydrate. T.H. Thomas

6942. RESIN METABOLISM IN THE SAPWOOD OF PINUS RADIATA. A-T.Wilson, J.M.Gumbley and D.J. Spedding: Nature, Lond., 1963, 198, 500 (Dept. Chem., Victoria Univ. Wellington, New Zealand)

Measurements of the ^{14}C content of annual rings of a *P. radiata* tree indicated that the resin in the sapwood is not in metabolic equilibrium with the metabolism of the tree and that any circulation laterally through interconnected resin canals is very slow. G.M.Lewis

6943. CHANGES IN METABOLISM OF ISOLATED ROOT SYSTEMS OF SOY BEAN. A-L.Kosten: Nature, Lond., 1963, 198, 709-710 (Bot. Lab., Dept. Expt. Bot., Univ. Leyden, Netherlands)

After excision of the shoot of soybean plants, the transpiration stream was artificially induced by application of pressure and analysed. A rapid decline in respiration was observed after excision and a rapid decrease in uptake of O_3 and NH_4^+ , although uptake of PO_4 was not affected. The same effects were observed when phloem only was removed by ringing and the xylem left intact. Addition of 0.025M succinate to the medium surrounding the roots maintained respiration at a high level and largely prevented the decreased absorption of NH_4^+ . G.M.Lewis

6944. CONVERSION OF PROTEINS AND NITROGEN-CONTAINING SUBSTANCES IN RIPENING BEANS.

V.G.Klimenko and A.D.Berezovikov: Biokhimia, 1963, 28, 238-245. The total N, protein N, eiec⁻ ttophoreric fractions of saline extracts and total globulin were determined at various phases of ripening in fresh and dried, intact and skinned beans (*Vicia faba*). The content of the substances was found to be affected by both the stage of ripening and the condition of the beans. H-j-cooper (Russian)

TRANSLOCATION

6945. TRANSLOCATION IN THE GIANT KELP MACROCYSTS. B.C.Parker: Science, 1963, 140, 891-892 (Univ. California, Los Angeles, Calif.)

^p ~~all tissue of *Macrocystis*. Depending on con of wh transp~~ all ^{all} ~~fully ascertained, the direction of Sbf pred~~ ^{no} ~~ominantiyapical or towards the base~~ G.M.Lewis of the plant.

6946. TRANSLOCATION OF DIQUAT [1,1'-ETHYLENE-2,2'-BIPY]

B-C.Baldwin: Nature, 1963, 198, 873 (Hill Res. Sta., I.C.I., Bracknell, Berks., U.K.). When [^{14}C]diquat dibromide was applied to a leaflet of tomato plants in darkness no movement of the compound was observed. However, after only 5 hr., the herbicide has been completely distributed through the plant. xylem, this compound which probably occurs through Lewis is discussed.

6947. MOVEMENT OF GROWTH REGULATORS IN PLANTS. III. COMPARATIVE STUDIES OF TRANSPORT IN PHASEOLUS VULGARIS. E.C-S.Little and G.E. Blackman: New Phytol., 1963, 62, 173-197 (Dept. Agric, Univ. Oxford, England)

The courses of initiation of bending and subsequent rates of curvature of the petiole and stem of *P. vulgaris* have been followed when growth substances are applied to different sites in the seedlings. 2,4-D and 2,4,5-T had longer initiation times than IAA and much greater doses were needed. Autoradiography was used to demonstrate the time taken for entry into the vascular strands, of growth regulators applied at different sites. The velocity of growth regulator movement was calc and the amounts of regulator present in the tissues was also followed. T.H.Thomas

GROWTH AND DEVELOPMENT

(GENERAL)

6948. LENGTH OF THE LIGHT-DARK CYCLE AND PLANT GROWTH. H-B.Tukey, jun. and H.J.Ketellappen: Amer. J. Bot., 1963, 50, 110-115 (Div. Biol., California Inst. Technol., Pasadena, Calif., U.S.A.)

Max* growth of tomato, pea, peanut, and soybean plants is obtained with a light-dark cycle of approx- 24 hr. for cycles consisting "5 equal periods of light and darkness. The exact opj&num for tomato plants was determined by temp, but i&s were less sensitive to cycle length. Response to cycle length was not influenced by conditions prior to treatment. Response to cycle lengths of 18, 24*, 36 and 48 hr. was not changed qual. by temp. Stem elongation showed a rapid and initial increase in rate when the light was turned off. It was concluded that plants possess an endogenous time-measuring device with a period of 24 hr. T.H.Thomas

6949. STUDIES ON THE GIANT KELP, MACROCYSTIS.

I. GROWTH OF YOUNG PLANTS. H. REPRODUCTION. M.Neushul and F-T-Haxo: Amer. J. Bot., 1963, 50, 349-353, 354-359 (Scripps Inst. Oceanography, La Jolla, Calif., U.S.A.) I. Growth of young plants of *Macrocystis pyrifera* was studied in the lab. and in the sea. Plants were raised in lab. tanks under controlled conditions of light and temp. Max. growth rates in the lab. paralleled those observed in the sea. Transplant expt. and diving observations demonstrated the important influence of biol. activity on the establishment and growth of young plants in the sea.

II- Reproduction of *M. pyrifera* was studied in the sea and in the laboratory. The max. time needed for completion of the sexual life history was from 12-14 months. The behaviour of abscised sporophylls in laboratory tanks, as well as their morphology and coloration, suggests an interrelationship between the translocation of synthetic products and fructification. T.H.Thomas

6950. A TENDENCY TO PERENNATION IN THE CEREALS. A.Joffe and J.C.G.Smal: Nature, Lond., 1963, 198, 768-770 (Dept. Agric. Technical Serv., Pretoria, South Africa)

Expt. on oat plants show that even if die late tillers do flower for prolonged periods, this need not lead to the death of the plant in spite of an adverse seed to shoot wt. ratio. With adequate nutrition, the oat plant can

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behave as a perennial grass in that periods of reproductive growth can be readily alternated with periods of predominantly vegetative growth, simply by changes in day-length.

C.M.Lewis

6951. MARSILEA VESTITA: CONVERSION OF THE WATER FORM TO THE LAND FORM BY DARKNESS AND BY FAR-RED LIGHT. JJ.Gaudet: Science, 1963, 140, 975-976 (Dept. Bot., Univ. California, Berkeley, Calif., U.S.A.) A period in darkness or, more effectively, in continuous far red light, causes the fern *M. vestita* Hook and Grey to develop as a land form in a medium which normally allows only the water form to develop.

G.M.Lewis

6952. EXPERIMENTAL INVESTIGATIONS OF FLORAL MORPHOGENESIS IN PETASITES HYBRIDUS.

C.W.Wardlaw: Nature, Lond., 1963, 198, 560-561 (Dept. Bot., Univ. Manchester, England) Defoliation and bisection of the apices of *P. hybridus* plants prevented the formation of inflorescences and induced a return to the vegetative condition. Application of gibberellic acid to such plants caused inflorescence production and precocious flowering.

G.M. Lewis

6953. CHARACTERISTICS OF DOUGLAS-FIR ROOT SYSTEMS. R.G.McMinn: Canad. J. Bot., 1963, 41, 105-122 (Forest Entomol. and Path. Lab., Victoria, B.C. Canada) The root systems of 28 Douglas fir in four stands, aged 10, 25, 40 and 35 yr. were excavated hydraulically to determine the rooting characteristics of trees in different crown classes at various ages. The extent, depth, configuration, rooting density and mycorrhizal component of root systems were examined. The size of root systems is shown to be related to crown rather than bole size.

A.Meany

6954. ROOT PRODUCTION AND THE ESTIMATION OF NET PRODUCTIVITY. J.R.Bray: Canad. J. Bot., 1963, 41, 65-72 (Dept. Bot., Univ. Toronto, Ont., Canada) Data on the net production of oven-dry org. matter from 28 temperate herbaceous spp. and 4 temperate arboreal spp. have been analysed to determine the relationships between below-ground and above-ground yearly increment. Mean below-ground/above-ground ratio and mean below ground production was significantly higher for herbaceous spp. Mean above-ground production was higher for arboreal spp. There was no significant difference between total herbaceous and total arboreal production. Root production decreases with age in herbaceous spp. The below-ground/above-ground ratio increased from moist to mesic to xeric spp. Arboreal spp. were uniform in below-ground/above-ground ratios.

A.Meany

6955. GROWTH CHARACTERISTICS OF CITRUS FRUIT TISSUE IN VITRO. H.A.Kordan: Nature, Lond., 1963, 198, 867-869 (Dept. Bot., Univ. California, Los Angeles, Calif., U.S.A.) Cultures of excised vesicle stalks from mature lemon fruits (Eureka var.) are described.

G.M.Lewis

6956. INCORPORATION OF PHOSPHORUS-32 INTO NUCLEIC ACIDS DURING EMBRYONIC DEVELOPMENT OF BARLEY. C.W.Chang: Nature, Lond., 1963, 198, 1167-1169 (Dept. Bot. and Plant Pathol., Michigan State Univ., E.Lansing, Mich., U.S.A.) Abs.

amounts of ³²P incorporated into nucleic acids increased continuously during embryonic development while relative rates of incorporation into DNA/cell/unit of time and/or

the relative no. of cells engaged in incorporation of ³²P into DNA decreased as embryonic differentiation became more advanced. Rates of incorporation of ³²P into DNA in maturing embryos reflected the degree of tissue differentiation, while rates of incorporation of ³²P into RNA seemed independent of die level of embryo differentiation. RNA and DNA synthesis do not occur at the same time either in a single cell or the tissue as a whole.

J.R.Sargent

6957. DNA CONTENT AND CELL AND NUCLEAR VOLUME GROWTH IN THE DEVELOPING XYLEM CELLS OF CERTAIN HIGHER PLANTS. A.Iist, jun.: Amer. J. Bot., 1963, 50, 320-329 (Dept. Bot., Douglass Coll., Rutgers Univ., New Brunswick, NJ., U.S.A.) Observations were made on DNA content and cell and nuclear vol. growth in developing xylem cells of *Acorus calamus* roots, *Peltandra*, *Eleocharis*, *Dennstaedtia*, *Marsilea* and *Arisaema*. In *Zea* cell and nuclear vol. for metaxylem cells fit a fluctuating envelope better than a straight line and cell vol. probably fall into size classes related to nuclear vol. class. DNA content of nuclei was determined to fall into a freq. distribution having peaks at the 4-, 8-, 16- and 32-ploid equiv. DNA content was highly correlated with nuclear vol. in the overall growth of the metaxylem cells*

T.H.Thomas

6958. ROLE OF LIGHT IN HISTOGENESIS AND DIFFERENTIATION IN SHOOT OF PISUM SATIVUM, HI. INTERNODE. B.F.Thomson and P.Monz Miller: Amer. J. Bot., 1963, 50, 219-227 (Dept. Bot., Connecticut Coll., New London, Conn., U.S.A.)

P. sativum seedlings were exposed daily to red or white fluorescent light or kept in total darkness. Light did not alter the sequence or pattern of tissue differentiation, but did accelerate the rate of a const. course of differentiation. Light advanced cell division and enlargement in the longitudinal direction but reduced the final no. and final length attained. It was concluded that light accelerates all phases of shoot growth and differentiation and that cell division and elongation in later phases of internodal growth are reduced by light because of accelerated cell maturation.

T.H. Thomas

6959. PHOTOOHIBITION OF GROWTH IN ETIOLATED STEM SEGMENTS. II. GROWTH CAUSED BY COBALT IN PISUM. W.F.Bertsch: Amer. J. Bot., 1963, 50, 213-219 (Dept. Bot., Yale Univ., New Haven, Conn., U.S.A.) The effects of various metal ions on the red, far-red photoinhibin. of stem growth were studied using etiolated pea stem sections. Excision of immature tissue resulted in loss of photosensitivity but growth caused by Co in the presence or absence of sugar was inhibited by red light. Either sugar or Co induced photosensitivity in this immature tissue. Ni also promoted growth but this was not photosensitive. The photoinhibin. of a growth system which utilises sugars and is promoted by Co and the relationship of this system to certain de-etiolation phenomena are discussed.

T.H.Thomas

GROWTH SUBSTANCES

6960. EVIDENCE FOR INDOLE-3-ACETIC ACID IN BALSAM FIR, ABIES BALSAMEA (L) MILL. J.Clark and J.M.Bonga: Canad. J. Bot., 1963, 41, 166-173

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(Forest Entomol. and Pa*. Branch, Dept. Forestry, Ottawa, Canada) An ether extractable auxin was obtained from the inner bark of balsam fir. Characterisation of the auxin by paper chromatography, *Avena* bio-assay and chromogenic tests indicated that it was IAA. An inhibitor which counteracted the growth-promoting effects of the auxin and authentic IAA was also extracted.

A.Meany

6961. GIBBERELLOFIC-EFFECTON DIFFUSIBLE AUXIN IN FRUIT DEVELOPMENT. K.K-S-tostry and R.M.Muir. *Science*, 1963, 140, 494-495 <sup>D e ^ . ^ " * £ in ,, Iowa, Iowa City, Iowa, U.S.A.) Diffusible auxin is not Un*xnSwlo*versatanW **, ** amounts can be obtained after the plane ~~are treated with gibberellins.~~ lants growth treated with

Maturation and fertilisation; the amounts of diffusible auxin are not being significantly different over a period of 22 days. G.M.Lewis

6962. STUDY OF X-RAY DIFFRACTION ON CELL WALL OF STEM INTERNODE C? What TREATED WITH GIBBERELLIN. Cytologia, 1962, 27, 106-110 (Biol. Inst., Univ. Shizuoka, Japan) X-ray diffraction studies showed that cellulose micelles first normally er at about 45° to the long axis, but after treatment with gibberellin the arrangement appeared much more random and amorphous material was evident.

6963. QUANTITATIVE DIFFERENCE OF GIBBERELLIN-LIKE SUBSTANCES IN NORMAL AND DWARF VARIETIES OF PHARBITIS. rfuU : T - Q g ** <pt. Mag. Tokyo, 1962, 75, 449-450 (Lab. Agric. JBot., Fac. Agric., Univ. Kyoto, Japan) By means of rice seedling bioassay following paper d w n « *W*aphy of the aq.-ethanol sol. fraction from hypocotyl of *P. nil*, 2 found to be present.

- 1 max. on the 2nd day after germination, while 'Pharbitis factor III' (Rf 0.1) reached a max. on the 4th day after germination. Both extracts from the *ent* of the gibberellin-like activity of the normal variety. (Short N.J.Pinfield comm.).

6964. OCCURRENCE OF 'WATER SOLUBLE' GIBBER-

- ta-ku, Tokyo, Japan) water ected in seeds of *Pharbitis nil* and by the rice leaf sheath assay method. two zones of gibberellin activity were detected at Rf 0.2 and Rf 0.4 on the chromatograms. (Short N.J.Pinfield comm.).

6965. EXPERIMENTAL MODIFICATION OF THE PATTERN OF ORGANOGENESIS IN HYDROCHARIS. E.G.Cutter. *Nature*, Lond., 1963, 198, 504-505 (Dept. Bot., Univ. Manchester, England) Modification of the usual pattern of leaves and buds in *Hydrocharis* is achieved by treatment with Kinetin or gibberellic acid. G.M.Lewis

6966. EFFECTS OF KINETIN ON GROWTH AND FLOWERING OF INTACT GREEN P^TS. H.Wittwer and R.f.Dedolph: Amer. J. Bot., 1963, 50, 330-336 (Dept. Hort., Michigan State Univ., East Lansing, Mich., U.S.A.) Dry matter accumulation of aerial

parts, and height of tomato, cucumber and pea plants were reduced on adding kinetin to the culture soln. root medium in concn. from 10⁻⁵ to 10⁻⁷M. Concn. suppressing top growth had lesser effects on root growth and in some instances, enhanced it. Flowering was inhibited in tomatoes and accelerated in peas. There were changes in root morphology. Kinetin had an effect opposite to that of gibberellin on internode elongation, root extension, top/root ratio and flowering of dwarf peas. N⁻Benzyladenine was more active than kinetin in suppressing growth of intact green plants.

T.H.Thomas

6967. THE EFFECT OF THE EXTRACELLULAR SUBSTANCES PRODUCED IN CULTURE BY NOSTOC SP. AND CHLORELLA VULGARIS ON THEIR GROWTH. G.S.Venkataramarc Indian J. Microbiol., 1962, 2, 121-126 (Divn. Microbiol. Indian Agric. Res. Inst., New Delhi, India) *Nostoc* sp. produces in culture medium a thermolabile growth-promoting substance which accelerates its growth and that of *C. vulgaris*. Chlorella produces a thermolabile inhibitory substance.

