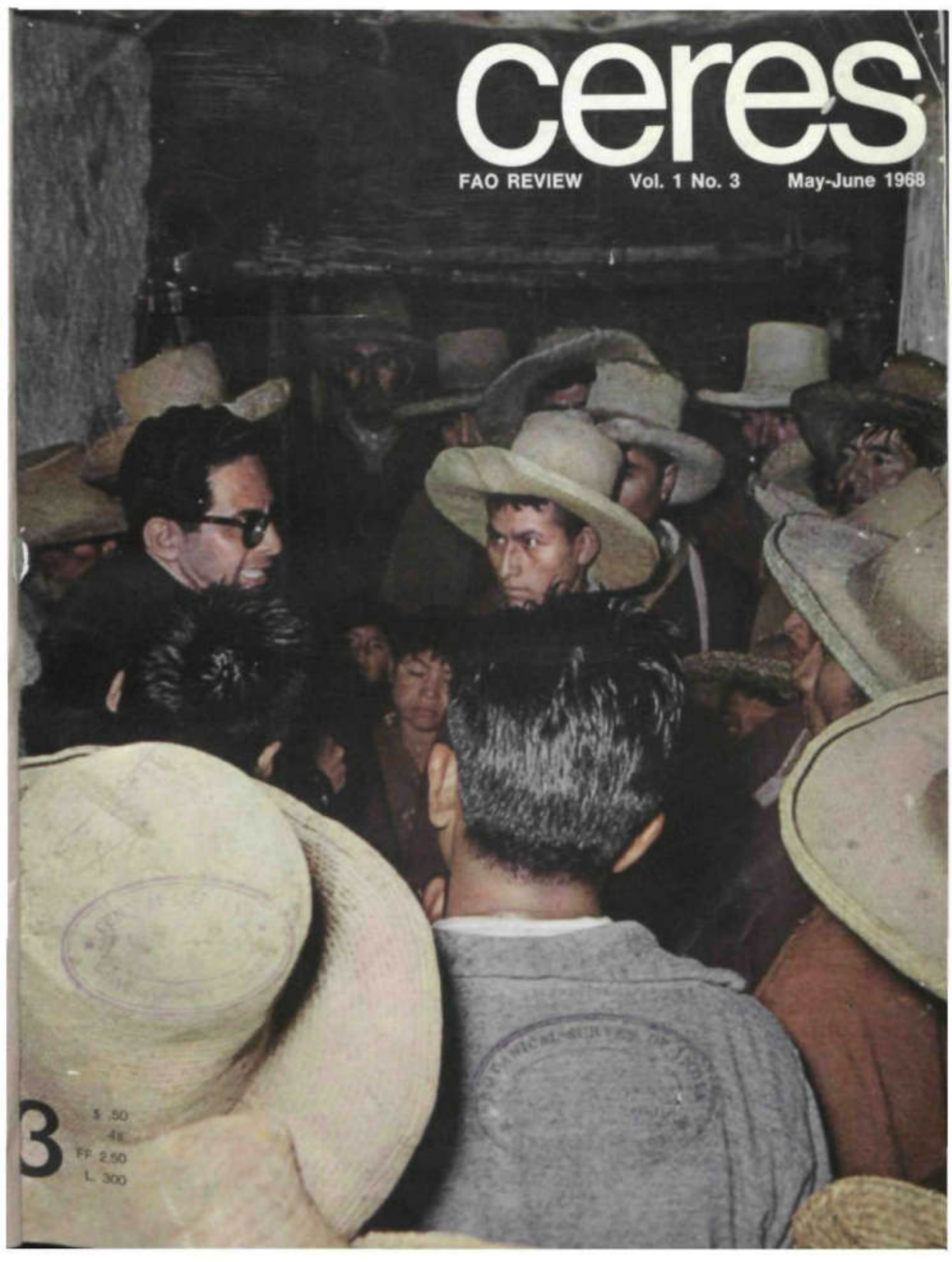

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FAO REVIEW Vol. 1 No. 3 May-June 1968

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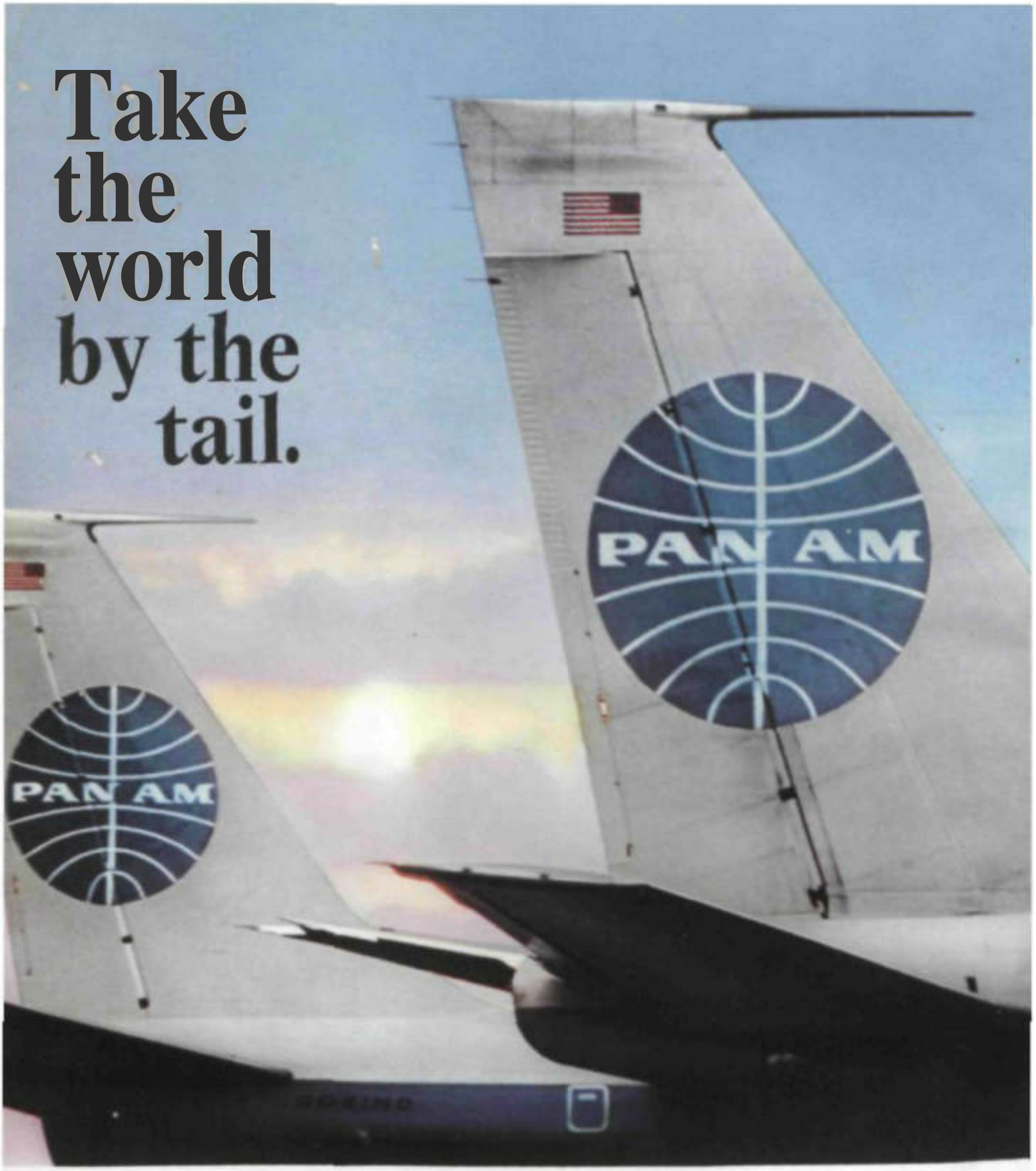

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Latin American farmers must form their own organization which can act as a fulcrum for national development. From the anonymous mass oi peasantry must come the natural leaders of social change, says the article on page 41. (Photo: A. Pittet).

FOOTPRINTS in the Rice Fields...

At planting time and during the growing « » o n , footprints made by planting ar hand weeding result in substantially reduced yield*. Trampled plants never rtgrow to full maturity and cause a rice loss up to 15 bushels per acre.

This lass during the critical growing season can be minimiitd by using CHEM RICE GRANULES to control weeds. These granules can be applied by hand, botk duster. Or airplane- They effectively kill weeds that tejke valuable farfiHxer from growing rice plants.

WfttTf FOR mil BULItTtN

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Chiie is one oi the few countries where an active land reform program is being carried out. it is also a country where intensive post-Sand reform activity is under way. The article by Jacques Chonchol, on page *41, describes the organization* of *the Chilean farmers into a cohesive whole, able to make theit presence ieit in the development process.*

Another aspect of farmer organization can be seen in the article, on p&ge 32, by **Derek Bryceson.** *A country like Tanzania needs aid but should be, as much* as *possible, independent ot outside assistance, he says. Such self-reliance can only be gained by the efforts ot the peasant farmers channeled through cooperative societies.*

One ot the world's foremost economic planners, **Jan** Tlnbergen, *describes the slow growth of national and international planning toward a new worldwide development plan in his article on page 19. He advocates the cooperation of all the specialized agencies with the U,N.'s Center tor Development Planning, Projection and Policies in the preparation ot a framework for a global master plan.*

The logical outcome of UNCTAD 2 is a rather similiar strategy tor global development, according to **Janez Stanovnik,** *in his article on page 50. Such a strategy would be dependent upon the linking of national and international effort, and on the adoption ot adequate sociaf reforms and policies in the developing countries, he says-*

The way in which tour African countries are working together to develop the Senegal river is a very practical example of national and international cooperation. **Robert N'Dao.** *who has worked with this project since its earliest beginnings, is interviewed on page 22.*


Jacques Chonchol


Derek Brycmion


Jmn Tinbergen


Jtlttl Sfnavnrk


Gunnar Myrdal

Another example of successful cooperation is the industry-backed program to increase fertilizer use in some 22 countries, now in its eighth year. A modest sampling from this program can be seen in the picture-story of a woman's lonely assignment in Ecuador (page 3$).

Practical help for such programs can be given by FAO's new documentation center (page 25), which may soon blossom into a network of interconnected centers. Too much valuable information has, in the pest, been lost in the archives, says the article. Now, technical assistance experience can be quickly brought to bear on specific problems.

Help ot a rather different kind is offered by a private organization which is attempting to act as a *bridge between the village-level and industrialized societies.* **E.F, Schumacher** *explains the meaning ol intermediate technology and what his group is attempting to do In an interview on page 29.*

WltJian Payne, *an expert in animal husbandry, suggests a new kind of research, oriented toward the problems of the tropics, in his article on page 46. Such 'meaningful' research would encompass both sociological and technological aspects and should be launched from new regional research-cum-training centers, he says.*

196S may well be remembered tor the publication ot **Gunnar Myrdal's** *" Asian Drama " a three-volume exploration ot the growth processes of that vast subcontinent. The flavor of this trank and realistic appraisal can be caught in the book review on page 60 and in echoes from the world press on page 61.*

FIAT the world over

More than 500,000 Fiat industrial and agricultural tractors ranging from 22 to 180 HP are working in five continents. Fiat manufactures tractors in nine countries with the most modern techniques in Turin. Sydney. Cordoba, Osaka, directly or under licence. Each and every tractor Fiat makes is the image of the experience and the technique of a world-known Trade Mark.

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AFRICA

• £»«(*African* and EEC talk trmdm*

Negotiations between the European Economic Community (EEC) and 18 African associated states (mainly in .West. Africa) for a renewal of the Yaounde Convention started in May.

Similar negotiations lor an association agreement are also under way between EEC and Kenya. Tanzania and Uganda in an attempt to strengthen EEC*African links, Previous negotiations were halted eighteen months ago following the inability of Common Market countries to agree about the products on which they wanted preferences; also because of the East African states' refusal to accept the principle of preferences for Common Market products in return for duty-free entry of East African goods into EEC countries.

The European Community has now presented to the East African states an "indicative" list of widely assorted items for discussion and selection.

• *Atricmn* ar»r«s *form rogtommt mm/on*

The Central African Republic. Chad and the Democratic Republic of the Congo grouped togelher last month to form a new regional organization, the Union of Central African States

The agreement was signed ir> Fort Lamy. Chad by President Joseph Mobutu of the Democratic Republic of the Congo, President Jean-Bedel Bokassa of the Central African Republic and President FrancoisTombalbaye of Chad.

The new union will, at first. be primarily one Of economic cooperation, with the emphasis on customs and transportation.

The new regional grouping covers an area of over 1.600 000 square miles and contains a population of 21 million,

Union in Alnca Presidents ***Jomptt Uetutu, Jmrnn-Brndtt*** *Bohassa and francois Tamt>atb*v* agree* to *form tft** ***Untoti*** or *Central African States*

• *M*w* Mor*ooeo *tivm-year plan*

Morocco has just revealed its new 1968/72 five-year plan. It calls for a total investment of $1,000 million. Nearly hall of the money will be spent on dam building and agriculture When completed, the plan should increase national income by 5 percent. Forty percent of the costs win be financed from abroad and $200 million in foreign participation is already assured, according to a report Irom Rabat.

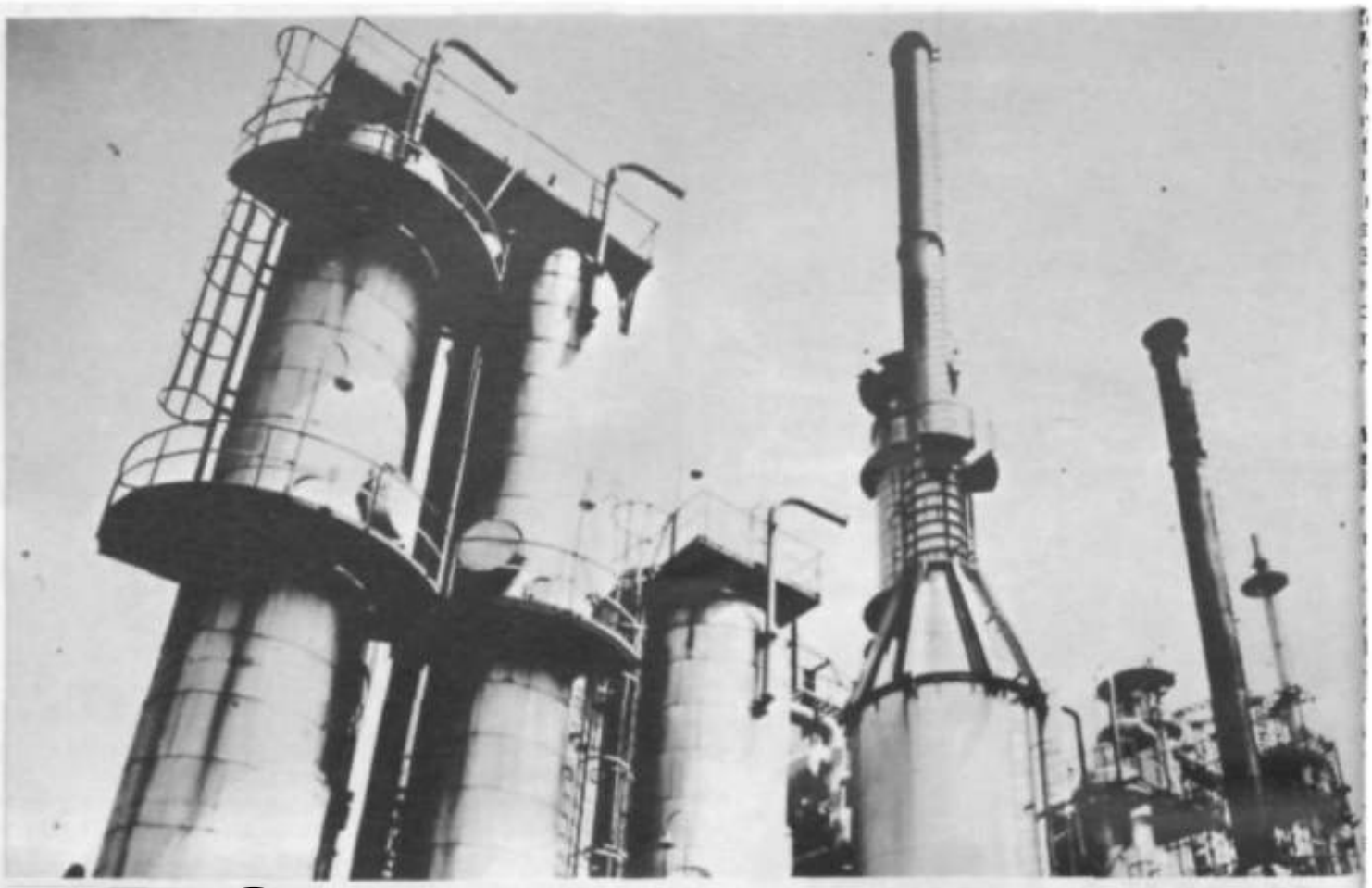
• *Omtm*m oftmrm mmw openings for- invmmtorm*

More investments in Guinea are expected lo fotlow the country's new policy oi cooperation and co**i»ience with all countries. Iron and bauxite production is steadity rising and a Canadian conopany, Harvey Aluminum, recently made the first shipment from its Boke concession. Among other countries also cooperating in the development of Guinea's economy are the U.S.S.R.. Mainland China and the U.S.A. Guinea looks forward particularly to increased French participation.

More foreign investments in Ghana are likely to follow the recent visits of Ghanaian officials to Europe.

In the Federal Republic of Germany, Mr. J.W.K. Harlley. vice-chairman ot the National Liberation Council, said Ghana wants Krupp to take part in its large-scale irrigation projects. Other suggestions discussed with Krupp executive! concerned the building of freight and passenger ships for use on the VoJta artificial lake.

Mr. E. Omaboe, Ghanaian Mintster of Economic Affairs, who was in Paris recently lor a meeting, said Ghana wants French agricultural experts, particularly for its palm and cotton plantations. French participation in Ghana's devefopment would also extend to other fields. A French company, for instance, may lake over the Ghanaian pharmaceutical slate enterprise.



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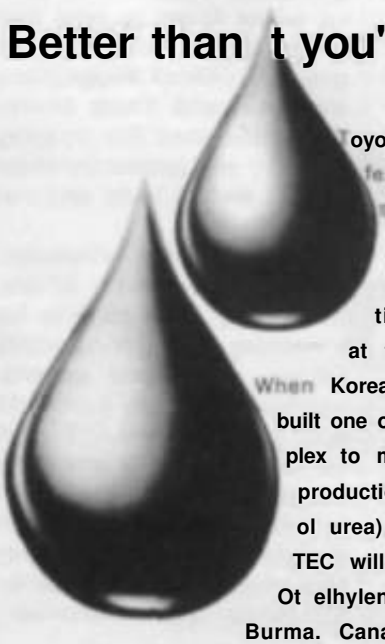

oyo Engineering Corporation [TEC) has already featured in the industrial planning of over • score of nations By doing so we've built up volumes ot round the world experience In planning, designing and constructing procev ting planti for anybody'* requirements And at the same time a reputation tor efficiency When Korea needed more fertilizer* TEC designed and built one of the world'* largest ammonia end urea com plex to mi that need m a thort timi, {with a daily production of 590 lons ol ammonia and 1.000 ton* ol urea) In Japan, live plant* under construction by TEC will turn out en annual totat ol 1.400.000 ton* Ot elhylene in the near future, arid m India. Brjjil, Burma. Canada. Pakistan. England end a tot of other countries, our wide selection of engineering *n4 struction technique*, which reduce eonttructionl have fitted the MM, and the demand for ert operation.

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TOYO ENGINEERING CORP

lanym cotfam crop

n uncontrollable fungus lt has destroyed 70% of jiya's coffee crop this year, lee has been for years iya's top export.. worth rly $50 million yearly, year's loss is estimated XCOO tons. So far, no -tive control has been covered and many cotfee ners and planters am re- nting their land with tea.

Malawi: vmmt n»w harsts ptannmd

laize production in Mart's lilongwe regionshould rease about ten times and ndnut production twice ing the next 13 years, fol- ing the approval of a S6 ion interest-free Iniema- al Deveiopmenl Associa- ODA) loan to the Malawi ernm*nt to promote the cultural development of Q

he loan covers a first ftse of 163.000 acres, pan Pn eventual haff a million es

nother IDA credit ol $3.7 •on will assist the devel- ["erit OM30.000 acres in the ire valley, where n is hoped treble cotton production *r the next five years P^flh improved cultivation -ctices and the use of 'ayers and insecticides. DA credits will cover the ei9n exchange require- »nts of the two schemes $ Part of the local costs. e Malawi government will ver ihe rest

Bo^th the projects were pre- fed under the supervision h^° and the Wofld Bank nn anc)al assistance from

EAR EAST

Iran reverses the ain drain

the rtMdeo man- |* pjem#fii ,it fourth ,t pian a come- / WW b« made by lf3nian government to 1 of thB 10.000 Iranian eri ty ^d college gradu- in Europe ano North America. A special group, headed by a minister, will tour these two continents to recruit personnel from among Iranians now living and working in the more industrialized countries of the world.

• *World'* hiagmmt dmm for Wmmt Pmkimtan*

The contract to build a giant earth dam at Tarbela on the Indus river in West Pakistan has been awarded to a consortium of French and Italian companies led by Impregilo of Milan

This is the largest single public works bid ever awarded- The project Is three times larger than the Aswan High Dam. Tarbela is to be the major contributor in a chain ol dams and canals which will provide power and water to 50 million people and 33 million acres of arid land. The central dam will be 9.000 leet long and 470 feet high. The dam will create a lake 50 miles long and will not be completed until 1976.

Total cost of the project: $827 million. The financing has been arranged by a group of seven countries and the Indus Basin Fund under the auspices of the World Bank.

LATIN AMERICA

• *Program* toward Caribbean community*

An interregional free trade area embracing most of the Caribbean countries came a step nearer reality following a recent meeting of the heads of governments of the present CARIFTA members: Anligua. Barbados and Guyana

Accomplishments Included the following:

..drafting of a charter for a Caribbean Development Bank, to come into being in May of 1968.

..adoption of the CARIFTA agreement as the basis for an extended agreement aimed at more complete free trade among commonwealth Caribbean countries, with an eventual full customs union and economic community

...organization of a Caribbean regional secretariat, located in Georgetown. Guyana.

...agreement to esiabiish various regional services, such as a press service a bureau of standards and a population center.

The Eastern Caribbean Common Market (ECCM) countries — Dominica, Grenada, Monserrat, St. Lucia and St. Vincent — as well as other Caribbean countries, are stilt considering various form of agreement.

• *Maw dmm to* Aryan* Una approfad*

The World Bank has decided to take part in the financing of tne Chocon-Cerros-Colorado hydroelectric scheme in Argentina which will permit the irrigation of half a million hectares in northern Patagonia. Cost of the project will amount to $440 million,

A major aim is 10 bring to an end the periodic floods from ihe Andes which are a constant threat to this fertile region. The dam forming part of the scheme will be one kilometer long and 75 meters high. Also included in the project wi!T be an I 800.000 kilowatt power station

The three loundvr mambBfs at CARIFTA' Antigua Barbados and Guyana

• *S IBS million invamttnant in L.A.'* foraaia*

A leading role in the expansion of forest industries in widely separated countries in Latin America is being played by private investment

A Chilean/FAO team set up the Institute (or Development of Forestry Resources under the United Nations Development Program (UNDP) which spurred the recent large scale development of Chile's forest-based industries (pulp and paper plants, veneer and plywood mills) During the last six years, more than $105 million have been invested in these industries, and from 1962 to 1965 exports of Chilean sawnwood rose by 107%.

An HoncJuran/FAO team recently carried out a UNDP survey or the forest potential of Honduras which spotlight* and that country's resources. It eventually led to a government partnership wil*» the United States international PapeT Company for the construction of a $77 million pulp and paper plant in that country

The plant, the largest International Paper project outside the United States and Canada, will have an annual production capacity of 40 million board feet o(lumber and 210,000 metric tons of linerboard.

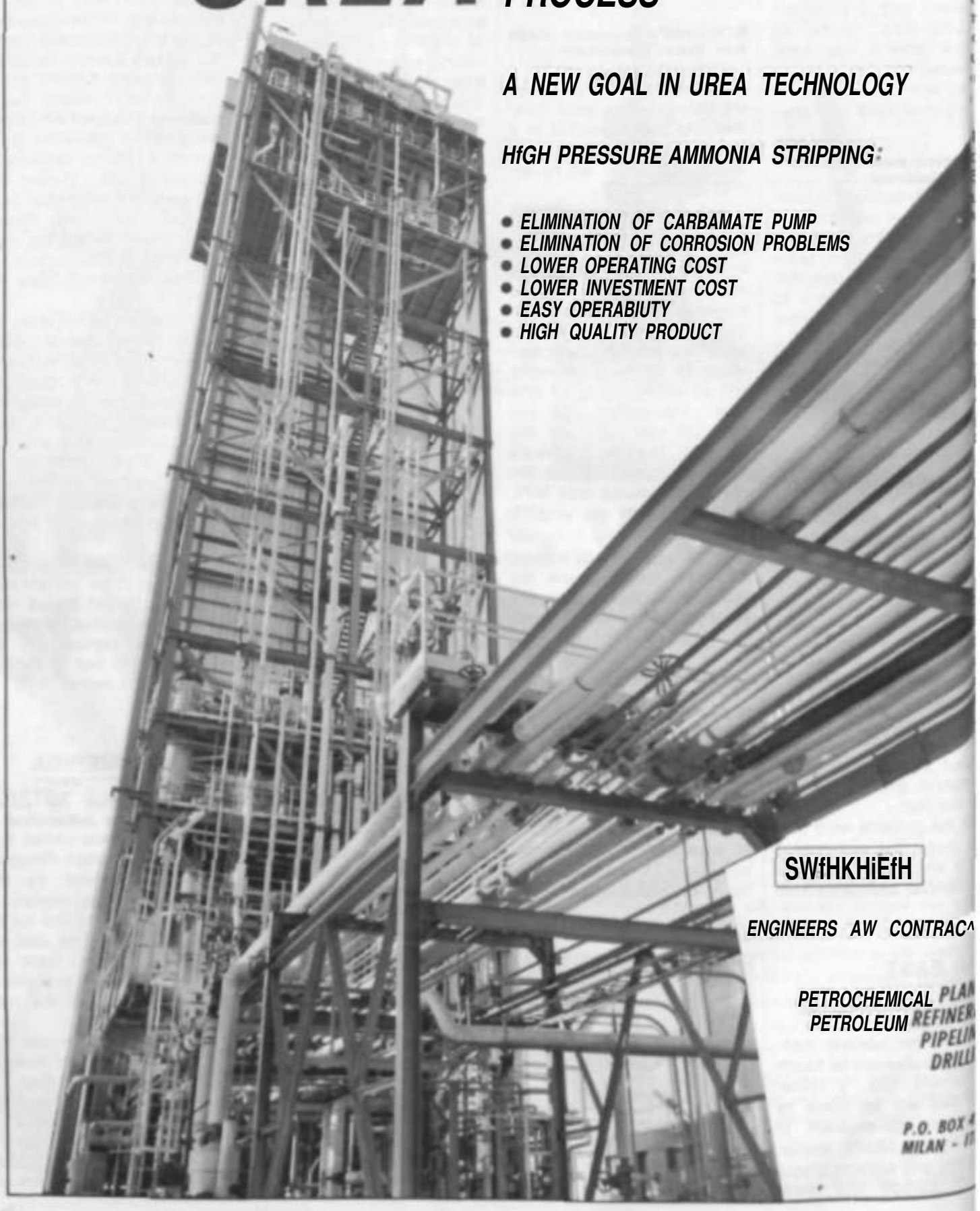
NORTH AMERICA

• *S W million in oontraotn to ha mwardod*

The list of new United Nations Development Program projects approved by the UNDP governing council In January, to be earned out by the United Nations and its various agencies, calls (or nearly $10 millton in contractual services over the next few years.

The tefger contracts in- , ciude $t million for lorestry consultant services over the next four and a half years to pave the way for a national forest development plan m West Africa Two contracts (or nearly SI million each will

UREA STRIPPING a new SNANI PROGETTI PROCESS



A NEW GOAL IN UREA TECHNOLOGY

HfGH PRESSURE AMMONIA STRIPPING:

- ELIMINATION OF CARBAMATE PUMP
- ELIMINATION OF CORROSION PROBLEMS
- LOWER OPERATING COST
- LOWER INVESTMENT COST
- EASY OPERABIUTY
- HIGH QUALITY PRODUCT

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i required for a pesticide lint. to produce, among her chemicals, 1,000 tons DDT annually in the Near »&t; and survey work preiratory to river valley devel->ment in the Far East, ther contracts include an tiouni of $650,000 for lechcal and economic transport udies in Africa and $500,000 •r a marine seismic survey ' Ihe Caribbean,

Between 1959 and mid-1967 NDP projects involved 337 sntracts worth "more than 2 million and equipment lii-chases totaling some $88 litlion.

Briton hmmdm muralv lisposat grunt*

The 41-nation subcommitte on surplus disposal of gricultural products relected John Eaion. of the hited Kingdom, as its chairan for 1968 at its recent eeting in Washington. Jose H. Sanchis Munos of Argen-Hna was elected vice-chair-Aian

• The subcommittee isFAOs tergouernmental torum for verseeing ihe orderly transr of agricultural products rom food-rich to food-deficit ountries. It works under a t of rules designed to revenl "dumping" of agricultural surpluses, or the mergence of unfair com pet itive p radices in intern at ional trade. These rules have he status of an international convention and are known as Ihe "FAO Principles on the Disposal of Agricultural Surpluses."

• IDA: %+QO miliion m ymmi- for iomnm

^ Over the next three years *Hhe International Development Association, an affiliate of the *World* Bank, will dispose of Hi ,280 million for loans to delvelgping countries. Major contributors are the United Si«le* ($480 million), the United Kingdom (SI55.5 million). the Federal Republic ol Germany ($117 million) and France {S97.2 million) Other major donors are Australia,

Robert Strange McNamara, president ot the World Ban*

Canada. Italy, Japan, the Netherlands and Switzerland.

Because of its present balance of payments difficulties, the U.S. contribution can now *only* be used for purchases inside the United States.

Sweden has announced that it will make an additional contribution to IDA of $21,36 million in freely convertible currencies over the next three years. This would be in addition to the $29.64 million contributed by Sweden to the $1,280 million fund.

• Who* owns *Ihm mmmbmtf

Recent findings of manganese oulcroppmgs on the ocean floor have stirred international action on the problem of seabed jurisdiction. Acting on a Malta proposal, the United Nations General Assembly has sei up a committee to study practical means to promote international cooperation in the exploitation of the ocean floor.

A resolution covering the establishment of a United Nations licensing authority for exploitation ol the seabed has been proposed in the United States Senate.

The US government has designated an interdepartmental committee, chaired by the State Department, while the US, Marine Science Council is financially backing three research projects on tnternationaf law and marine minerals, fisheries and scientide exploration

ASIA

• ADB hack* Thai Coi>~ ttoration

The Manila-based Asian Development Bank has approved a S5 million loan to the Industrial Finance Corporation of Thailand.

The aim of the loan is to help the corporation contribute to the industrial development of Thailand

This loan is the first made by ADB from ordinary capital resources. The bank started operations 18 months ago and has so far also helped finance a major agricultural survey of Ihe Asian region and agricultural production in Indonesia.

• U.S.S.R.* IMT *mm* coopmrmtm* on *ttwvmlopmrnmt ptanm

India and the Soviet Union want to cooperate more closely in their development plans. The economic planning commissions of both countries will meet before the start of India's next five-year plan in 1969, and the Soviet Union's in 1971. in order to coordinate their activities.

The commissions will consult particularly over the use of aid from the Soviet Union to India. Present indo-Soviet trade stands at around $180 million annually.

The Soviet Union is expected to accelerate its purchases of Indian manufactured goods, particularly railway wagons and jute

EUROPE

• AgrvGntBitt* on *food mtmndmrd*

Agreement has been reached on international food standards for canned fruits and vegetables, a range of sugars and glucose syrups and other commodities.

The join! FAO/WHO Codex Alimenlanus Commission. * 50-nation body, mat m Rome for its (ilth annual session ending 1 March.

The commission is attempting, through its own work and that of its various groups, to arrive at standard of food quality, hygiene, labeling, additives and pesticide residues which can be adopted by governments in their national legislation It is hoped, in this way, to remove ngntariff barriers to trade and thus contribute to food availability.

■ New indus•Irimm tnvmrntmtmmt vmmtttrm

New ways to increase cooperation between the United Nations and industry and to facilitate industrial investment in developing countries were worked out at a meeting' in March of FAO's Industry Cooperative Program,

Representatives of 37 major international (irms met in Rome under the chairmanship of Dr. V.H. Umbrichl. managing director of Ciba A. G . who was also elected pro* gram chairman for 1968

Dr. Umbricht appeared for the adoption of "a widely acceptable coda of conduct for the protection of private investors." This, he said, would allow private concerns to

Or V H. Utntntcht, chairman ot the FAO Industry Cooperative Program

be as enterprising as they woutd wrsh to be." He expressed regret that some developing countries tended to see such a code as a form of discrimination against them He appealed also to private enterprise to adopt "an attitude which reflects recognition of todays conditions."

•

Informal arrangements on industrial fibers pave way for similiar commodity agreements

A new technique for dealing with international market and price problems of various commodities, first adopted for jute, kenaf and allied libers, has now been extended to two other groups of fibers: sisal and henequen; and abaca.*

commodjtjgs com·noatti's c imi mX od lies

The traditional formal commodity agreement tends to be rather rigid and cannot be easily arid quickly modified to meet changes in world supply and demand: it is difficult to arrange for some commodities due to technical problems

FAO's Consultative Committee on Jute. Kenaf and Allied Fibers has worked out a technique of informal international commodity stabilization arrangements which seems to be working satisfactorily.

The relative success of these informal arrangements is due to three main reasons: because most of the key personalities in each relevant industry and trade sit at meetings side by side with their government representatives; because of the informal, flexible nature of these arrangements, and because of the very real pressure to BvoJve workable solutions at the meetings in the light of 1hB critical conditions facing the respective fiber industries concerned.

These conditions include the growing competition from the new polyolefin synthetics, (he downward trends in world fiber prices, and upward movements in fabor and other costs in most countries. Not only have exporting countries been anxious to assure a future for their exports of fiber, but importers loo, unwilling for economic and technical reasons to commil 1 hem selves wholeheartedly to the new synthetics, have wished to assurB themselves of supplies or natural fiber al a mutually negotiated price.

In jute and kenai these informal consultations have mainly sought agreement on an indicative price range for a representative export grade of jute, to be supported by a recommended monthly or quarterly phasing of purchases by the major importing counties and by thfe internal price and marketing policies of the key agency on the exporting side, the Pakistan Jute Board. At a recent meeting for example, representatives of the main countries exporting and consuming jute agreed to revise the indicative price range in the light of sterling devaluation.

In sisal and henequen, where no one exporter predominates, the informal indicative price arrangements, as worked out for jute, have been carried a stage further by the elaboration of a full, though still informal, export quota system

Under this sysiem n is intended to support the market at an agreed price level sufficient to maintain both a viable industry in the producing countries and a competitive price in the face of synthetics.