G.M.Lewis

6968. INHIBITING SUBSTANCES IN IMMATURE CARYOPSES OF WHEAT (FYLGIA). CHubacs C.R. Acad. Sci., Paris, 1962, 255, 4, 758-761. In the immature caryopses of wheat there is a germination inhibiting complex, comprising 2 kinds of substances, the one fat-sol, and the other water-sol. The latter can be divided by chromatography into 2 separate fractions. (French) J.M.Thomas

6969. INTRAMOLECULAR CATALYSIS OF THE HYDROLYSIS OF N-EthylETHYLAMINOMALEAMIC ACID. G.Dahlgren and N.L.Simmermans Science, 1963, 140, 485-486 (Dept. Chem., Univ. Alaska College, Alaska, U.S.A.) The retardation of plant growth by N-dimethylaminomaleamic acid is considered to be due to some of the products of its decomposition in aq. soln* by an intramolecular reaction, the kinetics of which are studied.

G.M.Lewis

6970. STRUCTURE AND PLANT GROWTH-REGULATING ACTIVITY OF SOME 2-BENZOTHIAZOLYLOXYACETIC ACIDS AND 2-OXOBENZOTHIAZOLIN-3-YLACETIC ACIDS. R.F.Brookes and E.L.Leafe: Nature, Lond., 1963, 198, 589-590 (Chem. Divn., Boots Pure Drug Co., Ltd., Nottingham, England) A compound thought to be 2-benzothiazolyloxyacetic acid [I] was shown unambiguously to be 2-oxobenzothiazolin-3-yl-acetic acid [II]. When tested for their effect on the growth of wheat coleoptile and for their activity against 4 common weeds, I and its chloro deriv. were inactive while II and its chloro deriv. were highly active.

G.M.Lewis

DEVELOPMENTAL EFFECTS OF LIGHT AND TEMPERATURE

6971. QUANTITATIVE AND QUALITATIVE RELATIONSHIP OF U.V. AND VISIBLE RADIATION TO THE INDUCTION OF REPRODUCTION IN ASCOCHYTA PISI. C.M.Leach: Canad. J. Bot., 1962, 40, 1577-1602 (Oregon Agric Expt. Station, Oregon State Univ., Corvallis, Ore., U.S.A.) Irradiation under daylight fluorescent lamps or diffuse sunlight stim. pycnidial development in 40 isolates of *A. pisi*. Treatment of

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colonies with monochromatic radiation of wavelengths 2378A to 5461A at the same intensity of 100 $\mu\text{w}/\text{cm}^2$ and with exposures ranging from 1/50 to 20000 sec showed that only u.v. radiation induced sporulation. The peripheral zone of young mycelium was the most sensitive region to the radiation. A photoactivated sporulation precursor was able to move small distances from the irradiated peripheral mycelium to newly formed non-irradiated mycelium.

A.Meany

6972. PLANT MORPHOLOGY: ITS CONTROL IN PROSERPINACA BY PHOTOPERIOD, TEMPERATURE AND GIBBERELLIC ACID [GA]. A.Wallenstein and L.S.Albert: Science, 1963, 140, 998-1000 (Dept. Bot., Univ. Rhode Island, Kinston, R.I., U.S.A.) GA changes leaf orientation and prostrate growth habit of the short-day *P. palustris* plant to that typical of the long day plant. It also modifies leaf shape in both types of plants. Low temp. resembles short days in its effect on leaf shape and stem orientation of long day plants. Geotropic responses of the stem appear to be modified by photoperiod, temp., and GA.

G.M.Lewis

6973. EVOLUTION OF APICAL MERISTEM OF SINAPIS ALBA L. (LONG DAY PLANT) IN LONG DAYS, IN SHORT DAYS AND DURING TRANSFER FROM SHORT DAYS TO LONG DAYS. G.Bernien Caryologia, 1962, 15, 303-325 (Centre de Rech., Hormones Vegetales, Inst. Bot., Liege, Belgium) The evolution of the apical meristem of *S.alba* is described under various photoperiodic conditions in a phytotron.

o> J.L. Batten

6974. CELLULAR RESPONSES TO THERMAL AND PHOTO STRESS. I. EUGLENA AND CHLAMYDOMONAS. J.A.Gross and T.L.Jahrn: J. Protozool., 1962, 9, 340-346 (Life Sci. Sect., Armour Res. Fndn., Illinois Inst. Tech., Chicago, Ill., U.S.A.) Both spp. were cultured in the dark and at 15, 60 and 150 ft. candle light intensities and at temp. in the range from 20-35°. Growth of *Euglena* below 32.5° was independent of light while *Chlamydomonas* was light dependent at all temp., at which growth occurred. *Chlamydomonas* failed to grow in the dark and at 15 ft. candles and at temp. above 32.5°. At 35° die growth of *Euglena* decreased as the intensity of illumination was raised. At this temp., multi-nucleated giant specimens of this sp. appeared but monsters were not found in cultures of *Chlamydomonas*.

To explain the monster specimens of *Euglena*, it is suggested that a dark-formed thermosensitive protein, essential for normal division, is denatured at high temp.

R.J.Walker

DORMANCY AND GERMINATION

6975. GERMINATION OF MELAMPYRUM LINEARE: INTERRELATED EFFECTS OF AFTER-RIPENING AND GIBBERELLIC ACID. E.J.O'Curtis and J.E.Cantlonz: Science, 1963, 140, 407-408 (Dept. Bot., Michigan St. Univ., East Lansing, Mich., U.S.A.) Seed germination of *M. lineare* proceeds only after activation followed by an extended period of chilling. Up to 1/3 of seeds can be activated by storage at room temp., while all seeds are activated by gibberellic acid. Chilling before activation is ineffective.

G.M.Lewis

6976. IRON DISTRIBUTION DURING WHEAT SEED GERMINATION. P.A.Kolesnikov and A.A.Mutuskin: Biokhimiia, 1963, 28, 216-223. Dipyridyl and spectrophotometry were used for determining Fe distribution during wheat seed germination and seedling growth. A large amount of Fe^{2+} was accumulated in the scutellum of the germinating grain (up to one seventh of the total Fe of the grain). During the growth of seedlings there is variation in the Fe distribution; during the first days more Fe is consumed by the roots, and then by the leaves, little Fe is taken up by the coleoptile.

(Russian) BJ. Cooper

6977. PHASE CONTRAST MICROSCOPIC STUDY OF POLLEN-GRAIN GERMINATION, NUCLEAR MOVEMENT AND POLLEN-TUBE MITOSIS IN TRADESCANTIA VIRGINIANA. G.Venema and A.Koopmans: Cytologia, 1962, 27, 11-24 (Genet. Inst., Govt. Univ. Groningen, Haren, Netherlands) The elongate generative and rounded vegetative nuclei exist in a single body of cytoplasm. Pollen-grain germination and pollen-tube growth are described, the former being accompanied by the formation of a vacuole in the cytoplasm which enlarges as the latter proceeds. Some of the kinetics of pollen-tube growth and nuclear movement were analysed, and it was shown that although the vegetative nucleus enters the pollen-tube first it is overtaken by the generative nucleus. Pollen-tube mitosis of the generative nucleus has been followed, and it is noted that vegetative nuclear degeneration does not commence until that stage.

C-A.Stace

MOVEMENT

6978. RED LIGHT, AUXIN RELATIONSHIPS, AND THE PHOTOTROPIC RESPONSES OF CORN AND OAT COLEOPTILES. W.R.Briggs: Amer. J. Bot., 1963, 50, 196-207 (Dept. Biol. Sci., Univ. Stanford, Calif., U.S.A.) Red light decreased the phototropic sensitivity of corn and oat coleoptiles. White light-dosage after 2 hr. red-light treatment induced almost max. first pos. curvature in both corn and oat coleoptiles. Increase in curvature obtained reflects the decreased phototropic sensitivity of both plants shown by a dosage-response curve shift. After red treatment, the effect of red light remains max. for one hr. red light suppresses auxin production by corn coleoptiles but this effect decays after the end of red treatment. Some results obtained can be accounted for by the hypothesis that red light induces an increase in the amount of pigment mediating second pos. curvature.

T.H.Thomas

RADIATION EFFECTS

6979. CHEMICAL PROTECTION AGAINST THE EFFECTS OF α -RAYS AND OF THERMAL NEUTRONS IN PLANT CELLS BY PRE- AND POST-TREATMENTS. R.Biebl and W.Urfc: Radiat. Bot., 1963, 3, 67-73 (Inst. Plant Physiol., Univ. Vienna, Austria) Cells of the outer epidermis of scales of *Allium cepa* were irradiated with

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(X-rays and thermal neutrons and pre- or post-treated with various chem. substances. Thioacetamide, thiourea, methylthiourea, AET [S-[3-aminoethylisothiouronium bromide HBr] and MAT [methylallylisothiourea] afforded protection in pretreatment and when present during irradiation. Hypotoilic soln. of glucose, fructose, sucrose, glycerine, CaCl₂ and KC₁ afforded protection by post-treatment only. It is suggested that different mechanisms are responsible for the protective effects of pre- and post-treatment respectively.

J.R.Broome

6980. INHIBITION OF FLOWER INITIATION OF PHARBITIS NIL BY Y'IRRADIATION. K.Wada: Bot. Mag. Tokyo, 1962, 75, 483-484 (Biol. Inst., Fac Liberal Arts and Sci., Univ. Shizuoka, Japan)

Seedlings of *P. nil* were subjected to Y'rays from a ⁶⁰Co source in the dose range of 300-600 r at a dose rate of 44 r/min. This specifically affected flower initiation and had no effect on stem elongation. Irradiation immediately at the end of a 16 hr. dark period had a much more inhibitory effect than irradiation prior to a 16 hr. dark period. When irradiation subsequent to the dark period was delayed the inhibitory effect diminished until it disappeared after 48 hr. (Short comm.) N.J.Pinfield

6981. RADIOSENSITIVE OF SEEDS. III EFFECTS OF PRE-IRRADIATION HUMIDITY AND Y'RAY DOSE ON SEEDS FROM FIVE BOTANICAL FAMILIES. T-S.Osborne, A.O.Lunden and M.J.Constantin: Radiat. Bot., 1963, 3, 19-28 (Agric Res. Lab., Univ. Tennessee, Oak Ridge, Tenn., U.S.A.)

The seeds of 5 spp. of plants from different families were equilibrated at relative humidities of from 10% to 85% and then exposed to doses of from 0 to 400 kr of oOco Y-rays at 450 kr/min. Except for *Festuca elatior* L., growth of both irradiated and control seeds was affected by storage humidity, higher humidities being generally more damaging than lower humidities. The humidity resulting in max. growth varied with the sp., from 9 to 38% R.H. in the controls and 42% to 53% R.H. in the irradiated seeds at the highest doses tolerated.

J.R.Broome

6982. INFLUENCE OF PARAMAGNETIC IONS ON THE RADIATION SENSITIVITY OF PLANT SEEDS.

Y.Hazama, K.Hazama and L.Ehrenberg: Radiat. Bot., 1963, 3, 7-18 (Inst. Org. Chem. and Biochem., Univ. Stockholm, Sweden) Barley seeds were soaked in soln. of paramagnetic ions, desiccated to low water content and then irradiated with 60Co γ -radiation at a dose rate of 9000 rad/min. In dry seeds paramagnetic ions exerted a protective action against ionising radiations under one atm. of air, but in some cases, e.g. at a high water content, in the absence of O₂ or under high O₂ Pressure, this protection could not be detected. j.R.Broome

6983. IRRADIATION OF SEED WITH RELATIVELY SMALL Y'RAYS SOURCES. ^w*^{*} ^w? ^m ^f ^y ^{Sr} ¹¹³ ^C Vermaak: S.Afr. J. agric. Sci., 1963, 6, 91-102 (Radioactivity Div., S.African Nat. Physical Res. Lab., Pretoria, S. Africa). LA.B.S.

6984. ACTION OF Y'RAYS ON FIRST STAGES OF DEVELOPMENT OF EMBRYO OF NICOTIANA RUSTICA L. M.Devreux and G.T.S-Mugnozza: Caryologia, 1962, 15, 279-291 (Lab. Appl. in Agric C-N-t-w. Centra di Studi Nucleari della Casaccia, Roma, Italy)

Several different grow* anomalies were Pn^{affJ?} Objecting *N. rustica* to y-radiation from J ^w g J * " . source). Endosperm formation seemed to be particularly

affected and large polyploid nuclei were produced by endopolyploidy. (French) J.L.Batten

PLANT CONSTITUENTS

6985. D-TRYPTOPHAN IN HIGHER PLANTS. M.H.Zenk and H.Scherf: Biochim. biophys. Acta. 1963, 71, 737-738 (Bot. Inst. Univ., Mlinchen, Germany). (German) B.M.Stevens

6986. CHOLESTEROL IN HIGHER PLANTS. D.F.Johnson, R.D.Bennett and E.Heftmann: Science, 1963, 140, 198-199 (Nat. Inst. Arthr. and Metab. Dis., Bethesda, Md., U.S.A.) Cholesterol has been identified by chromatographic and other techniques in the sterol fraction from *Solanum tuberosum* and *Dioscorea spiculiflora*. G.M.Lewis

MISCELLANEOUS

6987. BUILD-UP AND DECLINE OF AMMONIA AND ACIDITY IN GRASS AFTER SUCCESSIVE SOWINGS AND REGROWTH. H.F.Birch and H.W.Dougall: Nature, Lqfd., 1963, 198, 506 (Makerere Univ. Coll., Kampala, Uganda) The concomitant build-up and decline of ammonia and acidity in the grass *Setaria sphacelata* has been observed through 3 successive sowings and during regrowth, but never occurred in the grass *Brachiaria razizensis*. G.M.Lewis

6988. MINERALISATION OF NITROGEN IN SOILS UNDER GRASS. J.J.Theron: S.Afr. J. agric. Sci., 1963, 6, 155-164 (Transvaal Reg.. Dept. Agric Tech. Serv., Pretoria, S. Africa). LA.B.S.

6989. SOME CONSEQUENCES OF BITUMINOUS MULCHES. N.Collis-George, B-CDavey, D.R.Scott and D.R. Williamson: Aust. J. agric. Res., 1963, 14, 1-11 (Sect. Soil Sci., Sch. Agric., Univ. Sydney, Australia) Unlike conventional mulches incorporating an 'air-blanket', bitumen mulches increased soil temp, as a result of colour and surface contact. They also conserved soil moisture, whether in a continuous surface, or in a cultivated and admixed form. Field expt. with a sandy soil and pot expt. with a sandy and a clay soil under different temp. regimes are described and effects of various concn. of bitumen-in-water emulsion on temp, moisture, and plant behaviour are noted. When vegetation cover was sparse, physical conditions imposed by the bitumen mulch in the soil dominated plant behaviour.

R.L.Weston

6990. THE GREEN LEAF AS A HEAT ENGINE.

D.CSpannen: Nature, Lond., 1963, 198, 934-937 (Dept. Bot., Bedford Coll., Univ. London, England) Analogies are drawn between the green leaf and a heat engine. Thermodynamics of photosynthesis, temp, of radiation, entropy of radiation and max. thermodynamic efficiency are discussed. The problems of heat loss in the green leaf appear to have been overcome by using working parts of microscopic dimensions which operate at

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exceedingly large speeds. Energy efficiency considerations suggest that the quantum requirement for photosynthesis is unlikely to be 4. J.R.Sargent

6991. BEHAVIOUR OF GRAFT PARTNERS AND DISTRIBUTION OF CHEMICAL ELEMENTS IN TOMATO GRAFTS. D.Scheidecker, M.Bouloux-Hardy and G.Billarcf. C.R. Acad. Sci- Paris, 1962, 255, 555-557. Autografts and heterografts were made, using 2 spp. of Lycopersicum. After 3 months no morphol. modification was apparent. In die autografts, H₂O content and composition of elements showed little difference in both stock and scion; in heterografts greater differences were observed. (French) J.M.Thomas

6992. ROOT HAIRS, CUTICLE AND PITS. F.M.Scott, B.G.Bystrom and E-Bowler: Science, 1963, 140, 63-64 (Dept. Bot., Univ. California, Los Angeles, Calif., U.S.A.) An E.M. study of root hairs of Ranunculus sativus, Brassica nigra and Triticum aestivum.

G.M.Lewis

6993. ABNORMAL STOMATA ON DIPLOID AND TETRAPLOID BRACKEN FERNS. C.Takahashi: Cytologia, 1962, 27, 151-157 (BioL Lab., Univ. Nagoya, Japan) Three types of anomalous stomata were found on tetraploid plants produced sexually from aposporously formed prothallia: a circular undivided stomatal mother cell, also found rarely on diploid sporophytes; an 'epidermised' poreless stoma, where the 2 products of stomatal mother cell division resembled epidermal cells rather than guard-cells, confined to tetraploids; and an irregularly multiullular poreless stoma formed by guard-cell division, four*4 on 3 tetraploid plants only. These 3 plants had no normal stomata, yet grew healthily. C.A.Stace

6994. OBSERVATIONAL AND EXPERIMENTAL STUDIES OF SENSITIVE PLANTS. XIV- ON CHANGES IN A NEW CELLULAR ELEMENT OF MIMOSA PUDICA IN DIURNAL AND NOCTURNAL CONDITIONS.