In abaca, where the number o) importers is limited, a third informal technique has been evolved: that ol agreement as to an approprtate price levef which the major importing interests agree round the table to pay in the market. Al a recent meeting, for instance, buyers and sellers of abaca and their government representatives agreed that producers need urgent assistance and that the present price of the fiber should be raised to maintain a minimum level of production m ihe main producing country.

** Abaca (Manila hemp—W* of which " pntJueed in the Philippines) is mainly used fur matinr and in Ju until ropes. net% and eaUm, with* **fowv** *fadn and waste guing into paper. The hi slier f rod ft ha\ e been hard hit recently by groHinu i I'tnpelitii'tt from* **lyHtkitlcx:** WHJ/ *and henequtn, which ate cheaper,* ***compete with the /«h-rr v'liiM The bulk af niti/ h Uftd for halft and binder twtnr, though it is also employed in rope manufacture, Hmrauen if timiliar u> usat ihtrugh M'mewhitl wrairr. It is used for industrial and cotnmrr-mil rwbut u\ vrll at a packaging material iuir ix mainly v, making hag* and tacit, buckings for ctfrpff.i and, increasingly, in manufacturing frit.***

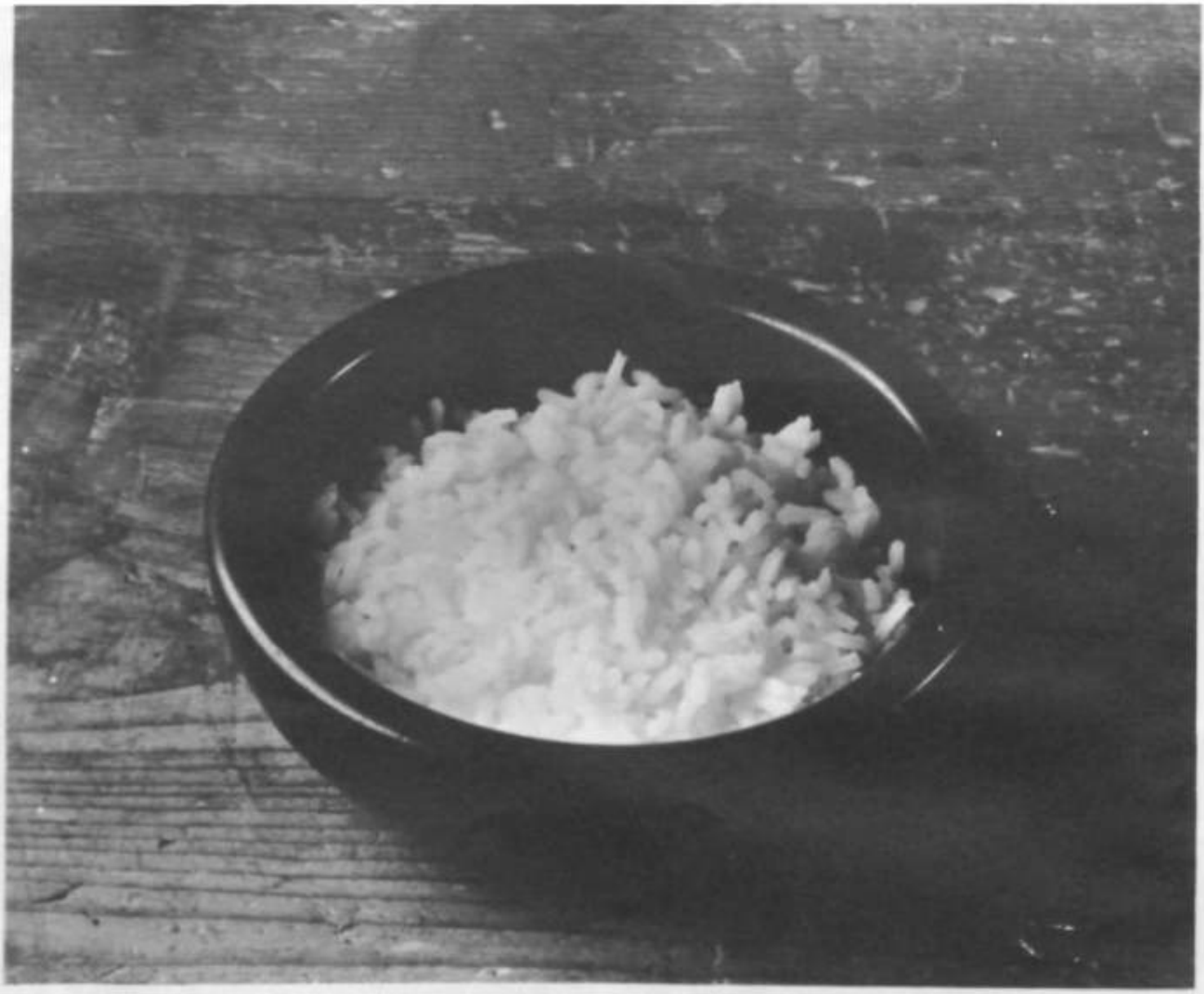
Attack

Thiv ii the world's mtui peaceful fleet: harvesters. Their atiatk on hunger has t«*n helped by Geigy. GeigY pft>ducls pfotect ({rowing unpv lrom weed* *tnd* insects.
Fgll eifS O" vigorous hlufim m«an rKh harv«fti.
No mofe w«ds.
And the harvesters *Hht(only grains
Whriher cewals, corn or rice, Cetgy has been help<nK tb* harvesters for years.

Wrth Cesjfin[1], Cesapnm*, EU&udirt*, jnd oiher well-tried products |lhe rifllfit one for every crop).
This nwltei Geigy *i* poTenl aily.
In the attack on Sunger.

G G I Q V

Creators of Chemical* (or Modrrn A^Ticulture



There are many ways to get more food from earth. The simplest is to provide the crops with the right nutrients without useless waste.

: ne the t.rop* *is easy,* there ire lots of good fertilizer brand* to choose from. To avoid wane is another pair of boot*. Only a comple* granuljr (tnih/cr can proem th'iv In a Scifafcrt. for instance, the plant nutrients linked in a dcfinite cbemksl structure h> a modem synthesis give the cnpi the riffat amount of food at the richi monnrni The franular shape oT Seifafcrts aflowi easy and cwm broadcasting and. at (he *nmt* tine. av«iHh their being swept m\ by wind of » jshcJ a»ay by rain. Being more won ccntraieJ. they are lev* bulky: this means less in trans)soct, storing and broaden*ing e\pen>.cv Even the package can be vpecial you mav find Seifafen granules packed in waterprmf ptaslic bags so thai, should it be necessary, ihcy can be vafcJy stored outdoors.

SEIFA

Seifi - Piazza Duc» d'Amta, 4 - Milino

Seifafert is the registered trade mart for Self* complex fertilizers. Further to ihee. Scil« markcti MJI types of straight fertilizers.

WOOD

A top foreign exchange earner

Forest products are among the fastest growing exports of the developing countries as a whole and ace the top foreign exchange earners of a number of African and Asian countries, according to an FAO report presented at UNCTAO 2.

In the ten year*. 1955-66 the export valua ef these products grew from $2B0 million annually to $770 million. This total is expected to reach Si.500 million annually by 1975 The developing countries' export trade in these products continues to grow at a considerably faster rate than world trade, and at a very much faster rate than that of these countries' altcommodities trade.

A number of dramatic increases are quoted In the report, such as the Republic of Korea whose exports of hardwood plywood increased more than 100 times between 1960 and 1966, from 3.300 cubic meters to 272,800 cubic meters.

However, Only two fifths Of these forest products are at present exported to the developed countries in processed form. By 1975 this share should, and could, increase considerably, says the report. Processed forest products present unusually favorable prospects for early, rapid and large-scale expansion of exports from the developing countries.

COTTON

Low or arop tor mom t tor thin V***

The world cotton crop in 1967/68 is estimated at 47 2 million bales as compared with *A1A* million bales harvested a year earlier and a record high of 53.1 million bales in 1965/66, according 1» a recent report from ltle US. Department of Agriculture.

The production estimate from the U.S.- was reduced to 7-6 million bales, due to 3 reduction in acreage and lower yields, Crops in Mex- Ico. India. Iran. Israel and the U.S.S.R. were also reported to be lower.

Asia and Oceania, account for a major part of world cotton production, estimated at 17 3 million bales for 1967/68 as compared with 4 9 million bales in Africa and 38 million bales in South America.

COFFEE

Way *oimmr for now agreement*

The second International Coffee Agreement should now come into force when the 1962 agreement expires at the end of September.

The final area of disagreement — namely that of the exports of soluble coffee from Brazil which, in the United States' opinion, had been facilitated by discriminating treatment in favor of green collee processed in Bni.il — has now been resolved.

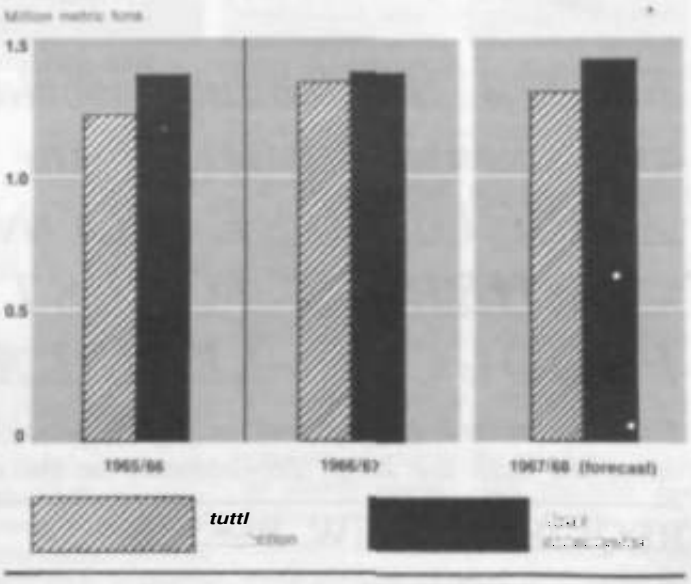
The new agreement prohibits the application of governmental measures which constitute discrim in a tory t reame n t in favor Of exports and re-exports o(processed coflee as compared with green coffee; provision is also made for an arbitration panel to settle disputes between member countries.

The export quota mechanism of the 1962 agreement was successful in holding slock off the market and in improving and stabilizing prices Annual export earnings from coffee nave been raised by over $500 million.

The atm of the new agreement remains unchanged though there has been some readjustment In basic export quotas. The system of selective quota adjustments, in order lo maintain adequate supplies of th#different types of coffee at equitable and stable prices, is being maintained Ouota-fr«« exports to certain countries which consume little coffee will be continued in order to develop new markets, but control measures are to be strengthened.

The long-term problem oi coffee supplies is to be tackled by the establishment, before the end of 1968, of production goals lor the 1972/73 coffee year and by setting up a diversification fund to help producing countries become less dependent on their coffee crop.

World production and consumption of cocoa



COCOA

Contifttntio— mymin higher tttmm production

World production of cocoa in 1967/68 is forecast at 1.3O8.0O0 metric tons, slightly down from the revised estimate for the preceding crop year ot nearly 1.347.000 melric tons, according to the committee on statistics of FAO's Cocoa Study Group, which met in Rome in April

Africa is expected to produce the (ton's share, more than 960,000 metric tonv followed by South America with slightly more than 230.000 metrtc tons

World grinding* (contumption} are forecast at 1,419,000 metric tons for the calendar yea; 1968, a slight increase over the revised figure of 1,369.000 for the previous year.

Europe and the U.S.S.R will account for nearly 750,000 metric tons ot this estimated total, followed by North and Central America with a consumption figure Of nearly 350,000 metric tons.

For the third year in succession production has been more than 300.000 tons below the record crop of 1964/65 The trend in grindmgs is still upward, despite an apparent stagnation of demand in some of the major consuming countries

Consumption has been rising over the pasi nine years. At the present time world reserves do not represent more than two months production. Up till now the imbalance between production and consumption has been balanced by the record crop of 1964/65.

Prices rose again during 1967 Ounng UNCTAD *2.* the Principal producing countries — Ghana. Won/ Coast, Cameroon. Brazil and Nigeria — went some way toward a possfble price agreement witti the principal consuming countries.

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Prwc *5.4» or

Honduras

Here «re itie re%uk* oJ • fn^a arpwiwil to pnmde Ikm. **H needeil** for prom **pine foreM ureus of Ht*dw** H» «n«»**

coverinf such upects u foreit ura>nizia(ion. fire OQnMl and I he de-vekipcncni of roads. It cuncludn by Matin f thai .\tth I he introduction Ol .cikqualr pruiKiion and a stHirvd forest management, thevc pine fores:. tould produce enough wood ID uiitain • far morr mteniive forest industry.
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FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

opinion

seeing beyond one's nose

From art t-iiitoriai by Bernard Hollowooti ***in*** **Punch.**

...It should be fairly obvious that the strength of the rich countries lies in their economic versatility — their ability to •wftcfe labor and capiial resources quickly to meet (he needs of the market.

If the workl wants color TV. then ihc west rejigs industry u> supply it. Il tlk world WKUt pills Of sporting equipment or man-made fibres, then the west shuffles iu labor around and turns out the goods, at fancy prices.

The underdeveloped nations, on the other hand, hue no such opporluniiiL-. They have the know-how to produce only a very restricted line of raw materials ami agricultural products.

The west encouraged ihesc countries to product ninning but cocoa, tea, codec, rubber, rice, coconuts and so on; encouraged ihem by guaranteeing to buy heavily. But no price was fixed, and the guarantee usually promoted overproduction. So the poor nations were stuck with a rigid economy utterly dependent on ihc market for their subsistence. They m..re, and are, in (he pocitels of the rich.

The past fifty years huvc demonstrated that communities which ;irc encouraged to put their irusi in a narrow range of product* are extremely vulnerable, and at the mercy of the rest of the world.

Even Kuwait, ihc richest state on earth, » itinious: any scientific development that puts oil in (he background would 'utomatkalK convert the people of Kuwait to the primitive desert nomads they ʷ= « ihiny years ago.

Undeveloped and underdeveloped nitioni must be helped (o diversify, to industrialize and (o compete with the west in ihc production of manufactured goods. And the west, responsible for their present plight, hai a duly 10 provide them with the rttOWOM to accomplish this divcrsiIk Lit ion.

The west has now to decide whether it is prepared to allow millions to descend to the acutest poverty by refusing to sacrifjee an insignificant fraction of its bloated standard uf living, or whether to KBp up its aid lo a level that will make Ihe poorer countries economically viable.

It is not an easy choice, for governments survive only when they plea.se the pockets of the electorate and the electorate, almost everywhere, is so stupid and selfish that it cannot sec the end of ils nose.

stoking our own fires

From an address by M. Louis Nigre, Minister of Finance in the Rrpublic o] Mali, at VSCTAD 2.

...I approach this problem from an angle which is likely to be rather disagreeable. 1 feel an obligation for us, ihc developing nation*, to look at our-KIWH J[ust fl)r 0O08, bukI) and critiodly. especially in this auguM assembly, for out conference cannot be merely the Forum for criticising fruuwtfcm perhaps rather superficially) only those countries which are already developed.

It is certainly legitimate <and indeed •good lorm") to require industrialized countries to roise the rules of the game of in tern at ion ill trade. But what have we done ourselves t-[1] hd&Me trade within our own regions? Our products arc subject to the same ridiculous system of taxes and tariffs, even though they are nol competitive; and although our periodic meetings {at least so far as west African slates are concerned) are osiensihly devoted to harmonizingOHf legMftHnn on tariffs and taxes, they almost invariably end in admissions of deadlock — and therefore in failure.

tIld what is happening to economic and industrial collaboration? We have enough tobacco and match factories to KI fire to the whole of Afrki) We all have textile industries — but sometimes no cotton- lots of slaughterhouses and L.»Ul-M..ragc facilities — but very often no livestock; lots of sugar refineries, but scarcely ever any cane sugar. Or again, what is there to be said for the proposal to set up an iron-and-sr.eel industry at Mbregjonal level, when it appears that no final agreement has yet been reached among the countries concerned?

There you have a description in broad outline of the present slate of economic cooperation among the countries of west Africa, it is as disappointing as any platitude.

My country's position in this matter is anyway quite clear and unambiguous. We, in Malt, hold that economic cooperation between underdeveloped countries {such as our African countries) can bear lasting fruit only insofar as it is bused upon a partnership of peoples who are fully conscious both of their rights and of their obligations, and who are resolved to make mutual concessions in order to ensure th;it each participant enjoys his fair share of real advantages accruing from project,[1]? which are jointly put in hand.

We bold that such cooperation ihnulu not be confused with *A* vague association for mutual aid or solidarity, whose notfw principle is one of hroiricrlincss or "fra-(crrtiilism," quile as dangerous as any paternal ism since it will only confirm the wealthier partner in the privileges which he already enjoy*. Still kss with any division of labor between nations on a regional or subrcgional level, which would have the effect of crystallizing the inequalities bequeathed by the colonial system and which would run the risk of finally and permanently condemning certain countries tohcingnoihing but markets for the mhcrs.

change of heart

From an address fry Professor J, May fine ***Sryaet to*** *a meeting on population pmbtems in Latin America*

...Although the intensity of effort va-rfc» grcitly from country to country, at the present time 18 Lai in American and Caribbean governments provide some degree Of support to family planning progrimi.

In 1967, the International Family Planning Federation spent more in the

Latin American region than in nil other regions combined. In this same area, AJ» (Agency for International Development) during 1965 and 1966 invested in family planning campaigns double the amount ii had spen: in other continents on similar programs.

The rapidity with which this situation has conic upon us is as remarkable us I he Tact that it has occurred at all. In 1960 there was only one private group dedicated 10 family planning in the whole of Latin America; that was in Mexico and was run by North Americans. In .1467 only three nations lacked such programs: Nicaragua, Haiti and Bolivia.

pro and con modern technology

From an article by Gerard PM. publisher oj Scientific American, *in the* Buliclin of the Atomic Scientists.

...The hordes of underemployed people in the countryside and of the plainly unemployed irt the squatter cities have encouraged the idea that development programs should call in iabor-miensivc technologies. A strong case can be made (or the opposite slralcgy.

In the first place. *tlKtc* is a generation or two of la bor- in tensive work lo be done in every pic-industrial country on the infrastructure tif ports, rails, highv/ays, bousing and building.

When it comes lo the productive apparatus, on the other hand, this ought to incorporate the most advanced developments in science and technology. The model is (he petrochemical plant, with MO operators at * control panel

Technology at this stage of perfection is highly portable, easily installed, makes least demand on local human resources, and operate* al the same efficiency independent of local conditions whether in fialveslnn or Kuwait.

In sum there is no reason why with adequate capital and technical assistance from outside, the prospective new steel industry in Chile should have to evolve through the beehive coke oven and backyard blast- furnace phase Ideally, it should install direct reduction and continuouv casting at the oulset.

The application of **Mtmot** and technology lo development may. therefore. offset and reverse the forces that tend to widen and deepen the gap between the rich and the poor...

two halves make a whole

From an interview with Edgar Faure, French Minister of Agriculture, appearing in Enterprises.

An effective global plan of aid to toe third world is almost impossible without real international cooperation.

It would seem lo be very difficult to effect an operation of this magnitude without complete international cooperation, embracing l-voth LUM and west, both market and centrally planned economies.

It would be difficult to obtain (tic unilateral consent of cither camp to an equal amount of its gross national product for aid: difficult, in other words, to conceive of such a plan from the point of \icw of the recipient rather than that of the donor.

why call it aid?

From tut *article by Taya Zinkin in thr* Daily Telegraph.

When the Italians lend money at *6'/j%,* they call it aid. When the Japanesc pay reparations, they call it **lid** When the British pay tiresome colonies money to *go m* .n. they call it aid. When the French provide money for African t-ountrics to compensate Frenchmen with, they call it aid. When an oil company finds oil, that too *h* aid

I his !•. id) very odd. Aid, as the name denotes, is eh;irit}-helping I hose who an* less fortunate than oneself. To lump private investment, or reparations for damatK done, under the aid label is a misnomer.

I Iw reason for this misnomer b tjuifc sirnpltf. The developed countries have all *beta* bulldozed at (he United Nations into promising to hand over to the developing countries 1 % of their national income. Except for the French, they have no intention of making such enormous gifts, for the United Kingdom it would mean over £300 million a year, much the same sort of money as is at present splitting the government. So, naturally, the developed countries put everything into the aid rag bag: gifts, soft loans, hard loans, military assistance, f * y W ii^sistintc, supplie.iV credit, rescheduling of debts, anything they can rake up.

"The western voter," told that he is pTo-* id ing 196 of his income in aid, sees himself as a Galahad, The Pakistani olliaal, who finds himself paying '6*% on **a** seven-ytfar loan and then 20% esirj for his generator because the supplier knows thai he cannot go shopping around, sees the Galahad as a Shy lock.

The story of aid is tittered with nonsense: Russian snowplows for Guinea, which has np winter; a refrigerated van for Iran meant for vaccines, but used to bring caviar up from the Caspian instead; Russian arms for Indonesia used to kill Communisis; IMJ loans for **Argentina** accompanied by such inappropriate ad iante (hat the national income went down.

If such nonsense is to be avoided, three ruk-s have to be adopted. First. business must he separate from charity Situud, (he donors must get together. And third, they must be prepared to tk vi i\ umiih strings round their aid...

CREDITS

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If there is disillusionment with technical assistance it is largely because of ill-planned and uncoordinated ventures of national, bilateral and multilateral aid. Here is a significant attempt at a global plan for development

The way out of the labyrinth

Ay *JAM TiNBEROEH*

Everyone knows that our world is becoming smaller und smaller. We can now reach Tokyo, or Santiago, from Europe in about IK hours, half the lime it took ten years ago. Every year some 15% more people Ily and sec countries they have never seen before. Even more people do not fly, although " ii is cheaper than you think," but they see other people coming into their countries. They sco something of the way of life ;itid prosperity *of* the people who **ctt** afford to My : they sec things they would like lo have thumselvcs.

For an even lunger lime many h;«c known that their living was dependent on what distant populations bought from them. The Brazilian coffee planter and his employees know it The metalworkers of Europe know ihui they earn part of (heir income **bflCMBI ol** dicwl engines constructed for Argentina or India, f he Japanese know that **(hsj** muM build ships for Europciti!., and so 00. Without such niuiuall> dependent relationships **toCOUM** would be quilt a bit lower.

I lure was ;i lime when ruling groups everywhere thought (hat economic life could best he left to itself, and thiit free enterprise and free competition would automatically i$_{ta}$d to •he best of all possible worlds But this i> no longer **befievaEfe** for w_c have seen too mam misfortunes resulting from free enterprise: unequal incomes misery for tfu- **BMOlploJpDd,** the sick and the old; recurring crises with mass unemployment. erratic fluctuation;, in the prices of coffee, cocoa and rubber: the richer **COtHMriM** becoming richer at a faster pace than the poorer to unifies.

We have learnt lhat freedom is only fruitful within a controlled framework. Income ux and social irtsurancc were introduced to eliminate (he extreme* of poverty. Budget policies were enacted to counteract economic cycles. Markets were regulated so ai to reduce the men I violent price fluctuations. A very modest start has been made in transferring income from the rich to the poor countries rather than the other way round- We now have a complex system of slate inier vent ion within which freedom can exert its stimulating influence without unduly damaging human relations.

It Li mostly the national gmernmems who are organizing la nation, market regulations, social insurance and so, on. Nations! govemmenis we ihc moM important power centers. Power has a tendency lo shift from local, state or provincial authority to federal or centralized authority.

Rmcopmirfitg t(km need for nrorM *ottlmr*

I tic **mdoaal** svsi^ms of nockwconomk intervention are >ufficicRtK Li implex iii require careful preparation, which we now call planning Preparation *h* needed if a complicated mechanism has to be changed. This is especially so if changes are needed within lonp-term processes. A long lime is required to build a dam and, if a sun is not made on time, there may be a long period without electricity or with inadequate wiicr for irrigation. Fducation also tak« a long time. If **the right educational facilities are not created when ihey arc** rtceded. then there may be too few engineers five or ten yews later on.

Wc must look ahead. We must set ourselves targets in order to check the efficiency of our policies. We must inordinate (he action* taken by various groups, organisations K ministries Mt thai they fit together. When the factory is erected, the machines mifei also be ready *h>(* installation; the roads and trucks to transport both raw materials and finished products must lie available; housing for rnnh ihc workers and engineers must be built. A great many factors often hau- to be accommodated into a balanced system. This is why planning has been accepted not only in eastern Europe and main-

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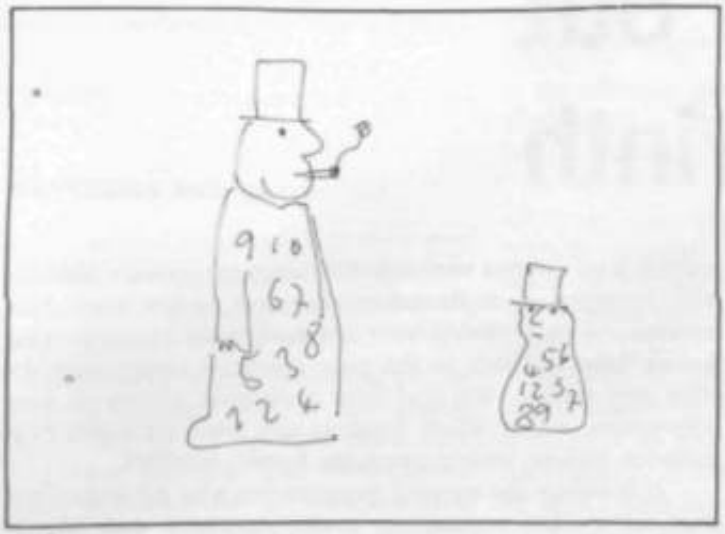
)pdUOt *>l *Ktonomkt, head t>t* '*<" *tl«***" tnniitUt*]<>r **SacM** *$t*dia 'and rhdirmmH «/ ike (' *>' l>f\rt»ptnrni ftannimg Commuter. Hr* **ii *bffn* A-fwmmif aJuiff H "*« r Jrcfl«pinir *rtmnirifs* ***and*** **fa** *iht*

Princ**rfct «nd D ^ , n ShtfHPf '•« ^ " f k t I'*™™")'. TNe Dewpi *at t > t** opment and Central Planning.

land China, but in every large industry ami by almost all governments.

National governments claim to be autonomous in many respects. While **risgk LJtlWnt** have to behave according to the many laws of ibe country — and law and order has taken the place of the jungle familiar from Westerns or from history books (at least, in a majority of countries for a majority of the population) — national governments claim ihe right of ihe strongest, " right or wrong, my country."

Somewhat wiser men have shown us that many disasters have been caused by this attitude. Other disasters will follow unless we recognize the need for international order. But governments, and their parliaments, are changing Ihcir attitude wry reluctanily We found that wheat prices could only be



A v'Y* mootsf *start has been made in transferring income tram ttw rich to the poor countries, rather than the other* ***way*** *round...* A *we <tQ* nof ***anter*** *irtltf* ***a*** *stalg pt war with poverty we* rnny *find ourselves involved in other kinds of* ***war"***

kept under control if there was an international wheat agreement which both governments and producers had to obey. We h,i\c discovered that trade policies cannot be left to the jungle, and we now have GATT, UNCTAD, common nuiTkcis and the Jike under construction. But siitl. on so many occasions, governments behave iike bad little boys.

We now have **tMMMtiOM)** institutions whose (ask it is to regulate on *a* worldwide basis what cannot be left uncontrolled. The International Labour Organisation and the Food and Agricultural Organization are among the most venerable of such institutions. The International Bank for Reconstruction **and** Development and the International Monetary r-und *mm* created after the second world war. prior to the central organization, the United Nations itself There art* others, L'neseo, IMIK), the World Health Organization and so on: they are the beginnings of what we must hope will, sometime, be the ministries of a world government. But he careful not to say so; for a large number of governments wil) show their bad-boy mentality. For the lime being such international bodies have more modest duticit which they carry out very well.

We arc discovering the need **faf** coordination ut the world level, for looking ahead so that the pieces can be filled together more precisely. Thi\ has brought us to the beginning of global planning, FAO is a pioneer: its Indicative World Plan is the •first such attempt, the prototype version of which will be ready in 196**. The JLO is working hard on a World Employment Plan.

The U.N.'s Center for Development Planning, Projections and Policies (rDPPP) is preparing whai could well be called^ ilK- framework for a master plan covering all such activities. 1 his is pan of the task imposed on it by assembly resolutions which request the secretary-general, in plain words, to prepare future development efforts which arc un improvement on the present development decade.

I like to speak of DD 2, or the Second Development Decade, as the subject of this coordinated undertaking in global planning. One of its most important tasks will be to create a set of coherent statistics which will enable us, year **aftef** year, to check the effectiveness of our operations, In business, everybody is subject to such checks: if someone fails to meet his goal, he must explain why; if he has exceeded the target, so much the better for him and for all concern ed.

Thc various international bodies should follow the example set years ago by the OECD countries. Formerly known as OEEC (Organisation for European Economic Coope rationJ. Periodically, each country's socioeconomic policy is thoroughly investigated by two other member countries and their findings arc discussed in full plenary session: many useful suggestions have resulted from such a scrutiny. We can hope that in the future, at the international level, the performance of both governments and of international agencies will be examined from the point of view of benefiting common interest, that is, that the world at large (rather than at small) becomes prosperous

The major task of CDPPP will be to set some genera! goals and to indicate the main ways by which these goals can be attained at both national and international levels. The goals should not be ove ram bilious, because they will then be unrealistic. But they should not be realistic in ihc .sense of being overcautious and wifhoul imagination, ihe realism of the *stotus qua.* As in eu-r\ dynamic enterprise, (here should be an element of difficult achievement stimulating all involved to do their utmost.

***Involvef In oihmr kitn/m mf* IW>**

There is every reason to urge the utmost effort. Too often Ihc prosperous countries, and the prosperous strata of poor countries, take it easy without understanding the present emergeIKV situation. We arc faced with a tremendous challenge. Hundreds of millions of people live in misery: hungry and ill-fed; suffering (TOUI disease; living in dwellings that hardly deserve the n;imtr, or without dwellings like the two hundred thousand people in t'akuiu who cat and sleep in ihc Mrceis with no more shelter than their rags —true also of many in latin **America** and Africa. If we are not ready to enter >"io a Mate of war wilh poverty, **m** will soon find ourselves **Involved** in many other kinds of w«r, I u*e 'he phra.se 'war against poverty[1] |Q indicate ihc needed state of mind.

The advantage of hii\mg a plan for DD *2 is* Ihal we can then tiMi,ih/i our "war goals" wnd concretely define the **obHgMkm «f .ill s,M.,| groups,** ifcluding gmcrnmcnli.

But the center cannot do this task by itself. The cooper alion of all ihc specialised agencies is needed lo lihd mil whit! is really possible in the various tic Ids: in agriculture, industry, iradc, **education,** population policies and so on. The center's provisional frinn:work for a master plan will have to be ^discussed with all the specialized **agencies. Hwmgftfl** will be proposed and the center is needed to ste that **locfa** changes arc mutually consistent.

Thus, a complicated procedure of calculation and consultation will have to be developed over (he next two years, one of the **t u b** being ID carry it through on schedule. It is well known thai anc of the mo.sl difficult accomplishments is to be on lime ami to aho maintain a sense of proportion: to be able to leave out details ii tfn.- operation can be saved as a whole,

Bui before knowing what are details and what are not. one has to look into ***svpry*** little corner: this helps to explain **the** size of some of the international organisations, the large quantity of paper consumed, the number of subunits. of nicetings, of people. ..The efficiency of the international organizations is sometime* >c\crch criticized, often based upon comparisons with industry. Some of these criticisms may well be justified and. in any cave, thdr **operation** should be continually scrutinized for they are financed by the national laxpayers.

Yet, a sense of proportion should guide us and we should try to understand the dimension uf the problem. It is **relatively** easy lo eflicicnily **UtgUlitt** a busings of fifty or *a.* hundred persons for they can he seen at work. It is less easy to supervise an enterprise of 10,(MK) or 100,000 employee^.

The world at Urge has a population of three billions, that is. three thousand million. Think of ihrcc cubic meters of

'Otoaniimg somtthtno; m which all Htm citittni ol th* wttrtrf art 'fi*orv»d... ft '* highly dtztrtbt* tn*t »ll th* coordinator*, and Iha Coordinators ol th* coordinators, rtmtm amtra Ot how tr>* peoptw at "•• trass-roQls taytl* tfff twfWFrg. ttmcliflQ tnd thinking"

timber. Imagine they arc sawn into little cubes measuring one cuhkr millimeter each. Now, imagine you want lo sec "H ihc three billion of these little cubes at once. Spread them out over the *flout* • you will need a space 55 meters long by 55 mcler* wide. Organizing something in which all the citizens of the work) arc involved means supervising thut square of 55 by 55 mcle* nlled up *«h tiny ***otbm*** **of** wood.

Not all citizens would be actively involved but, if we stick to a democratic way of dealing with our problems, ihc adult population would have m he **contdtod** in one way or another. Such consultation would be at various levels: local, **State,** federal, national, continental or regional and, finally. global. And some such consultation is nL'ecs^try for m must know how, for' instance. Ihc individual farmer in Asia reacts to new possibilities, *u,* ihc use of fertilizer, better seeds, more waif r and new varieties of crops.

The field workers of the international organisation* are **Eiccsd** wiili such problems; they often only really know what is going on " in the field " But it is highly desirable that all the coordinators, and the coordinators of the coordinators, and the coordinators of the coordinators of the coordinaio^ remain aware of how the people at the grass-roots level are behaving, reacting and thinking. This does result in a network of relations which is, indeed, near (he top, appalling *in* its complexity. Criticism which is not based on a knowledge of such difficulties is easy to make.

A murw **pfM** *for tha* **'seventies**

But let us return to the joint operation of the U.N. family necessary in order to enter the 'seventies with an improved development policy, What I would like to advocate is ar operation carried out in four main phases: firstly, two phases covering the framework for *a* master plan, the main features only; then, two phases leading to the construction of a more deiailcd world plan. In e:u;h case, the second phase would take into account comments from all levels; specialized f" sector") agencies, regional ('geographical") agencies and govern men ts. The framework would indicate the ntain features while the mastcT plan Would cover regions :ind, in some cases, individual governments if large, countries posing major problems arc involved.

The complete work should be ready by 1970 for subnnsskHi to the U.N. General A&sembly as the basis of the Second Dcvclopmeni Decade: a decade in which we hope more progress will be achieved than is possible in this decade

This objective is of such paramount importance thai all the energies of the United Nations family should be directed toward it.

It requires a stale uf mind of the decision makers involved which, unfortunate^, docs not e\Lsl everywhere. Our actions must be dcicrmincd by the interests of the whole, all of us. together. We must overcome attitudes of narrow national thinking, ol narrow depart mental thinking, of narrow indi-\utii.il thinking. The world situation demands that national delegates think internationally and that civil servants think interdepartmental!) A unified operation is what ts important, rathe* than the gtar\ a(a Mngic a|«ivcv. whtlhcT \\ he VM>, Uncsco, ihc World Bank or epppp.