H.Toriyama: Cytolojda, 1962, 27, 276-284 (Biol. Sect., Tokyo Women's Christian Coll., Tokyo, Japan)

The presence of a new organelle, the carotenoid-body, in motor cells of Mimosa pulvini is reported. Suitable fixation enabled them to be observed without staining, but they were stained with brilliant Cresol-Blue, iodine and Carr- Price reagent, and were observed also in the petiole and mesophyll, and similarly in three other leguminous genera. In the daytime the carotenoid bodies are more inflated (spherical, 2-7 11 diam.) than at night. They are gradually dissolved in ethanol. C.A.Stace

6995. STUDIES ON GAMETE COPULATION IN HETEROTHALLIC CHLAMYDOMONADS. L.Wiese and R.F. Jones: J. cell. comp. Physiol., 1963, 61, 265-274 (Biol. Dept., Princeton Univ., Princeton, N.J., U.S.A.)

The mating process in 3 spp. of Chlamydomonas involves a flagella aggln. reaction dependent on divalent cations (Ca, Mg) followed by pair formation, which is inhibited by Na laurylsulphate and sulphhydryl reagents.

G.M.Lewis

6996. CROWN GALL AS AN ANATOMICAL AND CYTOLOGICAL PROBLEM. S.KupiUu: Cancer Res., 1963, 23, 497-509 (Dept. Path., Univ. Wisconsin, Madison, Wis., U.S.A.) A review. 58 ref.

B.M.Stevens

6997. ACID-FASTNESS OF PINE POLLEN. D.H.Heilman, H.W.Bernton, D-L.Dunner and S.M.Barben: Stain Technol.. 1963, 38, 193-197 (Tissue Culture Lab..

Mt. Alto V.A. Hosp., Washington, D.C., U.S.A.) A loss of acid-fastness observed when fresh pine pollen came in contact with tissues or mucous membranes led the authors to investigate this phenomenon. They found that acid-fastness of viable pine pollen was destroyed by crushing, germination, or contact for several hr. with serum or saline soln., but was unchanged by exposure to 0-1% soln. of streptomycin in water. MJ.Bell

6998. NATURE OF COHESION WITHIN POLLEN TETRADS OF TYPHA LATIFOLIA. J.J.Skvarla and D.A.Larson: Science, 1963, 140, 173-175 (Dept. Bot., Univ. Texas, Austin, Tex., U.S.A.) E.M. examination shows that pollen tetrads in T. latifolia result from the fusion of the outermost portion of the exine (tectum) where microspores within the meiotic tetrad are contiguous. Exine stratification is discussed.

G.M.Lewis

6999. RADIOACTIVITY IN SOME AQUATIC PLANTS. P.R.Burkholder: Nature, Lond., 1963, 198, 601-603 (Lamont Geological Observ. Columbia Univ., Palisades, N.Y., U.S.A.) 3- and γ -radiation emitted by representative aquatic vegetation during 1962 was measured, γ Spectra showed the presence of common fission products and induced radioactive elements, but short-lived elements were not detected. G.M.Lewis

7000. ENZYME-COENZYME RELATIONSHIPS IN GLUTAMIC ACID METABOLISM OF RUST-INFECTED SUNFLOWER COTYLEDONS. J.E.Smith and E.R.Waygood: Canad. J. Bot., 1963, 41, 41-54 (Dept. Bot., Univ. Manitoba, Winnipeg, Manitoba, Canada)

The activities of glutamate decarboxylase [GDC], GOT and glutamate dehydrogenase [GDH] were determined in cell free extracts of healthy and rust-infected sunflower cotyledons and uredospores. Uredospores contained an active NAD-linked GDH but little GDC or GOT activity. GDC activity was lower and GOT was higher in rust-infected tissue as compared to healthy tissue as a result of redistribution of pyridoxalphosphate- GDH activity was higher in extracts of infected tissue as a result of the presence of the fungal enzyme.

A.Meany

7001. GLYCOLIC ACID OXIDASE AND FUSARIOSE WILT OF TOMATOES. B.D-Sanwal and E.R.Waygood: Canad. J. Bot., 1963, 41, 55-63 (Dept. Bot., Univ. Manitoba, Winnipeg, Manitoba, Canada)

Roots of tomato plants were infected with Fusarium and changes in the glycolic acid oxidase [GAO] - glyoxylic acid reductase [GAR] system of the leaves was followed. GAO activity decreased 8-16 days after inoculation when the leaves showed chlorotic symptoms. GAR showed an increase in activity 20 days after infection. These alterations in enzymic activity resulted in an accumulation of glycolic acid even though the fungus was never present in the leaves. Both FMN and FAD decreased after 8 days - the depr^sed activity of GAO, is due to the decreased concn. of its FMN coenzyme.

A.Meany

TECHNIQUES

7002. METHOD FOR DETERMINATION OF FAT PERCENTAGE p UNICELLULAR ALGAE. D.M.Collyer: J. Mar. biol. Ass. U.K., 1962, 42^ 485-492 (Fish. Lab-i

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Burnham-on-Crouch, England) The method is suitable for algae down to 2 μ diam. and determines the wt. of total fatty acids and total unsaponifiable fat-sol. matter in fresh algal material which contains 20-280 mg. total dry matter. Chem. treatment is based on the method of Belin (1926). P.J. Baron

7003. EFFECT OF VARYING RESIDUAL MOISTURE CONTENT ON THE VIABILITY OF LYOPHILISED ALGAE. O.Holm-Hansen: Nature, Lond., 1963, 198, 1014-1015 (Dept. Bot., Univ. Wisconsin, Madison, Wis., U.S.A.) There was no difference in viability of *Nostoc muscorum* or *Chlorella* sp. after freeze drying at -21°C or at room temp. Removing progressively more of the bound water by heating at 10°C markedly reduced the viability. G.M. Lewis
7004. IMPORTANCE OF ELECTROLYTE IN THE DETERMINATION OF MOLECULAR WEIGHTS BY 'SEPHADEX' GEL FILTRATION, WITH ESPECIAL REFERENCE TO HUMIC ACID. A.M.Posnen: Nature, Lond., 1963, 198, 1161-1163 (Dept. Agric Chem., Waite Agric.

Res. Inst., Univ. Adelaide, Australia) Humic acids could be separated on Sephadex columns into 2 bands when NH₄Cl was used as eluant, but not when water was used as eluant. Average mol. wt. for the 2 humic acid fractions were 70000 and 200000. Cultivation of soils under continuous pasture of wheat fallow rotation leads to a shift in the humic acid components from a high to a low mol. wt. group.

J.R.Sargent

7005. FUCHSIN STAINING FOR NaOH CLEARING FOR LIGNIFIED ELEMENTS OF WHOLE PLANTS OR PLANT ORGANS. CFuchs: Stain Technol., 1963, 38, 141-144 (Lab. Biol. VSgStale Appl., MusSum Nat. Hist. Naturelle, 61 rue Buffon, Paris, France) The author has developed a method whereby die lignified or suberous elements of plant tissue are stained without the staining of hairs and parenchymal tissues which so impedes observations to any appreciable depth. The principle of this method is to stain with basic Fuchsin and clear with NaOH. Three procedures are given suitable for tissues of soft or hard consistency.
- M.J.Bell

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CYTOLOGY

7006. LOCOMOTION OF AMOEBA PROTEUS.

L.G.E.Bell and K.W.Jeon: Nature, Lond., 1963, 198, 675-676 (Dept. Zool., King's Coll., Univ. London, England) Locomotion of A. proteus, A. dubia and Pelomyxa carolinensis was observed in Chalkey's medium on clean glass both from above and from the side. Components of the locomotory system identified include: - (1) an extension of surface to provide a main exploratory pseudopod which is not in contact with the substratum, (2) streaming of cytoplasm into the exploring pseudopod, (3) formation of small adhesive pseudopods from the ventral surface of the main pseudopod, which stick to the bottom and support the amoeba, (4) the eventual detachment of these supporting pseudopods from the substratum and their incorporation into a tail region which is carried off the bottom. G-M-Lewis

7007. ARREST OF PLASMODIAL MOTILITY DURING MITOSIS IN PHYSARUM POLYCEPHALUM.

E.Gutté and S.Gutté: Exp. Cell Res., 1963, 30, 242-244 (Dept. Biol., Brown Univ., Providence, R.I., U.S.A.) During mitosis, locomotion, expansion and internal shifting of material were completely arrested in all plasmodia, whereas the rhythm of protoplasmic streaming remained unchanged* K.Jones

7008. CELL DIVISION; DIFFERENTIAL EFFECTS OF HEAVY WATER UPON MECHANISMS OF CYTOKINESIS AND KARYOKINESIS IN EGGS OF AKACIA PUNCTULATA. D.Marsland and A.M.Zimmerman: Exp. Cell Res., 1963, 30, 23-35 (Biol. Dept., New York Univ., New York, U.S.A.) The 2H₂O treatments exerted a stabilising action on the nuclear membrane and various cell structures of inseminated eggs of A. punctulata, as studied by pressure-centrifugation and by isolation of the mitotic apparatus. The gel structure of the peripheral cytoplasm became firmer, the value of die gel strength at 2f being about 24% higher than normal. However, the 2H₂O treatment did not abolish the furrowing capacity of the eggs. The anti-mitotic effects of the heavy water are interpreted in terms of changes in the chem. bonding of gel structures. K.Jones

7009. RETARDATION OF DIVISION OF THREE CILIATES BY INTERMITTENT AND CONTINUOUS ULTRAVIOLET RADIATIONS AT DIFFERENT TEMPERATURES.

A.C.Giese, B.McCaw and ^Cornell: J. gen. Physiol., 1963, 46, 1095-1108 (Dept. Biol. Sci., Stanford Univ., Stanford, Calif., U.S.A.) The same dosage of u.v. radiation retarded the division of several protozoans more effectively when the light was intermittent than when it was continuous, and especially at temp. of 25-35°. At lower temp., the difference in effectiveness was less marked. The result indicated that thermochem. dark reactions succeed the absorption of u.v. radiations by the cell. In Blepharisma, besides initial delay in division, the cells stopped dividing after one or two divisions, a stasis ensuing. K.Jones

7010. ULTRASTRUCTURE OF CUTICLE OF FASCIOLA HEPATICA. L.T.Threadgould: Exp. Cell Res., 1963, 30, 238-242 (Dept. Zool., Queen's Univ., Belfast, N. Ireland) Prelim. note. K.Jones

7011. E.M. STUDY OF THE FORMATION AND STRUCTURE OF THE PELLUCID MEMBRANE OF THE TELEOST,

LEBISTES RETICULATA (POECHIDAE). P.Chambolle, RtCambar and P.Gendre: OR. Soc. Biol. Paris, 1962, 156, 2018-2020 (Centre E.M., Fac Sci., Bordeaux, France) Between the ovocyte and the basal membrane of the follicle in L. reticulata were villi which developed from the ovocyte. Between these villi was an osmophilic substance, secreted by the follicle. There was no noticeable variation in structure of this layer during development of the embryo. (French) M.A.Price

7012. HISTOLOGICAL AND HISTOCHEMICAL STUDY OF THE EPITHELIUM OF THE WALLS OF THE URODAEUM OF BLINDWORM EMBRYOS, (ANGUIS FRAGILIS, L.). J.Raynaud and A.Raynaud: OR. Soc. Biol., Paris, 1963, 157, 8-13 (Inst. Pasteur, Sannois, S.-et-O., France) The epithelial cells of the walls of the urodaeum of A. fragilis embryos weighing 80 mg. stained red with Best's Carmine and gave pos. PA-Schiff reaction. The staining material was situated in the basal part of the cell, below the nucleus. Incubation of sections with saliva decreased the intensity of colour after staining. (French) M. A. Price

7013. DEPOSITION OF SKELETAL STRUCTURES IN CRUSTACEA. IV. MICRORADIOGRAPHIC STUDIES OF GASTROLITE OF CRAYFISH ARCONECTES VIRILIS HAGEN. D.F.Travio and U.Friberg: U. ultrastructure. Res., 1963, 8, 48-65 (Orthopaedic Res. Lab., Harvard Med. Sch., Massachusetts Gen. Hosp., Boston, Mass., U.S.A.) In the early gastrolith, microradiographs with soft X-rays have shown loosely packed globular centres of mineralisation to be present along the less dense lamellae^ giving an overall picture of globular prisms. The matrix contains non-uniformly spaded lamellae. In mature gastroliths the mineral distribution becomes more dense and arranged along the lamellae to give an alternate dense and less dense lamellar picture. H.B.Waynfirth

7014. CALCIFICATION OF KERATIN. P.f.C.Blakey, C.Earland and J.G.P.Stell: Nature, Lond., 1963, 198, 481 (Dept. Textile Ind., Inst. Technol., Bradford, Yorks., England) The X-ray diffraction patterns of platypus hair, lion whisker and goose feather calamus show apatite reflections. Similar reflections were observed in X-ray diffraction patterns of 16% of human finger nails. G-M.Lewis

7015. A JMMORPMC SPERMS OF RHINOPOMA KINNEARI (CHILOPTERA). R.S.Mathur and T.C.A.Kumar: Experientia. Basel, 1962, 18, 570-571 (Dept. Zool., Univ. Rajasthan, Jodhpur, India) The 2 types of sperm differ in their shape and length of tail, but it is not known whether the dimorphism is due to differences in the chr. complement. R.S. Tonics

METABOLISM

7016. CO₂ FIXATION STUDIES WITH THE CULTURE FORM OF TRYPANOSOMA CRUZI. I.B.R.Bowman, E.J. Tobie: Physiol., 1963, 19, U.S.A.)

T[^]CTU_ZI incubated in manometric flasks with air/CO₂ aim. produce succinate in bicarbonate or pSsphate buffered salines. In anaerobic conditions fcfamount of

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CO₂ as dissolved CO₂, carbonic acid or bicarbonate affected *xh6* production of succinate. When glucose was present succinate production depended on a source of CO₂* in absence of glucose no succinate at all was formed. Expt. with [14C]glucose indicate that metabolism proceeds to a large extent via the Embden-Meyerhof scheme, followed by the tricarboxylic acid cycle, forming succinate. Succinate formed either via Krebs cycle or fixation is partly excreted into the medium. Malonate increases the yield of succinate without affecting production of CO₂* M.S.Laverack

7017. ISOLATION AND CHARACTERISATION OF MEMBRANE OF LEISHMANIA DONOVANI. B.K.Ghosh:

Ann. Biochem., 1963, 23, 159-168 (Indian Inst.

Biochem. and Expt. Med., Calcutta, India)

The membrane was isolated in the form of a ghost and was found to make up about 1Qrfa of the dry wt. of the cell. On analysis the membrane was found to have a predominantly lipoprotein structure, but an unexpected finding was the presence of carbohydrate in the form of mannose.

L.Barnes

7018. COLD AND ANAEROBIA ON TOTAL TREHALOSE OF BOMBYX MORI. J.Dutrieu: CR. Soc Biol. Paris,

1962, 156, 2020-2023 (Lab. Physiol. Gen., Fac Sci., Bordeaux, France)

Trehalose was absent from the egg of *B. mori* after laying, during pre-diapause and summer diapause*. During development the trehalose content was 10-15%. Cold increased the trehalose content. Trehalose decreased at the resumption of development, increased during later developmental stages and decreased at hatching. Trehalose was present in the haemolymph of larvae. (French) M. A. Price

7019. UTILISATION OF NUCLEOSIDES IN THE CRICKET OVARY AND THEIR VARIATIONS DURING OOGENESIS. I. INCORPORATION IN RNA. II. INCORPORATION IN DNA. CFavard-S&r&io and M.Durand:

Develop. Biol., 1963, 6, 184-205, 206-218 (Lab.

Physique Atomique et MolSculaine, Coll. de France, Paris, France)

I. In follicle cells PHcfidine and cytidine were incorporated in chr. and there was a progressive accumulation of labelled RNA in the nucleolus. Cytoplasmic labelling occurred later, associated with a loss of nucleolar RNA which occurred more rapidly when follicle cells were active. In the oocyte, uridine and cytidine were first seen in the nuclear saR and subsequently labelled RNA accumulated in chr. and ooplasm. KNA activity remained high during cytoplasmic growth, but declined after the onset of vitellogenesis.