I knuw chbii many readers. Mown by the cold wind of riMltty, will doubt whether such an anhudc tan be crcaicd. Much will depend on the Leadership of those directly responsible. Their task is far from easy and a grcal deal of **mimpi** will be needed. Let us wish (hem success in their cfTiHi<i to he real leader* and let each of us apply the same standards *Ht* our own m»k .ind responsibilities •

Once upon a time, four brothers lived by a great river

Guinea, Mali, Mauritania and Senegal have joined together to develop the Senegal river basin. Robert NDao, who heads the four-country team, talks about this aim

by ROBERT CURT AT

Framed by the doorway, the river stretches away from Saint Louis into the ha^c of the delta. In bis office, Robert N'Duo, secretary-general of the inter-governmental committee for development of ihe Senegal river basin, envisages the future:

" Down this formidable, wild river flow some 22,000 million cubic meters of water over an average year. It represents a reserve of one mil1inn hectares of cultivable land, enormous hydro-electric power potential and a thousand kilometers uf navigable waterway. The river is one of the most extraordinary means of development that n.iturc has bestowed upon us. Turning and harnessing it is our endeavor and our adventure."

I he p:tssinn of the pioneer sounds in the wt>rds of Robert N'Dao, from Mali, a man of athletic build dressed in a comfortable suit with open neck, a high forehead over a sculptured face. Respect grows quickly for this man who has made the development of the Senegal river the main task of his Rfc

It was a long, hard road from July 1962 at Conikry when representatives of Guinea. Mali. Mauritania and Senegal signet! r.rornmerulaiions " to develop the potential of the basin for the benefit of ail, " »o November CMtf at Nouakchott, when the four heads of state of ihe countries bordering on the river formally declared that ihey wiihed to build the

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k.>herl CurUt " • journalist ,m tht i). ff of Ir.h.nc Jc Lausanne.

future of their peoples around Ihc river, A further difficult stretch led to November * I9f>7 at Bamako when Modibo **Kdtft,** President of Mali, rccaliinji ihc spirit of **rfruwlrrhoft.** urged the peoples of the ^ river **and** [IlL- **politicil** leaders of the four countries io find " large-sea Jo solutions Ut our burning economic problems. "

After so many other appeals, this anguished pica by *a* head of state clearly shows thai this pan of Africa, a wcdfK into the Atlantic, is in a state of underdevelopment.

All ihe conditions of long-lenti poverty are to be found here: the race between agricultural production and an i*x.panding popufafion; *the* unequal fight a gain si unfair terms of trade; the iron taw of inlemaiional **COMMMI** which leads the poor Y into ever-greater-poverty: the predominantly subsistence economy at it primitive level, incapable of providing for a belter life; the rigidity of social organization, and living standards so low thai povcm can only perpetuate itself.

*Intolerable mtmtm ot mffml***

In traveling through the **OQHlrtrtfti** bordering on the river it is impossible to contradict the authors of FAO'S remark able *African Sttrvry* from whom we ha\t borrowed the fo re going lines,

The mask of undcrdevelopment **tin** everywhere. It marks poverty as « habit and the smallest luxury as an insult. It marks the- futility of disjointed **efforts.** It marks the national struggle against misery. Undcrdevclopmeru brands the hundreds of thousands of people grouped in tribes along the bants of the river, enclosed in ancient social structures in which power rests upon cattle ownership It marks the peasants subjected to the ' vagaries of the weather and to the ravages of disease: to the terrible onslaughts of ***OHChoctnkub*** which leaves whole village* blind; lo malaria which strikes throughout the basin. It marks a million human beings ci>rtdcmncd tu ignorance for lack of classroom*, teacher* and money. This frightful burden ot ills, due both to nature and to man, weighs heavily on ihc Senega) river project.

Reliable statist io toll us that the aver- I age per c»piu, income "f IIK" region, what would be handed out to ***ttA*** inhabitant if **everyone** received an equal &hai>, is $75 a year Try to imagine ihai on the first day of the year there is $75 in your pocket knowing th;it **tben** will **be** nothing else to liie on until the end of December.

Regional development centering on ihe river is an urgent remedy against *M* those **OOWdWoBi** jji which " poverty tends to perpetuate ilsclf. " In November 1967 11 liamako, the project received the highest guarantees after having proved during the preceding two years that it was an indispensable clement in cementing together the river states. Bamako was an early stage, but its achievement required men devoted to development df the basin, men who could negotiate **these** tirsi rapids with case. Robert iVDao. whu has *been* one of the steersmen from the beginning, sums up the sLmgjiL':

" What is dcmnnslrahly simple **it** all the more difficult lo earn through We :iri- **experiencing** :iv **OBSJ** difficulties as a sleepy administration or national susccplibjlitics touched on the raw. Nothing is more diflicult than to convince pcopk [hi.it small, mean reasons stand in ihc way of our project. Finally, everyone has to agree on the future use of the river for **tfUfWOved** agriculture, power and **UM.T nim^ation. "**

Robert N'Dao first tested the banks of the river and hacked out rock, samples in the upper basin as a young geologist. He knows ihc obstacles nature has put between the present and the future: the ridges that cannot be crossed without powerful modern equipment; the prevalent diseases; the climate which grips the peasanfs and bends their heads down **to** [lie ground, condemning them to sow too laie when the floods have receded, hoping onjy that the sun and the insects will **l«ve** them part of ilu-ir **tan**est.

NDao, "Wo mill tiave to struggle wtWout ceasing belote the first light bulb** receives electric**itf wrested tr<tm th* rivet, belore th* floods** **are condoled** ***and the stored water reaches the first cuitn/ufd plot"

the founders of the European Common Market; even more because we arcpiHirer. Our only wealth is the future, what the sign1.1lories of our birth certificate called the common potentialities of the basin

" We will ha\c IQ struggle without ccaMtig before the first light bulb receives electricity wrested from the river, before ihc floods ure controlled <tnd the Sli'rcd «;ttcr **mdMH** tiur first cultivated ptul

" We will haic io struggle against men at first because in an undertaking such as ours nothing *in* more damaging than

In the close, stagnant air of the delta, men and women live and work very much in this way, as do their brethren in I he vitlk>. In spile **ofgmcmaMH Gfffattt,** despitv aid, a giant effort will have to be muifc before their condition can improvc. Waftcr Lippman has written. "We knew now. both in theory and in practice, how I.I repJitce famine with abundance •

Robert N'Dim, like so many of us, *uh«.ribcs to this hope bui he also knows just how the fong battle of development will have to be waged throughout the

Seae$Bl basin: " Great ills call for great ivniL-dks. We must break the present vicious circk of underdcvclopment, in which we arc forced to live on charity, for we cannot lokrate such a slate of affairs. "

These remedies cover the following four poinis:

___Gouina, a dam capable of reguhiting the river flow by retaining 20.000 million cubic meters of water. A feasibility study is being completed by a Swiss group who will shortly submit a report on tin- economic and financial implications of the proposed dam site.

— From Saint Louis to Kaycs, a hydrp-agrk-uliura] stuily of the basin, requested by the four riparian countries, is being carried out by an FAO team under a United Nations Development Program (UNDP) project. Two pilot plots for agricull urc will be established in this area under the second phase of this project.

___A study is under way of tiic Senegal's main tributaries — Falcmc, Baling, Baoule and Bakoy — as they cross the Manding plateau in thu upper basin. The discovery of important mining resources in thi$ area has given fresh impetus to the whole- undcrtakiTij:-

—t Finally, the navigability of the rh.cr from Kayes to its mouth, representing about 1,000 kilometers of waterway. i» under study as is the possibility of opening up the continent to the SL-J fag bmfe> ing the bar at Saint Denis.

In Robert N'Dao we discover a man who is not only a geologist, tprwonriii and economist hut also a river pilot and a guide to the future. We sec with him the million hectares of potentially irrigable land, a marvelous reserve of bauxite lying on the frontier between Guinea and Mali, vast rice crops which could be grown as I he result *d* controlled flooding: :ill these arc his weapons of conviction. And, since he has the knowledge, he does convince people.

*A mtm/or Aft*ican victory

He strengthened his beliefs in the United States and Europe where he saw what others have achieved in irrigation. river navigation and (he production of electric power. Me b one of those who beliesc. and who hive every reason 1o hclk-ve, that in the Senega] basin there lies an opportunity for a major African technical victory:

" We are going to set up irrigated plots of 500 hectares each, one at Matam in Senegal, the other at Rosso in Mauritania. One thousand hectares, that's, noih-

Pro"f> *number one Gowna* rJom"

ing. but thes wU provide a start for our tests.

" I he people of [he basin will begin to feel that they belong to a region, and to understand the African way of international cooperation. We shall also set up two /ones for animal husbandry outside the valley because we mutt put an end to the frantic search for the last grazing grounds of the dry MMtOQ.

" At the same lime, there will be the Gouina dam, priority number one. At Jong last we are going to start taming and using the river as a powerful modern means of regional development. All this will quickly fedtow efficient studies. Afterward, there will be the gradual citab-Irshmcm of a new granary for the world. Everything is there. It has got to be done. And we arc going ro do it."

Robert N'Dao's faith is nurtured on reason. Lite the Re\crcnd Father dc Breuvery. oT trasoc's Resources and Transport Divbion. who more than ten years ago launched the idea of mulii country UK of the river's resources, he thinks Ihat the new states are bound to quickly reach the ceiling of possibilities for development if they remain within their cramped frontiers. To enter the 20th century in force, it is necessary to want things in a big way and to achieve them on a simitar scale.

International organizations, who have contributed nearly $12 million to various studies, are keenly interested in the regional development of the Senegal river. All the U.N. agencies are anxious to support the integrated project, and this generosity has had I-J be coordinated at conferences in Milan and New York. FAO, which has a large share in the overall operation, maintains a mission at Saint Louis, whose chief. Jacques Grolee, has acquired remarkable competence in the problems of African agricultural development.

A ftmmt and a *tmtmrm*

The Senegal night envelops the house by the river, obscuring the big map of the basin on the wall, while Robert N'Dao tells us about the interest that the project has aroused abroad.

" Firstly, we had to come into being. But now we exist and interest goes fur beyond the boundaries of the river countries.

" We represent a past and a future for dHM people of the river who have never let themselves be enclosed within administrative frontiers. They arc going to ht-lp us win the battle. It is a paradox, but they know that they do not know i-nough. So they go at it. tooth and nail, lo gain knowledge, and they arc successful. They must be part of it at all costs. 1 have lived with them for JPMn. I have seen unskilled laborers become excellent drillers in six months. "

Robert N'Dao has more to say about Ihc future. I watch the smile on his face as he talks about new boats, ihc growing rice, mighty dams, about what will be the beginning of happiness, to (wo million pMUMa\ rather than merely a way of improving production.

And looking at this passionately simple man, I quite understand that he will not like (hi* tribute and that he would new accept it without mention of the men of Bamako, NouakclnHi, Dakar;ind< nnakry who. with him. "farm the river team, •

Twenty years in a second

A computerized retrieval system, part of FAO's documentation center, means that the accumulated experience of agricultural development is readily available to everyone

EVERYTHING PUBUSHEO ON THE OLIVE
An electronic memory gives quick* access *to tfi9* storefl *txpttionce at technical assistance

by JtAN-CHARtLS ***ABREU***

An i-piduiiit threaten* entile in the Far I el and ilic animals must be immunized ;i(once. One of (he regional **OKpeffe milWUhrn** thai • similar outbreak had been successfully dealt **wiA** in Madagascar. Bui he doesn't remember the formula of Ihe **VBCdoc** or how it was produced.

A cable is immediately sent to the i ui Documcnutioii Center. By return posi, the center sends hack micro curds containing infotmaiktn on the vaccine, abstracted from the proceedings of a **IB riling** held in Rome MR) years before.

I MI is ihc simplest, swiftest and **not)** ctimpictc way »l M>lvinp a **pmbien** o! this kind, whether for ;m aprkullural spcculi^ working in ihe ik-vi-ktpin^ countries. • student preparing his degree the**rfi** or for an industrialist faced with a produciion pruhk-m.

From now on, MO can supplement the skill *at* it* experts with the capability of the computer and the knowledge of its memory hunk*, in which lie the indexed experience of more than 20 yean of technical assistance activity.

"Where there it activity, there is paper." cry ihe enemies of burcaucticy. But in the mouth of Gerard Dubois. in charge of the ccnteT. it ceases !o he a **satirical** phrase. Quite the opposite, for ihc scr\ice ofkred by the center turns hilhertn uwctcu> documents iniu v.ituabk[1] items.

The panoply of administratkin — ***tHtm,*** reports and stattna-nls — is not an n i l in itself. Everything depends 00

the way il is used: it can be left to lose its value, carefully slowed away in a woollen stocking in a secret drawer, or it can be put at the disposal of mankind.

FAO chose the second road in 1966. The idea first occurred to Raymond A Librae, a former engineer with the French Highways Department, while *working on u project to establish uneep* in arid areas of Morocco.

*• We tost six months and spent several million francs just preparing the plans for stone sheep pens. There was no wood and we made do with what we had. Two years later I met an expert who, for many years and without limber, had been building stone pens in another area of North Africa that WLTC much betier than ours. His plans and reports were lying idle in a drawer at Rome headquarters."

Many experts are daily trying to solve rural development problems which have already been solved elsewhere: the waste runs inio millions of dollars a year.

The Documentation Center has a budget of SI00,000, several offices in an annex to the main building and a staff of a dozen analysts and mdexcrs. The ccmer ts built around • computerized information retrieval system, in which references from FACVS 150 publications and from two to three thousand documents (out of some 12,000 produced each yeaT) are being stored. This modest bul effective entry into the era of electron in has already avoided costly **false** movrs and duplication of work.

*Thm Im*nguage ofito computer

The computer uses a language. It would have been convenient to use the index system of th* p*o library, but decimal classification is unsuitcd to the multiple cross-indexing needed.

Such indexing is particularly valuable in order to preserve and use all the information gathered on assignment. For instance, one expert who wanted to find out the dome market for wood products, se as to ascertain whether it was worth developing forest exploitation in Turkey, completed * thorough study on energy sources needed for the production of power and for healing.

This study is very complete and could be extremely useful but normally it would be hidden in a report on foral exploitation. By indexing documents under > great number of headings and subheadings, however, the computer will recall this study whenever such key words as heat, energy, power or heating are raised in connection with Turkey.

The index system consists of "descriptors" : words or groups of words, which define, without homonyms or synonyms, *the concepts [iDiicf* which information is to be listed and retrieved. Thus, a very **simple** language has been created; so simple that questions asked of the machine must be phrased very carefully.

For example, it is not enough to ask the computer whai has been published on olive cultivation in the Mediterranean it is necessary to add the names of all relevant Mediterranean countries.

StrmolMlixmtt tmttmxmw mvaftabto

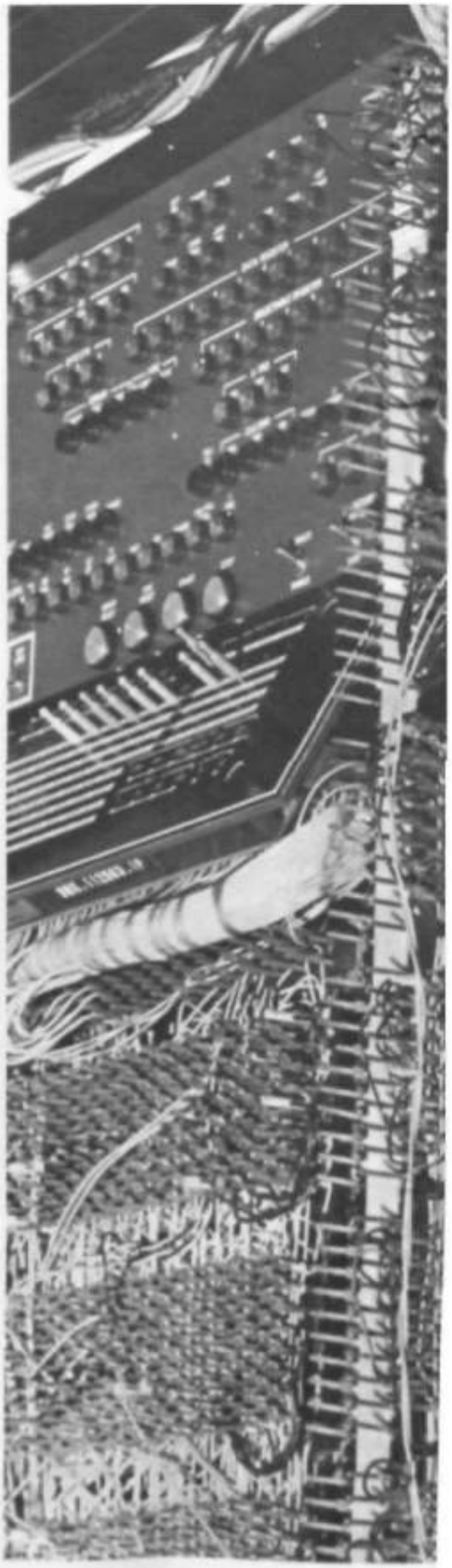
The questions sometimes seem bizarre: a government adviser in Laos once asked for everything lhat was available on the breeding of frogs. More usual customers arc, for instance, a pulp and paper company wanting to obtain details on the industrial processing of certain tropical woods, or *3* gradual *student preparing* a paper on nutrition problems.

The reply which comes back from the typewriter coupled to the computer is in the form of bibliographic references. Occasionally, questions that arc too vague or badly put force KAO specialists to spend time on research or to ask for additional details.

A monthly index of current production of documents is being published. It consists of two parts: one is bibliographical, containing summaries of the documents in their order of accession; the tit her ij analytical and lists in alphabetical order the descriptors and key words used in the indexing.

Each month the recipients of the index can quickly spot the documents of in. tcrcst to them simply by going through the descriptors. Some institutes arc already ordering about 40 documents each month in order to keep their collections up to date.

A cumulative index containing a n]|l|1. elaborate analysis comes out twice *a* year, in June and December. Raymond Aubrae. n«w director of F/M/I Program Liaison Division, who helped in establish the center, explains: "The mere lining of entry number* opposite the descriptor.



and key words does **DOt,** in **toctt,** help wiib selection of items, so we decided lo **produce** an analuical index in which descriptors (and key words*)* appeared in their context, reproducing all or part of I hi- summary composed while indexing "

Selection thus becomes a somewhat caster **matter.** I his approach was made possible by adapting a specific information retrieval system known as KWJC (key words in toti(ent) for which prearranged computer programs exist.

FAO marked its 20lh anniversary in 1966. Twenty years of documents had to be stored in the computer's memory hunks Specialized indexes are being produced winch catalogue all of FAO'S technical document, covering such field* as forestry and fisheries.

Watching the computer at WOTIC processing one of these indexes, one sees the lape impl.ic.ihly consuming the subject matter at a rate that is inhumanly fust.

These indexes, hulky as telephone directories, art available K> the public. They are divided inlo three parts: bibliographical; b> author; and according to the **CWK** system, They make up a complete set of references lo JAO'S entire work since its founding, from nutrition to land reform.

" It all seems quite simple but it DM called for considerable work, " says Mr. llubois. " F-AO'S technical divisions h;i\t-grasped its usefulness and helped us greatly by select ing and collecting documents. Sometimes, though, we had to pl.i> **detective,** tracking down *a.* veteran who was hoarding the last copy of a document out of print for nearly 20 years."

Mr, Dubois was not the first to under-Like this kind or search, though he may be the tast. One day, when FAO was ten years old. one expen became very angry. He was studying Iraq's natural resources He asked for documentation but received only two small pamphlets. " You are pulling my kg. " he flared up. " Is this all you **have** learned in **tea** yc.irs about a country with such fantastic oil poleniial? "

THE NAKED BRAIN OF THE COMPUTER
An *irtlQimgtion network wilt some* **day** *link the contirnnits. drawing upon tti* wnptmncm* **of** *major organitattans trttt Oittwmffittiny this muteriat througtwu) the* W

Hut it was impossible to find other ihn-iinitnts for him. >o he had lo tour the offices one by one trying lo find what he wanted To his great surprise, he emerged from each talk with a report, a **bundle** of correspondence or the minutes of a meeting. The eventual pile of documentation exceeded all his hopes.

Today, all of the FAO documents dealing wjih a particular probk-.ni **Bit** easily available. If they have been published and arc available in stuck, there is no problem. If there is only one copy, it must be reproduced. *lv* ihis end, the center uses micro cards, each sheet of which contains W) pages of documents

ill* *imtmrmmtiommi* **network**

This is a mosi economical, quick and **KKI** nwthod of reproduction: mistakes arc impossible, and dispatch by airmail LS not too expensive.

Rcqucsis can be handled for positive micro cards, which can be read on a special apparatus, negative micro- cards which can be reproduced at will, or photographic enlargements of the micro can.l% large enough for unaided reading. The center will soon store its own archives on micro cards.

" In every country, it seems quite natural to turn to the authorities to find the answer to one's problems." says Dr. Aubrac. " Aren't the ministries public services? One forgets all too often thai organizations such as FAO arc international public services.

"We are among those best qualified tit solve rural problems. We have one of the **BBHI** libraries in this ncW, (he most extensive documentation and a great ranye of specialists. Add lo this (he fact that we take a worldwide vkw of sudi problems. With the help of present-day technical resources, we can solve many development difficulties.

" We wimkl like the ccmer to become R liaiion point between bilateral and multilateral aid liikitcml aid is HM— limes expended in useless efforts tor lack of knowledge of what is being done elsewhere; we can help avoid this problem. Hut we also hope thai it will be a dialogue and that, through *uir center, multilateral program* can profit by the experience of bilateral aid

"We should like **to** forge ;m international network covering enchan^ of

technical information on the development problems of food and agriculture. It would have to include thiise research bodies with long experience in this field from which we have drawn inspiration: [he Centre national de ta recherche scien- iiliqiif in France, the U,S. Department of Agriculture and the Tropical Institute in ihe Netherlands, to name only a few.

" On the other hand, our efforts must also be directed toward increasing the number of specialized[1] *dacumemitiion* centers. Already we have helped to establish 2 national documentation center in Morocco which will use FAO'S indexing system. Similar efforts are planned for other developing countries.

[11] Studies on rural development have multiplied in most countries of the third world over the past few years. In many cases the rcsulti have not bevn published and the original documents arc in danger of being lost. It would, be \ery useful to eolteel them together unJ in increase their usefulness, "said Dr. Aubrac. " In Morocco this would **Eavota translating** the central vocabulary which has been drawn up in English to meet the documentation needs of FAO.

" But one thing is **dear.** In publishing our indexes, we do iu>(w^ni to add >ct another pamphlet to the nearly *2XXV)* periodicals which already furnish summaries of published articles. Our aim is to explore unpublished material which generally disappears, The vanguard sec- *JOTS,* such *as chemistry, nuclear science* ud molecular biology, are the only ones at present to issue **indent ol** unpublished J.XJUHU.IUV We think, thiit ibe science of development is sufficiently imponant. and in such constant evolution, that it also needs this kind of treatment.

Rmmmaro results confirmed*

" It would meet a pressing need. For example, research has been going on jn **Morocco** over ihc pas! 15 years on the cultivation **of** long-staple **OOOOB** using a sizabk pilot project of 100 **beet**ures. Excellent results have been achieved, but so **fir** these have noi been published. Scientists in the Sudan, who have been improving long-stapJe **cotton** with **fRd** success for half a century, do not know of the work of their Moroccan **coUesgi**ues. As a result, Iwo highly spcciili/cd mm have been grappling with the same problem: they could have shared ihc job **fat** they are both working in similar **eeo-** logical conditions. "

The tenter recently published a document indexing agronomic research projcc!s in eight West African **countries.** The document was prepared as the basis for discussion at a conference ort the priorities of agronomic research for economic development in Africa, held at Abidjan in April under the sponsorship *of the U.S. Academy of Sciences. These* indexes enabled researchers to keep abreast of all similar projects. They confirmed not on Is the importance of the results obtained but also the need to continue such research work.

Great mmvimgm pommlblm

Savings in money ;ind effort which Could be gained through general application of this method arc enormous. In Worldwide agronomic research, perhaps 20% H spent nn duplicated work: the L'nited Stales alone **tfewtH** $400 million J war **to** such research.

National and inu-nuiijonal documentation centers, research stations — the **ftlflrnfltltl** of a world-girdling information network for agricultural development — •Mm complete.

It is now planned to extend indexing to documents dealing with problems of rural development and food production published by nongovernmental organizations. Here, too, **Vflfnbk** material. Ihc work of specialists. Is not being widely enough used and is in danger of being lost. If this project materializes, the results of work by the private sector would be integrated with the results achieved by governments,

I [.i\ing pushed hack the dark frontiers of disease and death, man has become aware of another human failing: his ivrrihlc isolation, ihc barriers preventing him from ti>iiiii)unk:uting with his fellowmen.

This is why our century is, above all, the century of communication. To know **everything,** at once — this is the aim which distinguishes ours from preceding centuries.

As Ihc modest embryo of a giant worldwide information network for development, the FAO Documentation Center inecis this most **taportmt** requirement uf our time. ■

A plea for intermediate technology

£. F. SCHUMACHER
give Mm viowm to O«rwttatw»m Komn*

When you launched the Intermediate Technology Dt'vchftmrnt Group m 1966, 'what where you aiming at[7] Whur made you feel thai an intermediate technology was u> important?

A controversial attempt to increase the productive capacity of the two million villages of the third world

F..F. St hu **matter,** *dirttior of tkt Intermediate Trrkntiliify (Iritup Lid., if an* (vomimir «/• *ritrr In thr U.K. Naliottttl C<*1 BtwJ. **He*** KUl **KtMKMKit** ***mMtn*** *I" Ik** CffVWNWfiili *'/ *Hurma* in fWlJ. *untt »t Inditt in 1966.*

In mj view ihc real problem <•f world poverty :md [hereby the problem of de-vcJapmcnt, lie in ihtr vfltages — perhaps -lillioa *of* them Tbcv \illumes find their ^juyltfinn *v* multipt\tnf. lhcv have i»a(fpl caavfh IjmJ. their present farm-dace a pT'v i itdBioad. *to* • result, people .ii imje iiJI the land and into thi: lowns, I his, in tum. is making I he towns quite unm;mufoahlc.

The high level of technology that we have developed in ihc west can only (uncikm if there is 3 town in the vicinity, ami mewl of the aid effort has gone inii> tuch towns. This meant thai ihe people

who need aid most arc simply being by-passed. Can we bring aid into the rural areas so as to stabilize this position, slop the great drift into towns, do something about unemployment and banish ihc specter of world hunger by raising productivity?

The moment you begin to think along these lines, you see that an appropriate technology is required, something very much simpler than the highly sophisticated technology we arc using in the west. The term that we use is an intermediate technology.

What do you see this technology as being intermediate between?

It should be very much better than the non viable technology in the rural areas of the poor countries today. At present there is a gap, a huge gap, between these traditional primitive methods and the high-lcvd technology of mtKlL-m farming.

Take, for instance, harvesting equipment. This means either the sickle or the combine harvester. What we want is to 6l1 the gap between the two. Some thing better than the sickle but much easier to maintain and much sturdier than the combine harvester.

Quite a tot of work i\ already being ***done*** *in developing countries along these inns. Do you think that you have something different to offer?*

We do nw want to be different. We **wam** to tackle a particular aspect of iht: problem that is generally neglected. Pen - erty is a terrible condition, though most ill us do not know very much about it. One of the drastic features of poverty js that you arc cut off. out of touch, unconnected wilh what is going on elsewhere. There is no communication, and the same methods have to be rc-invcnted again and again alt over the world. Our main job is to tackle the problem of communication.

In India some splendid solutions have been found of an internicdiatc technology kind, but in Peru or, say, Tanzania, nobody knows about them — and vice *m*:rsa. tt is tragic to see people struggling lo find solutions to quite straightforward problems, which have been solved king ago somewhere else.

Further, we have research establishments, both in the developing and in the aid-giving countries, **wbdt MtutKOS** have been found using an appropriately simple technology. But these solutions arc unknown to those who need them.

How do you aim tit ***bridge*** *this gap?*

Quite obviously we cannot communicate with two million villages directly from London. Our policy is to set up local groups in the developing countries themselves. We have groups in India, Peru and Colombia. Negotiations are going on in many other places: Pakistan, Ceylon and various African countries.

We want the. local group to do two jobs: first of all. to gather information on all the positive work already going on in the country: secondly, to receive and disseminate the **information** that « can pass to them from London.

"What we want it to fill '»» Qbp belwetn tin two Something tmtt*r rhttn torn 3icM*..~

We try to feed these groups with information in an easy-reference form, like the catalogue that we have recently published called *Tmth fur Progress.* We are working on specialized manuals dealing with important everyday problems. At the same lime we arc very iiniiuu* to get from the groups a feedback of what the problems really arc.

*What M*rt of nmlius du \t>u form in linr.tr* ***Countries?*** *Is it round, a gttvernmem agency or private individual who are doing particularly good work in the field?*

II >ou want lo achieve anything in Ihe real work! you always look for something ihai already exists, some growing point: a technical university; a group of private individuals.

If you ask me for a general formula, | [would say that j! has got to combine the three forces of society. I call them the A.BX" forces.: A stands for admin- * istralion — in this case, government and in i cm a! tonal agencies; B stands for business, for industry; and C stands for the communicators, the intellectuals, the research people, universities and so on.

Setting up these groups is dearly the first xtep. The next, presumably, is lo sifi cinJ sort out the information you receive and to issue publication-; which can, in turn, be used by the grotips. h Tools for Progress *typical of what you are seeking to do in this direction?*

I think it is. We have been talking for Mime time about the appropriate equipniifii for these two million villages. People quite naturally said to us: " Well. **where** is it? Has it stall got to be invented? **Who** is manufacturing this type of equipment'.' "

We started with British industry and found that what we consider appropriate equipment is being produced, commercially, today. There is no need to invent it; there is no need for new designs. Nu une had hitherto gathered the information into a catalogue which could be **essit?** used by people in the field to find • >ui what they wanted.

The catalogue lists manufacturers who arc producing down-to-earth equipment. 11 contains the names of British manufacturers who are prepared to help with ihc production of this type of equipment abroad, cither as a join! venture or under license. Where a certain product has gone out of production in Britain, because ***the*** market for it is no longer large enough, the manufacturer has offered to make his blueprints available to anyone interested in selling up production in a developing **ooutn**

Wow *that \n» have established a base, what* ***b*** *your* **fmqp** *aiming to tackle next?*

We arc now becoming more specialized. (>ur most important project is an- ***i*** other publication dealing exclusively with low-cost huikJinp mcihodv The$_{rc}$ is • ' wide range of "building method* but a

director of education, for example, who has to build SO **Khoob** nr 50 houses *tor* teachers, has very liitle information 10 help him choose between the alternatives, particularly on really low-cost possibilities.

We are assembling a manual which wiJI present a complete view of the alternatives that are available.

Another subject on which we are actively engaged is waier supply and storage. A large number of the developing countries are arid. Water is the beginning of everything. JJntjl this problem is tackled, no development effort can get off the ground. Here again, a great deal of knowledge IMMS in highly scattered **form.** Our aim is to bring it together into a low-cost brochure.

There are many simple possibilities which could make a very real impact at the village level. The rainwater catchment tank, for instance, has aroused great interest in Botswana. Two of them have already been built and we arc negotiating at the moment 10 get the very simple technique involved taught in primary schools throughout the country.

The introduction of simple ioois and equipment could have an ***tmnmnte*** *impact on village problems hut this impact can <»ily he feit on the world level if you can reach several hundred million people "i ihv rural sector The task is huge. Do you* in *\t>ur\f!vt-\ working closely* Hif/i *government and international agenda?*

Time is getting very sh»rt. We must **use** every means available and must work with everyone who is prepared to work with us. The international agencies are doing excellent work, but they arc large and bureaucratic. **Then** ;trc **BMBJ** things which they cannot do because it would be tactless. They cannot easily initiate action and very often must wail for the local people **to** ask them for help. We are extremely anxious to wort with them and have so far been quite successful hut we will noi wait for them.

The network that is coming into **befaf b I** network of groups of individuals who Tcally want to da something about the development prohlcm and want to do K now,

We cannot, of course. Teach two million villages in one throw but we can reach people who arc really concerned about the problem and we have **to** hope ih:ti there will be some snowballing efleet.

We arc trying to supplement our activity on the commercial side by getting people to tackle the trading aspects and also the question of credit. Credit is a major problem in poor villages and there is very little one can do about it from London. Bui, at least, when we get people interested in appropriate equipment we now have good banking connections who will help with the financing.

I do not think thai a small private group like ourselves can solve the world's problems. But I think that through our work people arc now becoming much more interested in this approach. E hope that we can persuade the big agencies to work with us. In this country there are the big money-collect ing agencies like OXFAM and Freedom from Hunger. We are working very closely with them.

Charity can have an enormous impact in a small area, but there is surely a very definite limit to what it can achieve?

My answer is both yes and no. I do not believe that the problems of development, are problems of money. It is more a question of giving the right kind of help and advice. You can waste an enormous **unoool** of money on promts which are noi appropriate to the conditions of poverty as they actually **exiM**

Lei us assume that there are some two million villages thai represent the real heart l;md of poverty today. You can establish a firsl-ctoss woodworking and metal-work ing shop for £. 100. One hundred limes two million is noi an insuperable **problem.**

It is organisation that is, perhaps, beyond us. It is intelligence, the application **of** intelligence to village problems, that is in short supply. Il **tfaa KMOB** given is the right advice and the equipment available is the appropriate equipment, then finding the money to buy it is not such a problem.

I think great mistaken are being made in being too generous. People do no! \alue a thing so much if they have noi had to work for it. You **CBUWl** av-,imilatc any knowledge without your own effort. But the right information can be supplied Free of charge — a form ot charity if you like. Our funds are very limited. Our contribution is to mobilize knowledge that already exists and make it available in the right places.

And this is the nap that you are aiming to bridge?

It is a major gap at an all-important level. Many people assume that I want to do away with all high-level technology. In fact, I am not concerned with thLs at all. I am concerned with the gap. Can we fill this gap? Because if we do not. ihcn the main aid effort will continue to bypass the poorest and will not torch the rural areas except at a few points.

The scientists and research workers of the rich countries work on ihe problems of the rich countries. The much less numerous scientists and research

but much* easier *to maintain tnd much Sturdier then th9 comtine harvester'

workers of the poor countries also work on (he problems of the rich countries **Only** in a few special cases, often at the instigation of international agencies, do the scientists and research workers of the rich countries apply themselves to the very humble and down-to-earth problems of the poor countries.

Our principle is to set up working groups of real experts on a voluntary **bub** to tackle simple questions: water ctmscmiliori, transport, fish drying, cr.ifK **UKJ** ir.tdcs; the tools a village needs, from clothing and footwear to simple processing rof agricultural products.

We want to make availahlc detailed background information on technologic^ tluap enough to be of use and which can be applied on the inevitably small scale that the village economy demands. *m*

Tanzania says: yes, but...

Although aid is both needed and wanted, the country cannot allow itself to become dependent upon outside sources. The farmer is the key to self-reliance

by DEREK BRVGESQM

Is a developing country really developing? What Ik Ids of activity arc being developed? Who controls this develop , ment and who benefits from it?

Statistics, which admittedly may be quoted to illustrate almcist **anytt&g,** in-, dicaic that life, today, is hardly more secure or comfortable than it was ten years ago for the vast bulk of mhabitanls of the underdeveloped world.

Governments of the countries making up that world are young. They lack experience of administration and adequate manpower resources for the most fundamental services as well as needed capital und skills for development. Such countries arc nearly all largely dependent on ;ijj.rii.-i.il(uiv fur ihi-ir livelihood ***tid*** t h^-][development: such agriculture being an industry composed mainly of smallholder piMs.in! farmers.

The highly developed countries generally accept that they have a moral obligation, which can. of course, also be justified on economic grounds, to assist in the development of the poorer countries of the world; and they do so to a greater or lesser extent and in varying ways.

Tanzania is one of these underdeveloped countries which we hope is developing. During the Tew years since our 1961 independence, we have gained some **experience of** the difficulties of development, of the ways to use limited resources and of how technical aid may best be used; *Mw* something o(the requirements and hope* for foreign capital

The government of Tanzania is a socialist government, dedicated to the formation of ;i truly socialist society with ever-rising standards of living This *is* a most interesting philosophy but also a most diflkult one. as our friend. Professor Duinont, has pointed out in us.

When a country is basically agricultural, the quickest and easiest way of **iMWM-**ing the national product is through large-scale enterprise using modern methods of produc(k>n. When a government has wr\ limited resources to instigate this development itself, even supposing that such is a proper function of a government. then it has to look outside iticlf. and usually outikfc the country, for such activity.

D.N.M. Brv«*n«i. ***lofmrtff TtuttonWt Mittttttff of Minn *mi Cvmmrtr,*** **o*/** *)itt•n nf //(• alth and Cooperatives.*

But even if developers can be enticed in, is this really what **underdeveloped** countries need? Foreign capital, particukirlv when it is private Liipital, comers in seeking profits which it wishes to export. In many cases it wishes to make ihe prolli in iis own home country or even, for tax reasons, some third country, so prices and arrangements have to be adjusted accordingly.

*Loming control of / * • economy*

When taken loo far, this kind of development can lead to* a situation in which the government docs not control the country's cconomy. Rathtr, the cconomy becomes controlled by interests that may, at times, find themselves in conflict with the country's own best interests. DedsimiN may be taken which arc logical from the point of view of the enterprise concerned, but which may be damaging to the country, bringing about undesirable political and economic results,

Similarly, though to a lesser and **nacfl** less obvious extent, foreign aid. We all talk about " aid without strings" and most people in both worlds, the rich and poor, pay lip service to the ideal. But **bow** much aid is truly without cither economic or political strings? There is some, ii is true, and more honor to **those** who give ii, but it is the exception rather than the rule.

In order lo retain a country's indepeniknce of action jt is important. **When receiving** or **Accepting** aid. to balance up such aid as far as possible and al$o to keep the basic necessities and, wherever it can be done, the development of the ci>untry independent of it. In other words, the daily bread or the country should not rely on outside factors, only lilt- hope of getting some buiicr and jam now and then.

Independence from these outside factors allows independence of national act km and thus both honor *and* esteem. In an ajiru'uliural country, therefore, ihc government must enable the farmer* to be providers of the daily bread.

When our hrst five-year development plan was laid out in 1963, great cmphasis wis, placed tm outside capital and **skills** to tielp develop nil seetofs tf the economy. Agricultural development was divided into **two** ^.tu-juries: " iransformation." meaning devclupmcni **tafel|** modern, usually capital V"^'"'^ *mclh,*

* Essential facts on Tanzania

Julius Nyeme. president of The *United Republic of Tanzania*

Unlttd Republic of Tanzania consists of Tanganyika and the islands of Zanzibar and Pomba Tanganyika lies an the east coast of Africa wilh Uganda and Kenya lo the north, the Democratic Republic of the Congo lo the weal and Zambia. Malawi and Mozambique to the south. Zanzibar and Ms sister island. Pemfca. p*re situated in the Indian Ocean About 25 mties' Oft the coast. Tanganyika, formerly a UN Trusteeship Territory under British administration, became independent in 1961 And was declared a republic, within the Commonwealth, in December 1962. The Zanzibar government signed an act ol union with Tanganyika in April 1964. thus creating the United Republic of Tanzania.

Government: an interim constitution based on a one-parry system, was Introduced in 1964. The legislative organ is the unicameral National Assembly Of up to 204 members, The President is elected by universal suffrage and a presidential election must be held whenever the Assembly is dissolved and new Assembly elections held In October 1965, President Julius Klyerere was returned to power and in each constituency one Ol two Tanzania African National Union (TANUJ members was chosen by the voters Th* country is divided into seventeen regkms. each with a commimofw CueH ••twng lo how official posts must relinquish their tribal auli.

Population *2 12 million Mi annual growth rate of 3.4%. Population CtaMMl >• 3<* pw aqM>« *mttm* an fJ and 347 per square mile on the islands |13] p*r iqmn *»*, and 133 par km respectively),

Language and a number of tribal languages. *

Ar»a: 36T BOO I

Land UH <m arable 139.900/99.750). plantations {4.100'11,619l ptrmmnt . uncullivaHKl (68,200 176.638), forested {141.500 366.485). other (73.KXV1B9.329)

Major natural feature* and resources: borders on Lake Malawi (lo south), Lake Tanganyika (to west) and Lake Victoria {to north). Lies partly in the savanna, parity In the tropical forest region Diamonds, gold. 1in and salt are mined.

Economic development: gross national product (GNPJ was $684 1 million in 196*. Ol which agriculture was responsible lor S393.8 million; mining and quarrying lor $16.5 million; manufacturing for $24.5 million; and commerce for $79 5 million The Five Year Development Plan (1964-69J involves an expenditure of about E246 million (S689 million).

Agricultural development: MAIN CROPS (production in metric tons): sisal — 221,529 (1966>: sugar — 990,000 (1965), cotton lint — 67.000 (1965), COifee — 4J.000 {1965); Cloves — shipments worth £3.596,000 <$10.068.B00) in 7966 ANIMAL PRODUCTION: beef, veal. pork, mutton and lamb production Irc-m indigenous animals totaled 91.000 metric tons in 196S. FISHERIES PRODUCTION: fresh markeled liih totaled 25,000 metric tons in 1965. cured hsh totaled 65,900 tons in 1965. FORESTRY PRODUCTION: round wood production totaled 11.562.000 Cubic meters (equivalent) in 1965.

Trade: total merchandise Irade exports (1965| amounted to $179,400,000; total merchandise trade imports {1966| amounted to St40.IOO.000 total agricultural exports (196S) amounted to S147.400.000, total agricultural imports (1965) amounted to $ IB, 700.000 Breakdown of agricultural exports {1965) was as follows tea 14,288 metric tons — $4,230,000); SfMl (213,770 meiric tons — $39,989,000); collon (2,615 metric tons - $3,419,000). coffee I2.W1 metric Ions — $24,060,000)

Finance: all banks were nationalized in 1967- Tanzania belongs to the East African Community and to Vhe African Development Sank. Foreign aid in 1964 included $24 million Irom the international agencies and $6 million in grants and credits from Ihe United Slates Development FuniJ estimates tor >965-96 included 420,7 million (United Kingdom): $5,6 million [United Stales): $7-3 million (Intefnahona! Development Association), $3.6 million (Other foreign sources): $21.6 million (internal sources), arid S28 million [unsecured revenue)

Ttwrlem: m 1965 revenue Totaled approximately £2 million ($5 6 million) Tanzania plans to spend *£B* million {Si 5 million) over the next few yean on touriim promotion

CommunteatkHie: a network of paftteng and 0OOdS road services (2.611 mites' 4,204 fcmi.) is operated in the southern highlands providing links witti Zambia and Kenya. Rail and harbor service* are part of the Eait African Common Service? Organization.**

*(Oslt tram !'• UN Y.,r*ooi - IRC* fAO PrvriuCll** r**rboah — 1964 f-At) Iridt Yttrbenlt - f*O Ki#»*«t* ol f!*tnrv Sftitiic* - <••«, e*0 ******* or Fortl r*nduef* - 1966. tump* tr-a llrnf *»d rfw lew*,*. 1 I U '*** tf*W an £«f AIHCM)*

ods; and " improvement, " meaning development based on ameliorating the basic techniques of the peasant farmer.

It did not take us long to learn some lessons. Firstly, that capital-intensive schemes arc also skill-intensive and that we were short of both commodities. Secondly, that we had grossly underestimated the capacity of the small farmer to increase his production given only the smallest of incentives and assistance. Thirdly, that foreign aid, and even more foreign capital, comes in where it chooses and not where you choose.

Mood *for molf-roliance*

We started out with great enthusiasm for planned settlement schemes, but it soon became clear th^t there were a number of sociological and economic factors which had not been given due weight: the return from such investment was likely to be long-term and high-risk. This is not to say that all settlement schemes are bad, for we have had some notabic successes, particularly in the tobacco-growing areas; but it does show that great care must be taken. Some workers adapt themselves to such schemes better than others; a certain amount of experience is essential before large-scale expansion becomes possible; while certain crops, such as sugar, tea and tobacco, are much more suitable than others.

We learned also that our school-leaving youth looked upon agricultural work as a last resort, an occupation for the failures and the uneducated. Our school system was geared to produce good university students, whereas only I in 50 of those entering primary school could find a place in a university. This meant that 49 out of 5(J had to re-enter an agricultural society having been alienated from that society and taught that to go back was an admission of failure.

These factors, touched upon superficially and briefly here, as well as others, have led Tanzania to readjust and reform its priorities and to form new policies. We arc determined to retain our newly gained independence. This means we must be self-reliant though not, as some people have interpreted, that we no longer want aid front outside. That would be narrow, stupid and illogical. We want aid very much, in many fields, but we cannot allow ourselves to become dependent on it, either from one source or from a whole crowd of sources.

We seek a position in which anything we really must have, that is essential for our country's and our people's well-being, we should be able to provide internally or else be able to go outside and buy.

Practically the whole burden of such self-reliance falls on our farmers, in the absence of industrialization, mining or tourism. It is the farmers' efforts which must produce our food, our clothing and our shelter. They must produce surpluses for sale abroad to provide us with foreign exchange needed for both capital and recurrent purchases. It is they also who must provide, through their savings, the local resources for local industrial development, and, through their purchasing power, the local markets catering to an increasing range of locally manufactured consumer goods.

Gradually, of course, this picture will change, gradually industry will assume a greater importance in our national economy, and, more important still, in the everyday lives of the people. Even so, a wealthy industry is one which is built on a solid base of local demand. This will mean a purchasing public in the farming sector for some time to come.

What does all this add up to? As seen in Tanzania, it means that we must concentrate on supplying the farmer with the services and incentives he needs. This means on the government side, research and extension in both crop and animal husbandry. It means organization of the transport and distribution system. It means adequate credit under proper control. It means accurate forecasting of requirements for seed, fertilizer, insecticide and their availability in the quantities and in the places required. It means assistance to the farmers' cooperative societies so that they may properly serve the farmer and their organization, so that they may act as a two-way channel of communication between farmer and government. It means storage and crop protection It means vaccination and inoculation campaigns, disease control and eradication. It means advice and assistance on marketing and many other aids and services.

And it means, at all times, education and mure education. 1 use the word "education" deliberately because **i** mean more than just explanation, although explanation is very importani in iiv.-If ^ n_{Art} of the education process.

It is not simply the farmers who need educating but also government. Far too many people working in, and for, governments arc unrealistic and impractical. Too often they lie comfortable and snug in their central cocoon, too ready to solve problems on paper without asking advice from those who have experienced the problems at firsthand. This applies perhaps even more to the U.N. agencies because their headquarters are even further from the reality of the field than most central governments. Education must be a two-way traffic of information.

It is important thaf technical aid should be aimed at increasing the receiving country's capacity for self-reliance. Many underdeveloped countries, like ourselves, accept aid which creates a situation in which continuing aid is necessary for the furtherance of a particular project.

Often we overestimate our capacity to undertake certain tasks within a given time. Sometimes this is a financial failing but, more often, it is manpower shortage which is the missing factor. Aid-giving countries would do well to insist on on-thc-job training so that the receiving country is more likely to be able to carry on a project after the aid comes to an end.

Tragic waste *of of fort*

This applies to personnel as well as projects: there should be a training element in all technical aid posts as far as possible. This would ensure that a country continues to have a particular job done by local staff after the aid assignment is completed.

Often, technical assistance experts do not slay for more than a two-year period. This is long enough, though, for some jobs and. in any case, is enough to allow national counterparts to be trained so long as they have enthusiasm and requisite basic knowledge. Too often experts come, drift along without proper guidance or a specific assignment, and leave with no follow-up.

There is little enough of the rich world's resources devoted to the assistance of the underdeveloped world; it is tragic to sec so much of it go to waste. Such funds would often be far more cf-fcciive if they were made available to the underdeveloped country on a much freer basis. Aiding countries like to use their own personnel and their own equipment. They Hke to be able to clearly

identify the project which they arc helping. This can lead to much wasting of (Valuable time and effort in the kind of **situation** which is **pctaen)** in most underdeveloped countries.

"% The delays that often result arc frustrating and. because of the changed circum stan ccs, can render the original scheme Jess effective, Unfortunately, only too often the government of the underdeveloped country involved is as much, or even more, to blame for waste and delays. It seems to be in the nature of

we try to reach the majority of our farmers, to leach them new and improved methods and to introduce them to new varieties and new crops. They provide the channel for credit, both crop loans and longer-term credit- Tin; farmer markets his crop through his society and the society is in the best position to ensure repayment i>f outstanding debts.

Here, too, farmers can mccl together and learn tt> manage their own affairs on a col lot-live basis. I nd i v id u *a* l h•. o f cou ***nt***, they may have been their own managers

Tanzania is now beginning LO clarify itself. Our job is now mainly leaching: teaching government officials in the Divisions of Agriculture and Cooperatives and Community Development the fundiiriKii[;i(concepts of cooperation nd how to stimulate and assist the cooperative movement. We teach the workers in the cooperatives, the managers, **bCWBCn** and secretaries, to be more diligent and efficient at their jobs. We teach the committee members how they should guide the progress of their society and

Tanzania's ***economy tests upon agriculture*** ***From Mt lo right: pulping cottev, harvesting pad*** *dy; and gr* ***owing tomatoes***

r governments, democratic ones anyway, that ihey are unable to lake decisions in a hurry. While the reasons for this can be well understood, it docs not make the • *hok exercise any less frustrating **to** eager official*.

In Tanzania's Ministry of Agriculture and Coopcrativcy we have always Iricd to identify and spelt out the job thai an ex-Pen from outside should, be dning. M \hc sat nc time, it is important not to tic him too closely within lightSy defined tcrmi of reference, unless the job is very spec ilk — not often (he case in our situation.

O"* of ihe most important aids to agricultural development i* the assistance (hat *can be channeled lo the smalt farmer ^through the cooperative society. These societies arc [he basis of Tanzania's develop men (program. Through !hcm **foe** y.ns hut. **durtag** this time, they may have been very largely at the mercy of dishonest and unscrupulous traders.

The cooperative is the organization through which the farmer may invest. The building up of his financial reserves by payment of **MM** or levy could lead lo primary **pTOCCMtag Ol** hi\ **CTOp,** later to more sophistkated iiiusimtnts.

We can show good examples in Tanzania of very successful cooperative development and of failures. The successful ones arc generally those which have built upward from the **faiMBU** themselves. Where they have failed it » usually possible Co trace this back to the formation »f a **top bfitV)** ***todtty*** led by some tnihusiastic but misguided **leader.**

After having had to take **KNM MthM** drastic action **laM fear,** the **rifnatiM** in look after the inicrests of their fellow f.irmers who elected them. We teach the small farmer what a cooperative should be and how it can help him.

This is quite a job. * Luckily it is not necessary in the **cue** of all societies, but the **job** is urgent and sLitlicicnily widespread lo mean that all our resources are stretched to the limit. As each society becomes •Atongct and **BBOIC** efficient *vt*.* try to expand its activities into more and different fields: from marketing, transport, storage, processing, provision **of credit** and simple farming requirements to the sophisticated cooperative.

Thi» is ihe **devdopmal** path lhat we 1I:UL' **fhfltf** u for **we** belk\e that it can fulfill our aim of creating a society in AIIILII there is equal opportunity for all and a fair return for labor. □

Low incomes in the high Sierras

A young Dutch agronomist helps to introduce fertilizer to Ecuadorian subsistence farmers as a short-cut to higher crop yields and cash returns

by FIORITA BOTTS

More than half of Ecuador's five million people struggle for an existence on the bare, high slopes of the Sierra region.

These highlands are occupied by people of pure, or nearly pure. Indian ancestry, speaking Quechua, language of the Incas, and living in a sjbsisience economy.

So great is the pressure lor land that potato and maize-growing are earned on up io 4.000 meters Higher still, sheep grare the grass-covered slopes.

It is a paradox that people are so numerous and land is so scarce in ihis mountain region while, m the fertile coastal belt, there is plenty ol land but little labor to produce the cocoa, cof^e. bananas and rice which, together with sugarcane and balsa wood maKe up Ecuador's mam exports.

More food is needed to sustain *the* Sierra people, according to the Andean Mission, a national rural development agency, who have plumped lor fertilizer as the quickest way to increase agricultural production.

Over the past five years some 4.000 fertilizer demonstrations and trials havft been earned out in the Sierras by FAO's fertilizer program working with the Mission

Annei van Heisdmgen is a tall, well-built Dutch girl who would draw whistles any time she walked down Amsterdam a Kalverslraat Annet, whose swirl ol btond hair bestows a marked resemblance to 'Ceres' herself (see *page 66 at thts issue),* was born in Indonesia 26 years ago. She was trained in horticulture at Rjjswijk. Netherlands, and previously worked as a Dutch volunteer in Cofombia She was brought up on a farm and gets on very well with ihe Ecuadorian farmers.

M

Farmers are canny folk the world over and must be convinced that what they are doing will help them and not a distant politician, iocs! traders or officials.

The first step *(below)* is for Annet to taJk to the villagers belore the land is sown or fertilized and ro get one of the farmers to allow part of his land to be used for a village demonstration.

Individual holdings are small and these farmers have been encouraged by the extension workers to form their own club where they can discuss mutual problems.

Gaining Ihe confidence or the farmer's wife is almost as important as winning over the husband.

Social workers like the one talking to An net *(above let!)* teach the villagers everything from chicken-raising to school gardens in efforts to increase and diversify the kinds of food grown and eaten by the family.

Same of the fields are a long way from the village and fertilizer has to be brought In by donkey. This area *(above* cenferj is 3,500 meters up in the highands: fertilizer, originally shipped to Ecuador from a donor country, is provided for these demonstrations by the Freedom from Hunger Campaign program; improved seed is loaned to the farmer by ihe Andean Mission. Ihe cost *being* repayable *oui* of *proceeds from* the harvest.

Annet and an Ecuadorian co-worker *(above right)* explain to the farmers and their families what fertilizer is all about. Fertilizer is no! a magic formula. Annei explains *(right)* that fertiliser needs Ihe right amount of moisture 1o act properly, and that It works best if used together wi1h proper cultivation of ihe soil, improved seeds and insecticides and pesticides to guard the growing crops

Results In Ecuador have been promising: a 50 la '00% increase in crop yields on the average, corresponding to an additional cash return to ihe farmer of twice the cost of nis investment in fertilizer.

Through this program the farmers have learned the value ol fertilizer and the need tor new and improved methods and techniques, like the larmor *{above)* learning to use a fertilizer and seed spreader.

The rwxt step is to make sure that ftrtihier la-available. So far. fertilizer of uneven quality is on sale only «t (he larger villages The program is about to «i»«r its second stag* wilh the start of pilot schemes In which good fertilizer will b* distributed on credit through cooperative organizations, which win also assure a market for the farmers' produce.

From isolation to unity

The achievement of the Chilean farmer

by JACQUES CHOMCHOL

One of the basic problems facing ilic developing countries throughout the world today ts the need (o acccieratc producttan of fcxxj and other agricultural commodities in order to meet the rising demands of ihcir domestic markets.

The rupki population increase (due to extremely high birth rates and fast diminishing death rates), (he chronic and often acute undernourishment -of large section* of the population, the impnnrment in per caput income Hhiinks to the expansion of industrial and other income-earning activities) and ibc rising expedalion of the masses for improvement of their living standards (resulting from the widely puhlici/cd image of the industrialized countries) all combine together to creite i pressing need for I he ks- de-

Jacqun C'hormhol < hait u rrnrulitr *utr-prrs-UttM of Chilt's NatUmat Instinttt* /•» *Ltrt-*tioet *Devrlapmrnt. Ht ha* written ff\rral* hooks *on land rrform ami rtrtfn>mk- drvttop-mrnt Ill Lalin Amrrxa imluJing* \\ Dr\arrolki Econ&nico de Am<rk» Uitin> v I* Rrfi«m» **Agriria.**

veioped countries to speed up their economic development.

This requires u swift and steady increase in their agricultural output, partly for export to fori^i^n murkcis, in order to enlarge their prospects on the world market, but primarily for llwir own doincslie markets where there is a real and growing need.

All kinds of policies have been designed and promoted to deal with thU situation in (he developing countries, ranging from birth control (which encounters serious rnrtrtWlHT ba many of the world's **lesi** developed countries) to technical improvement schemes, farmers' economic incentives, redistribution of production resources through land reform programs, wider extension of agricultural credit to new sectors of the etnnnmy and improved supplies of modem agricultural inputs (fertilizers, improved seed, pesticide, machinery and equipment I, etc.

Nevertheless, the results show that a vast distance lies between what the **technic**iarjs uf the developing countries, using all the international aid thc> **receive,** are capable of accomplishing in the laboratory and at the experimental station OT pilot demonstration farm level and whul the Farm population, as a **whole,** in these countries can do to raise its output, productivity and living standards.

Even with the aid of everything that has been proposed in **reCQBI** years — planning techniques, project evaluation, modern technical training methods, pure and applied scientific research — the remits, from the standpoint of **overall** impact on agricultural production, have been slight.

This is because the aspect which is most probably essential **to** success — *the* ***motivation,*** *mobilization and Kriitinizaiion of the brood mass of the farm poputaium toward o dynamic approach to uiiriuillurat prttgnrss* — has been relegated to a position of minor significance ThU is apparent even m organua'.ions bearing worldwide responsibility for the progress and production of the agricultural population, nidi as i MI. which I reals this **VWJ** marginally. And this shortcoming is even more nurktd in many developing **OOBBtriCi** where (he problem MM is not dcall with by ministries uf agriculture, development organizations or those responsible fur ihe allocation o(investment funds

There arc several reasons for this situation. Those who draw up development programs frequently seem to belie u[1] in the **existence** of a sort df automat it[1] response between :hc amount of investment and the quantity of production, as though the economic s y sic mope r-atcd without the presence of a Uirgc number of people from widespread geographic locations, cultures and social and economic spheres who ultimately determine the nature of the relation between iiucsiment and production.

Another, often unconscious, cause lies in the attempt to draw similarities between the industrial form of progress, which mav be concentrated in a few

OWNING THE LAND TS NOT ENOUGH
At tho turf* Of ltnti r#/o™ Wr at ttt* ChiHMn tm/mtrt had prtcttctHy no* form *01 Orguritimtion

large production units in any country, tiiid the agricultural form of progress. In the latter, operations must be performed *b* thousands of production units gco-^TsiphkvtUy spread over i vui territorial area, usually kicking communication facilitie•;„ in each uf which are people who tend lo work independently. In such cases. IIK- NII.II result depends on the coordination and uniform reaction of all these people.

The mere process of communicating production target* and of assigning the means foT meeting these targets to these people raises remarkably complex problems, especially in view of the shortage of qualified personnel and of I he many economic drawbacks in the developing countries.

Until xpvcial emphasis is given, at the international ***tsvtl*** *and in* ***the*** *developing* ***countries,*** *lo the ways and /neons of organizing and promoting, of motivating, mobilizing and training the broad farm masses, the present sharp disparity* ***between*** *the technical possibilities for speedy modernization of agriculture and* ***bKfttUtnj*** *ajfricutliiraf outpul, iind prutticttt achievements, will persist, regardless of* ***the*** *progress made in applied scientific research ami planning techniques and* ***the*** *abundance of financial resources for investment.*

This is tltc great challenge confronting ill I (hose concerned with the mpid ugri-L ii llural progress of the developing countries (politicians, economists, sociologists, engineers and other technicians). Unless it is met. It will be very difficult to make quicker progress in the next few years than has been made so far.

Taking this as a working assumption, we might suggest some ideas which Chile, a country in urgent need of speeding up iis agricultural growth rate, has recently been trying to put into practice.

Litttm contact with th» farmers

The proportion of the farm population of Chile's total population of 9 million K comparatively small, about 25%. In *\[1]>M,* this farm population consisted of 350.000 families, accounting for just over *2* million people distributed roughly in the following groups: about 30,000 families were large- and medium-scale producers; about 7.(KKJ families were employed hy them as administrators or technicians; about 60,000 families were self-employed family farm producers; somc 80,000 familk-s were small-scale fanners, partly living in communities and **partly** indcptncrtjiilly. rnit .ill ^K-vmployed, supplementing their own farm production by doing extra jobs to make a t\ir[L]- livinp: another 30,000 families were tenant farmers; and about l4O,(X)O families were wage earners of various typea. usually employed by the large- and medium-sole landowners.

In Chile, ihe first problem ariMiii: when the land reform process was hegun in 1965 was the physical impossi-

bility of even establishing contact with these large farm masses which were supposed to be the subject of the reform.

Up to that time, the only organized groups consisted of the large landowners belonging to agricultural associations. These were actually social and economic pressure groups influencing the state authorities and the rest of the farmers. Traditionally, they considered themselves the legitimate representatives of the country's agricultural interests.

Throe motivating forces

Yet, despite its power and influence, this type of organization included less than 2% of the country's rural families. The other 98%. particularly the large mass of agricultural wage earners and small independent farmers, had practically no form of organization, although the existing laws theoretically provided possibilities for the establishment, and operation of agricultural workers' unions and farmers' cooperatives.

These conditions led to the need to seek simple, rapid methods to promote the accelerated organization of the farm sector and to endow it with the resources and ability to play a dynamic role in the progress of the nation as a whole. This was an indispensable first step toward arousing an awareness of progress.

This farm population had an illiteracy rate of over 50% in some areas and average literacy ranged between 30 and 40%. Also, the isolated way of life and cultural values imposed by the dominant members of society fostered an altitude of profound individualism. It was found to be impossible to motivate organization of the farmers by abstract concepts of the advantages of mutual aid and solidarity, cooperative action, or farmer participation in the social power structure through organizations, etc. Therefore, it was essential to discover some simple, concrete ideas that could be readily grasped by the masses and would encourage (hem to organize, allowing, of course, for the specific situation of each farmer group.

Under [he conditions existing in Chile, these motivations took the following forms: for wage earners — the organization of a union as an instrument of claims to social rights (better wages and working conditions, due observance of the social legislation for the protection of farmers, which the laws guaranteed but which were seldom respected in practice); for the small independent farmers — credit facilities (membership in a small farmers' committee or a farm cooperative was established as a basic condition for loan eligibility under the programs for extending credit to these sectors); and, for both these groups — opportunities for obtaining cheaper provisions of their main consumer goods (through the organization of consumer cooperatives capable of supplying their members at lower cost than the traditional traders in the rural areas).

These three ideas: labor union demands; access to credit formerly unobtainable for lack of the traditional security required by the banking system; and cheaper consumer goods, proved to be simple enough and easily grasped by the farm masses. They were quickly organized, in only three years, into basic rank-and-file associations composed of families (between 20 and 200 families in each).

This first phase of organization has, itself, led to another advantage: the establishment of a milieu from which new farm leaders can arise. In the traditional, unorganized and individualistic community there were no such leaders because their emergence was physically impossible. The only leaders were the dignitaries (the large landowner, the local trader and the most highly educated person) who, as a rule, based their power and leadership on exploitation of the farm masses because they had greater opportunities for communication with the rest of the country's economic, social and political structure (the authorities, the banking system, wholesalers, members of parliament, etc.).

Emergence of new leader*

Thus, as these new basic community groups began to organize (cooperatives, labor unions, small farmers' committees. etc.), it became immediately possible for new leaders, more genuinely representing the farm masses, to emerge and become capable of replacing the traditional leaders.

But. obviously, if the process of organization and social mobilization were to stop at this level it could not be consolidated, and there might even be the possibility of its backsliding to the former situation. In fact, in many of these base organizations which have suddenly sprung up there is a real risk that, as the first obstacles arise, their members may become discouraged and prefer to go back to the traditional system.

A climate of discouragement can arise: if the unions have difficulty, for whatever reason, in fulfilling the hopes their members have placed in them; if some of the business operations of the consumer cooperatives fail, due to their managers' lack of experience or attempts at boycotting by local traders; or if the credit or supplies of inputs the small farmers hope to obtain through their committees are delayed, or only partly forthcoming. The more pessimistic members, or those who arc more traditionally minded, tend to spread their gloom and there is a risk that the entire organization may be undermined.

Heati for training

Along with the organization process, immediately following the formation of the base organizations, there must be a large-scale training program for the, new leaders and the farmer rank and file to arouse them to growing awareness of the significance of their organization, the inevitable difficulties in making a start, how to overcome them, the requirements for the organb.ation to move forward, and the long-term advantages it can afford as it grows stronger.

This training effort can be implemented through a combination of media: short and frequently repeated courses for leaders and rank-and-file members; audiovisual methods; illustrated manuals; farmers' publications and radio programs. At first, the approach should be primarily social and economic, rather than purely technical. The new leaders must quickly learn the meaning of a union or cooperative: how to- manage (hem. and their possibilities of action within the framework, or outside, of the existing legislation; the farmers' position in traditional agrarian society and what they must do to emerge from it; the country's real agricultural possibilities, etc.

While this is necessary for the leaders, it also applies to the rank and

file. It is absolutely indispensable to concentrate a substantial amount of resources for several years on this program, especially human resources. It will call for imagination to find these resources and to teach training personnel as soon as possible. It is worth mentioning that in all developing countries a fairly large number of people can be found who, with a little additional instruction, are capable of doing this work. They are usually without university degrees or special diplomas, while many of them may well come from the farm communities themselves.

The need for a new step forward automatically arises as this training effort enables the base organization to become firmly established. This involves a transition to farm organization at a second and higher stage, capable of forming socially influential and economically effective units. The basic farmers' organizations, after all, consist of a small number of families which are not often in a position to provide positive solutions to social and economic questions indispensable to rapid agricultural progress.

Danger of dopottttonay

A few examples may serve as illustration. In the case of unions, collective bargaining at the level of one or a few farms is often impossible, and even undesirable. It must be conducted at the regional level, requiring a federation of unions capable of representing all the farmers of the region. As for the small farmers, as they begin to improve and increase their output they automatically encounter new problems which did not occur when they were marginal subsistence farmers. By this time they need modern equipment at low cost; they must have a marketing infrastructure which allows them to provide their own financing and to keep part of their production, without being forced to deliver it to the nearest trader the day after the harvest, or to pledge it even before the harvest is in.

All these requirements mean that the small farmer needs a group of services — sometimes even facilities for industrialization (milk processing plants, silos, concentrated feed plants, dehydrating equipment, oil extraction equipment,etc.) — which are economically impracticable at the small cooperative level, and which place those who control them in a position to determine the rules and the> profit margins of agricultural trade.

Thus, as agriculture becomes modernized and more complex, and unless farm organizations take care, it will, sooner or later, become dependent on, or controlled by, those who dominate the important technical and economic factors.

Taking part in dovolopmant

State intervention, because of lack of resources, administrative problems or overbureaucratic red tape, may not always be able to adequately help the organizations in dealing with these new situations. Therefore, the farmers, without losing social and human contact with those immediately surrounding them (which can be maintained through their base organization), are obliged by the greater complexity of the development process itself to favor the ramification and extension of farm organizations to a second and third stage (through their vertical and horizontal integration covering many more farmers and activities). If they do not they will soon be deprived of any benefits they may have gained in the initial phase. Certainly, this is one of the vital problems confronting the new farm system of technical progress and development emerging in the land reform process in Chile, as in other countries committed to similar methods.

The rank-and-file farmers' groups (unions, cooperatives, small farmers' committees, settlement committees, women's and youth organizations, neighborhood boards, etc.), composed of comparatively small numbers of families living and working in the same geographic area who arc all personally acquainted, provide a basic point of departure for the application of the development plans and programs the planners may design in keeping with the country's needs.

Naturally, these plans and programs will never be more than a set of good intentions or documents to satisfy the intellectual concern of the planners and the international organizations, and will not have concrete, effective impact on the country's conditions, unless these groups participate both in the establishment and, particularly, in the execution of such plans and programs.

The existence of these farmers' groups offers, first and foremost, the major advantage of greatly simplifying contact between the managerial personnel of the development process and the broad mass of farmers. Certainly it is much easier to discuss and agree on action with one, two, three, four or five thousand farmers' groups than with several hundreds of thousands of individual farmers.

Secondly, as the base group itself develops its awareness of its significance as a group, of what it can accomplish and of what is available to it (in terms of resources), as compared to what each member possesses and can do as an isolated individual,, this awareness changes the farmers' traditionally passive attitude into a far more dynamic approach enabling them to engage in the solutions of some of the most immediate problems weighing on the communities to which they belong.

In Chile, for instance, one of the typical problems of the small farmers was their physical isolation. Although the main highways and secondary roads arc rather good, the third-class or smaller roads (giving many small farm communities access to the urban centers) are deplorable. Farmers are completely cut off during certain periods of the year when the rains make these roads absolutely unfit for transit. The farmers' attitude was traditionally expressed in requests, through members of parliament and local representatives of the central government, that such roads be built, repaired and maintained.

Joining in government effort*

Naturally, since the governments economic and technical resources were small, progress was extremely slow and the main efforts continued to be concentrated on the principal highways and secondary roads. Meanwhile, the farmers continued to wait for the state authorities to solve the problem for them, without shaking off their passive attitude.

However, they soon realized, through their base organizations, the economic limitations of the central government. but that it could, nevertheless, increase its capacity ta action considerably by

making agreements with the various farm organizations. By agreement, the government would supply heavy equipment while the farm organizations would provide free labor (when not otherwise employed in farm work) and materials (rubbk, sand, etc.).

As a result, the number of small, new or improved country roads, linking ihe farm communities with the main **road** network, increased remarkably quickly: and this work was accomplished at a cost to the national budget which was in keeping wtth the limited funds available to the government for this item.

The roads, which were the most pressing necessity, marked only the beginning. The effort was extended to other services: construction of schools and health centers; irrigation and drainage installations; airstrips for small planes, commodity storage facilities, recreation and community centers, etc.

Strmtogy of mothtm

All these achievements show that an accelerating dynamic movement toward the development process can be set on" in the rank-and-h'le farmers' organizations by a kind of cumulative chain ol cause and effect. Progress is imposMhk without these organized and moti\aled groups.

Another great advantage of group organization is that it enables the farmers to piiiiiap.ui: in the establishment of development plans: the base groups and the representatives of the government can jointly analyze the farmers" problems, expectations, resources, possible new uses of these resources, the requirement for meeting these needs, and what I regroups themselves can contribute to development carried out for their benefit — all in a spirit of action rather than in an abstract way. Plans and programs can then be designed: not only as broad overall national objectives, but as much more realistic goal* based on a region- by -region and com m unity »b>-«ommunhy analysis of available resources, existing problems, the minimum requirements *unii* most appropriate forms of action

Efficient operational plans and programs can be drawn up in this way which arc based on ihc real conditions of the country's various rcgkvis and human population groups and its available economic and technical resources, etc. A strategy uf ad km can be established which allows the plan* to be applied in concrete form and adapted to actual conditions.