H- No* of follicle nuclei labelled with PHjthymidine increased with onset of secretory activity and after 5 min. incorporation approx. 30% of nuclei were labelled during middle period of vitellogenesis. No further rise in no. of labelled nuclei occurred following increased treatment ^me during later stages of development. No uptake was observed in germinal vesicle, but during max. follicle cell activity labelled DH was present in follicle cell Ooplasm and in the ooplasm. Following long incorporation times pHjuridine and cytidine were used for Y^NA synthesis. Incorporation of uridine was similar to that of thymidine but incorporation of cytidine followed a special pattern. (French) j.W.S.Harris

7020. PHENOLIC COMPOUNDS IN [HYDROLYSATES OF] THE COCKROACH OOTHECA. R.H.Hackman and

M.Goldberg: Biochim. biophys. Acta, 1963, 71, 738-740 (Div. Entomol, CSJ.R.O., Canberra, Australia).

B.M.Stevens

7021. ENZYME CHANGES IN FLIGHT MUSCLE CORRELATED WITH AGEING AND FLIGHT ABILITY IN THE MALE HOUSEFLY. M.Rockstein and K.F.Brandt:

Science, 1963, 139, 1049-1050 (Univ. Miami Sch.

Med., Coral Gables, Fla., U.S.A.) Mg-activated

ATPas e in flight muscle sarcosomes of ageing c? houseflies decreases concomitantly with failure in flight as reflected in the loss of wings during die 2nd week of adult life. Preceding the loss of wings, there is a rapid decline in (X'glycerophosphate dehydrogenase activity in the extra-mitochondrial fraction which is dependent on NAD.

G.M.Lewis

7022. CHEMICAL CHANGES WITH REPRODUCTIVE ACTIVITY OF THE CHITONS, KATHERINA TUNICATA AND MOPALIA HINDSH. A.CGiese and

G.Araki: J. exp. Zool., 1962, 151, 259-267 (Dept.

Biol. Sci., Stanford Univ., Calif., U.S.A.) Analysis was made of the protein, non-protein nitrogen, lipid and glycogen of the gonads, hepatic gland, foot and mantle of both spent and gravid specimens of *K.tunicata* and

M.hindsi. In these spp. lipid plays a more important role than glycogen as a storage material. There were no striking changes observed in organs other than gonads between spent and gravid animals. The ovaries store a large amount of lipid most of which passes into the eggs. In addition the protein content of the ovaries falls from 42% to 20-1%. There was little difference in the hepatic gland content of org. nutrients between spent and gravid specimens. During prolonged starvation, the lipid content of some of the tissues of *K.tunicata* decreased. It is concluded that lipids play an important role in the life cycle of these animals.

R.J.Walker

7023. EFFECT OF FASTING ON THE GLYCOGEN LEVEL OF THE MYOCARDIUM OF THE TENCH (TINCA TINCA L.). G.Peres and A.Suard: CR. Soc. Biol.,

Paris, 1962, 156, 1431-1432. In tench, 15 days after the initiation of fasting, there was an increase in the glycogen content of the myocardium from 2907 mg./100 g. After 90 days the glycogen content fell to 853 mg./100 g. The glycogen content increased to 1775 mg./100 g. after 120 days.

(French) M. A. Price

7024. EFFECT OF HYPO-OXIA ON THE DISTRIBUTION OF PHOSPHATES IN THE BLOOD OF THE TENCH (TINCA TINCA L.). CBange: CR. Soc. Biol.,

Paris, 1962, 156, 1400-1403 (Lab. Physiol. ggn., Fac. Sci., Lyon, France) The org. phosphate content of the blood of tench showed a seasonal variation with an increase during winter and spring. During mild hypo-oxia there was a decrease in the blood content of mineral phosphate. The acid sol. org. phosphates decreased initially and returned to the normal level. The ATP content decreased rapidly after 2 hr. hypo-oxia. During severe hypo-oxia there was an increase in phosphate content of the blood with a decrease in acid sol. org. phosphates and ATP. (French) M.A.Price

7025. HAEMOGLOBIN: MOLECULAR CHANGES DURING ANURAN METAMORPHOSIS. CD.Trader, J.S.

Wortham and E.Frieden: Science, 1963, 139, 918-919 (Dept. Chem., Florida St. Univ., Tallahassee, Fla., U.S.A.)

Rana grylio and *R. catesbeiana* tadpoles have Hb that sediment at 4³S (mol. wt. 68000) and gradually produce a heavier 7⁰S component (mol. wt. 136000) during metamorphosis. "There is extensive change in the amino acid composition of these Hb which may account for observed changes in electrophoretic mobility." G.M.Lewis

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EMBRYOLOGY

7026. PRELIMINARY OBSERVATIONS ON SCALES AND THEIR MODE OF ORIGIN IN CHRYSOCHROMULINA POLYLEPIS SP. NOV. LManton and M.Parke: J. Mar. biol. Ass. U.K., 1962, 42, 565-578 (Lab., Citadel Hill, Plymouth, England) *C polylepis* produces 4 different types of scale on the same cell. The scales develop in vesicles in the body and are later deposited on the surface of the cell. Rates of scale production vary with the time of day. P.J.Baron

7027. ENVIRONMENTAL FACTORS INFLUENCING THE GROWTH OF CORDYLOPHORA. CFultone J. exp. Zool., 1962, 151, 61-78 (Dept. Biol., Brandeis Univ., Waltham, Mass., U.S.A.) Using a defined culture method, the hydranth no. of cultures of the colonial hydroid *C lacustris* increased exponentially, with a doubling time of approx. 3 days. In a defined culture soln., *C lacustris* requires Na, K, Ca and Cl* for growth and in addition Mg²⁺ for growth at a max. rate. A max. growth rate is obtained by feeding once a day with larvae of *Artemia*. Light has little effect on growth, while within the pH range 6-9 and temp, range of 18-26°, the growth rate is similar. Expt. indicate a distinct but low O₂ tension requirement for growth. R.J. Walker

7028. THE EXTENSION OF FERTILISABILITY AND A HYPOTHESIS ON SPERM ENTRANCE IN SAND DOLLAR EGGS. O.Rulon: Biol. Bull. Woods Hole, 1962, 122, 391-395 (Dept. Biol. Sci., Northw. Oftern Univ., Evanston, Ill., U.S.A.) The eggs of *Dendraster excentricus*, which normally lose their capacity for fertilisation in 2 days, can retain it for as much as 8 days when treated with M/400-M/800 CoCl₂. Neither thioglycolic acid or cysteine hydrochloride had this effect on the eggs, but when combined with CoCl₂ preserved the fertilisability for 21-25 days. It is suggested that these substances have these effects by preventing destructive oxidations in the egg and further, that fertilisation is facilitated by reduction of disulphide to sulphhydryl at the egg surface. G.J.Peaikin

7029. ACID PRODUCTION AT FERTILISATION OF SEA URCHIN EGGS. K.Aketa: Exp. Cell Res., 1963, 30, 93-97 (Biol. Inst., Fac Sci., Nagoya Univ., Nagoya, Japan) Sea urchin eggs released sulphate into the sea water surrounding them upon fertilisation. It is suggested that the acid formed upon fertilisation of the sea urchin eggs corresponds to the inorg. sulphate spit off from mucopolysaccharide contained in the cortical granules. Paper chromatographic analysis showed no qual. difference between the sea water in which sea urchin eggs were fertilised and normal sea water. K.Jones

7030. FUNCTIONAL MORPHOLOGY OF LARVA, AND POST LARVAL DEVELOPMENT OF VENUS STRIATULA (DA COSTA). A.D.Ansell: J. Mar. biol. Ass. U.K., 1962, 42, 419-443 (Dept. Zool., Univ., Glasgow, Scotland) A description of the functional morphology of die veliger, pediveliger and early post larva is given. The phylogenetic significance of the mode of development of certain organs of the post-larval stage is discussed. P.J.Baron

7031. FINE STRUCTURE OF POLE CELLS AND POLAR GRANULES IN DROSOPHILA MELANOGLASTER. A.P.Mahowald: J. exp. Zool., 1962, 151, 201-215 (Woodstock Coll., Woodstock, Md., U.S.A.)

The pole cells from embryos of *D. melanogaster* are distinguished from cells of the blastoderm by a less dense cytoplasm, annulate lamellae, hollow spherical nucleoli and polar granules. Polar granules originate in stage 9 oocytes as small dense bodies 0*2 p in diam. They are not bounded by a membrane but contain RNA*. Their basic structure during oogenesis is composed of granules the size of ribosomes and also a smaller granular or fibrillar component.

R.J.Walker

7032. DEVELOPMENT OF PARTHENOGENETIC AND AMPHIGONIC EGGS IN BREVICORYNE BRASSICAE. A.M.Pagliai: Caryologia, 1962, 5, 537-544 (Inst. Zool., Univ., Modena, Italy) Parthenogenetic and amphigonic egg development of *B. brassicae* are compared. As an examination of Aphid amphigonic egg development shows peculiar chr. behaviour when compared with that of most insects, this has probably permitted endomeiosis establishment in parthenogenetic individuals and hence the genetic variability in single parthenogenetic lines of Aphids. (Italian) J.L.Batten

7033. FERTILISATION IN DROSOPHILA. I. EVIDENCE FOR THE REGULAR OCCURRENCE OF MONOSPERMY. P-E.Hildreth and J.CLucchesi: Develop. Biol., 1963, 6, 262-278 (Lawrence Radiation Lab., Univ. California, Berkeley, Calif., U.S.A.) Examination of 294 prep. of meiotic eggs of *D. melanogaster* and *p. virilis* and autoradiographs of 20 eggs fertilised by T³H-thymidine labelled sperm revealed on 11 eggs containing more than 1 sperm. It is suggested that in a large no. of insect spp. physiol. polyspermy does not occur, and that pathol. effects of polyspermy need not be manifested when accessory sperm enter the egg. J.W.S. Harris

7034. A MARINE FISH-REARING EXPERIMENT USING ANTIBIOTICS. J.E.Shelbourne: Nature, Lond., 1963, 198, 74-75 (Min. Agric, Fisheries and Food, Fisheries Lab., Lowestoft, Suffolk, England) Treatment of eggs of plaice, *Pleuronectes platessa*, with penicillin and streptomycin increased the no. of eggs hatched and the no. of larvae developing. The optimum temp, for egg incubation was 6-T, rising to 10-11° during larval development. G.M.Lewis

7035. EFFECT OF MESODERM ON AUDITORY VESICLE IN ACIPENSERIDAE, URODELA AND ANURA. E.V.Chulitskaia: Dokl. Akad. Nauk, 1962, 144, 245-247. Transplant expt. showed that in Acipenseridae, Urodela and Anura, in that order, the mesodermal layer becomes increasingly important in its inductive effect on the material of the auditory vesicle.

(Russian) B.J.Cooper

7036. PERMEABILITY CHANGES IN FERTILISED AND ACTIVATED AMPHIBIAN EGGS. S.Lovtrupc J. exp. Zool., 1962, 151, 79-84 (Dept. Histol., Univ. Goteborg, Sweden) The changes in permeability to water after fertilisation and in activated and unfertilised eggs of *Rana platyrrhina* in which symmetrical cortical contraction occurred were followed. A distinct rise in the permeability const. occurred during the early phase of contraction in fertilised eggs. As this reverbates, the value for the permeability const. decreases to reach at grey crescent formation, a level slightly higher than in the unfertilised egg. In activated and unfertilised eggs, there is a temporary increase in permeability associated with contraction but the max. value of the permeability const. was lower. J.Walker

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7037. DIFFERENTIATION AND GROWTH OF THE EMBRYONIC NOSE, LENS AND CORNEAL ANLAGEN IMPLANTED INTO THE LARVAL EYE OR DORSAL FIN IN AMBLYSTOMA PUNCTATUM. R.W.Reyer: J. exp. Zool., 1962, 151, 123-153 (Dept. Microanat., Sch. Med., West Virginia Univ., Morgantown, W. Va., U.S.A.) The expt. were performed on embryos and larvae of A. punctatum. The prospective nose ectoderm at the neural stage can self-differentiate when transplanted to the ear region of the embryo or into the larval eye or dorsal fin. There is a gradual increase in the capacity for self-differentiation of the lens anlage from progressively older donors. The environment of the larval eye chamber did not stimulate lens development from the prospective lens ectoderm of the neurula and head and tail-bud donors. Following transplantation to the fin or eye, a lens grows better in close association with nasal tissue than when alone. Embryonic lens vesicles develop normally when transplanted into the host pupillary space of the larval eye following removal of the host lens, but are retarded in growth when transplanted to the larval dorsal fin. Prospective corneal epithelium does not form a lens when implanted into the ^{lentectomised} ~~lentectomised~~ ^{J.S.J.S.F.A.}

7038. TISSUE-SPECIFICITY OF FROG EGG-JELLY ANTIGENS. J.R.Shaver, S.H.Barch and O.A.Shivers: J. exp. Zool., 1962, 151, 95-103 (Dept. Zool., Michigan State Univ., East Lansing, Mich., U.S.A.) The double-diffusion technique employing antisera prep. in rabbits against egg-jelly of Rana pipiens and against various adult tissues of this sp. were used to analyse the antigenic components of the jelly coats of the frog egg. Apart from the ovary and oviduct, no tissue was found to contain components identical with those in W Jeuy. It is suggested that the cross-reaction between jelly and ovarian material may be due to the presence in the jelly of material secreted by the egg or the oviducal cells. The results of the antigenic analysis of frog egg-jelly are discussed in relation to the effect Ab against egg-jelly have on the fertilisation process in this sp. w. walker

REGENERATION

7040. ^{m^T}TOTAL STUDIES OF MECHANISMS IN V O ^ S U ^ GENERATION. D-B-Spangenberg and R.E.Eak: J. exp. Zool., 1962, 151, 85-94 (Path. Dem. Univ. Arkansas Med. Cent., Little Rock, Ark. SSfc) LiPoic acid affects the generation of the tentacles of Hydra oligactis and 4 strains of H. tenuiflora and H. tenuirostris by *d***TMgf regeneration. It is concluded that the inhibitory effect of LiSSic acid is not related(*) its vitamin function as both toe E active and inactive antipodes are inhibitory. Lipoic acid retarded the differentiation of interstitial cells into cnidoblasts. while the mesogloal kyer was restored at a normal rate. R.J.waiKer

7040. STUDIES ON VISCERAL REGENERATION IN SEA STARS. I. REGENERATION OF PYLORIC CAECA IN BTSt SKS?ffiKS⁰%₁₋₃₄₂ (Dept.

ⁿ Zool., Cornell Univ., Ithaca, N.Y.. U.S.A.) [^]generation was studied grossly and histol. at 1, 2, 3, 4, 6 and 8 weeks after removal of the pyloric caeca through

a median longitudinal aboral incision in one arm. After 2 weeks the incision and the cut ends of the caeca were found to be healed. Subsequently, the caeca grew out into the arm and showed progressive differentiation from the tip to the base. The tip comprised a solid mass of undifferentiated tissue but no signs of mitotic activity were revealed. G.J.Peaikin

7041. TISSUE AFFINITY IN AMAROECIUM. H. REAGGREGATION OF THREE PARTIAL ZOOIDS INTO FUNCTIONING SIAMESE TWINS. F.M.Scott: Biol. Bull. Woods Hole, 1962, 122, 396-416 (Seton Hill Coll., Greensburg, Pa., U.S.A.) Young adult zooids were divided into branchial and abdominal halves and then 2 branchial and one abdominal part were inserted into the tunic of a 2-week old zoid which had been previously emptied of its occupant. After mild maceration the reaggregation of the parts in various combinations took place within 5 days to produce functioning Siamese twins. G.J.Peaikin

7042. POLARISATION OF THE PIGMENT PATTERN IN THE REGENERATING IRIS OF ADULT NEWT EYES. L.S.Stone: J. exp. Zool., 1962, 151, 269-278 (Anat. Lab., Yale Univ. Sch. Med., Yale Univ., New Haven, Conn., U.S.A.) The observations indicate that the well marked nasal and temporal black pigment spots in the eyes of the adult of the newt Triturus v. viridescens, become permanently polarised at opposite poles in the horizontal plane, and that they can be replaced if temporarily lost. When the entire nasal or temporal half of the iris is excised, the regenerating iris is derived from peripheral wound edges of iris tissue and retina pigment epithelium. The iris with its chromatophores and pigment pattern can be regenerated from retina pigment cells which are not of neural crest origin. R.J.Walker

7043. REGENERATION OF HOMOPLECTICALLY DEPLANTED FORELIMBS FOLLOWING SPINAL CORD ABLATION IN AMBLYSTOMA OPACUM LARVAE. R.A.Liversage: J. exp. Zool., 1962, 151, 1-15 (Dept. Zool., Univ. Toronto, Canada) Expt. were carried out on 82 larvae of Ambystoma opacum of 25-56 mm., to test to what extent a forelimb can be isolated from the central and peripheral nervous systems and still retain its regenerative capacity. Using deplantation techniques it was found that the function of the nerves in larval urodele regeneration was solely at the local level and was possibly neurosecretory in nature. The conduction of impulses would appear not to be a prerequisite for limb regeneration in larval A. opacum. R.J.Walker

OSMOREGULATION AND EXCRETION

7044. IONIC REGULATION AND MODE OF ADJUSTMENT TO REDUCED SALINITY OF STARFISH ASTERIAS RUBENS L. J.Binyon: J. Mar. biol. Ass. U.K., 1962, 42, 49-64 (Dept. Zool., Royal Holloway Coll., London, England) The perivisceral and ambulacrinal fluids of A. rubens are isosmotic and isoionic with sea water, even if that medium is diluted by half. There is slight accumulation and regulation of Ca in the perivisceral fluid. To a much more marked extent K is accumulated and regulated in the water vascular system. It is

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suggested that there exists, for the K of the water vascular system, an active accumulator mechanism.