At the same time, such participation by the base community, in the determination of both national and community objectives within the overall plan.

SHARING THE DECISIONS
In only ***three*** *years termers' organizations* ***wire created*** **composed of** ***b*tw**n 70*** **«nd** ***200*** limiliM ***fitr unit***

creates a psychological commitment that forcefully motivates these-groups to play an active part in meeting the challenge.

Chile's experience in 1967, in promoting encounters between farm base orgatm.iiiorts and the various slate services {agriculture, liL-.ilth, L-ducatton. communications, etc.) has proved remarkable not only from the standpoint of helping the farmers' organizations to mature, in their awareness of their responsibility toward the development process, but because it has also enabled many of the state services to define their work objectives on the basis of a better knowledge of Ihe real farm situation

An indispensable condition for eonturning the action we have described is a clear social consciousness and a high degree of commitment by the managerial and tfffhniffil personnel guiding the program (meaning not only the increase in per capul income, but also its redistribution aiming the population as a **whole).**

These personnel members must be willing to break with many of the traditional society's values, social and economic relationships and forms of operation. Such an attitude means, of course, thai there will be a more or less violent conflict bc(wcen them (depending on Iheir power and attitude to the change) and the influential members and leaders of the traditional society, especially in the rural areas where the tatter groups are the strongest and most conservative.

Unquestionably, the large landowners, the traders {who lived and prospered by exploiting the farmers through both their **MIH** and purchases) and the dignitaries of the local community (who acted as the mediators between the farmers and the authorities and other institutions of urban society, and based (heir power and influence on this mediating capacity) will oppose any change in the social, economic, and even the technical ***statin*** *qti>>* insofar as it will signify a loss of iheir power and influence, And all these i.*roup\ uf dipniiarics will right with'every *capon .it their command against those promoting change, including, of course, the slate authorities.

I ha state must, therefore, have personnel for the promotion of change who are not committed GO the traditional powei structure. These people can only emerge from the younger generation, whether professionally or technically trained or simply gifted with an ability for social leadership. An entire strategy must he defined, in terms of the conditions ol MC& country, to solve this problem (ranging from the discovery of people who can constitute ihe personnel to lead the proifss of change, **to** training them and instilling in them an action mystique),

f IKS is ;i rusk pnJolcfrt for (h<: dtevc (oping countries to **Rltvi** if it is hoped to organ JA' and raise the status of the farm populations which, in turn, appears to be an **iodiqpCMlbk** condition for speeding up development achieving a **per**mancnl increase in agricultural production, effecting a more cqujtabk- redistribution of its benefits and modernizing society. ■

White collar research - a luxury

Rejecting the alternative of 'basic' or 'applied' research, the author proposes a middle way — 'meaningful' research containing both sociological and technological aspects and aimed directly at regional problems

fry *WILLIAM PA YNL*

The situation of animal production research in the tropics today is somewhat confused. In some respects there has been retrogression, in others progress. Everywhere there are hopes, dreams and plans.

In general, expatriate staff have withdrawn from tropical research centers and have not yel been replaced by equally well-trained locally recruited staff. Some ccn:crs have been closed as a consequence, others arc operating on a 'care and maintenance' basis while, at others, new projects are being developed with the assistance of multilateral, bilateral or pri**vste** aid agencies.

New methods of organizing animal production research in tropical countries must emerge during the next decade. If these arc to be inherently sound and arc lo assist such countries to develop their li\ustock product ton, it is [[iipon.nn that all possibilities should be freely debated and examined and that policy should not iiL-LL-ssLinly he bused on attitudes inherited from the past.

In many tropical countries research f.iLilitics were first provided by the former colonial powers, cither at special government stations or at the new universities. Private industry or foundalions were the donors in a limited number of impical countries, while there were a very small number of regional research schemes, such as at Tum;ilh:i. Costa Rica, and at Muguga, Kenya

Generally these facilities weir liniikil in scale and concept. There was Mule

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W.J.A. Payne *wm dirtClor for stveral ytatt "} ihf E«tt Africa Agriculture atij Farcitry Rnearclt Orgatiizaiiutt <'"'* '"<'"> norLrd in ihr Philippines in the fairy Training 9Hd RIxfim-h hi\ni,4lr Ut i\ the ro-mnhar tij B M,m,t,nJ animal husbandry tttt.*

cooperation among different centers, or between research workers and producers in the countries concerned. Often, particularly in Africa and Asia, the major effort was concentrated on the control of endemic diseases, so that oniy minor [iriijirvs* WH BUUfc in Sni-kiti^ solutions to production problems.

Nevertheless, useful results were achieved. Many endemic diseases were brought under control; indigenous breeds were differentiated; and an effort was *nr.uk* to select for productivity within these breeds, Useful information was acquired on (he effect of environment, particularly climatic environment, on animal productivity; and a start was made in selecting suitable forage species for different tropical environments and in studying how these could test be u&ed.

The need for greater emphasis on training at all levels has now become very obvious.

In the past, expatriate research staff and many laboratory technicians were trained outside the country. The small number of locally recruited staff who received professional train ing were usually granted fellowships to study abroad.

This situation has created many problems for administrators concerned with the organization of training programs. At present, there is an overemphasis on the value of academic training and the acquirement of diplomas and degrees rather than skills. At the same time, academically *trained* personnel have a strong bias in favor of participating in research rather than in teaching or extension work; they consider that research is a more prestigious occupation.

Overseas training has acquired a snob value that is difficult to counter, or to eradicate. It seems to be fashkinnNi today for the young graduate to have received some academic training overseas.

The majority of multilateral and bilateral aid schemes cater to this attitude by providing overseas fellowships-, competition remains acute while ihe authority <o recommend overseas training constitutes it subtle form of patronage that is willingly exercised. Most researchers are eager u> accept overseas fellowships, whether or not they have any [mention of using ihcir training **QB6t** they return.

There \s tmc Olhor difficulty which arises when biologists or agriculturists receive postgraduate training overseas: such training usually takes place in an alien environment so thai, only too often, the experimental work has lit tie relevance to the work carried out in the national environment.

The need for greater emphasis on training at all levels has now become very obvious, It is necessary .to encourage and support training schemes jn tropical countries so that adequate personnel can he provided at *ait* revels in the future. *It* is also essential to assist research centers to recommence, improve and expand their programs by providing expert assistancc. equipment and supplies.

It is generally believed that the very existence of research institutes or organizations endows prestige on the country in which they are sited'. Thus, applications for the provision or strengthening of research organizations multiply at a prodigious rate.

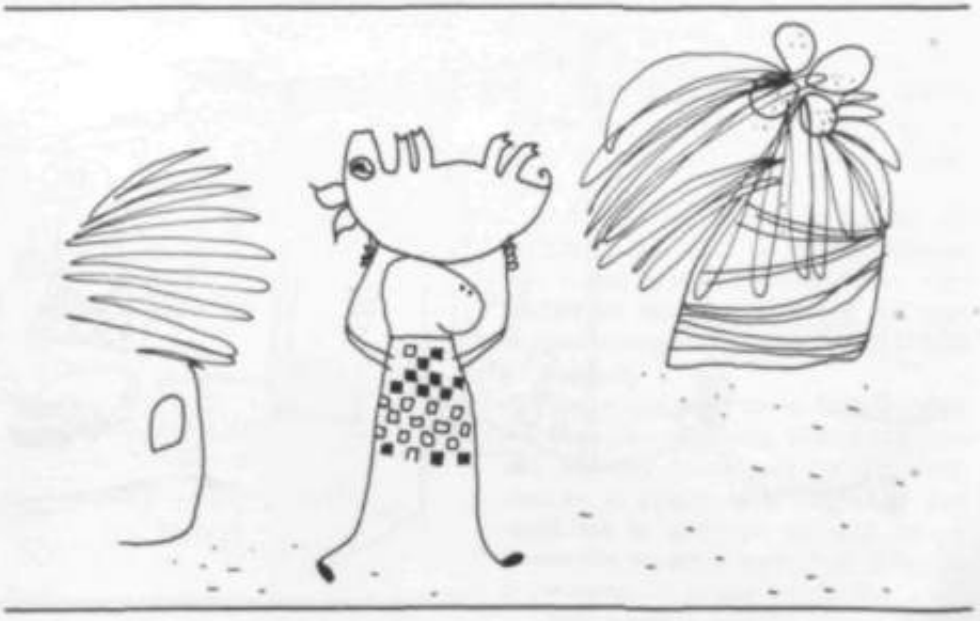
The number of such schemes which •H operational or under consideration by multilateral, biiateral and private aid organizations is very considerable. The United Nations Development Program has already approved approximately 58 projects, costing $50 million, in the fields of forage, animal production and animal health training and research. It is difficult to estimate what part of this total sum will be spent on research but it cannot be *kit.* than $20 million.

Unfortunately, at present there is link cooperation between, and often a minimum of Cooperation within, aid organisations in planning the allocation of resources for research purposes.

Requirements for 'meaningful' research programs on a national and on an international scale should be urgently examined so that resources can be allocated on a more rational basis.

What is meant by 'meaningful'research? All too often research is rather facilely ***dtvkkd*** into two categories, 'basic[1] and 'applied.' At present it is fashionable to suggest that any research carried out in a developing country must be capable of immediate application and be 'economically orientated,' whatever the **tsttet** term may mean. It is often categorically stated that developing countries should not engagt in 'basic' but only "applied" research: because 'basic' research is too costly; because such countries do not possess the necessary resources; or because ihe research can be more advantageously conducted in economically advanced countries.

This is tantamount to suggesting that developing countries should not think about basic problems of animal production but should concentrate their attention on applying knowledge acquired in completely different and alien environments. The disastrous consequences of these atliiudes arc already apparent. Government agencies and new universities equipped to carry out control, extension



My uncle's right, there s a future In research"

or leaching functions arc encouraged to engage in short-term, so-called 'applied', research that is sometimes meaningless and ill too often a. complete waste of effort and funds.

The icrms 'basic' and 'applied' should be discarded and the developing countries shoute be encouraged to undertake ' meaningful' research that might include problems formerly categorized under cither heading. Research should be directly related, and ultimately applicable in practice, to the animal production problems of the country.

This suggests that 'meaningful' research has both a sociological and a technical content: that the most brilliant and suc-C*M& technical research will not be **exptofeod to** its fullest advantage unless it is sociologically acceptable; and that **MckdogEai** research should precede, or be conducted together with, technical research.

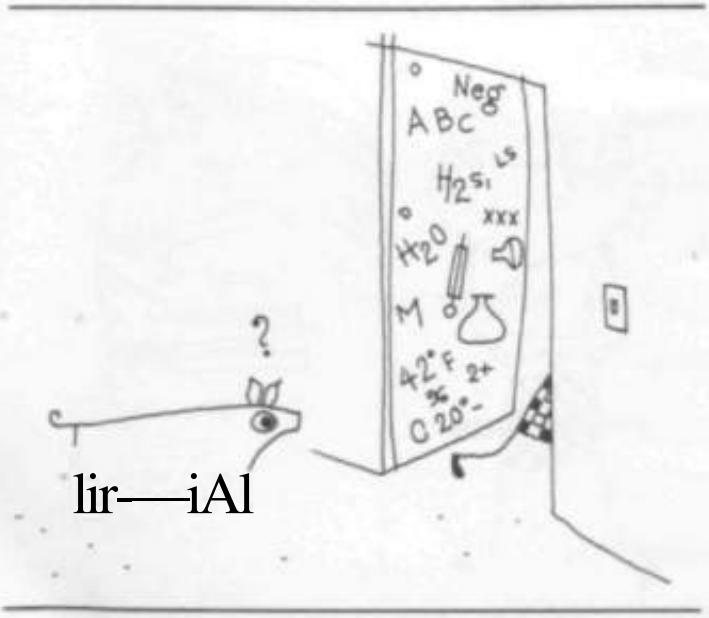
contemporary society, and to make rational guesses as to what motivations will ,-irisf within one or two generations.

Examples of mistakes made due to a lack of appropriate sociological knowledge can be multiplied indefinitely. When long-term livestock breeding programs arc organized, it is absolutely essential to select for the type of livestock that producer* will wish to raise, and that will produce the type of livestock products that consumers will wish to purchase.

It is of little use selecting for single-purpose cattle, however productive they may be. if producers will eventually require a double- or triple-purpose animal. Similarly it is no use selecting for a type of animal that fattens rapidly at an early age if consumer demand points toward lean meat.

Improving the growth rate and the size of most farm livestock appears to be an obvious aim to most animal breeders and administrators, Hnwver, unless farm M/L- and fnrm organization art: radically altered, large animals may become uneconomic on small farms and Ihc farmer may not be able to produce or purchase the fcedingsiuffs required to take advantage of the growlh poiemial of the improved livestock.

buffalo indigenous to the country, ihe idea being **to** provide the farmer with a larger and more powerful work animal [hat will also produce more milk. Though the upgraded animal can undoubtedly work longer hours and produce more milk, it has never been accepted by the farmer; the indigenous water bulfalo is smaller and therefore cheaper to feed, it is capable of carrying out the work on listing holdings (which have probably decreased in average sure during :hc last fifty years), and it produces all the milk that the farmer requires (in the absence of milk collection schemes that would



[1] *Ht'i got ma t grant and bought ma my ticket"*

' I've Spent many long months cramming (or my exams "

*C*** **of** *tttm wmtmr bmtfrnlo*

Sociologies] studies arc needed to keep the animal production scientists informed .ibiHit what new practices the farming population will accept, **001** only immediaidy but — in view of ihc long-term nature of so much animal production research — for several decades ahead.

It is necessary to know something of the motivation* of producers wiihin

During the la_si fifty years in the Philippines, (he authorities have imported **nwffi)** Murrah buffalo bulls from **todfa** in order to upgrade the smaller waier

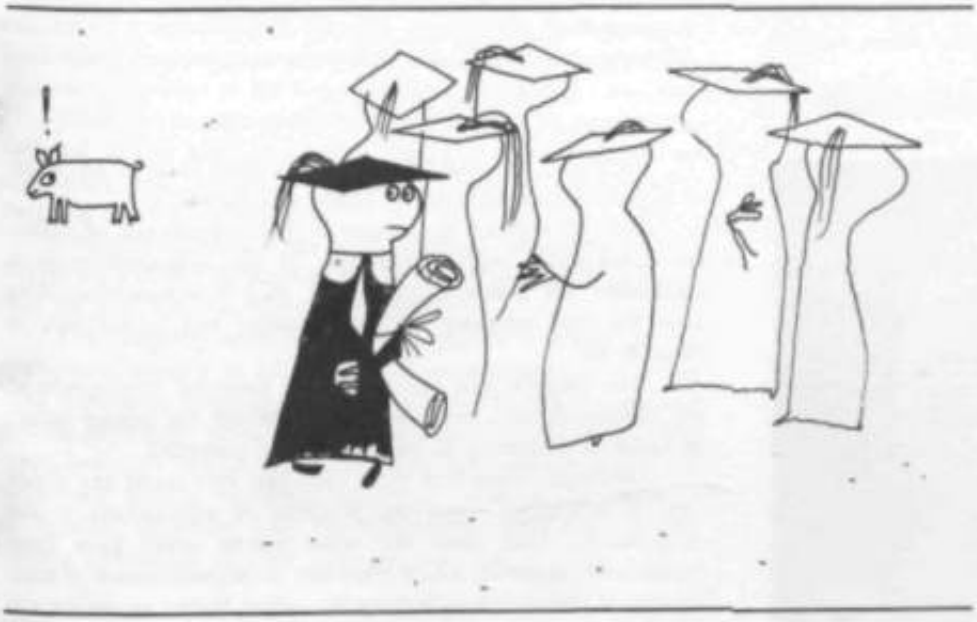
m:tkc (he production and sale of milk **i** viable enterprise),

Even if land reform and consolidation were instituted, so that the average si/L- of holdings radically increased during the next decade, there might still be no place nn the farms for an upgraded water hufTalo: the farmers might decide lo mechanize.

Thus the sociologist has a very in> pomiii *wlc to phy in -atcsnin^ful'* animal product ion research. It is not suggested that all research should be tailored |o ensure that it fits in with tlic sociologist's concept **of** nhat is. or what will be. acceptable **lo** ihe farming community. Technological changes *based* on research findings may occasionally alter ihe whole basis of rural society' What is suggested is that the **iccWofW iboaH** be an inicgral member **of** any' research icam and that

sociological data should be evaluated before decisions are-made as to the form, • Content and direction of any major animal production research program.

Animal husbandry is an integrated sub-Wjcct embracing many scientific disciplines; therefore, "meaningful' animal production research must be based on an integrated Approach. So often in the past, **short-term experimeotatioa** by biochemists, nuiritiomsis, physiologists, animal breeders and parasitologists has been considered a substitute for an integrated research effort, simply because it was easier and cheaper to conduct. Unfortunately this



** At last I'm on **mi** way home: doctor o> OfiNITHOLOQY "*

splintered approach to animal production research problems is sometimes encouraged by vested interests in specific scientific disciplines; also by the emphasis that aid administrators place on 'applied' research which, rightly or wrongly, is associated with the idea of short-itrm, i m media teuiility research.

There is considerable confusion in defining the requirement* for increasing livestock productivity. There must be adequate incentives for the farmer, a suil able infrastructure, available credit and *n efficient marketing system. The farm* cr muit be able to educate himself in <hc necessary managerial skills and be advised by ;> knowledgeable extension ^ service.

Research *is.* required (<> chart the course along which the en tension service should guide the former. For example, a dairy farmer in a humid tropical environment where there has been no tradition of dairy farming must know whether he should manage his dairy Cattle indoors or nutdoors, Once a decision has been made this will guide the whole pattern of his **investment,** his managerial methods and the type of dairy cattle ikii be breeds,

At the present time nobody can advise him as to which is the most suitable system. This can only be decided by large-scale integrated animal husbandry experimental work conducted simultaneously at several different centers.

ts this 'basic' or 'applied[1] rewarch'.' H is certainly 'meaningful' research- Such research has not yet been carried out, and is not likely to be carried out given the present situation, because work of this type requires the cooperation of many special bis, the use of large numbers of dairy cattle and extensive facilities.

Or again, we know that under good management in the humid tropics a Ihrecquarter bred temperate *x* tropical type dairy cow is likely to be the most productive animal to Use. whereas in other areas where management is noi so flood a halM>rcd temperate x tropical cow would be the most suitable type. Arc we attempting to hrced stabilized crosses of this type? The ansuvr **h** generally no, because this would require large numbers of catttc, very large and expensive facilities and. perhaps, twenty years of breeding work. Aid administrators think in terms of up to five years' assistance and a relatively small allocation of facilities for a very large number of so-called research centers that will concentrate on short-term 'applied' programs.

*New trapicmt ratmarch amittmt**

There arc three major environments in the tropics: humid: arid or semtarid; and montane or medium-to-high altitude. Within these three major types there are many microenvironments.

The aid organizations, multilateral, bilateral and private, should cooperate to support and adequately finance six to nine major animal production research centers in the tropical world, two or three in each of the main environments.

These centers could concentrate on evaluating the effect of soil-plant-animal interactions in their environment in ordcT to find out the most economic and productive managerial systems for all classes of livestock.

They would have to be interdisciplinary institutes employing first-class scientists enjoying exceptional research facilities of a quality and magnitude ihat could not be provided at small animal production research centers, or university departments of animal production.

These specially selected centers should act as training grounds for animal production scientists from all developing countries in the region, and should form part of a first-class university. Scientific **gal** from smaller centers could be offered postdoctoral fellowships at the larger ones.

These major centers should maintain ␣iniact with all animal production rc-^:irch in their ecological region. They should organize and assist in cooperative experiments so that new ideas and methods evolving from their research programs could be simultaneously tested in a variety of micrncnvirunmeriK

The value of major research cenim of this (ype would be inestimable. It is likely (hat they can only be established if the Food and Agriculture Organization is willing lo take the lead and persuade ;i)| aid organizations to cooperate in an overall world animal production research program. g

UNCTAD 2 - success or failure?

The outcome depends on the lessons that are learned. The next step: for the United Nations to launch a gfobal strategy for development using the Marshall Plan approach

hy JANLZ STANOVHIK

UNCTAD 2 was considered by few as a success, by sonic as a limited success, and by many as a failure.

Such divergence of opinion is the consequence of different conceptions and expectations of (he organisation as a machinery for cooperation, rather than a misunderstanding over the real meaning of the decisions and happenings at NLW Delhi.

The international economic and financial atmosphere ai the conference was certainly not propitious for bolder action in favor of assistance to the developing countries.

However, there is a great deal that one could say about [11] pro up procedure" and the progress of denotations at the conference One must ask what results could have been ri\iliMik\tlh **expected** which *mm* noi achieved because of such (actors as ihcM.\ before putting the entire blame on an unpropitious atmosphere. This requires somt recoiled ions of the origins of **UNCTAD.**

FOT ;ilmoM i he entire two decades of the existence of the United Nut ions. [In- major trading countries have maintained thai the ope rat ion tit aspects of trade and finance could not he dealt with by a UN.-type international organization.

They have maintained thai they should be carried out in an appropriate contractual framework such as OAT7 (General Agreement on Tariffs and Trade h IBRD (International Bank lur Reconstruct km and Development) and IMF (International Monetary Fund).

This was the real reason for the nonaccepjancc of the idea of I TO (International Trade Organization}, !hc opposition *(to ihc point* pf *nonparticipation* hy some court tries J fo CITT (Commission on International Commodity Trade), as well as for Ihc resistance to the very idea of SUNFED (Special United Nations Fund for **Economic** Development >

UNCTAO was not created willingly. The participants

1»n« Stanovnik wai *for tit years thr director* •>((Ae ***iitMttmtt*** *lor tnirrimiivnal* ***Econonria*** *and* ***foUey*** **in BWr«"'"**; "• '**? *fit wan u? poiiitnl* ***exttmtht*** *feffUrr »/ thr U.S.* &-«•"•"*• ***Committkm fm Sunpt.*** *fir hat publniird taeral IHHAX* I***" *dfal* *i'h thr prabftnu* > *»/* J*r *world tritiumv from the point "I* *lifw* *"t 'fit J eveloping* co*UMII* ies.

to UNCTAD 1 will remember the bitter debates over the principle of "one country — one vote.[11] A reading of the terms of reference will show that the conciliation procedure was elaborated in order to prevent the adoption of decisions affecting the economic or financial interests of the major trading countries without their consent.

Discussion of the Trade and Development Board, preceding UNCTAD 2, on the question of whether it should be a negotiating conference or not, will show that this basic difference over the role of the organization was not resolved.

The major trading countries see in UNCTAD a forum for international discussion where they are open to the impact of dialogue with the developing countries, and even to pressure by them. This process could lead to two positive lines of action in their view.'

Firstly, delegates carry home the results of this dialogue and try. to translate them, through appropriate parliamentary procedures, into autonomous political action: thus helping the gradual integration of the developed and developing countries.

Secondly, this discussion has a bearing on concerted international action not necessarily operated by the UNCTAD machinery but, in a decentralized way, by IBRD, GATT, FAO and other organizations.

There was, during the year, a slight evolution in this "debating society" approach, but it would be wrong to think that the position has radically changed.

The socialist countries do not regard UNCTAD as an operational agency in the field of international trade. They have repeatedly emphasized the importance of the general and special principles governing international trade relations and trade practices which have met with the opposition of the developed market economy countries. The trade relations °f socialist countries with the developing countries are still mainly conducted through bilateral trade agreements.

Whoto n&w philosophy of davalopmenl

However, the developing countries arc pressing for the transformation of UNCTAD into a truly operational body. This was the meaning of their insistence that the conference be a negotiating conference and that it be a "New Delhi Round," parallel to the "Kennedy Round."

The Algiers Charter* was drafted in this spirit so as to[1] 'ay the basis for such negotiations. The developing countries recognize that the negotiations cannot take the form of give-and-take, as in contractual negotiations, as the whole structure of UNCTAD rests on the recognition of the principle of non-reciprocity of trade concessions. However, they consider that an agreement on a joint program for development provides a sufficient number of elements for practical negotiation.

But even this type of negotiation did not really get under [w]ay in New Delhi, with possibly one exception: the declaration on the world food problem and, in some respects, in the financial field.

This is a matter of greatest concern. The historic mcaning of the Algiers Charter consists not merely in the elaboration of a detailed program of action, but in the laying down, in unequivocal terms, of a whole new philosophy of development.

The cornerstone of this philosophy is the recognition by the developing countries that development is their own primary responsibility, and that it must rest upon their domestic efforts.

One cannot help but think, however, that the forces of the past, with their attitude of confrontation, were stronger at New Delhi than those who recognized the new opportunities offered by the Charter of Algiers.

But all chances are not lost. An international conference cannot be judged by its formal decisions but rather by the effect of an exchange of views transmitted to their home countries by the delegates.

Major task ahead for UNCTAD

Raul Prebisch, UNCTAD'S secretary-general, was rightly disappointed that the conference did not pronounce itself on the strategy for development which he expounded with such vigor and persuasiveness. The fact that the conference has not adopted a resolution stating the main future lines for such a strategy should not, however, be interpreted as indifference to this task.

Judging the political will of the conference on the basis of ministerial declarations in the plenary debates, rather than on the basis of expert discussions in the committees, one could come to the conclusion that it strongly supported the main lines of a global strategy for development, and that the lack of a formal resolution was due more to the time factor than to substantive disagreement.

It is clear that the way for elaborating a strategy for development is open and that this is the major task now confronting UNCTAD.

There are several points on which such a strategy could be built:

... the determination of the developing countries to mobilize their own resources and to liberalize intertrade relations to the maximum extent possible;

... the decision of the developed countries to grant, in general, a nondiscriminatory and nonreciprocal preferential treatment for the imports of manufactured products from the developing countries — there is every hope that the inclusion of processed agricultural products will have its effect in the shift of necessary capital from the developed countries;

... the agreed upon calendar for commodity conferences. It is regrettable that the question of access to markets and a technique for the operation of buffer stocks has remained open, though the outcome of the declaration on world food problems gives some ground for hope;

...the financial discussions leading to an agreement on the yardstick for aid — it is disappointing that there was no agreement on the supplementary financing scheme though it was decided that efforts should continue.

Taking all these elements together, one can see that a decisive breakthrough has not yet been reached; though some basic lines have been drawn up for future action.

The development of an overall strategy should proceed

*T he Algiers Charter: a serifs of recommendations on commodity trade **policies,** development **financing** and **tariff** preferences which were **adopted** hv the representatives of developing countries at the Ministerial Meeting ol the Croup of 77 in October 1967 as a program of **action** for **UNCTAD** 2.*

hand in hand with persevering work on practical agreements in the major sectors: commodities; manufacture; finance; and transportation. Such an overall strategy without concrete action schemes would be senseless, but it should also be recognized that the operation of individual programs outside such a strategic framework would be just as senseless.

The elaboration of such a strategy should rest upon the cornerstone of a joint developed/developing countries' venture. It should provide a rationale for such cooperation and should be based on the Song-term planning of this cooperation. A long-term perspective would open the way for an outward looking policy and would influence political decisions against concentrating on short-term measures which are too often inward looking.

Unking of domestic and international offort«

This strategy for development should adopt appropriate targets in the key sectors of interrelated international economic policies. A financial target was adopted by UNCTAD 2 and some progress has also been made toward agreeing on a target in the developed countries for sharing the increase in domestic consumption between domestic producers and foreign suppliers.

It should not be too difficult, in the light of the present trend, to agree on a target for manufactured products, either "in terms of domestic production or in terms of imports, or both. Such targets would serve as political guidelines for the parliamentary organs of the developed countries.

The global and sectorial targets should then, of course, be translated into appropriate instruments and schemes, which is wtere agreements on individual problems fit in. It is to be hoped that the work begun in New Delhi can be accomplished through a permanent mechanism.

The basic point on which the entire concept and success of a global strategy for development hinges is, of course, the linking of domestic and international efforts.

Development is not only an economic but also a social and political process. There is little use in pumping resources into a country where there is no social change and where aid is dissipated in making the reactionaries and the corrupt even richer.

The scheme of supplementary financing, prepared by the staff of the World Bank, was not adopted by the conference. **But** its basic philosophy — ensuring the continuity of development plans by new financial action if the trade mechanism fails for reasons which are beyond the control of individual developing countries — was universally accepted. This idea deserves wider application.

Discussions on financial questions at UNCTAD 2 showed that the tlcbt burden and the imposed conditions of aid arc afnong the greatest obstacles to faster growth in many of the developing countries.

The problem of tied aid was widely discussed: while international lending for development is largely tied, repayment is not tied. This leads us into a flagrant contradiction: the developed countries, with considerable production facilities and competitive power, secure for themselves the export outlets with tied credits; the developing countries, already in a weak competitive position, must search for convertible currencies so as to repay these credits. The way out of the existing situation can only be found through a new kind of payment arrangement.

What is urgently needed now, following the New Delhi conference and in the present world situation, is a new Marshall Plan for the developing countries.

This plan would differ from the first one in being applied ihrough the United Nations and in embracing substantially all the developing and developed countries, both socialist and nonsocialist.

The developing countries would present, in UNCTAD, an outline of their own development policies within the framework of such a plan; just as in OEEC (Organization for European Economic Cooperation — which later became OECD) the European countries elaborated their own plans for reconstruction and regional cooperation. These national plans would then be supported by correlated international measures.

Such a procedure would have several advantages as compared to the present approach:

1 it would guarantee to all countries an equitable international contribution, commensurate with their own efforts and needs;

Jd it would guarantee the efficient use of international efforts and resources as these measures would be directed and interrelated;

O it would alleviate the fears of bilateral interference in domestic affairs as there would be a community of nations examining the performances of individual countries;

T: it would provide developing countries not merely with assistance, by furnishing material and financial resources, but also with the opportunity of economic management and planning through friendly international discussion in a forum where the developing countries arc in the majority;

J it would stimulate efforts for the development of trade and economic cooperation among the developing countries themselves;

O it would create the economic background **for** the elaboration of payment arrangements; and,

/ it would provide a framework for the gradual economic integration, on an equitable basis, of the developed and developing regions of the world.

Such an effort would require the increasing adaptation of the production structures in the developed parts of the world as well.

As the strategy for global development would be a planned operation, this would mean **thai** the developed countries should refrain from increasing their production capacity in those sectors where they do not enjoy comparative advantages.

Such an exercise in economic cooperation. goes on continuously among the developed countries. An extension of this area of cooperation and integration so as lo include practically the whole world is noi merely technologically feasible but politically indispensable for maintaining peace in the world, *

BURMA

■ ***Tractors gradually replacing elephant****

An efficient teak and hardwood logging rndustry is viia! to the Burmese economy, Forest products earn an average of nearly S25 million a year in exports. Some 145,000 square miles ot trie country {57% of the total area) are covered by forests and SCVn of the forest under harvest is suitable for mechanized extraction.

Traditionally, timber has been hauled from the toresi by elBphanis. but powered equipment is gradually taking over. Just before World War II. somB 6.500 elephants were working in the logging camps of Burma. When the war ended there were only 2.600 elephants left: and this (oss started the Stale Timber Board on I he road to mechanization.

in the field
in the field
in the field
in the field

From 1961 to 1966 Over S3 million have been spent on equipment, according to an FAO forestry adviser who worked with the Board. This mechanical power can handle up to 225,000 logs per season, nearly a quarter of the annual timber output. However, the changeover will be gradual for yields per acre and climatic conditions are favorable to the use of animal power for limber extraction whenever possible

AUSTRALIA

• ***Mmn-tnadm foreili: * growing wmmlth***

There are approximately 61 million hectares of man-made foresls in the world today and this area will double by 1935 according to an FAO world symposium on man-made forests held in Canberra. Australia, last year.

The symposium dealt in detail with questions ol policy, silviculture, management, utilisation, and integration ol planning and financing. It passed 66 recommendations.

Among facts of general interest

...approximately hall the total acreage consists of plantations in Mainland China and the USSR

...the most widely planted group are conifers — mainly pines — which make up about 70% of (he reported total.

...eucafypts are probably ihe most extensively planted ol the broad-leaved species Others widely grown are poplar, acacia and teak.

...the lastest growing man-made forests can produce wood for fuel or poles in 5 to 10 years, pulpwood in 10 years or even less, sawlogs in 15 to 20 years

ZAMBIA

• ***Livo fimh airlifted «opoii Africa***

Some 250.000 live fish have been airlifted from Lake Tanganyika to stock the waters of man-made Lake Kariba between Zambia and Rhodesia. 700 miles away. The .) i r lift was the latest step m a S1 million dollar UNDP (United Nations Development Program) project lor boosting [isheries devefopment in the Lake Kariba area. The 1.718-square mile artificial lake was formed by the damming of ihe Zambesi.

The fish selected for this venture was the small, silvery *Limnothfissa Miodoft* which is tasty and a prolific breeder. Lake Kariba is naturally supplied with fish but scientists feel its fishery potential could be greatly increased by stocking it with choice outside species

JORDAN

• ***Underground wmt«r***

The UN. Development Program has increased its contribution to the investigation ol sandstone aquifers project in east Jordan from S173.650 to nearly $1.400.000 while the Jordanian Government has upped its share from $1,620,300 to nearly $4 million.

Ultimate object ol this major land and water utilization project is to bring water to a region covering 60,000 square kilometers and noted at present lor its aridity and poverty. Large tracts of the region have been surveyed both above and below ground and 65 wells have so far been dug. In all. over 21,000 meters have been drilled in the search for the areas where the underground water can best be exploited for irrigation, slock watering and in* dustriai and domestic uses

JWosr *or* fhe *wood's man-made forests tie coniferous. Sikv ih>s planted forest at* flofofu* *New T>*

INDIA

• *Cutting losses in storage*

A five-year $1.6 million effort to reduce the large losses caused to stored grain in India by pests and fungi has started with the arrival of Gus Huysmans, an FAO agricultural engineer. The main aim of the UNDP project is to show local manufacturers how to make storage units adapted to Indian conditions from local materials, and to encourage creation of a storage industry. A grain storage institute will be set up at Hapur, near New Delhi, while two field stations will collect and assess research results and evaluate the nature and extent of losses in storage.

• *Flying check on forests*

initial conclusions of a UNDP forest inventory project being carried out by a joint Indian/FAO team indicate that central India should be able to support a pulp and paper industry.

A jet helicopter has been bought by FAO from UNDP contributions to help verify inventory work done in the course of the survey. The aircraft, which cost $100,000, is a five seater. It will shortly be used to transport members of the survey team to and from inaccessible parts of the forests.

The first part of the project — training a strong corps of Indian experts — will be completed toward the end of this year, when FAO experts leave them to carry on the survey.

• *Daily protein food for 25 million children*

Alarmed at the grave deficiencies in Indian children's diet, the director-general of India's Health Services has warned that unless successful efforts are made to combat malnutrition, irreparable physical and mental retardation may result for the two thirds of Indian children who are inadequately nourished.

A campaign is now under way throughout the country to give children a proper diet. As one of the first

New funds pledged for agricultural development

New projects approved by the governing council of the United Nations Development Programme (UNDP) for the first half of 1968. Projects listed are those in which the executing agency is FAO; FAO in association with the U.N.. or its agencies: or the United Nations, itself. in fields of interest to FAO.

Afghanistan: To assist the government in establishing an organization which will coordinate and control the development of all water resources throughout the country. UNDP — 51.416,200: government — S1,020.000. (Four and a half years.)