P.J. Baron

7045. FINE STRUCTURE OF THE SOLENOCYTE TREE IN PRIAPULUS CAUDATUS LAMARK. A.Nffcrevng; Nature, Lond., 1963, 198, 700-701 (Inst. Comparative Anat., Univ. Copenhagen, Universitetsparken 3, Copenhagen, Denmark). G.M.Lewis

7046. EXPERIMENTS ON OSMOTIC REGULATION AND IONIC REGULATION OF THE TERRESTRIAL CRAB, CARDISOMA ARMATUM HERKLOTS. M-de Leersnyder and H.Hoestlande Cah. Biol. mar., 1963, 4, 211-218 (Lab. Zool., Univ. Lille, France) The serum of *C. armatum* is hypotonic when the animal is kept in sea water ($A = -1^{\circ}70^{\circ}$) and hypertonic in fresh water ($A = -1^{\circ}391^{\circ}$). The urine of the animal is always isotonic with the serum, in all conditions. Temp, has no effect on osmo-regulation. Variation of the ionic composition occurs in response to environmental changes in the case of Cl, Na and Mg, but not K or Ca. Urine Ca is less than serum Ca. Excretion of Mg increases in sea water. (French) M. S.Laverack

7047. OSMOREGULATION IN LIGIA OCEANICA AND IDOTEA GRANULOSA. M.E.Todd: J. exp. Biol., 1963, 40, 381-392 (Dept. Zool., United Coll., Winnipeg, Man., Canada) The osmoregulatory response of *L. oceanica* and *I. granulosa* was tested expt. in various salinities at 5° and 15° in summer and winter animals. In 100% sea water the osmotic concn. of the blood of *L. oceanica* was markedly above that of the medium whereas in *I. granulosa* the blood was only marginally hyperosmotic. In both spp. the osmotic concn. of the blood was influenced by season, by temp, and by a tejn-p.-salinity interaction. A.J.Martin

7048. POTASSIUM METABOLISM AND ACCUMULATION OF 137CAESIUM BY DECAPOD CRUSTACEA. G.W.Bryan: J. Mar. biol. Ass. U.K., 1962, 42, 199-241 (Lab., Citadel Hill, Plymouth, England)

In unfed *Homarus vulgaris* and *Palaemon serratus* 137Cs is taken up and lost much more slowly than 42K. Higher whole animal factors are reached for 137Cs than for 42K*. The freshwater crayfish, *Austropotamobius pallipes*, in 0*-1% sea water does not concentrate 137Cs to the same extent as K. In all spp. muscle is the principle limiting factor in the uptake or loss of 137Cs, whereas with 42K the body surface is more limiting. P.J.Baron

7049. CHEMICAL COMPOSITION OF HAEMOLYMPH IN INSECTS AND SOME OTHER ARTHROPODS, IN RELATION TO THEIR PHYLOGENY. D.W.Sutcliffe Comp. Biochem. Physiol., 1963, 9, 121-135 (Dept. Zool., Univ. Durham, King's Coll., Newcastle-upon-Tyne, England) Details are given of analyses of the haemolymph of many insects representative of many orders of the Insecta. Three classificatory groups of haemolymph are suggested. Type 1, represented by *Aeschna grandis* larvae, have fluid in which Na and Cl account for the major part of the total osmolar concn. K, Ca, Mg and PO₄ are small in amount, and amino acids account for only about 10% of total concn. This type appears typical of Ephemeroptera, Odonata, Plecoptera, Dictyoptera, Hemiptera-heteroptera. Type 2 (*Locusta migratoria*). Na and Cl" provide less of the total concn. (about 50% combined) and there is a large amount of unknown material; found in some orthoptera, one dermopteran and one isopteran. In type 3 chloride is very low relative to Na which ranges from 21-48%. Amino

acids are present in considerable amounts (25<70- Exemplified by *Sialis* larvae, and found in trichoptera, diptera, megaloptera, neuroptera and mecoptera.

M.S.Laverack

7050. EXCRETION IN THE BLOOD-SUCKING BUG, RHODNIUS PROLKUS, STÅL. I. THE CONTROL OF DIURESIS. S.H.P.Maddrell: J. exp. Biol., 1963, 40, 247-256 (Dept. Biol., Dalhousie Univ., Halifax, Nova Scotia, Canada) The mechanism underlying the diuresis of fed larvae of *R. prolixus* was investigated. The rate of secretion of the Malpighian tubules isolated in a drop of haemolymph is at first high but soon falls to a low level. It can be restored by the addition of haemolymph taken from an insect during diuresis.

Diuresis is promoted by some substance, presumably a neurohormone, which can be extracted from the post, cells of the fused ganglionic mass situated in the mesothorax. A.J.Martin

7051. ABSORPTION OF Ca AND Sr IN SOLUTION IN THE AMBIENT MEDIUM BY LYMNAEA STAGNALIS L. O.Van der Borght: Arch. int. Physiol., 1962, 70, 611-623 (Centre d'Etude de l'Energie Nuclaire, Mol, Belgium) The fresh water gastropod *L. stagnalis* L. can absorb Sr and Ca from the surrounding water, it is not necessary for these elements to be ingested in the food. Ca is absorbed against a cone gradient from external milieu/blood. Rate of absorption is const, wheft Ca concn. is > 10 p.p.m. Below this concn. absorption is less rapid, possibly due to decreased efficiency of the transport mechanism regulating difference in Ca concn. between blood and external milieu. The rate of absorption of Ca is x 5 that of Sr under die conditions investigated.

(French) M.E.Nutt

7052. IN- AND OUT-FLUXES OF Ca IONS IN FRESH WATER GASTROPODS. O.van der Borght Arch. int. Physiol., 1963, 71, 46-50 (Radiobiol. Dept., Centre d'Etude de l'Energie Nucl&dre, Mol, Belgium)

Influx and outflux of Ca in *Lymnaea stagnalis* L. was measured, using 45Ca, and showed that Ca can be actively transported against a concn. gradient and used for construction of the shell. Since Sr seems to be accumulated in a similar manner to Ca the Sr content of the shell of *L. stagnalis* could be a possible indicator of radioactive Sr contamination*

M.E.Nutt

7053. OSMOTIC BEHAVIOUR IN AN INTERTIDAL LIMPET ACMAEA LIMATULA. E.Segal and P.A. Dehneb Biol. Bull. Woods Hole, 1962, 122, 417-430 (Dept. Biol., Rice Univ., Houston, Tex., U.S.A.)

Three populations of *Acmaea limatula* were used for osmotic and air desiccation expt. No osmoregulation took place over the range 50 to 150% sea water. Isotonicity of the blood with the medium was reached within 3 hr. in hypertonic media but took longer in hypotonic media. Extra-visceral water appeared to act as both as osmotic and a temp. buffer. G.J.Peakin

7054. GLOMERULAR FILTRATION RATE OF RAINBOW TROUT SALMO GAIRDNERI. W.N.Holmes and R.L. McBean: J. exp. Biol., 1963, 40, 335-341 (Dept. Zool., Univ. British Columbia, Vancouver, B.C., Canada) Upon adaptation of rainbow trout to 80% sea water, the GFR is reduced. Return to fresh water after one month in sea water is followed by a rapid re-establishment of die high GFR. The effects of adrenocortical and mammalian neurohypophysial hormones on the GFR were studied. Vasopressin and oxytocin, when given separately or together, increased the rate.

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aldosterone had no effect, while corticosterone caused a reductidh.
AJ.Martin

7055. UREOTELISM OF ECHIDNA AND PLATYPUS.
D.A.Denton, M.Reich and F.J.R.Hird: Science, 1963, 139, 1225 (Dept. Physiol., Univ. Melbourne, Parkville, Australia) Adult platypus and echidna excrete most of their nitrogen in the form of urea; amounts of allantoin and uric acid are small*. The presence of arginase in the liver was demonstrated. G.M.Lewis

FEEDING AND DIGESTION

7056. ABSORPTION OF VANADIUM BY TUNICATES.
M.Kallc: Nature, Lond., 1963, 198, 1010-1011 (Dept. Zool., Univ. Witwatersrand, Johannesburg, South Africa) E.M. studies of cells of Ascidia pygmaea Michaelson indicate that vanadyl cations from sea water are linked with sulphate groups in the acid pharyngeal mucus, which after neutralisation, passes by pinocytosis into the blood plasma and is available to amoebocytes. here the vanadium is reduced and pptd. on the membranes of cytoplasmic vacuoles. G.M.Lewis

7057. LACK OF DEPENDENCE OF THE FEEDING REACTION IN HYDRA ON REDUCED GLUTATHIONE.
H.Forrest: Biol. Bull. Woods Hole, 1962, 122, 343-361 (Dept. Zool., Rutgers State Univ., New Brunswick, N.J., U.S.A.) Of 10 spp. of Hydra none were found to be restricted to a diet of living animals of the higher phyla or exclusively dependent on release of reduced glutathione for initiation of feeding. Prolonged mouth opening was induced under the influence of 5 x 10⁻⁶ M quinine hydrochloride. It was concluded that prolonged mouth opening was not a natural feeding response, indeed dil. reduced glutathione soln. (10⁻² to 10⁻⁵ M) retarded normal swallowing and induced abnormal contraction of the tentacles. G.J.Peachin

7058. ADAPTATIONS OF TWO INTERTEDAL ISOPODS.
I. RESPIRATION AND FEEDING IN NAESA BIDENTATA (ADAMS) (SPHAEROMATIDAE). W-Wiesen J. Mar. biol Ass. U.K., 1962, 42, 665-682 (Zool. Inst., Univ., Vienna, Austria) Respiratory rate depends on the tidal cycle, max. respiratory rate being at high tide. In ? the turnover rate of gut contents, during max. feeding activity, is 30 min. Dry wt. of the faecal pellets increases in linear proportion with the wt. of the animal. P.J.Baron

7059. FEEDING AND RESPIRATION IN COPEPOD TEMORA LONGICORNIS (MULLER). A.Bernen J. Mar. biol. As*. U.K., 1962^ .42. 625-640 (Inst. Mar. Biol. Adv. A., Oslo, Norway) Radiophosphorus was used as a tracer. Filtering rate was found to be variable and is probably related to size. 1961 Summer weekly water samples estimated for participate carbohydrate showed that there was always enough food present in Temora. Respiration, measured by a modified Winkler method showed that O₂ consumption was related to surface area. P.J.Baron

7060. PRELIMINARY EXPERIMENTS ON FEEDING AND EXCRETION OF BIVALVES USING PHAEODACTYLM LABELLED WITH 32p. J.A.Allen: J. Mar. biol. Ass., U.K., 1962', 42,-609-623 (Dove Mar. Lab., Culler-

coats, Northumb., England) Venus arenaria* Venus striatula, Ostrea edulis and Cuspidaria cuspidata were fed with suspensions of Phaeodactylum labelled with 32p. O. edulis was found to have a filtering rate of 6'6 ml./ hr./mg. dry body tissue, a figure more than 6 times that recorded for M. arenaria and V. striatula. Up to 94% of the 32p in the Phaeodactylum filtered out of suspension was assimilated. Some of the 32p assimilated is excreted with the faeces, but most is released in soln. The kidney is probably the main organ for P excretion. P.J. Baron

7061. LOPHOPHORE AND CILIARY FEEDING MECHANISMS OF BRACHIOPOD CRANIA ANOMALA (MULLER). D.Atkins and MJ.Rudwick: J. Mar. biol. Ass., U.K., 1962, 42, 469-480 (Lab. Citadel Hill, Plymouth, England) Confirmation is given of Orton's account of the ciliary feeding mechanisms on the lophophore of C. anomala, but observations on the natural orientation of the lophophore have caused some modification of his account of the filter feeding water currents. P.J. Baron

7062. BIONOMICS OF CHRYSOPS SILACEA AUSTEN, 1907. I. LONGEVITY AND FOOD REQUIREMENTS OF ADULT FLY. W.Crewe and W-N.Beesley: Ann. trop. Med. Parasit., 1963, 57, 1-6 (Helminth Res. Unit of W.African Coun. Med. Res., Kumba, W. Cameroon) In order to survive the fly must ingest considerable amounts of sugar. After an initial blood meal and unless additional blood or sugar meals are taken, development of the ovaries is associated with a lowering of the survival rate of the flies. Under natural conditions blood meals are taken at intervals of 5 days and normal adult life is probably 3-4 weeks. P. J. Baron

7063. PREDATOR-PREY SIZE RELATIONSHIP FOR PLAICE LARVAE FEEDING ON OKOPLEURA.

J.E.Shelbourne: J. Mar. biol. Ass. U.K., 1962, 42,

243-252 (Fisheries Lab., Lowestoft, England)

Pelagic plaice larvae in the southern North Sea normally feed exclusively on Oikopleura dioica, larger plaice larvae feeding on all sizes of the appendicularian.

P. J. Baron

ENDOCRINES

7064. RESPONSES OF SPECIFIC NEUROSECRETORY CELLS OF THE COCKROACH, BLABERUS GIGANTEUS TO DEHYDRATION. BJ.Wall and C.L.Ralph: Biol. Bull. Woods Hole, 1962, 122, 431-438 (Dept. Biol. Sci., Univ. Pittsburgh, Pa., U.S.A.) Changes in the no. and distribution of stainable granules in the type A cells of the pars intercerebralis and the thoracic ganglia under conditions of dehydration are described and it is suggested that regulation of water content is under hormonal control. G.J.Peachin

7065. EFFECT OF THE REMOVAL OF THE FRONTAL GANGLION ON THE DEVELOPMENT OF THE GONADS IN LOCUSTA MIGRATORIA L. K.U.Clarke and P.A. Langley: Nature, Lond., 1963, 198, 811-812 (Dept. Zool., Univ. Nottingham, England) Removal of the frontal ganglion from fledgling ♂ and ♀ L. migratoria prevented further sexual development. G.M.Lewis



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7066. INFLUENCE OF NEUROSECRETORY CELLS AND OF CORPUS ALLATUM ON INTESTINAL PROTEASE ACTIVITY IN THE ADULT CALLIPHORA ERYTHROCEPHALA MEIG. E.Thomsen and hUflier. *J. exp. Biol.* 1963, 40, 301-321 (Zool. Lab., Royal Vet. and Agric. Coll., Copenhagen, Denmark) Adult 5 of *C. erythrocephala* fed only on sugar and water show a much lower intestinal protease activity than ♀ fed also on meat. Medial neurosecretory cells [m.n.c] are needed for normal production of proteolytic enzymes. Implantation of corpora cardiaca-allata in ♀ deprived of their m.n.c significantly increased the protease activity. Meat-eating acts indirectly on protease activity by causing liberation of m.n.c. hormone. A.J.Martin
7067. SHORTENING OF A DIAPAUSE-CONTROLLED LIFE-CYCLE BY MEANS OF INCREASING PHOTOPERIOD. G.M.Blake: *Nature, Lond.* 1963, 198, 462-463 (Pest Infestation Lab. (A.R.C), Slough, Bucks*. England) The effect of const. and changing photoperiods at 2/f on the development of the larvae of *Anthrenus verbasci* indicates that the length of the 1st cycle of the rhythm was controlled in a different way from the 2nd cycle. In uni-voltine individuals, the mean length of larval period decreased compared with the control in const. darkness when larvae were exposed to increasing photoperiods during early larval life, up to 13 weeks. The larval period became progressively shorter as the photoperiod on the 1st day of larval life increased. The metamorphosis of semi-voltine individuals remained largely under the immediate control of environmental light conditions. * G.M.Lewis
7068. PRESENCE OF THYROID HORMONES IN A PELAGIC TUNICATE, SALPA MAXIMA FORSKAL. J.Roche, G.Rametta and S.Varrone: *C.R. Soc. Biol., Paris.* 1962, 156, 1964-1968 (Inst. Gen. Path., Univ. Naples, Italy) After 5 days in seawater containing NaI¹³¹, *Salpa maxima* fixed 131I in tissues. Chromatographic analysis of the tissues showed the presence of thyroxine [T₄], 3-monoiodotyrosine [MIT] and 3,5-di-iodotyrosine [DIT]. A fraction of the 131I was present in a protein containing T₄, MIT and DIT. (French) M.A.Price
7069. SEX HORMONES IN FISH. H. OESTROGENS OF SCYLIORHINUS CANICULUS. T.H.Simpson, R.S. Wright and S.V-Hunc. *J. Endocr.*, 1963, 26, 499-507 (D.S.I.R., Torry Res. Stat., Aberdeen, Scotland) Ovaries of this fish were found to contain oestradiol-17_β and oestrone, each at about 19 µg./kg. Most of this material was located within the eggs themselves. The same steroids were also identified in the plasma at concn. of 3-4 pg./ml. and 0.5-1.0 (ig./ml. respectively. G.F.Blane
7070. STEROIDS IN SEMEN OF DOGFISH [SQUALUS ACANTHIAS]. T.H.Simpson, R.S.Wright and H.Gottfried: *J. Endocr.*, 1963, 26, 489-498 (D.S.I.R., Torry Res. Stat., Aberdeen, Scotland) The semen was found to contain as much as 500 pg./100 g. 11-deoxy-corticosterone, mainly in the non-ultrafilterable fraction. Small amounts of progesterone, androstenedione, dehydroepiandrosterone, pregnenolone, androsterone and possibly aldosterone were also identified. G.F.Blane
7071. SEASONAL AND SEXUAL VARIATION IN PITUITARY GLAND OF TRITURUS VIRIDESCENS. J.N.Denc Anat. Rec., 1961, 141, 85-95 (Dept. Biol., Univ. Virginia, Charlottesville, Va., U.S.A.) Four types of cell (acidophils, chromophobes and globular and

and aglobular basophils) are described. Staining reactions indicate that the aglobular basophils may be th'Jrotrophs and the globular basophils gonadotrophs. There is an apparent correlation between the cyclic changes of the globular basophils and of the ovary in the ♀. F.Beck

7072. TOTAL EXTRIPATION OF THE PREOPTIC MAGNOCELLULAR NUCLEUS OF RANA TEMPORARIA. K.Dierickx: *Arch. int. Riarmacodyn.**. 1963, 143, 268-275 (Dept. Embryol. and HistoL, Univ. Ghent, Belgium) Total extirpation of the magnocellular neurosecretory preoptic nuclei was performed in frogs*. Histol. studies confirmed the completeness of ablation. Normal seasonal gonadal and secondary sexual development were not affected. S.E. Smith

7073. METAMORPHOSIS-ACTIVATING SYSTEM OF THE FROG. W.Etkiis: *Science*, 1963, 139, 810-814 (BioL Dept., City Coll., New York, U.S.A.) Evidence is reviewed which supports a hypothesis of the interaction of thyroid, pituitary and hypothalamus in regulating the development of the tadpole. Thyroid hormone feedback matures the neurosecretory mechanism and coordinates the phases of metamorphosis. G.M.Lewis

7074. THE NYCTHEMERAL RHYTHM OF EXCRETION OF FAECAL NITROGEN IN THE RABBIT (ORYCTOLAGUS CUNICULUS); INFLUENCE OF THE ADRENAL GLANDS. R.Bonnafous, P.Raynaud and J.Catala: *Comp. Biochem. Physiol.*, 1963, 8, 321-326 (Inst. Physiol., Univ. Toulouse, France) When considering the total nitrogen excretion it is shown that the rabbit excretes more at night than during the day (46 mg./g. dry wt. at night; 18 mg./g. dry wt. in the day). This constitutes a diurnal rhythm, and the 2 faecal masses show differences in structure. Extirpation of the adrenal glands leads to a change in the structure and N content of the daytime pellets; the N fraction increasing above normal values. The diurnal rhythm of nitrogenous excretion is also disturbed, the values of nighttime voiding being no longer markedly different from those of the day. In one case the diurnal rhythm returned spontaneously after operation, but in other cases could only be partially reintroduced by treatment with hydrocortisone. (French) M. S.Laverack

NERVOUS SYSTEM

7075. THE CONTROL AND SYNCHRONISATION OF FLAGELLAR MOVEMENT. K.E.Machire: *Proc roy. Soc. B*, 1963, 158, 88-104 (Dept. Zool., Univ. Cambridge, England) Mathematical arguments are presented which explain some of the observed phenomena of ciliary and flagellar motion. It is suggested that waves of bending will arise spontaneously if changes in length of the contractile elements cause changes in tension, after a delay. The prop. of the contractile elements must be non-linear if the amplitude of these waves is to remain finite. This results in control of freq. and direction of propagation of the waves being exercised from the proximal end, and in synchronisation of freq. and Xby adjacent flagella. G.M.Lewis

7076. CONDITIONING OF A FREE OPERANT RESPONSE IN PLANARIA. R.M.Lee: *Science*, 1963, 139, 1048-

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1049 (Dept. Psychol., Univ. Maryland, College Park, Md., U.S.A.) Using *Cura foremani* as expt. subject, the rate of response of breaking a photoelectric beam to terminate intense light exposure for 15 min was quite different from that of control subjects matched for equiv. changes in light intensity. Reinforced subjects produced steady, spaced behaviour. G.M.Lewis

7077. THE FINE STRUCTURE OF THE NERVOUS SYSTEM IN THE STARFISH [ASTERIAS RUBENS L.] CONCERNING THE STRUCTURE AND THE INNERVATION-OF THE AMPULLAE. W.Bargmann and B.Behrens Z. Zellforsch., 1963, 59, 746-770 (Anat. Inst., Univ. Kiel, Germany) Ampullae of the starfish *A. rubens* L. were studied to elucidate their innervation; the wallstructure of the ampulla consists of an internal endothelial layer, muscle layer and connective tissue; no nerve cells or any other nervous endorgan could be detected. (German) J.E.Under

7078. RAPID RESPONSE OF MTCICOLA INFUNDIBULUM (GRUBE). M.B.Roberts: J. Mar. biol. Ass. U.K., 1962, 42, 527-539 (Marlborough Coll., Wilts., England) The rapid muscular response evoked by direct stunn. of the nerve cord with a single shock obeys an all or nothing' relationship to the intensity of stunn. Magnitude of the summated contraction obtained by repetitive stunn. of the nerve cord depends on the no. and freq. of me shocks'. The results obtained are discussed in relation to the animafc* mode of life and the morphology of its giant fibre reflex. PJ.Baron

7079. PHASIC STIMULATION OF A THORACIC STRETCH RECEPTOR IN LOCUSTS. E.Gettrupi J. exp. Biol., 1963, 40, 323-333 (Zoophysiol. Lab. B. Univ. Copenhagen, Denmark) The response to phasic stunn. of stretchreceptors located at the wing hinges Mai locus* wu analysed. Results are discussed in relation to co-ordination of flight. AJ.Mann

7080. CO-ORDINATION OF SUCCESSIVE ACTmTES IN AN APHID. THE EFFECT OF FLIGHT ON SETTLING. J.S.Kennedy and CO.Booth: J. exp. Biol., 1963, 40, 351-369 (Dept. Zool., Univ. Cambridge, England) Previous evidence that newly winged adult aphids become increasingly ready to settle down on a leaf the longer they have been in flight, and that this effect is appreciable after less than one minutes flight, was confirmed with aphids allowed to fly and alight freely without interference: The settling responses initiated after flight were quickly again by in unsuitable leaf, with reversion to flight, but repeated flights had a cumulative effect. A.J.Martin

7081 METHOD FOR CHRONICALLY IMPLANTING OF ION. C.H.F.Rowell J. exp. Biol., 1963, 40, 571 to* (Dept. Zool. Makerere Univ. Coll. Kampala, Uganda) Methods are described for plating and localising permanent SSSP⁺ brains and stimulating. The effect of stimulation largely confirms previous work: the brain is determined to be rather than S⁺S⁻min⁺; the brain car to inhibit, but not elicit, by stimuli. A.J.Martin

7082. EFFECTS OF TEMPERATURE ON THE ORDINARY SONG OF THE COMMON MEADOW GRASSHOPPER ORCHELIMUM VULGARE (ORTHOPTERA: TETTIGONIIDAE). H.Frings and M.Frings J. exp. Zool., 1962, 151, 33-51 (Dept. Zool., Univ. Hawaii, Honolulu, Hawaii) Oscillographic analyses of the recorded ordinary call song of *O. vulgare* at different temp., were made to study the effects of temp. on singing. The song has at least 2 bands of freq. in the notes; a note about 14-16 kc/sec. which is relatively pure and a lower freq. note which is a rather broad band noise. The expt. indicate that the processes involved in stridulation are affected by temp. over all effective ranges and that there is a pos. relationship between the rate of stridulation and temp*. It is concluded that there is a need for the study of long periods of the recordings from many individuals, analysed with methods which permit analysis of extended continuous samples. R.J.Walker

7083. THE SWIMMING PLANE OF THE CRUSTACEAN MYSIDIUM GRACILE (DANA). RJanden Biol. Bull. Woods Hole, 1962, 122, 380-390 (Zool. Inst., Univ. Freiburg, W. Germany) Normally *M. gracile* swims in a plane orientated as nearly as possible perpendicular to the direction of light and gravity. Horizontal illumination induced swimming in a plane intermediate between the positions dictated by each of the stimuli*. The turning tendency due to the dorsal light reaction increased with increasing light intensity, while those due to the effects of light and gravity seemed to inhibit each other. G.J.Peakin

7084. SOME ESSENTIALS OF NEURAL MEMORY SYSTEMS. PAIRED CENTRES THAT REGULATE AND ADDRESS THE SIGNALS OF THE RESULT OF ACTION. J.Z.Young: Nature, Lond., 1963, 198, 626-630 (Dept. Anat., Univ. Coll., London, England) Investigation of the brains of *Octopus* and *Sepia* indicates that the tactile and visual centres have developed out of the simple taste-bite mechanism. Examination of the organisation by which they achieve their ends suggests hypothesis about learning systems. G.M.Lewis

7085. DELAYED RESPONSES IN OCTOPUS. P.N.Dilly: J. exp. Biol., 1963, 40, 393-401 (Dept. Anat., Univ. Coll., London, England) Octopuses were tested for their ability to perform delayed responses after varying delays and lesions. Normal animals delayed for 10 sec were capable of accurate performance without training. After delays of 20 or 30 sec. some learning is needed. Animals without vertical lobes or median superior frontal lobes, delayed for 30 sec. responded correctly. AJ.Martin

7086. EXCITATORY AND INHIBITORY PATHWAYS IN THE ARM OF OCTOPUS. C.H.F.Rowell: J. exp. Biol., 1963, 40, 257-270 (Dept. Zool., Makerere Univ. Coll., Kampala, Uganda) The nervous mechanisms of single sucker reflexes are contained in the ventral axial ganglion, and connect peripherally by mixed nerves. The medulla innervates the main arm musculature direct, not via the lat. nerve cords which control only the subdermal muscle layer. Normal chromatophore expansion requires a medullar supply. The final chromatophore nerves are controlled by excitatory and inhibitory fibres in the dorsal medulla. Their significance, and that of excitatory and inhibitory supplies to the sucker reflex mechanisms is discussed. A.J.Martin

7087. 5HT, THE PROBABLE MEDIATOR OF EXCITATION IN THE HEART OF MERCENARIA (VENUS) MERCENARIA.

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R.E.Loveland: Comp. Biochem. Physiol., 1963, 9, 95-104 (Biol. Lab., Harvard Univ., Cambridge, Mass., U.S.A.) When the cardio-regulatory nerves of M. mercenaria are electrically stim. the heart beat is normally inhib. but if stimn. is carried out after prior treatment with benzoquinonium, an ACh antagonist, excitation occurs. This excitation is mimicked by the addition of 5HT to the heart, and both actions are blocked by treatment with 1-methyl-d-lysergic acid butanolamide. No excitation occurs in prep* rendered tachyphylactic to 5HT. The alkaloid reserpine also effectively blocks the heart response to 5HT, treatment which also decreases the amount of 5HT in the cerebral ganglia of the animal. 5HT has never been isolated from the perfusate arising from the heart of M. mercenaria, after electrical stimn.

M.S.Laverack

7088. ELECTROCARDIOGRAPHS AND OPERCULAR REACTIONS OF MARINE TELEOSTS PROVOKED BY LIGHT STIMULATION OR PRESENTATION OF AN OBJECT. R.Labat, C.Peyraud and A.Serfaty: J. Physiol., Paris, 1962, 54, 691-698 (Lab. Biol. animale, Fac. Sci., Toulouse, France) Shining a light at eye level is found to give a reflex inhibn. of cardio-respiratory rhythms, simult. decrease in heart rate and amplitude of opercular movement, mediated by the vagus nerve. This reflex is particularly marked in the pleuronectids, but less obvious in the non-homochromic fish, although the latter show an identical reflex to an object placed above the expt- tank.

(French) A-Angel

7089. DEVELOPMENT OF PHOTOTAXIS IN THE FROG RANA TEMPORARIA. W.R.A.Muntz: J. exp. Biol., 1963, 40, 371-379 (Univ. Oxford, Inst. Exp. Psychol., 1 South Parks Rd., Oxford, England) The development of phototaxis in the frog was studied by testing the behaviour of tadpoles at different stages of their development. The development of the retina at each stage was checked from histol. prep. Young tadpoles responded most strongly to green light. Gradually the no. of responses to green light decreased, while more responses were made to blue light, and also to darkness. The phototactic behaviour of frogs is probably mediated by a synergistic action of the green rods and the cones, which have an excitatory effect, and which are opposed by an inhibitory effect of the red rods.

A.J.Martin

7090. ABOUT A NUCLEUS SPECIFIC SYNAPTIC FORM IN THE NUCLEUS ROTUNDUS THALAMI OF THE LIP-FISHES. E.Horstmann: Z. Zellforsch., 1963, 59, 731-737 (Anat. Inst., Univ. Kiel, Germany) The glomera of the highly differentiated nucleus rotundus of the labridae contain at the end of nerve fibres, pre-synaptic star shaped formations whose further ramifications become lost in the neuropil of the glomera. This synaptic form is regarded as a nucleus as well as a family sp. characteristic

(German) J.E.Linder

7091. COMPARATIVE STUDIES OF THE BRAIN IN THE MACROPODIDAE. CONTRIBUTION TO THE PHYLOGENY OF THE MAMMALIAN BRAIN. E. L.S.Diuore: J. comp. Neurol., 1963, 120, 43-51 (Dept. Biol., A. and M. Coll. Texas, College Station, Tex., U.S.A.) G.M.Lewis

7092. PHYSIOLOGICAL SIGNIFICANCE OF SULCI IN SOMATIC SENSORY CEREBRAL CORTEX IN MAMMALS OF THE FAMILY PROCYONIDAE. W.I.Welker and G.B.Campos: J. comp. Neurol., 1963, 120, 19-36 (Lab. Neurophysiol., Med. Sch., Univ. Wisconsin,

Madison, Wis., U.S.A.) The somatic sensory-motor area of the cerebral cortex was mapped by means of the evoked potential method in Nasua, Bassaris, Potos and Ailurus of the family Procyonidae. The sulci, dimples and spurs within and around the cortical SmI region were found to delimit the representations of distinct adjacent body subdivisions despite generic and individual differences in sulcal no., location and directional orientation. Data indicating a correlation between certain aspects of behavioural expression and the differential enlargement of sp. cortical somatic sensory subdivisions are given.

G.M.Lewis

REPRODUCTION

7093. SEXUALITY AND SPAWNING OF MANX PECTINIDS. K.Reddiac: J. Mar. biol. Ass. U.K., 1962, 42, 683-703 (Eastern Reg. Stat., Zool. Survey of India, Shillong, India} Chlamys varia and C. distorta are protandric hermaphrodites and sex reversal is possible. C. tigerina, C. striata and C. furtiva are dioecious and do not have germ cells of both sexes in the same gonad at any stage.

P.J.

Baron

7094. DIFFERENCES IN REPRODUCTIVE POTENTIAL, FEEDING RATE AND LONGEVITY OF BOLL WEEVILS MATED IN FALL, AND IN FALL AND SPRING.

H.M.Taft, A.R.Hopkins and W.James: J. econ. Entomol., 1963, 56, 180-181 (Entomol. res. Div., Agric. Res. Serv., U.S.D.A., Florence, S.C., U.S.A.)

Weevils were collected during the spring, it being assumed that those laying viable eggs without spring mating, had mated during the previous fall. 8-20% ? weevils produced no eggs. Those not allowed to remate laid 50% fewer eggs but oviposition and pre-oviposition periods were similar. Feeding punctures were only 1*25 greater in paired than in separated ? groups. No significant longevity difference was noted.

H.W.Spencer

7095. EFFECTS OF FOOD, TEMPERATURE AND OVIPOSITION SITE ON LONGEVITY AND FECUNDITY OF ARMY CUTWORM [CHORIZAGROTIS AUXILIARIS].