To prepare detailed plans for the development and expansion of irrigated agriculture in the Kunduz-Khanabad district (in the northeast) with a view to defining the areas investment potential. UNDP — $671,100: government — $289,000. (Two years and three months.)

Algeria: To strengthen the government forest service and train professional staff and skilled workers in the course of developing and executing a national forest utilization plan. UNDP — S1.109.800; government — S800.000. (Four years.)

Argentina: To strengthen livestock investigation and promotion centers and to train personnel in intensified livestock production techniques. UNDP — Si,063.700: government — $5,006,000. (Five years.)

Bolivia: To survey the animal health situation and strengthen veterinary laboratory and field services. UNDP — $945,400: government — $1,769,000. (Four years)

To formulate and implement a program of groundwater development in the Altiplano. UNDP — 31,479,800; government — $1,159,000. (Four years)

Brazil: To establish a farm planning and training service for the Mogiana region. UNDP — S958.900; government — S1.350.000. (Four years.)

Burma: To carry out studies to develop the Sittang river valley, including general studies of the basin and feasibility Studies Tor the Yamethin *and* Yen we Pyuntaza areas UNDP — $2,179,200: government — $1,096,000. (Three and a half years.)

Chile: To continue and expand the training, research and advisory services of the Institute of Training and Research lor Agrarian Reform. UNDP — S982.000; government — $1,671,000. (Two and a half years)

Congo (Brazzaville): To plan and implement **a** regional program of rural development in the Niari-Loudima area and on the basis Of this pilot operation to define a nationwide program of rural development. UNDP — $1,399,500; government — $960,000. (Three years.)

Ethiopia: To complete the establishment of the School for Animal Health Assistants, Debre Zeit. by providing additional training, including field programs for Ethiopian veterinarians who will be assigned to take over its operation. UNDP — S991.500: government — $808,000. (Five years.)

Gabon: To assist the government in determining the extent and composition of the forests in the eastern zone and in preparing a forestry and forest industries development plan. UNDP — $1,346,200; government — $798,000. (Four and a half years).

Ghana: To increase production of food crops in selected pilot areas through extensive use of fertilizers. UNDP — SI. 188.400: government — $1,450,000. (Five vears.)

Greece: To undertake feasibility studies leading to the development of forest industries, with special reference to possibilities in western Greece, with a view to attracting investment. UNDP — $301,900: government — $410,000. (One and a hall years)

Honduras: To establish a forestry school for the training of low and middle-level technical personnel. UNDP — $938,200; government — S1.009.000. {Five years.)

India: To develop sheep husbandry in eight states through improved sheep breeding, shearing, collection, grading, marketing and utilization of wool. UNDP — $),634.300; government — 53.245,000. (Five years.)

Iraq: To complete the establishment of the Iraq laboratory unit for the investigation of animal diseases and the training of veterinary field services through the strengthening of the Veterinary Faculty, University of Baghdad. UNDP — $1,046,300; government — $450,000. (Three years.)

To assist in the preparation and planning of a pilot project for soil and water management and in training lor irrigated land development and settlement. UNPD — $203,800; government — S350.000. (One year.)

Jamaica: To conduct a feasibility survey to determine the economics ot production and the market prospects lor selected food crops. UNDP — $110,400; government — $137,000. (One year.)

Kuwait: To assist in the establishment of a center for the development of Kuwait's water resources, lo lest and evaluale equipment and materials for desalination plants, and to Irain the Skilled personnel needed for their operation. UNDP — $668.400 government — SidSOOOO (F)v*> vears)

steps, it is planned to distribute a new protein food. *Balahar,* among 25 million schoolchildren daily.

Also in the planning stage is the production of 100 million loaves of lycine-fortified bread. The first of nine bakeries, donated by Australia and Canada and set up by the Indian Government, opened recentlyandfivemore will be built shortly.

Says the health service report: '"The cost of counteracting malnutrition by raising the nutritional levels of children is far less than either the cost of the resultant decrease in productivity or the cost of treating malnutrition."

DAHOMEY

• New horizons for tishormttn

Today over 3,000 fishermen operate Off Dahomey's 75 miles of turbulent West African coastline as the result of three years' intense multilateral and bilateral effort to change and modernize fishing practice.

Until a few years ago the bulk of commercial fishing took place in quiet landlocked lagoons. Every year some 20,000 tons of fish were harvested from some sixty thousand acres of calm, brackish water.

Three years ago a new port was built at Cotonou: the construction of these new facilities caused the sands to shift. The lagoons opened up, never to close again, and a large part of the fish population vanished.

This meant a newapproach to fishing, new boats, new men and new training.

Many organizations have shared in the work. Outboard Marine (Belgium) S.A. contributed 50 motors worth nearly $20,000 to the Freedom from Hunger Campaign fishing boat mechanization project. The Canadian FFHC Committee gave over 210,000,

Dahomey's neighbor, Senegal, provided five crews of expert fishermen with their own canoes to prospect offshore fishing grounds and to train the Dahomeans in line fishing.

Stronger and bigger planked

Lebanon: To further the planning of hydroagricultural development in Lebanon by carrying out irrigation feasibility studies and related pilot schemes UNDP — $1,011,100; government — $2,378,000. (Four years.)

To complete the current survey and evaluation of Lebanese water resources and to plan their development and utilization with particular regard to agricultural needs and to the water supply for Beirut UNDP — $221,000; government — $240,000. (One year.)

Madagascar: To promote development of the fishing industry by training personnel, undertaking trial and demonstration fishing, and carrying out marketing studies. UNDP — $966,500; government — $364,000 (Four years)

Supplementary assistance for hydrogeological exploration in southern Madagascar, with special emphasis on the Morondava river basin UNDP — $245,500: government — $129,000. (One year)

Malaysia: To assist the government in strengthening all aspects of its forestry planning and services as a basis for the development of forest industries. UNDP — $1,221,800: government — S954.000. (Five years.)

Mauritius: To assist the development of the fishing industry through demonstration fishing and marketing studies UNDP — 5396,900; government — $504,000 (Three years.}

To prepare feasibility reports on irrigation development, and to undertake supplementary studies of naturai resources UNDP — $406,400: government — $171,000 (One and a half years.)

Morocco: Assistance in the establishment and initial operation of a center for the collection, indexing and dissemination of documents on rural and agricultural development UNDP — S174.000; government — 5292,000 (Two years.)

To develop a new curriculum for intermediate-level 'orest engineers at the Forestry School in Sale. UNDP — $1,051,700; government — $887,000. (Five years.}

Nicaragua: To assist the government in developing the pine forests of the northeast and to carry out technical and economic studies for large-scale investment in the region UNDP — Si.000.100. government — $1,551,000 (Four years.)

Peru: To investigate livestock production possibilities and to provide training in livestock production and health techniques [in] high altitude and tropical areas. UNDP — $1,124,400. government — $2,175,000 (Four years.)

Republic ol Korea: To assist in providing the expanding fishmg induslry with trained technicians to operate modern fishing vessels in coastal and nearby high seas areas UNDP — $1,117,600: government — 51.459.000. (Four years)

To assist in the expansion ol the fisning industry through the provision ol advisory services. UNDP — $121,100; governmsnl — $35,000. (One year.)

Romania: To improve, expand and strengthen research on plant breeding and seed production at the Institute tor Cereals and Technical Crops, Fundulea. UNDP — $1,377,200; government — 55,800,000. (Four years.)

Singapore: To assist in the development of new industrial fisheries through the training of fishing technicians. UNDP — $1,261,900. government — $1,481,000 (Five years.)

Somalia: To carry out intensified mineral exploration in" two zones; to strengthen the geological survey UNDP — $776,600; government — $977,000. (Two years.)

To assist in the field training of veterinary personnel in the control of rinderpest, contagious bovine pleuropneumonia and other diseases UNDP — $158,200; government — $374,000 (Two years.)

Syrian Arab Republic: To assist the government in implementing an agricultural development program in the Ghab region by helping to train personnel, establishing supporting institutions and creating permanent settlements. UNDP — $1,313900; government — $1,110,000 {Three years.)

Togo: To assist in preparing a comprehensive forestry and forest industries development plan. UNDP — $877,200; government — $580,000 (Three years)

United Arab Republic: To complete the establishment ol the Animal Health Institute for the investigation of animal diseases and the strengthening of veterinary leaching at the University of Cairo UNDP — $961,400; government — $654,000. (Three years)

United Kingdom, Fiji: To prepare development plans and feasibility studies for the rational utilization of forests and for the expansion of forest industries UNDP — $238,400: government — S200.000 (Two years.)

Upper Volta: To improve agricultural productivity by training increasing numbers of agricultural technicians and farmers UNDP — $1,129,500: government — $1,243,000 (Five years)

Uruguay: To study animal diseases and to train .national personnel in animal health techniques UNDP — $1,149,000: government — $2,215,000 (Five years.}

Republic of Zambia: To develop the natural resources of the Luangwa valley Ihrough improved wildlife conservation and utilization, and promotion of tounsm UNDP — S1.056.400: government — $2,679,000 (Three and a half years,)

Regional: Guinea. Mali, Mauritania and Senegal: To promote increased agricultural productivity through a comprehensive program of applied agricultural research and pilot demonstration (see *article* fcy Corral *in Ibis issue)* UNDP — $1,850,600 governments — $788 000 (Five years)

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vessels were designed to cope with the. force of the surf. Norwegian and Swiss cooperatives. French bilateral assistance, United States AID and FAO provided, a large part of the needed technical expertise and financial resources

PERU

• *Tunne>t% through the Andv**

After a Ihree-year survey of the mountain and coastal regions of Peru, FAO has submitted to the Peruvian government a large-scale project aimed at the agricultural and industrial development of the Pampas de Olmos region in the arid coastal belt. The course of three rivers would be diverted from east to west through two tunnels to be driven 12 miles through the Andes

This project, which will also involve the construction of a network of canals, power transmission lines and electrical power stations, will permit the irrigation of nearly 90.000 hectares of fertile land Given enough water, a wide range of tropical and subtropical products can be grown including cotton, rice, sorghum, soybeans, groundnuts, oilseeds and alfalfa. Livestock could also be increased from the present 15,000 head of cattle to 140.000. including more than 80.000 milk cows.

The three-year survey was carried out for FAO by an Italian firm Italconsult, under a UNDP proi«ct it included invwt>g*t»on into many aspect* **of topography.** hydrology g#otogy *otl *nd water and **maffcttinq**

SUOAN

• *Umlnff the water hyacinth*

The water hyacinth dogs up waterways, rivers and laKes all over the' world

• *Country gtiidmm tar imvmmtarm*

To encourage foreign private investment in developing countries, the FAO/Industry Cooperative Program is putting out a series of country studies — prepared by the FAO Legislative Branch — setting out in detail for the prospective investor the legislative and administrative measures taken by each country to attract and regulate foreign capital.

These studies deal exclusively wiih investments in agriculture, forestry, fisheries and related industries. The studies so far published concern Chile, Guatemala. Kenya and Turkey In preparation are studies on Argentina, Colombia. Ghana. Ivory Coast, Madagascar and Morocco. Other studies will also be issued later.

Ninety to 100 million tons ot it invade the Nile every year.

Dr. E.C.S. Little, an FAO weed control consultant, has set in motion a project in the Sudan to try to control the weed by gathering it by hand {and paying the workers with World Food Program food), drying it and spreading it m the vegetable gardens along the Nile as mulch and *tor* weed control. Tests are also being carried out to see whether it makes good compost, while the use of the hyacinth ash. rich in phosphate and potash, is also under study. Il may also find use as animal fodder.

Latest victim of the beautiful flower is the island of Java where it is taking over a large lake and stifling fish fife. Or. Little has been assigned lo Indonesia to investigate

ITALY

• *Substitute tar calves' ttommch*

• •.-. ;,. ihMs Irom 10 cooiitif ***tnmi*** m Rome in April **at *M*** consultation on **how • wortd thonage** of ranrun. **uMd « ch**u** making, **can** b* countered

Ranron. an enzyme from the fourth stomach of unweaned calves is traditionally used to coagulate or "set" cheesemilk. The available call veil rennet, or stomach lining. which producet it. cannot meet the industry s needs. Delegates discussed whether artificial enzymes now being tried can be made to act as efficiently as nature's product,

PHILIPPINES

• *Mow fithing vtimmet*

The *Ha$a HBSB.* British-built fishery research and training vessel, arrived in Manila recently where she will take part in *a* deep-sea fishery development project, financed over five years with nearly S4 million from the United Nations Development Program and managed by FAO

The vessel is equipped >or experimental trawling and livebait fishing and is fitted with the latest electronic «p**paratus** and fishing gear for locating **and** catching marine fish. The 70-ton vessel began operations in April, joining anoiher research-training vessel taking part in the projeci. the Japanese-built *Maya Maya*

Ttie Maya **Maya,** * *Jmpane$«-bmtt fsmarch Mining vessa! which it being useo in (ha Philippines* ***tlthtrits*** *development project* '

MEXICO

• *Changing Valtm dm Mmitfuitat*

A number *ot* food-for-work projects have been started in Mexico's Valle de Mezquitai under the banner-of DESMI, a nonprofit organization founded two years ago to (osier the economic *and social development of the 400,000 Otomi-speaking in* dians who live there.

These people, whosechronic malnutrition and extreme poverty are responsible tor one of the highest death rates m the world, still depend on a primitive system of agriculture for their living: Seventy percent of their land' only supports the hardier types of cactus life

One of their first necessities is water and three villages have been enrolled in a voluntary self-help community project to dig a 17-mile long canal which will bring into production 16,000 acres of arid land DESMI has also acquired a 120-acre farm started **a** pig raising program and next plans to build a small meat processing plant

TUNISIA

• *A model* agricultural college

The North African College of Agricultural Engineering, financed by the World Council of Churches, is due to end as a Freedom from Hunger Campaign (FFHC) project next year but the Tunisian Government has asked that the project, instead, be expanded and continued.

Located at Medjez-El-Bab, 40 miles southeast of Tunis, the college turns out every yea' about 50 specialized technical agents, several from Other countries of North Africa. It is the only agricultural college in Tunisia that gives both technical and practical courses in mechanized farming.

These specialists, trained in modern techniques yet workir.g closely with a peasantry still largely backward in its thinking, could become a vital force in the agricultural progress of developing countries. The Tunisian Government is planning to start three more colleges based on this model: one for forestry, another for livestock and a third for horticulture.

COLOMBIA

• *Improving tho fishing* industry

A four-year UNDP fishery development project went into effect in Colombia early this year. FAO specialists are advising the government on strengthening the fishery administration, developing the fishery industry and organizing research. The project, which costs nearly S2 million, w'll help to set up a national fisheries research and development center. Plans call for the delivery of a fully equipped fishery vessel for experimental purse seinina and trawling, and for research off Colombia in the Pacific Ocean and the Caribbean Sea.

MANY NEW FOOD-AID PROJECTS

A recent count showed pledges to the UN/FAO World Food Program (WFP) for the period 1969-70 amounting to just over $120 million, some two thirds in commodities, the rest in cash and services. This tola! represents slightly more than 60% of the target set at WFP's third pledging conference held in New York at the beginning of the year.

WFP"s governing body met in Rome in April to consider requests for food aid and to examine progress of operational projects. Projects approved, and agreements signed, this year have included:

... $534,000 to help farm settlement on an Afghanistan irrigation project (three years).

... $450,000 to help train more teachers in Algeria {four years).

...$436,000 to help rural development in the Central African Republic (four years).

... S5.9 million worth of coarse grains to help develop Indians poultry industry (five years).

... $800,000 emergency food aid to Indonesia in the wake of torrential rain and flooding (six months)

... $876,000 to help expand a farm settlement project in Iraq (three years).

... $262,500 to help provide meals in Liberian secondary schools (three years).

... $240,000 to help increase milk production and stimulate livestock improvement in Niger (four and one half years).

... $480,000 to Pakistan to help raise production sixfold from the Karachi milk plant (two and one half years).

... $145,000 for vocational training centers in Peru (three years).

... $672,000 to help increase milk supplies and provide cattle feed in Senegal (four years), with a further $714,000 going to self-help rural development (two years).

... $270,000 to help provide meals for trainees in Sierra Leone (five years).

... $423,000 to help build schools and extension centers in Somalia (three years).

..$510,000 emergency postwar food aid to Syria.

...$1,894,000 to Taiwan for an irrigation and flood control project ($1.2 million - (wo years: the balance - four years).

... $747,000 to help voluntary youth work camps in Tanzania (five years).

... $528,000 to aid the rural self-heip movement in Togo (three years),

-.$116,000 to help build small earth dams in southern Tunisia which will allow more cactus cultivation and. thus, more sheep fodder (five years)

... $840,000 emergency postearthquake food atd to Turkey.

... S198.000 to further help youth service camps in Zambia (two yearsl

... $434,000 to help build village wells, dams and reservoirs *in* Upper Volta (five years)

GHANA

• *Thirst* lor practical books

To help fill the need for technical literature in Africa, FAO jointly with the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) has been operating a project for the production and publication of manuals and text-books.

Sixteen titles have so far been released, the latest being an *Introduction to Agriculture in Nigeria* by Professor Oyenuga. Seven more titles wilf be published during 1968, according to a meeting of experts on book development in Africa, held in Ghana earlier this year.

KENYA

• 4-JtT *clubs shuw the* way to bettor farming

More than 6O% of Kenya's population is under 20 and one of the major problems of tomorrow wilt be to keep the country's young people on the land and out of the slums.

One Of the ways is through the 4-K clubs. The aim of the Clubs: to provide young people in rural areas with sound advice on all types of farming. The ultimate purpose: to prove that farming is a satisfying and profitable occupation.

Modeled on the North American 4-H clubs and started with United States funds. Kenya s 4-K clubs now receive backing from the Freedom from Hunger Campaign (FFHC) through the Unesco gifl coupon program.

There are over 1.100 4-K clubs scattered throughout the country wilh a membership ol some 30.000 mostly boys of school age. Club leaders are all volunteers who receive Iheir training from Ministry of Agriculture field workers under an FFHC plan, also financed with Unesco gift coupons.

The four Ks stand for Swahili words meaning unity, self-help, belter larming methods and Kenya.

Incomes Triple for Resettled Kenya Farmers

The Mwea/Tebere irrigation *settlement* ties about 60 miles northeast of Nairobi, close to the foothills ol Mount Kenya, some 4,000 feel above sea level. Il was started in 1955 to settle landless families Irom the *Cen*-Iral Province. By the end of the first development period in 1960. 5,000 acres of soil had_ been prepared,and divided into single acre units suitable for rice cultivation and had been provided with complete irrigation systems. The project involved a great deal of earthworks, mainly canal excavation and land fevelings.

By 1960. 1,200 landless African families had been settled. It was upon these foundations that the United Kingdom FFhC project was launched in 1964 at a cost of some $450,000. By the end of 1967 more than 2.000 additional acres had been developed capable of settling a further 500 families comprising about 3.500 people. A reception center to handle the rice produced on the new extension was completed in 1&6S. An efiicient development team has also been built up and «» »'" ment was therefore made with a commercial bank for them to be granted $140 house-building loans, repayable in three years from crop income and unsecured except by reputation ot the settlement. By the end ' of 1967 the farmers on the extension had received housing loans totaling some $55,000 and so far not one settler has defaulted on his repayments

By the end of the 1968/69 season when ihe whole extension will have been fully operational over its eniire surface for at least one crop, ii will have produced since inception 10,919 tons of paddy with a gross value of $750,000. An optimistic estimate of the annual wage in ihis area For unskilled labor working six days a week throughout the year (such steady working is, however, unlikely) amounts to $115.

Tenants on the Mwea/Tebere scheme earn an average of $350 annually.

In the words, of a senior agricultural officer in Kenya, the setting up and operation of Ihis irrigation scheme have been " nothing less than an agricultural and social revolution." When the settlement started, very few people in Kenya knew anything about rice production With the exception of two senior agricultural officers seconded to the scheme, everyone Irom senior officers down to the most junior member of the staff had 10 be trained locally. Not only is the crop new to Kenya, but there is no tradition of irrigation in Kenya. An immediate task was to find men who could absorb the basic rudiments of technology and who also had the personality and the leadership to pass on their knowledge to their |uniors and to the settlers themselves

The people settled under this scheme are a rural proletariat- They have come 10 these lands with nothing; most have never engaged in anything but the lowest subsistence farming Now. almost suddenly, they find themselves on an irrigated holding. They *are* taught to grow a crop they have never seen in more water than tbey knew existed They have become members of a team working within a highly organized, centrally controlled agricultural system, They are the targets of a concentrated program of agricultural education and information

Like many other countries in Africa. Kenya is faced with a formidable population expansion and with land hunger. This scheme provides a partial answer irrigation brings new land into cultivation, Jusi over ten years ago. Mwea/Tebare was a semidesert, seasonally grazed by a lew cattle. Today, it supports » m « 15.000 people.

***The irrigation scheme trtpfliW on*a(sr** *from two n/ers rising in Irug Mount Kenya foothills. Water pours through an intake canal irom Ihe Thiba river*

in the field
in tKa f sald
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in the field

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Asian Drama by GUNNAR MYRDAL

This is not a book like other books, which will be read and then put away on the shelf. Gunnar Myrdal's *Asian Drama* will live with us whenever we contemplate, discuss and argue about the problems of Asia and other underdeveloped areas.

It is a synopsis of all the manifold factors which have created south Asia as it is today, and which will shape its future. It is an honest book, written by a western economist who knows the difficulties of objective evaluation and the possibilities of bias, and who feels a compulsion for searching his own soul. It is written on the basis of worldwide experience and with the same methods which made Myrdal's *An American Dilemma* one of the most profound social analyses of its time.

The book will help Asian governments to understand the uncertainty of their present position, which is difficult to defend against the evils of the past and from which it is difficult to ensure the way to a better future. Myrdal says, in the chapter on agricultural policy, that the Asian countries now have the worst of both worlds: they cannot realize agrarian reform and cannot carry out efficient agriculture. In another chapter he talks frankly about the corruption which marks the atmosphere of south Asia (and other underdeveloped regions).

The developed countries will recognize the not very Mattering role that they have played in south Asia during the last few centuries, and even today. Myrdal stresses the weaknesses of their present policies and their bias in evaluating the reality of south Asia.

One of the great advantages of Myrdal's inquiry is that he brings out the divergency of western and Asian values and the great differences in development. When the western world understands this fundamental aspect of the development problem of Asia — and when western vested interests, looking for profitable solutions, discipline themselves or arc disciplined — then there will be hope that European and American aid and advice will be useful.

Gunnar Myrdal says that, generally speaking, the western approach is abstracted from most of the conditions that are peculiar to the south Asian countries and which are responsible for their underdcvelopment and for the special difficulties they meet in developing.

The unique importance of Myrdal's inquiry is the decisive questions which he poses to himself, to the reader, to governments and to the international agencies.

The central concern of *Asian Drama* is with the problems of economic underdevelopmcnt and development, and with planning for development. The starting point of Myrdal's study is recognition of the fact that pure economic analysis can never be successful. Distinctions between "economic" and "non-economic" factors arc artificial at best. The only worthwhile demarcation is between relevant and less relevant factors and the line of demarcation will vary with the characteristics of the environment in the study.

The whole inquiry has a strong institutional emphasis. The starting point is the incontrovertible fact that the basic socioeconomic structure of south Asia is radically different front that existing in advanced countries. The problems of development in the region call for induced changes in the existing social structure as a continuous development. As this structure does not change spontaneously, or to any great extent in response to economic policies, far-reaching institutional reforms become necessary.

This point is of utmost importance since the bias for purely economic solutions is very strong in the official policies of bilateral and multilateral programs.

Gunnar Myrdal writes: "The essential first step toward an understanding of the problems of the south Asian countries is to try to discover how they actually function and what mechanisms regulate their performance. Failure to root analysis firmly in these realities invites both distortions in research and faults in planning."

If the United Nations organizations, particularly **FAO,** were to draw one conclusion from Myrdal's inquiry, it would be recognition of the urgent need for an intensification of institutional research in order to ensure proper guidance for development programs. It is not sufficient to assert qualifications and reservations meant to take into account factors left out by conventional economic analysis along western lines; what is needed is a framework of theories and concepts that is closer to the realities of south Asia.

A study by Gunnar Myrdal always begins with a set of selected value premises. Any such study must look at the problems from the standpoint ,of the interests and ideals, norms and goals that are relevant and significant. Myrdal has selected new values directed toward modernization. This "modernization ideal" was impressed on the nations of south Asia at the dawn of their independence and has become the official creed, almost the national religion; Myrdal sees in it one of the powerful strengths of new nationalism.

An important element is the need to apply modern technology to increase productivity. Other elements which he feels should accompany such modernization include social and economic equality and improved institutions and attitudes.

The last is the most striking for it comprises the ideal of a social revolution aimed at the creation of the 'new man,' the "modern man" or 'citizen of the new state'. Such a man, he feels, must be efficient, dedicated, orderly, punctual, frugal and honest. He must be able to make rational decisions, be prepared for change, alert for opportunities as they arise, enterprising, cooperative and. most important of all, he must possess integrity and self reliance.

The chapter on the problems of labor utilization is of the greatest importance for all students of south Asia since it places the industrialization issue in its proper perspective. Myrdal states that only intensification of labor in agriculture can take care of the population's surplus during decades to come.

He says that a variety of institutional pressures have coalesced to induce spreading of the workload, while both traditional and modern factors have operated Ui restrict the members of the population regarded as **legitimate job claimants.** The net effect* of these forces has been

M

to suppress growth in output per head.

With respect to the population problem, Myrdal does not believe that conditions in south Asian villages are particularly favorable for awakening a desire to limit the number'of children. He rightly recognizes that the setting of Asian life is such that children are expected to fulfill obligations to parents more than parents to children. However, he forecasts dramatic changes in Asian governments' interest in the population problem and feels that by the beginning of the 1970s government programs for family limitation will be in force in all south Asian countries.

(n Jiis prologue Guonar Myrdal writes on the concept of drama and explains why he chose *Asxin Drama* as the title for his book. .He draws a distinction between the classic conception of drama and real-life drama. He says: "In life, while the drama is still unfolding —- as in the practical phase of a study, when policy inferences are drawrl from value premises as well as from premises based on empirical evidence — the will is assumed to be free, within limits, to choose between alternative courses of action. History, then, is not taken to be predetermined, but within the power of man to shape. And the drama Ihus conceived is not necessarily tragedy." We can only pray that it may be so.

Erich M. Jacoby

Asian Drama, An ***Inquiry*** *Into the Poverty of Ntiiii>n\,* by Ciunnar MyrJnl. rwemieth Century Kund and Punthcon, New York, 1%« nhrec volumes. 2.284 p.). SN.5O for 'he three **volumes.**

Other reviews of ASIAN DRAMA

Heralb (Tribune

Swedish economist Gunnar Myrdal Contends that economic development efforts in south Asia will not succeed until there is a social revolution.

Aid from the west can be of only marginal help, he believes, until countries such as India carry out radical reforms in agriculture, education, population planning and similar areas.

-Basically be believes that the Asian countries have been mistaken in attempting to adapt western approaches to many problems deriving from their particular historical circumstances.

He is especially critical of education, or what he terms "miseducation," and contends that the emphasis must be on quality rather than on mere quantity.

"Throughout soutb Asia there is a traditional contempt for manual work, and the educated tend to regard their education as the badge that relieves them of any obligation to soil their hands," he writes, noting that this attitude "is a very serious obstacle to development."

Western countries err in their judgments of Asian socialism, which is a "rather vague term for the modernization ideology," Mr. Myrdal asserts. It applies mainly in areas where there is little private initiative and nowhere has it extended to the collectivization of agriculture. Nevertheless, economic inequalities have increased since independence...

The Times of India

... Professor Myrdal is right when he says thai the western concept of employment "has little meaning in a society where, in the absence of a dole, the pressure of economic distress forces everyone to find some means of support, where the labor market is not fluid, where many persons of working age are disinclined to engage in physical labor and where standards of work performance are very low."

What holds down labor input and efficiency is not lack of capital but lack of stamina, ignorance and the deadweight of tradition.

Again, Professor Myrdal is not the first to point out that "without any technical innovation and even without investment other than longer and more efficient work, agricultural yields can be raised substantially."

But who is to provide the stamina? Very often the tenant or the sharecropper is not even sure how long he is going to stay on the piece of land he tills and he is afraid that the more it grows, the greater will be the rent he will have to pay. So he just docs not put his heart into his work, much less invest in the land he tills.

Professor Myrdal is not the first man to say that absentee landlordism must go. The planners have said it for 18 years. But no party has been able to muster the will to define "personal cultivation" in a way which will make it impossible for absentee landlords to resume land only to lease it out to tenants or sharecroppers.

Professor Myrdal is a radical. But out of sheer frustration he concludes that radical land redistribution, however desirable, is not politically feasible in south Asia today. So intead of paying lip service to the slogan "land to the tiller," he tells us, we will do far better by making "a deliberate policy choice in favor of capitalist farming."

Those who invest in land and make *a.* good job of it must be allowed "to reap the rewards of their efforts." Absentee landlords must be penalized by heavy taxes. And nonfarming nonresidents must be barred by law from acquiring land.

The government, is, of course, too timid to admit in so many words that it has made such a policy choice. It is inhibited by all that it has said in the past. But a choice on these lines is already being made, particularly in areas where the new • agricultural strategy is at work.

For the first time those who have money know that investment in agriculture, if made with care, can be more paying than in industry.

...Professor Myrdal almost despairs of the system. "Under the present southeast Asian conditions development cannot be achieved without much more social discipline," he writes, and adds that "an authoritarian regime may be better equipped to enforce social discipline." But then even he is careful to point out that the existence of even such a regime "is no guarantee of this accomplishment".

...The question here, as in most democratic countries, is how to make the system more responsive to the true needs of the people. As far as India is concerned the people will accept a far greater measure of discipline if the political parties do so. They have to put a curb on their greed and their petty rivalries and achieve some sort of consensus *s** issues which have a direct bearing on productivity and efficiency.

Only when they do so and limit the area of political conflict will the open competition for power become meaningful. Until that happens there will be no escape from mushy thinking or mushy planning.

Afiman Economic Development

by William A. Hance

Analysis, and forecast are the economist's major weapons. Let him rejoice as he open* Mr. Hancc's book, for pages 220 jnd 291 offer magnificent tables listing the symptoms of the ill!; afflicting Africa; aridity, political uncertainty, lack of roads and tribal rivalries — 33 countries, 10 parameter* and the pattern js analyzed. Then comes the treatment; agriculture, tourism, water power, each remedy marked from I to 4, Finally, the short- and long-term prospects, duly weighted and ready for the computer. If everything were that simple, what happened to Kansas and Oregon two centuries ago?

The reader knows from the foreword that this book is based on notes prepared by a study group dealing with United States foreign policy. A good hatf **of** the chapters, written more than ten years ago, have been compiled from documents rather [tun (kid investigation v Facts and figures are plentiful, [lumen in very extended order like a disjointed course of physical, economic and political geography (Norih and South Africa arc absent, and countries such as Nigeria. Senegal and Ivory Cotii arc given only u few paragraphs).

Nevertnelesv Mr. Nance's book is worth reading despite its ovcramhiijou* title and lack of homogeneity. Indeed, ii-includes integrated studies on three big pilot projects for development of the vasl cortlincnt — (he Gezira-Managil irrigaiion network in ihe Sudan, hydro-elect ric development of the Volta river in Ghana and the iron **odnfefl** complex in Liberia.

The Sudanese irrigation system, covering about 600,000 hectares, has made the Sudan one of the world's leading producers of long and medium-siLipk- cotton.

The Akosombo Dam, the aluminum plant and ihc pori of Tema have lurried Ghana into one of the worlds principul producers of aluminum. Libcrian mines are among the foremost supplii:r> of rieh iron ore for the iron and stcct industries of L-urupc. North America and e\en Japan. In each case, total investments amount to hundreds of millions of dollars. The author examines the s iehsUudes of such financing in the light of fluctuations of world poll lies and lhe effect on the infrastructure of the country and its general development (employment, living standards, balance of payments).

Sun, waier, earth and the peasants' labor in the Sudan, (he power potential of the Volta river in Ghana, the riches of the subsoil in Liberia arc supplying the developed world with raw materials and *arc* giving Africans a fighting chance. Here are three examples of development in which Africa is furnishing its riches in the foTm nf raw material to the industries and consumers of the rich countries. They are well chosen as examples, considering their technical success and their value,

Bu; from the point of view of long-term strategy ii is important to analyze how some of these undertakings threaten to increase the vulnerability **of** the countries benefiting by them because of growing jridchiL-drtcss and un suit led markets.

To achieve greater independence, I.iberia will have to process her iron ore one day, creating a big African iron and steel industry and sdling machinery tit Africa ;tnd ihe world Likewise. Ghana which, incidental!), LISCN **fcflotMt-horai** to process imported aluminum and di*> not. ycl enploit her own bauxite, will one day have to produce aircraft bodies and engines rather than aluminum ingots.

This poses the problem, among many others, of market size. Mr **Huetflboot** devotes a very instructive chapter to the integratiim **eflbftl** of I'.ait Africa. Kenya. Uganda and Tanzania arc endeavoring to set up a viable regional economy amid a thousand difficulties, of which politics is not the least important.

Strategics defined by (he Charter nf Algiers, which possess the great merit of having been drawn up hy qualified representatives **of** the poorer countries, illustraie and conclude the data supplied by a book such as ihis: which justifies iheir fundamental claim to recognition and independence.

Taking this into account. Mr. Hanw's book can serve as reference if Africa^ leaders will forget his too frequent objections to the Africanization of the superstructure.

Raymond Aubrac

African Economic ***Development*** **by William A. Hwcc;**
Krcderick A. Prater. New Yori. 1967 (J2* p.)

FAMINE 1975

by William :intl l'uul Paddock

Population expansion and stagnant food production in the underdeveloped nations are on ;i t:.>llision course. Serious **E&nrfOM** itud itccomptinying civil disorders arc **Inevitable** by 1975. With no possibility of producing the needed food and no **Other** production to finance importation of it. the hungry nations with have to rely mainly on the U.S.A, (or supply of food on noncommercial terms, state the authors. But even the massive production capacity of the United States will be inadequate and hard choices will **btvt** to be made as to who doe* and docs not receive food — in other words, what people and what nations may **Uffvivi**

Statistics and **tnatywi** de\eloped in Part I show thai the relationship between population and food *upplv in much of the developing world is already unfavorable People .ire hungry now and by 1975 will be starving — a time of famines, perhaps lasting for decades, will have begun. The authors argue that **a past** tendency to underestimate population increase and overestimate food production suggests that famine is **neaftf** and likely on a more massive scale than UN estimates, indicate.

While medical advance continues to lower the death rale, the hirthrale remains siahk- or rises. For a variety of reasons, hopes of substantially limiting *poptilntkia growth* arc *something far the* future. The authors dismiss the risibility that any of the already known means of increasing food production can h;tw ^utlKicnt impact by 1975. They conclude their analyjjj ut [he situation in the himfiry world by looking ;it factors outside the agricultural sector which affect **food** production. H crCi **top,** they find little **ground for opfaafcnt** *

the possible **contribution ol** the developed wiirid **to ftUeviaiioj Euoioc b considered** in Part II. Potential suppliers .iit.[1] the I .S. V. Canada, Australia and Argentina but, to dale at least, only the I'ruted States has .shipped substantial **quaot&ea** on **I** noncommercial basis. This position is seen as continuing due to the likely availability of commercial markets large enough to absorb the production of the other thrte countries

Given the situation of insufficient United Staler food supplies to meet the needs for shipments to all the hungry nations, the authors in Part MI of their book give their views on how the decision should be made as to which nations receive food. Drawing an analogy with the situation aL an overextended field medical station in wartime, the authors propose their system of "triage." Wounded coming to such stations arc classified as: (I) **QBB.1** be saved and thus no point in medical attention; (2) walking wounded, in puin but can wait for t re ii I men I: and (3) seriously wounded but ean be saved by prompt medkal treatment.

The rent merit of the book is that it draws attention, in dramatic terms, to the increasingly serious population food suppl> proHkin .irul this is tin- first **step** in bringing about action to deal with it. While the various aspect* of the **problem** arc cxtiemd) complex and difficult tu quantify, there CM he no doubt **about** the general conclusion lhat Famines li. ahead — only the timing and extent are debatable.

Unfortunately the text of the book is interspersed with rather subjective judgments, or at (cast judgments based on inadequate in format ion. on what counirics will do. Two examples, one from the developing and one from the developed world, arc illusimtivc: (!) United Arab Republic, p. 4K/ 49 — "The Aswan Dam is only a dcluskm uf progress; its new land will be farmed in the same old **Wtya** In **the** same old fclihins procrcaiinj; .7* *always wiihnul effective ifficia) support* to curtail family size;" (2) With **reference** to the contribution of Canada. Australia and Argentina to feeding the hungry nation*, pages 130 and **131,** "(c) f **veil** if they coutd afford generosity it that level, these countries have not yet developed within their governments ;ind citizenry a sense of moral duly, and this comes slowly. There is little evidence that this **exists** todaj **even** ut a rudi**meatfUj level.** During l9r>2-64 Canada shipped only MHMMX) tons of wheat and Australia only 50.000 tons on a noncommercial **basis,** insignificant amounts in comparison with the I3,5()O,O(X) tons shipped by the United Slates on a noncommercial basis during the same period,[-s] Such judgments can lead to a sligluly more pessimistic forecast than may be justified.

Mnre serious, however, they do not add to the reservoir of goodwill among **nation** which is absolutely essential in dealing with crises of the magnitude predicted by the authors and, eventually, iii achieving ***a*** better world for all. Nor does an unfavorable judgment, valid or imiilid, necessarily lead to the kind of action needed to improve the situation.

It b the third par: of the book, where the authors put forward their proposals as to how the U.S.A. should deploy its food resources in time of famine, that is most contentious. Here, the authors seem to be advocating on the part of the Uniied Stales the nationalism" dicy' deplore in the developing countries. One wonders, for example, if it would be in the best interests **of** the fnited States, **in lima of »idoprcad** economically, politically **and** vxially disruptive famine. **u> reserve for iivJf the decision** on how **•IN Toad wpptm would be** shared with **the** needy **rutjoitt of the** world. Is it pojkuHc **thai the authon** underestimate the degree **of inieruiioaftiiMii** prevailing in the United **Stale* is** wggesting that it would do so'.'

It is to a ainsiderablc extent the time factor — target date I<J75 — which leads to the extremely pessimistic conclusion of the book. Governments in the newly developing countries are acquiring increased experience and arc also increasingly appreciating the need to give higher priority to agriculture in their development plans and allocation of resources. Their capacity to make use **of** the findings of studies is, in effect, increasing. Then, *loo, action in'tttalctl* in *a number of developing* countries, including India, in tlie last few years may begin yielding results even before 1975 and thus ihc crisis may be on a lesser scale than predicted by the brothers Paddock.

O.C. Kimmei

Fvminr I<*75 **by William and Paul Paddock Uttle, firown and Company. Botton. (276 p.).**

Weather and Agriculture

Edited by
James A. Taylor

The primary demand for weather science came from agriculture until the sudden needs of aviation in **wartime** and in peace gave a very expansionist impulse to meteorology.

Those or us who are concerned with Food production art. on the one hand, grateful for a tremendous progress in weather observing, reporting and forecasting which could not have been achieved without this outside influence and, on the other, envious of the amount of attention given to this upstart and vociferous consumer of meteorological informalion.

A result of this new situation is a fairly widespread lack of exchange between jgrLuhural and mett't>mlop.ical **MCVfctt,** especially in developing countries.

Efforts are now bring made to remedy this, greatly facilitated by a giowing desire on the part of national meteorological services to diversify now that the aviation pressure is relaxing, Nowadays meteorologists tend to rx- **ptayddMB** and niLiihemalicians, rather than naturalists, but geographers have also come to the rescue. A shining example of the effective help they can render in ihc development of agricultural meteorology is the work of Dr. James A. TayloT at the University College of Wales in AberyMwyth.

Yearly symposia **htve** been held then? *since 1958 on varitxj*. j\pcci\ of* agricultural meteorology and. from their proceedings (Memoranda 1-Rl, Dr. Taylnr has selected some notable contributions rearranged under the headings of: The Imironmeni; The Hazards; and Productivity.

1 his » an excellent book. Its contents apply primarily to Wale* and. more generally, to temperate regions, bill there is nevertheless much in it of benefit to anyone concerned with the rational d©. i L-I op men I of agriculture in warmc^ and drier climates.

For instance, the climatic factors which favor the incidence of sheep liver fluke or of potato blight are sensibly the same :ill **OWW** the world; and the tipper air Liirrcnts which carry the spores of rusts affecting cereal* are part of a global atnuv spheric circulation which can link the Atlas with the Caucasus.

Developments in ecology[1] Ian integrated consideration of aJl the factors of the environment) and in operational research (ivhich give dimensions to hitherto subject ive impressions) discussed *in* cftis newt, lend themselves to extrapolation for work in developing countries, However, the process cannot be automatic. Sensible adaptation, which requires local knowledge as well as outside know-how, is essential.

J.A.M. Cochtmf

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ceres

Cetti wm ;id opted as the name of this review because of its close association with agriculture, **partjartariy** the growing of food crops. ***Cats,*** the Roman version of the Greek goddess Dcmeter, has its equivalent in most languages just as ***Ceres*** herself, symbol of agriculture and representing mother earth, has her equivalent in most cultures.

Roman ***copy of a*** Greek ***status o! CERES ol thv Stfi century BC.***

By the beginning of the Roman Republic, Sicily was known as the center of the worship of both *Ceres* and her daughter Persephone. *Ceres* herself was then considered as the most ancient and venerable of all the gods and goddesses. During the famine which ihc Romans suffered after the expulsion of the Tarquin monarch*, the dictator Tulio Postumio consulted the Sibylline books which advised that the worship ol CY*res* should be established in Rome. A temple to ***Ceres*** was therefore built in 493 B.C. on the Avcntinc hill (near the present site of FAO). *Ceres* was then regarded as the goddess of food grams and patroness of the corn trade.

Ceres also adopted Triptolcmus. thu son of Celeus, and initiated him in the **Htl** of agriculture. He became identified as the deity of agricultural crafis. iimi in some legends is named as ihc inventor *i**f the plow.

The attributes of *Ceres* arc chicfty connected with her position as goddess of agriculture and icf&taihm: cars of corn, the poppy, the nnstic haslcel (kalathos) filled with flowers, corn and fruits of **all** kinds, the pomegranate being espcti.ilh common. As the earth goddess she is often associated with the snake, myrtle, asphodel and **IHirlliui**

Letter to the Reader

Raising over a million dollars in SU ***yean*** *to help thirty leper colonies is not enough for Cardinal Leper, Archbishop of Montreal fit- b leaving* Ms *high office and the affluent society to go and ttnd the lepers in A irk a, [M]Beatin$ the drum to raise funds is easy. It's going down there that's hardest," he says.*

This is an example oi self-denial, of starling over from the ground up, thai commands respect. The Cardinal is sixty-three years old.

Two authors appearing in this number of CERES deal with the same problem, but from a different point oj view. Jan Tinbergen and Janez Stanovmk believe that development is only possible through the establishment of a global plan. "Coordination and cooperation." they say.

Those convinced of the need for action to he fa the. undtr privileged of rhe third world, honest citizens of the industrialized societies, gravitate toward the kind of hmtu-diair and personal solution chosen* fry *the Cardinal. Action, especially if followed by results — however slight — ts far more satisfying to the individual than the most brilliant theory*

One of the most frequent criticisms of aid efforts is that local and uncoordinated action i\ like pouring water into a Sieve. Aiding ten families, or a village, ***to produce*** *more cassava, or rice, falls iar thort of the takeoff of tin entire economy. In other words, the act of charity mti* ***rooUu*** *the giver's conscience, but r)t>! the recipient\ anxiety for the future,*

Wltat should we do then' Which is ***the*** *right choice?*

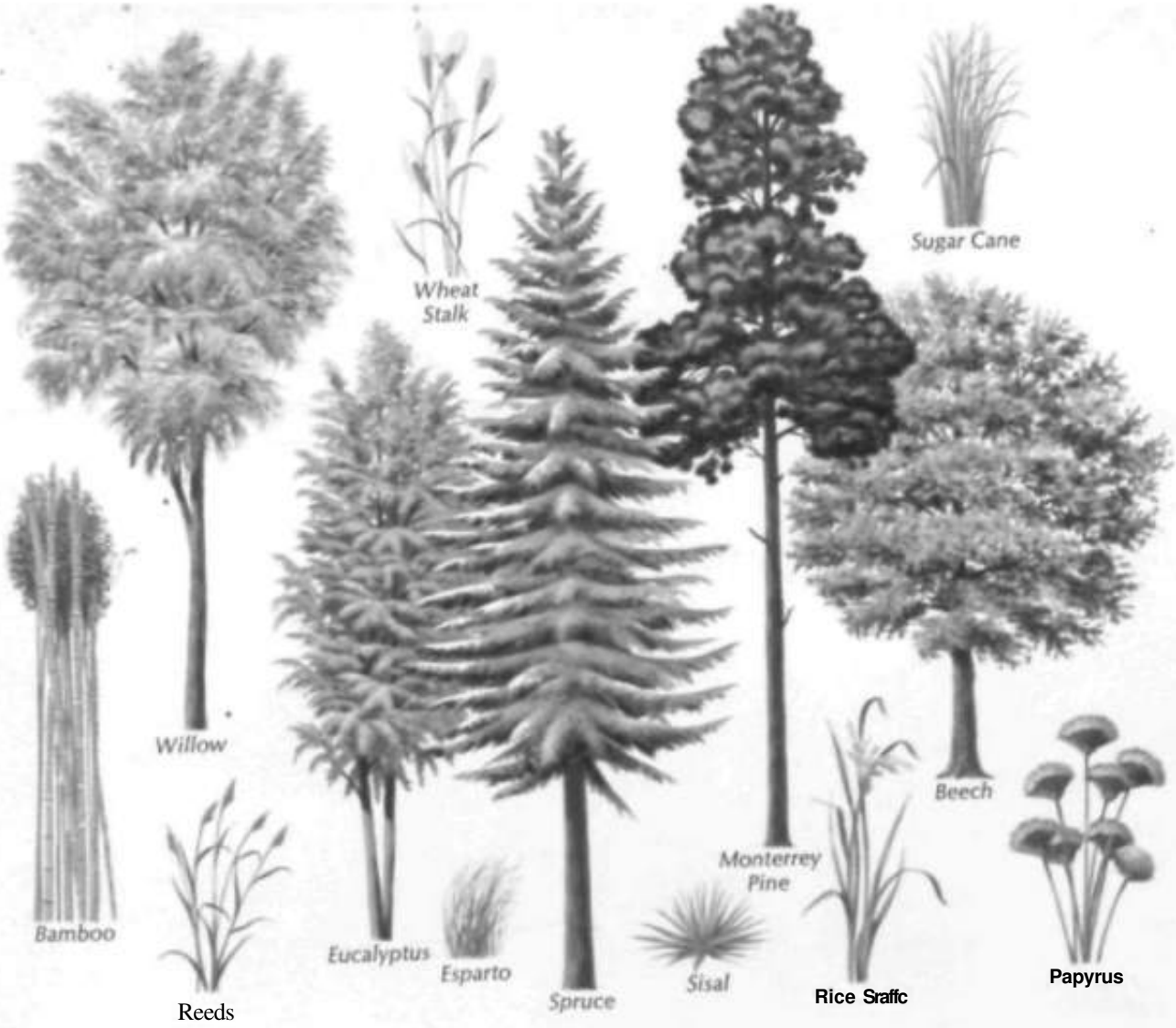
Above all, we must not try to "hide behind one's finger," ;< m old Greek proverb puts it. To evade reality through grandiose plans ***WOtdd*** *be* av *harmful as not having* ***a*** *plan at all. The integration of ail thr significant elements within thr* ***ttmOrne*** *of a global development plan, handled with realism but with the visionary's faith as well, seems the only effective course open to us.*

*The elaboration of a plan that wilt be useful to billions of people is an ardt4uu\ tu<,k Wr ran see from th< **OMOet** the quantitative problems: itatheriny an enormous volume of statistical data on a country-hv-country basis; analyzing it; and determining the order iff priorities and objective *

Yet the qualitative aspects are no less complex. Understanding by the planners of the poorer countries' present and future needs, and of the resources which are, or may be available to meet the needs must form the basis for thi> development plan. Who can product suck a plan if not the countries themselves, working within the United \ati»ns*

Moreover, now that there is hope of an imminent end to the conflict in Vietnam, the positive factors favoring a world-wide plan acquire a new element: the possibility of an immediate, or at (east rapid, shift of the fore ***o) datrttetk* to*** *forces for the advancement of the underdeveloped roum*

Ec ***mambU*** *are the firu to realize that reality* ***t*** *more complex and more uncertain than the forecasts and targets planners work with. Unfortunately, the pessimists amongst them httvt nut often hern proved wrong, the* ***prospect*** *of peace should now give the optimists their turn.* A, Biru



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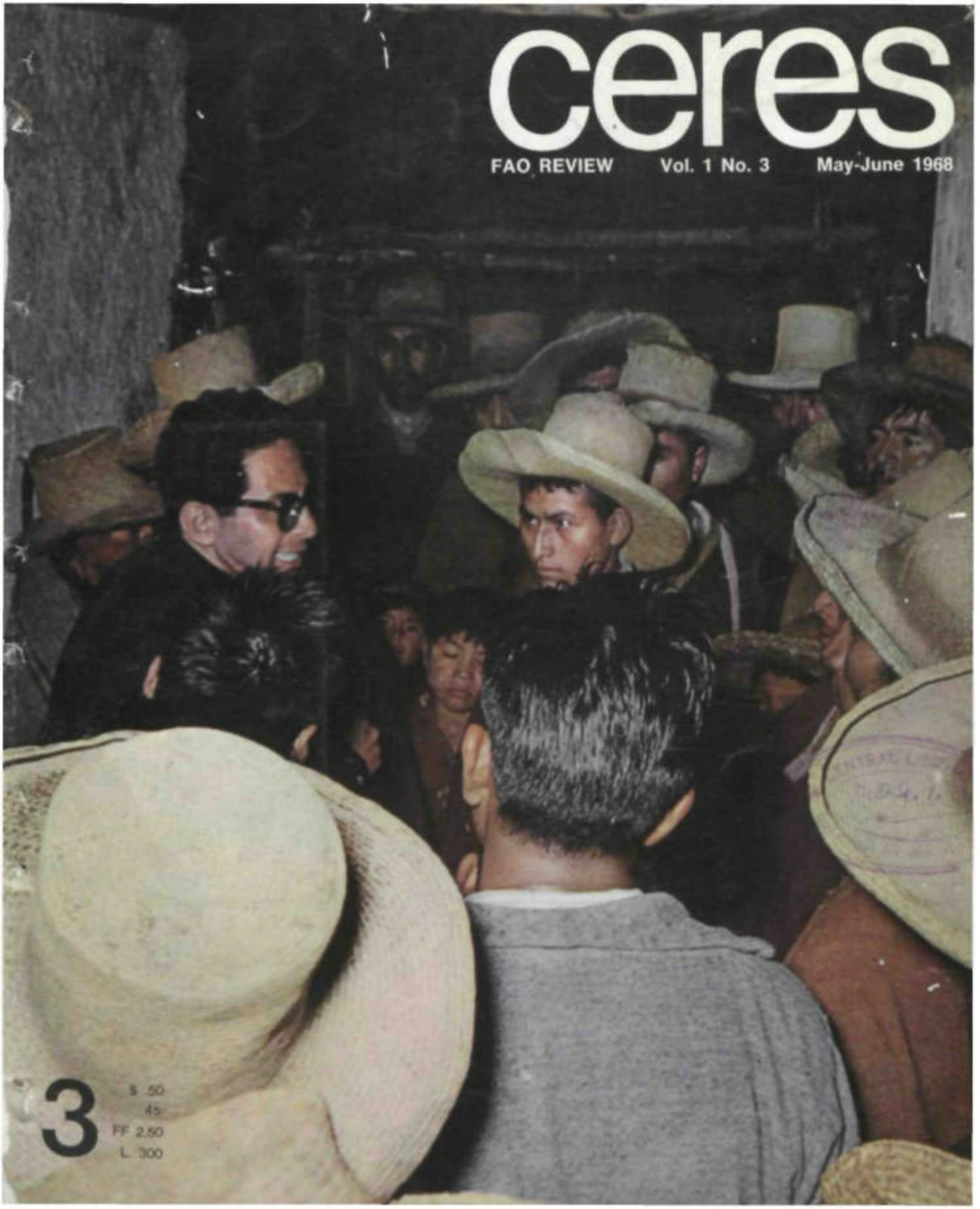

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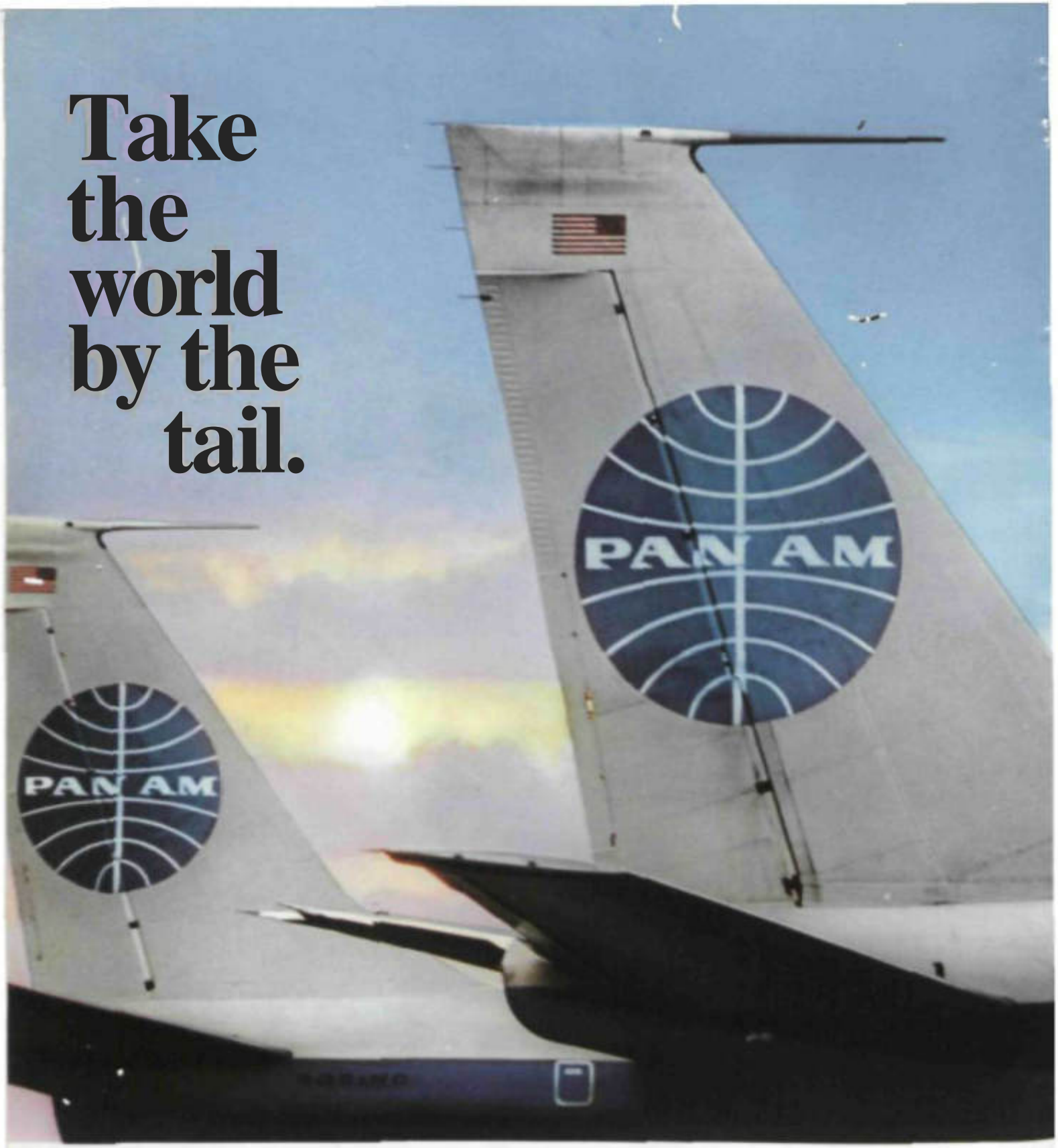

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VOL. 1. NO. 3
May-June 19W

Published bi-monthly by the Food and Agriculture Organization
Of the United Nations

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RttDDnjibtr lor tlvm Spin'(A edition
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Chile is one o/ the few *countries where an active land reform program i$ being carried out. It is also* a *country where intensive post-land reform activity is under way. The article by* Jacques Chonchol, on *page 41, describes the organization of the Chiiean farmers into a cohesive whole, able to make their presence felt in the development process.*

Another aspect of farmer organization can be seen in the article, on page 32, by Derek Bryceson. *A country tike Tanzania needs aid but should be, as much, as possible, independent ol outside assistance, he says. Such self-reliance can only be gained by the efforts* of *the peasant farmers channeled through cooperative societies.*

One of the world's foremost economic planners, Jan Tinbergen, *describes the slow growth of national and international planning toward a new worldwide development plan in his article on page 19. He advocates the cooperation of all the specialized agencies with the UN'S Center for Development Planning, Projection and Policies in the preparation of a framework tor a global master plan.*

The logical outcome of UNCTAD 2 is a rather simitiar strategy for global development, according to Janez Stanovnik, *in his article on page 50. Such a strategy would be dependent upon the Unking of national and international effort, and on the adoption ot adequate social reforms and policies in the developing countries, he says.*

The way in which four African countries are working together to develop the Senegal river is a very practical example of national and international cooperation, Robert N'Oao, *who has worked with this project since its earliest beginnings, is interviewed on page 22.*

Jacques CttOflChol

flirt* Bryceson

Jsn TfnberQ

jMfttl Stmnovmk

Gunnmr Myrdal

Another example of successful cooperation is the industry-backed program to increase fertilizer use *in some 22 countries, now in its eighth year. A modest sampling lrom this program can be seen in the picture-story of a woman's lonely assignment in Ecuador {page 36).*

Practical help for such programs can be given by FAO's new documentation center (page 25), which may soon blossom into a network ot interconnected centers. Too much valuable information has, in the past, been lost in the archives, says the article. Now, technical assistance experience can be quickly brought to bear on specific problems.

Help of a rather different kind is offered by a private organization which is attempting to act as a bridge between the viilage-ievel and industrialized societies. E.F- Schumacher *explains the meaning ol intermediate technology and what his group is attempting to do in an interview on page 29.*

WNHan Payne, *an expert in animal husbandry, suggests a new kind ot research, oriented toward the problems of the tropics, in his article on page 46. Such 'meaningful' research would encompass both sociological and technological aspects and should be launched from new regional research-cum-training centers, he says.*

1963 may weft be remembered for the publication of Gunrtar Myrdal'* *• Asian Drama " a three-volume exploration of the growth processes ot that vast subcontinent. The flavor of this frank and realistic appraisal can be caught in th& book review on page 60 and in echoes from the world press on page 61.*

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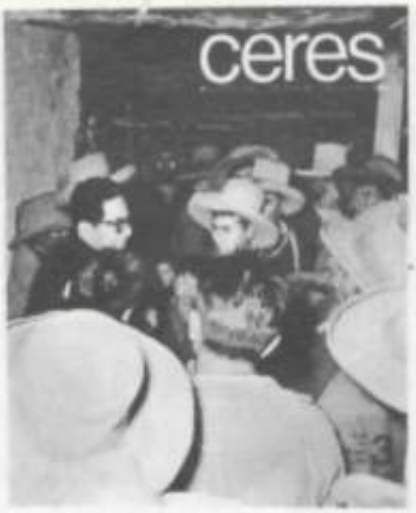
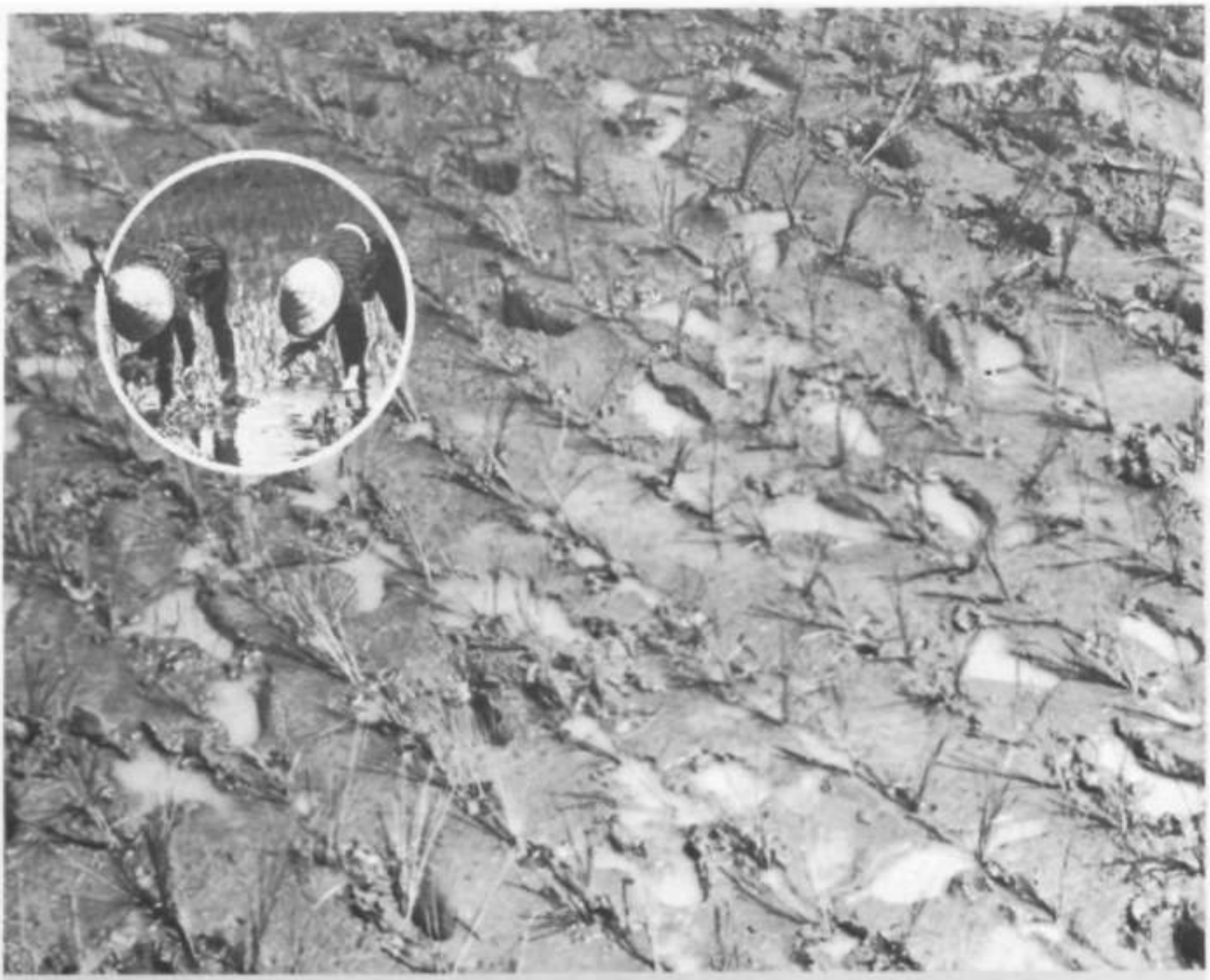


Latin American farmers must form their own organization which can act as a fulcrum for national development. From the anonymous mass of peasantry must come the natural leaders of social change, says the article on page 41. (Photo: A. Pittet).



FOOTPRINTS in the Rice Fields...

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AFRICA

• *Etnt Africmnm and EEC talk tf*dm*

Negotiations between the European Economic Community (EEC} and 18 African associated states (mainly in West Africa) for a renewal oi the Yaounde Convention startad fn May.

Similar negotiations for an association agreement are also under way between EEC and Kenya, Tanzania and Uganda in an attempt to strengthen EEC-African links. Previous negotiations were halted eighteen months ago following the inability of Common Market countries to agree about the products on which ihey wanted preferences; also because of the East African states' refusal to accept the principle of preferences (or Common Market products in return for duty-free entry or East African goods into EEC countries.

The European Community has n°w presented to the East African stales an "indicative" list of widely assorted items for discussion and selection.

• *African mtatm* farm reg[illegible]na union*

The Central African Republic Chad and the Democratic R^puWw: of th« Congo **grouped** iog«tf*r **last** month **njzsbon th»** Unton **o4 Central** ***Mricm*** States.

The agreement was signed **m Fort L*«y Chad** & President Joseph **WotMJtu** *at* **Ift***

Union In Attica: Presidents Josepft Mobutu, Jean-Beds! Bokassa and Franpois Jombaibaye agree to form Jnte Union ot Central African Slatgt

Democratic Republic of the Congo, President Jean-Bedel Bokassa of ihe Central African Republic and President F ra ncoi s Tom ba l bay e of C had.

The new union will, at first, be primarily one Of economic cooperation, with the emphasis on customs and transportation.

The new regional grouping covers an area of over 1,60X5.000 square miles and contains a population of 21 **million,**

• *Now Morocco tlva-yomr piait*

Morocco has just revealed its new 1968/72 five-year plan. It calls for a total investmeni of $1,000 million. Nearly half of the money will be spent on dam building and agriculture. When completed, the plan should increase national income by 6 percent, Forty percent of the costs will be financed from abroad and $200 million in foreign participation is already assured, according to a report from Rabat.

• *Gtiinm* off arm naw oponiitg* for tnvamtoi***

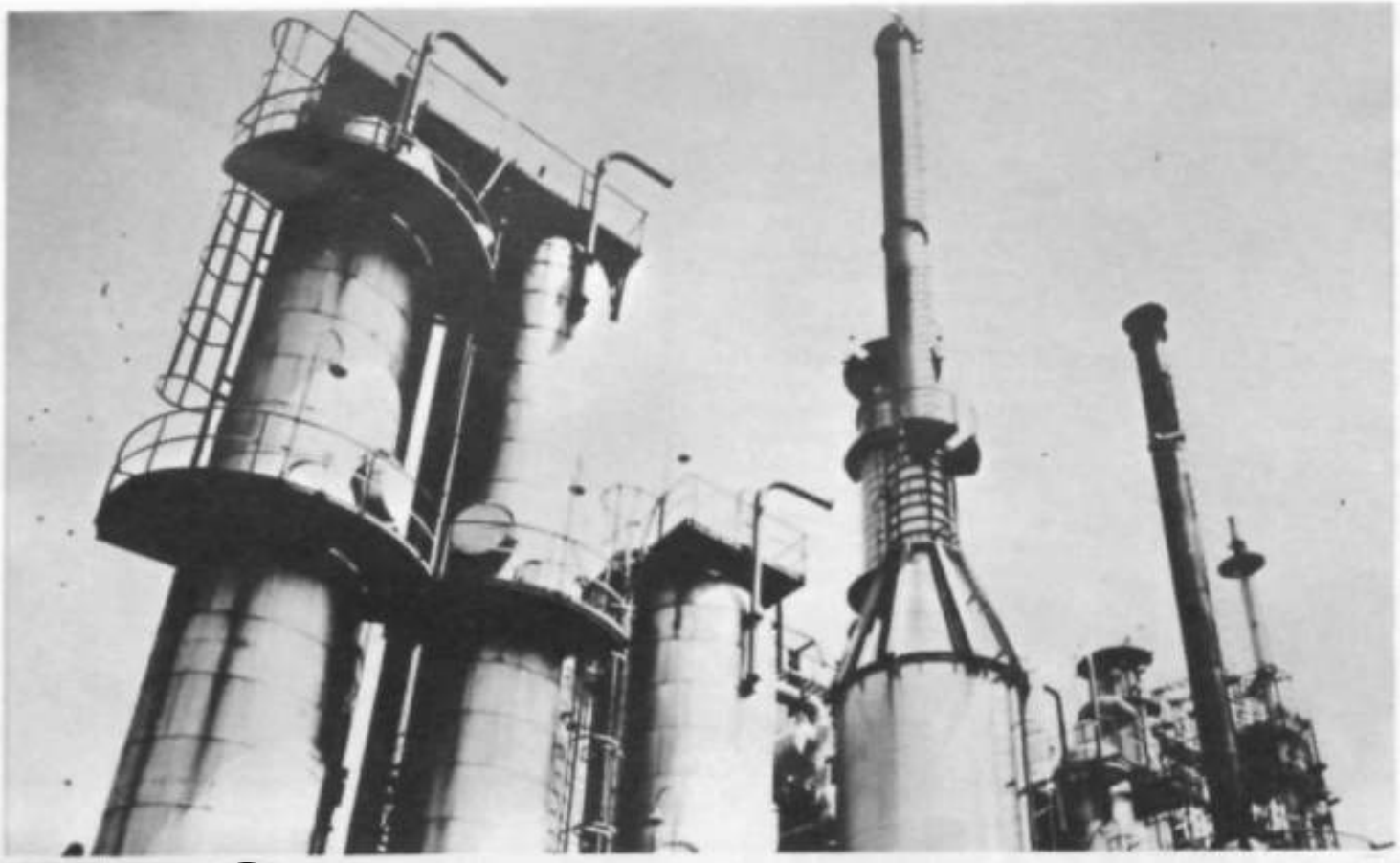
Mont invHImanii in '[illegible] ***na» arm*** vqjMctttf to follow it* country's **rww potey o* cooperation and** coexistence with **all** countrtt*. Iron and Mum!* production *t%* steadily risi-*g and a C*r»*«n company. Harvey Aluminum, recently made the first shipment from its Boke concession. Among other countries afso cooperating in the development of Guinea's economy are the U.S.S.R . Mainland China and the U.S.A. Guinea looks forward particularly to increased French participation.

■ *Ohmmm mamkm foreign capital*

More foreign investments in Ghana are likely to follow the recent visits of Ghanaian officials to Europe.

In the Federal Republic of Germany. Mr. j.w.K. Harlley. vice-chairman of the National Liberation Council, said Ghana wants Krupp io lake pan in its large-scale Irrigation projects. Other suggestions discussed with Krupp eneculives concerned the building of freight and passenger ships for use on the Voita artificial lake.