K.P.Pruess: J. econ. Entomol., 1963, 56, 219-221 (Univ. Nebraska, N.Platte Expt. Stn., Lincoln, Neb., U.S.A.) The insect normally oviposits in the soil.

Longevity of test moths increased with decreased temp. Females survived best at 20° and 25° and died at 32°. Oviposition did not occur at 32° and was completed sooner at 20° than at 25°. Sand was preferred as an oviposition site. Food is not essential during the oviposition period in the fall except to prolong life during unfavourable laying conditions. After starvation under unfavourable oviposition conditions reproduction was completed more quickly than in the absence of these unfavourable conditions*

H.W.Spencer

7096. SOME ASPECTS OF MATING AND OVIPOSITION BEHAVIOUR OF CODLING MOTH, CARPOCAPSA POMONELLA. R.D.Gehring and H.F.Madsen: J. econ. Entomol., 1963, 56, 140-143 (Univ. California, Berkeley, Calif., U.S.A.) The moth can mate

within 12 hr. of emergence and mating occurs in laboratory tests independently of light conditions sitfit being probably unnecessary. The laboratory pre-oviposition period was 1 day and most eggs were laid on the 4th day

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and none after the 6th day. Black-light traps seem a more useful index of field populations than bait pans. In the field ♀ are less attractive to Rafter mating and only 15% mated more than once. Mated ♀ were distinguishable from virgins. Multiple matings were checked by counting the contained spermatophores per captured ♀.
H.W.Spencer

7097. FECUNDITY OF PLAICE FROM COASTS OF NORWAY. T.B-Bagenal: J. Mar. biol. Ass. U.K., 1962, 42, 105-112 (Marine Statn., Millport, Scotland) An analysis of plaice fecundity at 4 localities in Norway showed that, in general, these fish had more eggs than those in the North Sea or round the British Isles. Plaice fecundity was especially high in Trondheim Fjord.
P.J.Baron

7098. SPECIAL TUBULES FOR SPERM STORAGE IN FEMALE LIZARDS. W.FOR Nature, Lond., 1963, 198, 500-501 (Dept. Anat., Louisiana St. Univ. Sch. Med., New Orleans, La., U.S.A.) Sperm has been detected in small tubular outgrowths of the vagina of the green anole, Anolis carolinensis.
O.M.Lewis

PARASITOLOGY

7099. COMPARATIVE OBSERVATION^NITTHE SCOLEX AND GERMINAL MEMBRANE OF ECMWOCOCCUS GRANULOSUS AS A SOURCE OF SECONDARY HYDATID CYSTS. G.K.Sweatman, fcG.Robinson and B.W. Manktelow: Amer. J. trop. Med. Hyg., 1963, 19, 199-203 (Univ. Otago, Dunedin, New Zealand)
Pieces of germinal membrane from P^rima 7₁K!₁¹_d cy trflm. cysts did not develop into secondary cysts following transfer to immature mice, rabbits and sheep using the cerebral intraventricular and intraperitoneal routes, polices appeared to be the only source of sMonterey cy**-/u secondary cysts were sterile. Non-viable lamiMted cuticle was more strongly eosinophilic *an mble cuticle.
A.A.Zimmerman

7100. T TPF HISTORIES AND POPULATION DYNAMICS OF SÖMMTGL ^ " T L " ffifife¹⁸
TRACHURUS(L.). J.Llewellyn: J. Mar. biol. Ass. U.K., 1962, 42, 587-600 (Dept. Zool., Comp. PhwWL, Univ.. Birmingham, England) Gastro-
a et Surian d an Hn trachuri infecryoung.
^trachurus when the 5 or 4 month old adolescent fishes dS¹SSdITthe sea bottom in October. Someamesithe Parasites mature in 1 month, but more usually in 3 or 4 months; their life span is normally no longer than 1 yr. The 2 spri of parasites v* less frequent on older fishes, ProbablJ being United by a post spawning n.j.n w o o «f the host from die concn. of free-living infective stages of e parasites in coastal waters.
P.J.Baron

7101. THE CONTRBUTION OF TWO ^ BURDEN AND HOST RESPONSE TO THE DEVELOPMENT OF HEPATO-SPLENIC SCHISTOSOMIASIS MANSONI ^ MICE.
K.S.Warren: Amer. J. trop. Med. Hyg., 1963, 12, 34-39 (Lab. Parasitic Dis. Nat. Inst. Allergy, N.I.H., Bethesda, Md., U.S.A.) Groups of Swiss albino f mice were infected with an average of 38, 29, 15 and 6 worms of a Puerto Rican strain of Schistosoma mansoni.

Hepato-splenic schistosomiasis occurred in all 4 of the groups, but its onset was delayed in the group harbouring the least no. of worms.
A.A.Zimmerman

7102. EFFECT OF AEROBIC AND ANAEROBIC DIGESTION ON EGGS OF ASCARIS LUMBRICOIDES VAR. SUUM IN NIGHT-SOIL. W.L.Reyes, CW.Kruse and M.St.C Batsorc Amer. J. trop. Med. Hyg., 1963, 12, 46-55 (Dept. Sanitary Engin., Sch. Hyg. and Pub. Hlth., Johns Hopkins Univ., U.S.A.) Aerobic and anaerobic batch digestions of night soil needed with eggs of pigs ascaris were investigated at various temp. At low temp. the eggs are preserved. Simple heating of raw night soil at 55° for 20 min. should provide public health safety.
A.A.Zimmerman

7103. THE ECOLOGY OF THE TICK KODES TRIANGULICEPS BIR. 1895. J.Lachmayen Bull Inst. Mar. trop. Med. Gdansk, 1962, 13, 149-160 (Inst. Med. Morskiej, Gdansk, Poland) L trianguliceps in Bi^zowieza National Park occur the most frequently on mammals originating from Querceto-Piceeto-Pinetum, pseudo-Quercetum and Piceeto-Pinetum. The activity of larvae is observed throughout whole year. Maximal activity of nymphs is noted in June and that of imagines in April. Both ♂ and ♀ of L trianguliceps can be found on small mammals.
M.Korbecki

7104. RESISTANCE TO DDT OF HIBERNATING FEMALES CULEX PIPiens PIPiens L., ORIGINATING FROM SEVERAL REGIONS OF THE COASTAL AREA. 1961. J.Lachmajen Bull. Inst. Mar. trop. Med. Gdansk, 1962, 13, 161*170 (Inst. Med. Morskiej, Gdansk, Poland) The highest susceptibility to DDT of C. PiPiers Pipiens L., found at the coastal area, was expressed by LD₅₀ = 0⁹6% The mosquitoes from some locations showed traces of acquired resistance to DDT.
(Polish) M.Korbecki

7105. DEVELOPMENT OF METHODS FOR TRAPPING VECTORS OF MONKEY MALARIA. R-H.Wharton, D.E.Eyles and M.Warren: Ann. trop. Med. ParasitoL, 1963, 57, 32-46 (Inst. Med. Res., Kuala Lumpur, Malaya) A mosquito net placed 25-30 ft. from the ground and baited with Macaca irus monkeys showed promise as a trap for Anopheles hackeri.
P.J.Baron

7106. PARASITIC ARTHROPODS OF RATS FROM THE TOWN AND PORT OF GDYNIA. Z.Wegner and T.Przyborowski: Bull. Inst. Mar. trop. Med. Gdansk, 1962, 13, 171-183 (Inst. Med. Morskiej, Gdansk, Poland) A total of 2198 arthropods (84*4% Anoplura, 8*9% Aphaniptera and 6*7% Acarina) were collected from 265 specimens of Rattus norvegicus B. and 72 specimens of Rattus rattus L. Rats from town exhibited a higher infestation with teas than those originating from port and sea-going ships.
M.Korbecki

MUSCLE

7107. SODIUM AND POTASSIUM COMPOSITION OF SOME INSECT SKELETAL MUSCLE FIBRES IN RELATION TO THEIR MEMBRANE POTENTIALS.
D.W.Wood: Comp. Biochem. PhysioL, 1963, 9, 151-159 (Dept. Zool., Durham Colleges, Univ. Durham, England) The intracellular K and Na concn. of

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skeletal muscle fibres of Locusta migratoria, Periplaneta americana and Carausius morosus bathed in blood, or in salines containing varied, known amounts of Na ions have been determined. Resting and action potentials of these treated fibres have also been measured intracellularly. By calcn. from the Nernst equation the value of E_k is about equal to the observed resting potential, but the overshoot or undershoot of zero potential in expt. salines does not correspond to calc. E_{fa}

M.S.Laverack

7108. SLOW AND FAST MUSCLE FIBRES IN ATLANTIC HAGFISH (MYXINE GLUTINOSA). P.Andersen, J.K.S.Jansen and Y.Loyning; *Acta physiol scand.*, 1963, 57, 167-179 (Neuro-physiol Lab., Anat. Inst., Oslo Univ., Norway) Two types of muscle of the hagfish, one giving rapid twitches of 150 msec* duration and the other of 500 msec., have been studied by means of internal microelectrodes. Indirect stimm. of the 'fast' fibres evoked a focal end-plate potential in one end of the fibre. The 'slow*' fibres, on indirect stimm. showed distributed function potential. Fast fibres are innervated by one motor axon each and slow fibres by 2 axons each.

H.B.Waynfirth

7109. INFLUENCE OF THE SIZE OF ENCLOSURE ON THE DEVELOPMENT OF MYOPATHY IN THE CAPTIVE ROTTNEST QUOKKA. B.A.Kakulas: *Nature*, Lond., 1963, 198, 673-674 (Dept. Pathol., Univ. Western Australia, Perth, Australia) Rottnest quokkas (Setonix brachyurus) kept in small enclosures lost body wt. and showed a high incidence of paralysis of the hind limbs associated with histopathological changes in the muscle whereas in large enclosures, the animates* gained wt. and remained healthy. Administration of vit. E completely prevented paralysis in the animals in small enclosures.

G.M.Lewis

MISCELLANEOUS

7110. A CODED WIRE IDENTIFICATION SYSTEM FOR MACRO-ORGANISMS. K.BJefferts, P.K.Bergman and H.F.Fiscus *Nature*, Lond., 1963, 198, 460-462 (Washington St. Dept. Fisheries, Seattle, U.S.A.) Pacific salmon (Oncorhynchus sp.) have been successfully tagged by implantation of a magnetically coded wire into the fish. It is estimated that fish tagged by this method can be detected in a channel as wide as 12 ft. providing instrumentation is present on both sides. J.R.Sargent

7111. MECHANICS OF THE LIGAMENT IN THE BI-VALVE SPISULA SOLIDISSIMA IN RELATION TO MODE OF LIFE. W.R. Hunter and D.C.Grant *Biol. Bull. Woods Hole*, 1962, 122, 369-379 (Dept. Zool., Univ. Glasgow, Glasgow, Scotland) The mechanical characteristics of the ligament of S. solidissima were investigated and compared with those of Mya arenaria. The differences found indicate that the ligament is the most important antagonist of the adductor muscles in S. solidissima and can be related to the modes of life of these 2 clams. The powerful ligament of Lutraria lutraria, a deep burrowing form like Mya, indicates its derivation from a mactrid like Spisula. G.J.Peakin

7112. EFFECT OF STANDARD COLD STORAGE AND CONTROLLED ATMOSPHERE STORAGE ON SURVIVAL OF LARVAE OF ORIENTAL FRUIT MOTH, GRAPHO-

LITHA MOLESTA. CG. Dust an: *J. econ. Entomol.*, 1963, 56, 167-169 (Canada Dept. Agric, Vineland Stn., Ont., Canada) Apples infested with eggs were kept in either a standard atmosphere [SA] at $32 \pm 1^\circ\text{F}$ and 95% RH or controlled atmosphere [CA] containing 3-5% CO₂ and at 38°F for 90 days. In SA young larvae did not survive 56 days, 22-5% survived 28 days while in CA a few survived 140 days and 2-6% survived 112 days. Using double wooden blocks to simulate apple boxes, 25+% larval cocoons (mostly non-diapause type) in SA and 27-3% in CA survived the conditions for 112 days, while 4-5% survived 140 days in CA. CA did not measurably affect larval mortality. H.W. Spencer

7113. MOSQUITOES: COMPARATIVE SEROLOGY OF FOUR SPP. OF AEDES (OCHLEROTATUS). A.E.R.Downe: *Science*, 1963, 139, 1286-1287 (Dept. Entomol., Kansas St. Univ., Manhattan, Kans., U.S.A.) Ag of ? adult A. communis (*DeG.*) A. punctor (*Kby.*), A. trichurus (*Dyart*) and A. excrucians (*Walk.*) compared by precipitin tests show a wider divergence than is indicated by external comparative morphology. G.M.Lewis

7114. EVOLUTION OF SOME FACTORS AFFECTING EFFICIENCY OF LIGHT TRAPS IN COLLECTING MOSQUITOES. A.R.Barr, T.A.Smith, M.M.Boreham and K.E.White: *J. econ. Entomol.*, 1963, 56, 123-127 (Bureau Venter Control, California Dept. Publ.Hlth., Fresno, Calif., U.S.A.) The following effects on mosquito attraction to traps were considered:- trap colour, screening, air movement in the trap, heat of the lamp and moonlight compared with light intensity. Aedes melanimon! Anopheles freeborni and Culex tarsalis mosquitoes were used. Trap colour had little effect. Horizontal screening reduced the no. of ? A. melanimon and vertical screening reduced the no. of all but cf of this sp. Trap air movement had no significant effect. Warm and cold lamps had no different effect on the trap catch. During full moon only ? of all 3 spp. showed differences with ref. to different bulb wattage (25 to 100 W) and always less than at new moon. H.W.Spencer

7115. THE PERMEABILITY OF THE CUTICLE OF PERIPLANETA AMERICANA (L) TO MALATHION. F.Matsumura: *J. insect Physiol.*, 1963, 9, 207-221 (Dept. Zool., Univ. Western Ontario, London, Ont., Canada) Three millicuries of 32p in terms of phosphoric acid was used to obtain radioactive malathion. The radioactive malathion in acetone was topically applied to the pronotum of P. americana. The rate of entry of malathion through the cuticle was found to deviate from the theoretical rate, especially at the beaming of penetration. This deviation was found to be mainly due to accumulation of malathion in the cuticle. If the absorbed malathion was removed by treating with hot water, the penetration of malathion could be explained by the diffusion theory. The Isolated protein from the cuticle can absorb malathion, which can become extractable to chloroform upon denaturation of the protein by trichloroacetic acid. It is suggested that absorption takes place mainly at the hot water-sol. portion of the cuticle which consists of protein. ttJ.WalJcer

7116. $^6\text{M}^1 \wedge I \wedge L ? ? 9$ W T H LAYERS TM LOCUST RUBBER-LIKE CUTICLE INFLUENCED BY AN EXTERNAL RHYTHM. A.C.Neville: *J. insect Physiol.*, 1963, 9, 177-186 (Zoophysiol Lab. B, Juliane Maries Vej, 36, Univ. Copenhagen, Denmark) Expt. verified daily growth layers have been found in both rubber-like

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and solid cuticle of *Schistocerca gregaria*. During night conditions, a wide brightly fluorescent zone is laid down; during day conditions, a thin faintly fluorescent zone is deposited. Three days* deposits are formed in the pharate adult prior to emergence. Then one pair of layers is added daily until the rubber-like cuticle is fully grown. Daily growth layers are of no mechanical significance in resilin, which is a mechanically isotropic material. Expt. prolonged days and nights produced correspondingly wide faintly or brightly fluorescent zones in which the characteristic daily zonation of control conditions had been suppressed. Daily growth layers appear to be a general characteristic of the exopterygote skeleton.

R.J. Walker

7117. STUDIES ON THE TOTAL HAELOCYTE COUNT AND HAELOLYMPH VOLUME IN PERIPLANETA AMERICANA (L.) WITH SPECIAL REFERENCE TO THE LAST MOULTING CYCLE. R.E.Wheeler: *J. insect Physiol.*, 1963, 9, 223-235 (Dept. Entom., Univ. Maryland, College Park, Md., U.S.A.)

The haemolymph of *P. americana* during the last moulting cycle was studied quant. in relation to haemolymph coagulability, haemolymph vol., total haemocyte counts, and differential haemocyte counts. The haemolymph coagulates about 13 times faster in last-stage moulting larvae and in newly ecdyed adults than in intermoult larvae and in adults over 1 hr. old. The relative no. of circulating haemocytes [THC] varies 8[#]-6-fold during the last moulting cycle. The THC increases prior to ecdysis, abruptly falls at ecdysis, and remains about die same for 24 hr. These changes are related to haemolymph vol. Injections of *Bacillus subtilis* into last-stage moulting larvae did not affect their normal THC or haematocrit for 24 hr. The mean abs. no. of circulating haemocytes during the last moulting cycle ranges from 9 to 13 million cells. This value remains approx. the same in intermoult, moulting larvae and in newly ecdyed adults. 24 hr. after ecdysis the absolute count decreases, while the THC remains about the same as at ecdysis. It is suggested that the changes in the THC during moulting can be accounted for by cyclic changes in haemolymph vol. and/or selective adhesion of cystocytes to tissue and/or destruction of these cells.

R.J.Walker

7118. THE EFFECT OF COLD ON PRE- AND POST-DIAPAUSE EGGS OF GRYLLUS PENNSYLVANICUS BURMEISTER (ORTHOPTERA: GRYLLIDAE).

fcRakshpal: *Proc. roy. ent. Soc. Lond. A*, 1962, 37, 117-120 (Dept. Zool., Univ. Lucknow, India)

Pbst-diapause eggs can withstand chilling to 6-7° with only slight detrimental effects. Pre-diapause eggs chilled on the first day after hatching, die, but if chilling is postponed, they withstand cold to a greater degree and continue developing at 6-f until they reach diapause. The Physiol. effects of chilling is to make the yolk more assimilable. . D.M.S. Perkins

7119. THE MESOSTERNAL BODIES [MB] ON ACRIDOIDAE. J.G.Thomas: *Proc. roy. ent. Soc. Lond. A*, 1962, 37, 107-113 (Roy. Holloway Coll., Englefield Green, Surrey, England)

Adult, nymph and embryonic stages were studied in 7 spp. of grasshoppers and locusts. MB are*small paired structures inside the mesothorax ventrally, attached by their epithelium to the 2nd spina (an internal projection of the integument) and sometimes to certain thoracic muscles. They are oval flattened bodies, mainly cuticular, formed of concentric lamellae^b Jd surrounded by an epithelium. Probably a new layer^c of cuticle is added at each ecdysis. MB were formerly

thought to be glandular in function but the present histol. studies makes this improbable. Alternative functions are discussed, whether they are proprioceptors, gravity receptors or merely vestigial apodemes. None have been found in non-Aridoid Orthoptera. D.M.S.Perkins

7120. ARTIFICIAL SELECTION FOR WEIGHT AND ITS CONSEQUENCES IN TENEBRIOS MOLITOR L.

J.LeClercq: *Nature*, Lond., 1963, 198, 106-107 (Lab. Zool. G\$., Inst. Agronomique de l'Etat, Gembloux, Belgium) A population of *T. molitor* was selected for small and large pupal wt., thereby producing 2 strains, which were found to differ significantly also in growth rate, size, resistance and fecundity. The results are discussed in relation to theories of natural selection.

G.M.Lewis

7121. SCENT-GLANDS OF LAND-BUGS [HEMIPTERA] THEIR PHYSIOLOGY AND BIOLOGICAL FUNCTION.

H.Remold: *Nature*, Lond., 1963, 198, 764-768 (Inst. Zool., Univ. Munich, Germany). G.M.Lewis

7122. CYANOGENIC GLANDULAR APPARATUS OF A MILLIPEDE. T.Eisner, H.E.Eisner, J.J.Hurst, F.C.

Kafatos and J.Meinwald: *Science*, 1963, 139, 1218-1220 (Dept. Entomol., Cornell Univ., Ithaca, N.Y., U.S.A.) The cyanogenic secretion of *Apheloria corrugata* is discharged from paired, serially arranged glands consisting of 2 compartments, one storing an undissociated cyanogenic compound, possibly mandelonitrile, and in the other, a chem. factor which triggers cyanogenesis. The contents of the 2 compartments are mixed at the time of discharge. G.M.Lewis

7123. ON BEHAVIOUR OF BARNACLES. IV. INFLUENCE OF TEMPERATURE ON CIRRAL ACTIVITY AND SURVIVAL OF SOME WARM-WATER SPECIES.

A.J.Southward: *J. Mar. biol. Ass. U.K.*, 1962, 42, 163-177 (Lab., Citadel Hill, Plymouth, England) Temp. ranges over which the cirri were active, and the freq. of beating at different temp., were measured in *Cthamalus depressus*, *C. stellatus*, *Balanus eburneus* and *B. amphitrite* var. *denticulata*. Irritability or survival at nigh temp. was assessed in these spp. and in others from Trinidad.

P.J. Baron

7124. ABSORPTION AND EXCRETION OF COPPER ION DURING SETTLEMENT AND METAMORPHOSIS OF THE BARNACLE, BALANUS AMPHITRITE NIVEUS.

F.J.Bernard and CE.Lane: *Biol. Bull. Woods Hole*, 1961, 121, 438-448 (Inst. Marine Sci., Univ. Miami, Fla., U.S.A.) The sites of Cu storage were identified in the barnacle cyprids and it was concluded that it is absorbed through the permeable surfaces of the body coincidentally with other ions, particularly Ca. The excess was excreted by the epithelia of the hind gut. Cu deposits were absent from decorticated settlers and young adults. Exposure to media of high Cu concn. resulted in an increased rate of elimination from the gut epithelium. G.J.Peakin

7125. OBSERVATIONS ON ORMER [HALIOTIS TUBER-CULATA L] POPULATION OF GUERNSEY. G.R.Forsten J. Mar. biol. Ass. U.K., 1962, 42, 493-498 (Lab., Citadel Hill, Plymouth, England)

It is suggested that the short larval life of 2 days prevents *Haliotis* from extending its range naturally. The average no. of ormers found by diving between 0-5 fathoms below low tide mark was 2[#] 4/m.². P.J.Baron

EXPERIMENTAL ZOOLOGY

7126. EFFECTS OF WATER OF REDUCED SALINITY ON VERTICAL MIGRATION OF ZOOPLANKTON. J. Lance: J. Mar. biol. Ass. U.K., 1962, 42, 131-154 (Dept. Zool., Univ., Hull, England) In an investigation of 6 copepod spp. and one larval decapod sp. it was shown that salinity discontinuity layers had a marked effect on vertical migration. A single discontinuity layer formed by placing less dense diluted sea water over full strength sea water acted as a barrier to animals attempting to swim toward the surface of an expt. water column. Homogeneous columns of reduced salinity depressed the swimming activity of copepods. P.J. Baron

7127. COMPARATIVE STUDIES OF LUMINESCENCE IN COPEPODS AND OTHER PELAGIC MARINE ANIMALS. G.L.Clarke, R.J.Conover, C.N.David and J. A.Nicol: J. Mar. biol. Ass. U.K., 1962, 42, 541-564 (Lab., Citadel Hill, Plymouth, England) Comparisons were made between several spp. of luminous copepods*. Photoelectric recordings were made of flashes produced by electrical and mechanical stimm. The flashes lasted from 2-37 sec. Latency and intensity of the flashes were also studied. An investigation of the luminous glands and areas was made. Some measurements of luminescence in other pelagic animals are given and the present state of knowledge regarding luminescence in copepods is reviewed. P. J. Baron

7128. DISTRIBUTION OF SOME PLANKTON ANIMALS IN ENGLISH CHANNEL AND APPROACHES. II. SURVEYS WITH GULF m HIGH SPEED SAMPLER, 1958-60. A.J.Southward: J. Mar. biol. Ass. I*K., 1962, 42, 275-375 (Lab., Citadel Hill, Plymouth, England) Fifteen cruises were made between latitude 2T and S° W and longitude 48* and 52° N. Results for larger or commoner macroplankton animals are in the form of sets of contoured maps for each cruise and accompanying maps show salinity and temp. data. The indicator concept has been revised to take more account of north-south differences and oceanic-neritic effects. P.J.Baron

7129. CAN IMMUNOELECTROPHORESIS OF MOLLUSC ANTIGENS SOLVE CERTAIN PROBLEMS IN THEIR TAXONOMY? P.Tranvany, F.Rose and F.Laudé: OR. Acad. Sci., Paris, 1962, 255, 366-367 (Lab. de Parasitol., Fac. de Med. et de Pharm., Lille, France) Ag soln. were prep. from the lyophilised whole bodies of the molluscs Australorbis glabratus (Say, 1818) (Brazilian strain), Planorbis corneus a., 77S\$, Limnea palustris (Muller, 1774), L. stagnalis (L. 1758), L. limosa (L. 1759). Antisera were obtained from A. glabratus, P. corneus, L. palustris and L. stagnalis by weekly s.c. injn. for 16 weeks. Immunoelectrophoretograms were made for die standard Ag against each antiserum*. A correlation between similar immunol. prop. and closeness of classification was observed. (French) S.A.Thistlewood

7130. APERTURAL LAMELLAE, EPIPHRAGMS AND AESTIVATION OF PLANORBID MOLLUSKS. C.S. C.S.Richards: Amer. J. trop. Med. Hyg., 1963, 12, 254-263 (Puerto Rico Field Stat., U.S.Dept. Hlth., San Juan, Puerto Rico) The occurrence of six apertural lamellae in Australorbis glabratus and 3 spp. of Tropicorbis was studied. In laboratory cultures both lamellate and non-lame llate offspring without intermediate forms, were derived in a single clutch from either a lamellate or non-lamellate parent. A.A.Zimmerman

7131. COLOURS OF OPHIOCOPINA NIGRA (ABILD-GAARD). I. COLOUR VARIATION AND ITS RELATION TO DISTRIBUTION. II. OCCURRENCE OF MELANIN AND FLUORESCENT PIGMENTS, in. CAROTENOID PIGMENTS. A.R.Fontaine: J. Mar. biol. Ass. U.K., 1962, 42, 1-8, 9-31, 33-47 (Dept. Biol., Victoria Coll., Victoria, B.C., Canada) I. Observations on 2 geographically distinct populations of O. nigra showed that body colour ranges in a continuously graded series from black to orange-yellow*. There is a distinct difference in the range and tone of colouration which each population displays and this may be correlated in some degree with differences in the colour tone of the substratum. As depth increases, so does the incidence of light coloured phases in each population.

II. The solubility, oxidation-reduction, fluorescence and other chemical prop. of the pigment, of O. nigra, indicate that it is a true melanin. Visible colour produced by the melanin depend on its state of oxidation in the integument, fully oxidised pigment being dark brown and partially reduced pigment fawn coloured. The anatomy of the melanin-containing cells is described.

III. Red to orange-yellow colours of O. nigra are due to carotenoid pigments contained in specialised lipocytes. The major pigments detected were:- 8-carotene, an acid carotenoid similar to mytiloxanthin, and four xanthophylls of uncertain identity. New organs (vertebral pigment spots) were found on the aboral surfaces of the vertebral ossicles. P.J. Baron

7132. BACTERIAL INFECTION AND REACTION TO INJURY IN SOME ECHINODERMS. F.B.Bang and A.Lemma: J. insect Path., 1962, 4, 401-414 (Dept. Pathobiol., Sch. Hyg. and Public Health, Johns Hopkins Univ., Baltimore, Md., U.S.A.) The coelomic fluid of healthy Asterias forbesi when removed aseptically was sterile; while that removed aseptically from animals undergoing autotomy, from animals that had been traumatised dermally, from animals collected from stagnant water, or from animals showing muscular weakness and sluggish movement, contained bacteria. Healthy A. forbesi when kept in stagnant water developed bacterial infection, while expt. induced bacterial infection could be eliminated within 12 hr. of return to running water. Temporary aggltn. of amoebocytes was induced by bacterial infection, by surface trauma, and by the injn. of foreign substances into the coelom. Injn. of extracts of amoebocytes produced the strongest reaction and resulted in oedema. R.J. Walker

7133. THE BIOLOGY OF ASCIDIA NIGRA (SAVIGNY). I. SURVIVAL AND MORTALITY IN AN ADULT POPULATION. I.Goodbody: Biol. Bull. Woods Hole, 1962, 122, 40-51 (Dept. Zool., Univ. Coll. West Indies, Jamaica) A population of A. nigra was studied throughout its life. A. nigra is a primary coloniser and when colonising a new surface the* earliest settlers survive longest and after three months very few animals are able to settle. Mortality was not high for 18 months after initial colonisation but all the population was dead after 22 months. G.J.Peakin

7134. SWIMMING SPEEDS OF PLAICE LARVAE. J.S.Ryknd: J. exp. Biol., 1963, 40, 285-299 (Fisheries Lab., Lowestoft, England) Swimming speeds attained by hatchery reared larvae of the plaice, Pleuronectes platessa L. were demonstrated using two methods; timing swims over a measured distance in a tank, and allowing larvae to swim a current flowing through a long glass tube*

The design of collecting gear for use at sea is discussed. Only a highspeed townet, with a towing speed about 10 times that attainable by the largest larvae (about 20 cm./sec.) and giving almost no warning of its approach, can be considered to collect a quant, balanced sample.

A.J.Martin

7135. FREEZING RESISTANCE IN SOME NORTHERN FISHES. M.S.Gordon, B.H.Amdur and P.F.Scholander. Biol. Bull. Woods Hole. 1962, 122, 52-62. (Dept. Zool., Univ. California, Los Angeles. Calif., U.S.A.)

Super cooling and org. antifreeze compounds in the blood were found in specimens of Myrophis cephalorus, the scolpin and Gadus oseac, die fjord cod Trom Labrador. These fish were resistant to freezing, even though seeded with ice. Non-arctic populations of the scolpin and the tomcod, Mirimp-ariik tomcod, a close relative of me fjord cod, lacked this resistance to freezing when supercooled and also the antifreeze substances. The tomcods, when exposed to low temp., showed an increase in plasma non-protein nitrogen content like the fjord cod and it seems that a compound of *ibis* type acts as the anti-freeze. The nature of this substance in the scolpin is unknown.

G.J.Peakin

7136. A MAJOR ABNORMALITY OF THE VENOUS SYSTEM OF THE FROG- MJ.Parn. Nature, Lond..



A specimen of Rana temporaria with no left ant. vena cava is reported. G.M.Lewis

7137. A COMPARATIVE ANALYSIS OF NEST STRUCTURE IN THE WEAVER BIJK-OCEINAE. J.H.Crook. Ibis. 1963, 105, 238-262 (Def Psychology. Bristol. England) An analyse of nest struc

and correlations with environmental factors such as wind and predation. An evolutionary trend towards more

elaborate nests that enable spp. to exploit marginal environments is suggested. The nest-building behaviour of Malimbus rupicola, which 'prepares' nest material before bringing it to the nest, is described.

S.J.Davies

7138. TEMPERATURE ADAPTATION OF ISOLATED MAMMALIAN CELLS. E.D.Skholl^f: Tsitologii, 1962, 4, 562-565. The effect of O₂ within a certain temp. range, corresponding to the temp. of warm-blooded animals, on isolated rat muscle, was to promote temp. adaptation, resulting in increased duration of retention of excitability. At the same time there was intensification of synthesis of protoplasmic proteins. (Russian) B.J. Cooper

7139. OBSERVATIONS ON THE RANGE AND MOVEMENTS OF A WOODLAND POPULATION OF THE COMMON SHREW SOREX ARANEUS L. J.F.Shillito. Proc. zool. Soc Lond., 1963, 140, 533-546 (Dept. Zool., Univ. Exeter, England) Marking, release and recapture technique has been used to study the range of movements of common shrews. The ranges of the juvenile and subadult shrews was very limited but some dispersed up to 119 metres. The range of breeding 2 was slightly greater than that of juveniles. Males were found to move over the greatest range especially in the spring when ranges of up to 144 metres were recorded. These ranges are on the average somewhat less than the ranges of the short tailed shrew Blarina brevicauda*.

D.N.Wheatley

7140. AGE OF WEANING IN TWO SUBSPECIES OF DEER MICE. J.A.Kingi-J.CDeshaines and R. Webster: Science, 1963, 139, 483-484 (Dept. Zool., Michigan St. Univ., East Lansing, Mich., U.S.A.) The weaning age for Peromyscus maniculatus bairdii was 18 days, and for P. maniculatus gracilis, 24 days. Age and food consumption were better predictors of the weaning condition, as defined in terms of wt. change with isolation, than body wt.

G.M.Lewis

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7141. ADVANCES IN ENZYMOLOGY, 1963. 25.

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7142. ANIMAL BEHAVIOUR, 1963.

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7143. ANNUAL REPORTS OF THE PROGRESS OF CHEMISTRY, 1962, 59.

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7144. ANNALS OF THE NEW YORK ACADEMY OF SCIENCES, 1963, 97, Art. 4.

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7145. ANNALS OF THE NEW YORK ACADEMY OF SCIENCES, 1963, 105, Art. 4.

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7146. ANNALS OF THE NEW YORK ACADEMY OF SCIENCES, 1963, 105, Art. 8.

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7147. ANNALS OF THE NEW YORK ACADEMY OF SCIENCES, 1963, 102, Art. 2., 471-808.

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7148. THE BIOCHEMICAL JOURNAL, 1963, 88.

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