Mr. E. Omaboe. Ghanaian Minister of Economic Affairs, who was in Pans recently for a meeting, said Ghana wants French agricultural experts, particuiarty for its palm and cotton plantations. French participaiioo m Ghana's de-**viocwtit** would also extend to other **heldi**. A French **company, for** instance, may **ujk* ow** »hn Ghanaian pharmaceutic*! slate enterprise.



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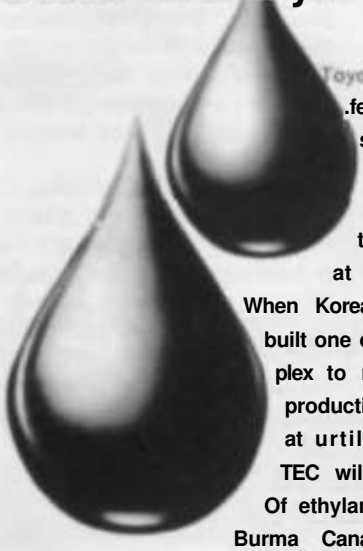

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• *Kmnym ooffmv* crop *fait**

An uncontrollable fungus blight has destroyed 70% of Kenya's coffee crop this year. Coffee has been for years Kenya's top export, worth nearly $S0 million yearly. *This* year's (ess is estimated at 300.000 tons. So tar, no eHactive control has been discovered and many coffee farmers and planters are replanting their land with tea.

• *Mmtmwii v-aat now harvests planned*

Maize production in MalawKa Lilongwe region should increase about ten tun« and groundnut production twice during the next 13 years, following the approval of a $6 mil lion interest-free International Development Association (IDA) loan to the MaJawi government ID promote the agricultural development of the region.

The loan covers *a* first phase of 163.000 acres, part •f an eventual half a million acres.

Another IDA credit of $3 7 million will assist the development of 130.000 acres mrh* Shire valley, where it is hoped to treble cotton production over the next five years lhrough improved cultivation practices and the use of sprayers and insecticides.

IDA credits will cover the foreign exchange requirements of the two schemes and part of the local costs. The Malawi government will covef the rest.

Both the projects were prepared under the supervision of FAO and the World Bank with financial assistance from UNDP

NEAR EAST

■ *Iran revers*fi *thm bra*

To find the needed man-Power to implgment its fourth development pfan, a come-home call will oe made by the Iranian government lo Wme o(the lO.OOO Iranian university and collage graduates In Europe and North America A special group, headed by a minister, will tour the** two continents to recruit pwtonnei from among Iranians now living and worfc-mg in the fltor* industrial iz-ed countries of me wortd.

• MroWcf'e *biggemt dam for WB*t Pmk/wtan*

The contract to build a giant earth dam at TarDeia on the Indus river in West Pakistan has been awarded to a consortium of Froncti and Italian companies led By Inv pmgMo ot Milan.

This a me largest tingle public work* btd ever awarded The project ts three times larg_H than the Aswan High Dam. Tsrpela is to be the major contributor in a crtam of dame and caneie which will provide power and water to 50 million people *and 33 million* acres *of arm* land. The central dam will be 9000 feet long and 470 feet high. The dam will create a lake 50 miles long and will not be completed until 1976.

Total cost of the project $827 million Trie financing has been arranged by tgrouo of seven countries and the Indus B*5tn Fund under the auspices of the World Bank

LATIN AMERICA

• *Program* tovrmrd Caribbean community*

Ai .nterregtonai free trade area embracing most of me Canbbean countries came a step nearer reality following a recent meeting of tne head* of government* of the present CARIFTA members Anligua. Barbados and Guyana,

Accomplishments included the following.

drafting of a charter (or a Caribbean Development Bank 10 come into being in May of 1968

..adoption of the CARIFTA agreement as the basis for an extended agreement aimed at more complete tree traoe among commoriweeith Canobeen countries, with an eventual fun customs union and economic community

organization of a Caribbean regional secretariat, located in Georgetown. Guyana.

agreement to establish various regional services, such as a press service, a bureau of standards and a population center.

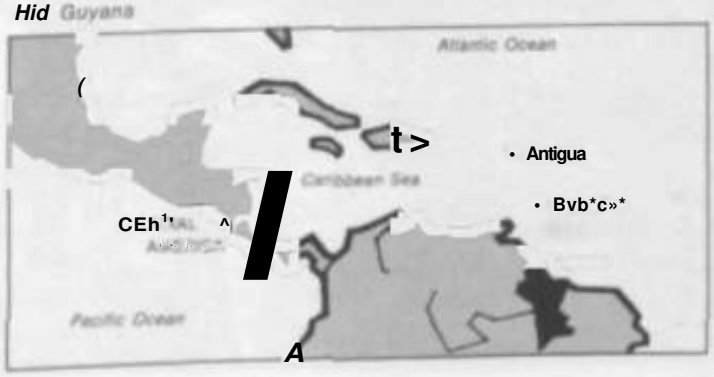
The Eastern Caribbean Common Market <ECCM) countries — Dominica, Grenada, Monserrat. Si Lucia and St. Vincent — as well as other Caribbean countries, are still considering various form of agreement,

• *Novr tSmm tor Argantinm mopfovmd*

The .Vorid Bank has decided to take part m the financing of tne Cnocon-Cerro*-Co-•oraoo nyoroeteciric scheme m Argentina which will permit the irrigation of half a miliion necisres in normern Patagonia Cost of the project will amount to $440 million

A major aim » to bring to an end the periodic floods Trom me Anoes wnicn ere a constant threat to this Fertile region The dam forming part of the scheme wtn be one kiiomew long and 75 meters high Also included m the proiect will be an 800,000 kilowatt power station

The *three loundot membars* or *Hid* Guyana *CARIFTA: Antigua,* Barbados



• * *tat million invmmtmmnt in t.A.'m formmtm*

A leading role in the expansion of forest industries In widely separated countries in Latin America is being played by private investment.

ACMsiM r^o team set up the Institute for Development of Forestry Resources under the tinned Nations Development Program (UNOP) which spurred the recent large scale development of Chile s forest-based industries (pulp and paper plants veneer and plywood rains) During the last stat year*, more than $105 million have been invested m these industries, and from l9S2 lo 1S« exports ot CNIaan sawnwood rose by 107*/,.

An Honduran f AO team recerrtiy carded out a UNDP survey of the forest potential of Honduras which spotlight-and that country's resources. It eventually led to *a*t government partnership with the United States International Paper Company for the construction of a $77 million pulp and paper plant in that country

The plant. tti» largest International Paper project Out* side the Untied States and Canada, win have an annual producttort capacity of 40 millton board (eel of lumber •nd 210 000 metric tons of -nerboard

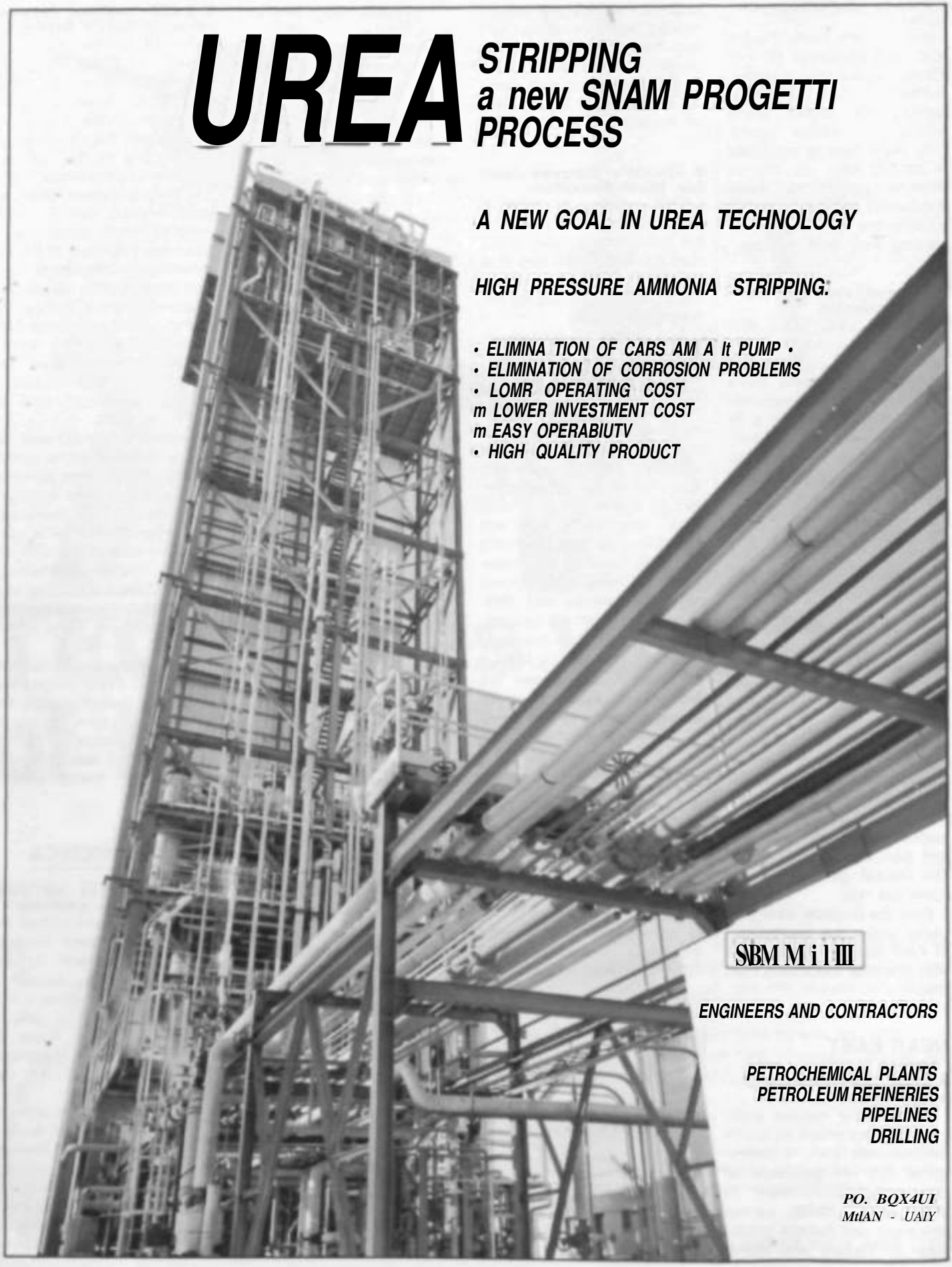
NORTH AMERICA

• 3 f O *million in oontrmoim to bo avrmrdrnd*

The list of new Umied Nations Development Program projects approved by the UNDP governing council in January, to be carried out by the United Nations and its various agencies, calls (or nearly $10 million in contractual services over the next few years.

The larger contracts include S1 million for forestry consultant services over the next four and a halt years to pave the way for a national forest development plan in West A)rjca Two *contracts* (or nearly $1 million each will

UREA STRIPPING a new SNAM PROGETTI PROCESS



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be required for a pesticide plant lo produce, among other chemicals. VCCO tons ol DDT annually in the Near East: and survey work preparatory to river valrey development in the Far East. Other contracts include an amount of $650,000 for technical and economic transport studies in Africa and $500,000 for a marine seismic survey in the Caribbean.

Between 1959 and mid-1967 UNDP projects involved 337 contracts worth mqre than $62 million and equipment purchases totaling some $88 million

• *Briton head* nurplu* dimpomml group*

The 41-nation subcommittee on surplus disposal of agricultural products re-elected John Eaton, of the United Kingdom, as its ch'airman for 1968 at its recent meeting in Washington Jose R Sanchis Munos of Argentina was elected vice-chairman.

The subcommittee is FAO's intergovernmental forum for overseeing the orderly transfer of agricultural products from food-rich to food-deficit countries. It works under a set of rules designed to prevent "dumping" of agricultural surpluses, or the emergence of unfair competitive practices in international trade. These rules have the status of an international convention and are known as the "FAO Principles on the Disposal of Agricultural Surpluses,"

• *tOA: |4OO million m Y9*r for loan**

Over the next three years the International Development Association, an affiliate ol the World Bank, will dispose of S1.2B0 million for loans to developing countries Major contributors are the United States ($480 million), the Uni!ed Kingdom (S155.5 million), tne Federal Republic of Germany ($H7 million) and France (S97.2 million). Other major donors are Australia.

Robert Strange McUamara, president **of** *the World Bank*

Canada, Italy. Japan, the Netherlands and Switzerland.

Because of its present balance of payments difficulties, the US. contribution can now only be used for purchases inside the United States.

Sweden has announced that it will make an additional contribution to IDA of $21.36 million in freely convertible currencies over the next three years This would be in addition to the $2964 million contributed by Sweden to the Si,280 million fund.

m Who own the* t « - *bed?*

Recent findings of manganese outcroppings on **the** ocean lloor have stirred international action on the problem of seabed jurisdiction. Acting on a Malta proposal the United Nations General Assembly has set up a committee to study practical means to promote international cooperation in Ihe exploitation of the ocean floor

A resolution covering the establishment ot a United Nations licensing authority for exploitation of the seabed has been proposed in the United States Senate.

The US. government has designated an interdepartmental committee, chaired by the Stale Department, while the U.S. Marine Science Council is financially backing three research projects on international law and marine minerals, fisheries and scien ttfic exploration

ASIA

• *ADB hack* Thai Corporation*

The Manila-based Asian Development Bank has approved a $5 million loan to the Industrial Finance Corporation of Thailand.

The aim of the loan is to help the corporation contribute to the industrial development of Thailand.

This loan is the first made by ADB from ordinary capital resources. The bank started operations 18 months ago and has so far also helped finance a major agricultural survey of the Asian region and agricultural production in Indonesia.

• *U.S.S.R. and India co-ops rat o on develop - mttnt plan**

India and the Soviet Union want to cooperate more closely in their development plans. The economic planning commissions of both countries will meet before the start of India's next five-year plan in 1969. and the Soviet Union's in 1971. in order to coordinate their activities

The commissions will consult particularly over the use of aid from the Soviet Union to India Present Indo-Soviet trade stands at around S180 million annually.

The Soviet Union is expected to accelerate its purchases of Indian manufactured goods, particularly railway wagons and jute.

EUROPE

• *Agreement on food standard**

Agreement has been reached on international food standards for canned fruits and vegetables, a range of sugars and glucose syrups and other commodities.

The joini FAO/WHO Codex Alimentarius Commission, a 50-natmn body, met in Rome for its fifth annual session ending 1 March.

The commission is attempting, through its own work and that of its various subgroups, to arrive at standards of food quality, hygiene, labeling, additives and pesticide residues which can be adopted by governments in their national legislation. It is hoped, in this way, to remove nontarift barriers to trade and thus contribute to food availability.

• *Hew industries investment venture*

New ways to increase cooperation between the United Nations and industry and to facilitate industrial investment in developing countries were worked out at a meeting in March of FAO's industry Cooperative Progfam.

Representatives ol 37 major international firms met in Rome under the chairmanship of Dr. V.H. Umbricht, managing director of Ciba A. G-. who was also elected program chairman for 1968.

Dr. Umbricht appealed for the adoption ot "a widely acceptable code of conduct for the protection of private investors ." This, he said, would alfow private concerns 'to

Dr VH {JmbtiCtil, chairman ol tti FAO Industry Cooperative Program*

be as enterprising as they would wish to be." He expressed f eg ret that some developing countries tended to see such a code as a form of discrimination againstthem. He appealed also to private enterprise to adopt "an attitude which reflects recognition of todays conditions.'

Attack

Tht* iv the world's moit ptacpful fleet: harvesters.
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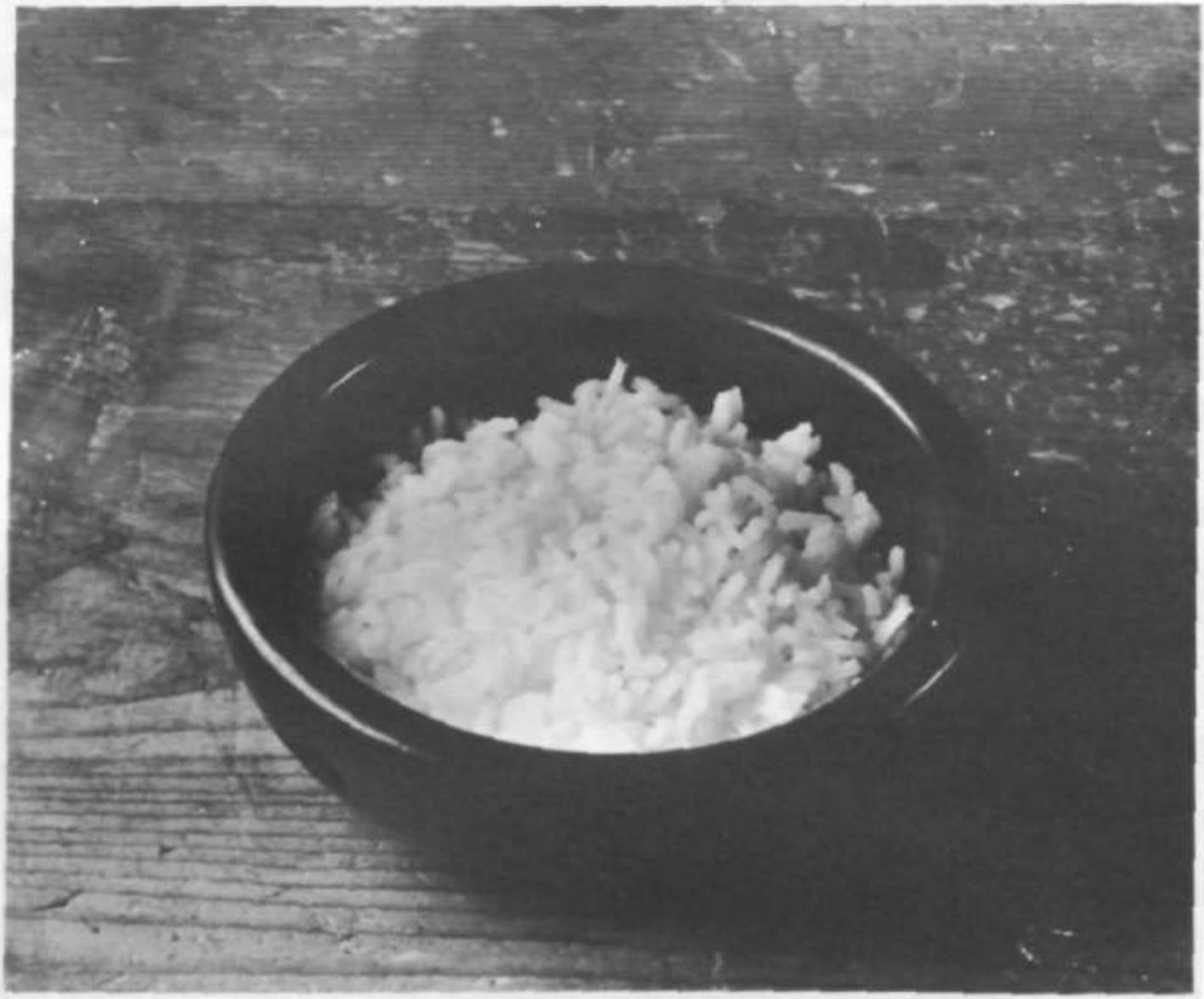

There are many ways to get more food from earth. The simplest is to provide the crops with the right nutrients without useless waste.

Feeding the crops is easy there are lots of good fertilize! brand* tu L'boose front I **o avoid waste** is another pa : • ≻! UH>>, ()»1\ a complex eranular fertilize i ..tn **prevent** th'iv In a Seifafen. for instance, ihe plant nutrients linked in a **definite chemical** structure *b*\ a modern synthesis give [he emps the right amount of food at ihe right **moment** The granular shape of Seifafens allows easy and even broadcastint: and. at the • .1 nit- titiK-, **ttvoidl** iheir being swept away by wind or **washed** away by rain. Being more concentrated, they arc kM bulky: this means lev, in transport, ntorin^r and broadcast in i; ***t%pmrft***$_L$ Even ihe package can be speciiil: you may find Seifafert granules packed in **VatHproof** *plastic* bags so that, should it be necessary, they tan be **safely** stored outdoors.

SEIFA

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Seifafcn b the r<C|is!fr«I tride mwW fnr Seifi ciimple\ Fcrtifi/cr-v further 10 thcie. Scif» mafkett »H IVP*» of «r«i(hl fcrlilircry

WOOD

M tort foreign exchange earner

Forest products are among (he fastesi growing exports of tha developing countries as a whole and are the top foreign exchange earners of a number of African and Asian countries, according to an FAO report presented at UNCTAD 2.

In the ten years. 1955-66 the export value of these products grew from $280 million annually to $?70 million. This total is expected to reach $1,500 million annually by 1975. The developing countries' export trade in thesB products continues to grow at a considerably (aster rate than world trade, and at a very much faster rate than that of these countries' all-commodities trade.

A number of dramatic increases are quoted in the report, such as the Republic ot Korea whose exports of *tiardwood plywood increased* more than 100 times between 1960 and 1966, from 2.300 cubic meters to *272,800* cubic meters.

However, onty two fifths of these forest products are at present exported to the developed countries in processed lorm By 1975 this share should, and could, increase considerably, says the report. Processed loresl products present unusually favorable prospects for early, rapid and large-scale expansion of exports from the developing countries

COTTON

(owar *crop forecast for* I Ma ymmr

The worfd cotton crop in 1967/68 Is estimated at 47.2 million bale* as compared with 47.6 million bales harvested a year earlier and a record high or 531 million **bftlw** In 1965/66, according lo a recent report from the US Department of Agriculture.

The production estimate from the U.S. was reduced to 7.6 million bales, due to a reduction in acreage and lower yields. Crops in Menico. India, Iran, Israel and the Lt.S-S.R were also reported to be lower

Asia and Oceania account for a major part of world cotton production, estimated at 17.1 million bates for 1967/68 as compared with 4.9 million bales in Africa and 3.8 million bales in South America.

COFFEE

Way *otamr far maw agreement*

The second International Coffee Agreement should now come into force when the 1962 agreement expires at the end of September,

The final area of disagreement — namely that of the exports or so l ubfe corfee from Brazil which, in the United States' opinion, had been fa*ciUtated by discriminating* treatment in favor of grBen coflee processed in Brazil — has now been resolved.

The new agreement prohibits the application of governmental measure* which constitute discriminatory treament in favor of ©sports and re-exports of processed coffee as compared with green coffee, provision is also made for an arbitration panel to settie disputes between member countries.

The export quota mechanism of the 1962 agreement was successful in holding stock off the market and in improving and stabilizing prices. Annual export earnjngs from corfee have been raised by over $500 million

The aim of (he new agreement remains unchanged though there has been some readjustment in basic export quotas. The sysiem of selec-live quota adjustments, in order to maintain adequate supplies of the different types of coffee at equitable and stable prices, is being maintained. Quota-Ire* exports to certain countries which consume little corfee will be continued in order to develop new markets, but control measures are to be strengthened.

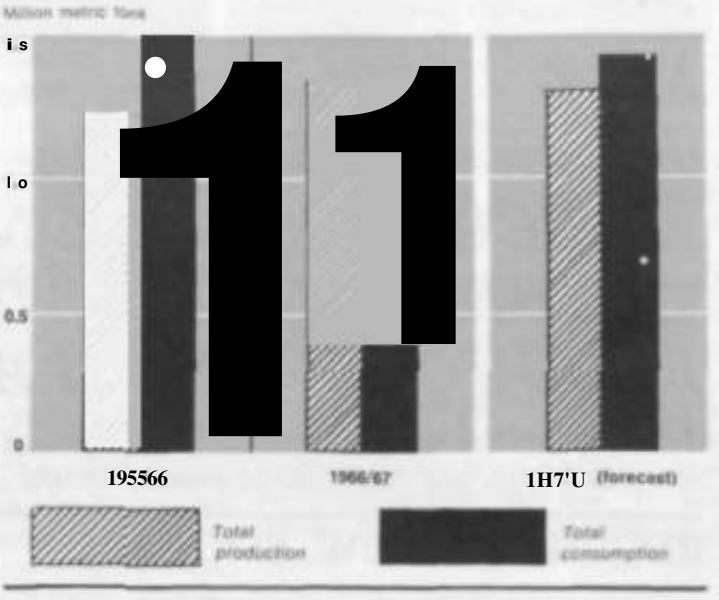
The long-term problem of coffee supplies is to be tackled by the establishment, before'the end ol 1968, of production goals for lhe 1972/73 coffee year and by setting up a diversification turd to help producing countries become less dependent on their coffee crop.

metric Ions lor the calendar year 1968. a slight increase over the revised figure of 1.389.000 for the previous year.

Europe and the U.SS.R. will account for nearly 750,000 metric tons of this estimated total, followed by North and Central America with a consumption figure of nearly 350.000 metric tons.

For the thfrd year in succession production has been more than 300,000 torts below the record crop of 1964/65

World production and consumption of cocoa



COCOA

Conmumtttion ***mgmin highmr than*** *production*

World production of cocoa in 1967/66 is forecast at 1,308.000 metric tons, slightly down from the revised estimate for the preceding crop year of nearly 1.347.000 metric tons, according to the committee on sfafisfics of FAO's Cocoa Study Group. which met in Rome in April.

Africa is expected to produce the lions share, more than 950,000 metric tons, followed by South America with slightly more than 230,000 metric tons

World grindings (consumption) are forecast at 1.419.000 The trend in grindtngs is still upward, despite an apparent stagnation of demand in some of the major consuming couniries.

Consumption has been risrng over the past nine years. At the present time world reserves do not represent more than two months production. Up till now the imbalance between production and consumption has been •atertcecf by (he recortf crop of 1964/65.

Prices rose again during 1967 During UNCTAD 2, the principal producing countries — Ghana, Ivory Coast, Cameroon. Brazil and Nigeria — went some way toward a possible price agreement with lhe principal consuming counlries

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Hul Rep<>rt I M>P Sh - h - 4) •» Pin* **Forests - Honduras**

Here are ihe resutt'> uf * anacc! or| anized to provide basic information needed for promoiitif <•* estry and forest industry development in the pine Jor^t 4ir<*> i-f HoaduTn Tht survey contains recommendations

covering nuch upetili tii foicsl organiutujn, fire tontrol and (he developmeul of raids. It conclude* by ilafing |faw „ nh ih< introduction i>(idequito proiection *n<l a stjurid forest management, 'hew pine Forests could pfuduce enouth wood (a iiutiin *a.* far more extensive (oreM indtiMr>

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FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

I •It inion

seeing beyond one's nose

Front an editorial by Bernard Hoilowood in Punch-

...Il should be fairly obvious that the strength of the rich countries lies in their economic versatility — their ability to switch labor and capital resources quickly to meet the needs of the market.

If the world wants color TV, then thtwest rejigs industry u> supply it. Jf the world wants pills or sporting equipment or man-made fibres, then the west shuffles Us labor around and turns out the goods, at fancy prices.

The underdeveloped nations, on the other hand, have no such opportunities. They have the know-how to produce only a very restricted line of raw materials and agricultural products.

The west encouraged these countries to produce nothing but cocoa, tea, codec, rubber, rice, coconuts and so on; encouraged them by guarantying **to** buy heavily. Bui no price **w» find, md** Ihc guarantee usually promoted overproduction. So the poor nations *CIT iiuck with a rigid econorm utterly **dependent on die** market for their subibieace They were, and **arc.** *in* the pocket* of the rich.

The past fifi) **yean have** demonstrated that communities which an encouraged to put their trust in a narrow range **ol** products ***m*** extreme!} vulnerable, and ai ihc mercy of the rest of the world-

Even **KumIt,** the **dcliett** Mate on earth. U anxious; any scientific development that put* oil **fa the background** would automatically convert the people of Kuwait to the primitive desert nomads they were thirty years ago.

Undeveloped and underdeveloped nations must be helped to diversify, to intlusi native and to com pel c *ith ihe west in the product km of nuinufactured goods. And the west, responsibly ft* their present plight, has a duty to provide them with ihc rwOUTCCi to accomplish this diversi**fication.**

The west has now to decide whether it is prepared to allow millions to **dewead to** the acutcsl poverty by refusing to sacrifice an insignificant fraction of its bkMtttd standard of Jiving, or whether to **•tap Up its** ii **iii** to a level I hat will make ***the* poonai couBtriea acooomicafly viable.**

It is not an easy **choke,** for governments sur\r\i: onl\ when they please the pockets of (he electorate and the electorate, almost everywhere, is so stupid and selfish that it cannot sec the end of its nose.

stoking our own fires

From *an address by M.* IMUIX *Negre, Minister of Finance in the Republic of Mali, at USCTA0 2.*

...I approach this problem from an angle which is likely to be rather disagreeable. I feel an obligation for us, the developing nations, to took at ourselves just for once, frankly and crilically. especially in this august assembly, for our conference cannot be **BBfdjf** the forum for criticising (sometimes perhaps rather superficially) only those countries which jrt ***fkmdj*** developed.

It u certainly legitimate (and indeed "good form") 10 require industrialized emntrio to **nvbo lbc rate** of the game of aicnutional **tndc.** But what have we done ouneives to facilitate trade within **oar own** regions[1]' Our products are wbject to the **emu rfdkakma** system of **bast** and tariffs, even though they are not competitive; and although our periodic meetings (at **least** so far as west African stales are concerned) arc osiunsiblj dcxotL'd **to** harmonizing our legislation **od** tariffs and taxes, they almost invariably end in admissions of deadlock —• and therefore in failure.

And what is happening to economic and industrial collaboration' We have enough tobacco and match factories to scl fire to the whole of Africa! We all have textile industries — but sometimes no cot I on; hits of slaughterhouses and cold-storage facilities — but very often no livestock; lots of sugar refineries, but scarcely ever any cane sugar. Or again, what is there lo be said for the proposal to set up an iron-and-stccl industry at subrcgional level, when it appears that no final agreement has yet been reached among the countries concerned?

There you have a description in broad oullinc of the present state of economic cooperation among the countries of west **Africa.** It is tt disappointing as any platitude.

My country's position in this matter is anyway quite clear and unambiguous. We, in Mali, hold that economic coopcr**BtIn** between underdeveloped countries (such as our African countries) can bear lasting fruit only insofar as it is based upon • partnership of peoples who are full) conscious both of their rights and of their obligations, and who are resolved lo make mutual concessions in order to ensure that each participant enjoys his fair share of real advantages accruing from projects which are jointly put in hand.

We hold thai such cooperation should not be confused with a vague association for mutual akJ or solidarity, whose motive principle is one of hrolherlincss or "fraternal ism," quite as dangerous as any paternalism since it will only confirm the wealthier partner in the privileges which he already enjoys. Still less with any division of tabor between nations on a regional or subregkmal level, which would have the effect of crystallizing the inequalities bequeathed by The colonial system and which would run the risk of finally and permanently condemning certain countries to being nothing but markets for the others.

change of heart

From *an address by Professor /. Ma vane Sty cox to a meeting on population problems in Latin America*

...Although (he intensity of effort varies greatly from country (o country, at the present time (8 Latin American and **Caribbean** governments provide some degree of support to family planning programs.

In 1967. the International Family Phmnjng Federation spent more in the

Latin **American** region than in all other regions combined In this same arta, Ain (Agency for International Development) during 1965 and J9nn invested in Family planning campaigns double the amount it had spent in other continents on similar programs.

The rapidity with which this situation has conic upon us is as remarkable as the fact that it has occurred at alt. In I960 there was only one private group dedicated 10 family planning in the whole of Latin America; that was in Mexico and. was run by North Americans. In 1967 only ihrcc nations lacked such programs: Nicaragua. Haiti and Bolivia.

pro and con modern technology

From an artide by Gerard firl. publish-et of Scientific American, *in the* Bulletin of the Atomic Scientists.

...The hordes of underemployed people tn the countryside and of the plainly uTICmpiuyed i" the squatter cities have **eaCOUHHad** the idea that development programs should call in labor-intensive technologies. A strong case can be made for the opposite strategy.

In the first place, there is a generation or two of labor-intensive work to be done in every pre-industrial country on the infrastructure of ports, rails, highways, housing and buildings.

When it comes Lo the productive apparatus, im the other hand, this ought to **hMOCpOMte** ihe most advanced developitiL-ms in science and technology. The model its the petrochemical plant, with two operators at a control panel.

11vhnukigy at this stage of perfection is highly portable, easily installed, makes **IMU** demand on local human resources, and operates at the same efficiency independent of local conditions whether in **Galweston or Kimk.**

In sum there is no reason why, with adequate capital and technical assistance from outside, ihc prospective new steel industry in Chile should have to evolve through the beehive coke oven and backyard Mast-furnace phase- Ideally, it shouW install direct reduction and continuous casting at the outset.

The application of science and technology to **devefapflMOt** may. therefore, offset and reverse the forces that tend tn widen and deepen the gap between me rich and the poor,..

two halves make a whole

From *an interview with Edgar Faure. French Minister of Agriculture, appearins; in* Enterprises.

An effective global plan of aid lo the third world is almost impossible without real internal km a I cooperation.

It would seem to be very difficult to effect an operation of this magnitude without complete international cooper-**•tion,** embracing Kith cast and west, both market and centrally planned economics.

It would be difficult to obtain the unilateral Consent of cither camp to an equal anu>unl of its gross national product for aid; difficult, in other words, to conceive of such a plan from the poini of \icw of the recipient rather than that of the donor.

why call it aid?

Frum tin article by Taya Zmkiti tn the Daily Telegraph.

When the Italians knd money at *6Vi %,* they call it aid. When the Japanese pay reparations, they call it aid. When the British pay tiresome colonies money to go away, they call it aid. When the French provide money for African countries to """f—f»— Frenchmen with, they call it aid. When an oil company finds oil, that too b aid.

This is all very odd. Aid, as the name denotes, b charity-helping iho« who **m** less fortunate than oneself. To lump private investment, or reparations f«r d.im age done, under the aid label is a misnomer.

The reason for this misnomer is quite simple. The developed countries **htve** all been bulldozed at ihe United Nations in to promising to hand over to the developing countries \% of their national income. Except for the French, they have no intention of making such enormous gifts. For the United Kingdom ii would mean over' £. 300 million a yair, *i* much the .same sort of money as is at present splitting the government. So, naturally, the developed countries put everything into the aid rag bag: gifts, soft loans, hard loans, military assistance, technical assistance, suppliers' credit, rescheduling of debts, anything they can rake up.

The western voter, told that he is providing t % of his income in aid, sees himself as a Galahad. The Pakistani nllidal, who finds himself paying 6% on a seven-year loan and Lhcn 20% extra for his generator **became** the supplier knows that he cannot go shopping around, **MM** the Galahad as a Sh>lock.

The story of aid is littered with nonsense ! Russian snowplows for Guinea, which has rto winter; a refrigerated van for Iran meant for vaccines, hut used tn bring caviar up from the Caspian instead; Russian arms for Indonesia used to kill Communists; iMH loans for Argentina accompanied by such inappropriate advance that the national income went down.

If such nonsense is to be avoided, three rules have to be adopted. First, business must be separate from charity, Second, the donors must get together. And third, they must be prepared to tie very tough strings round their aid...

CREDITS

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If there is disillusionment with technical assistance it is largely because of ill-planned and uncoordinated ventures of national, bilateral and multilateral aid.
Here is a significant attempt at a global plan for development

The way out of the labyrinth

fcy *JAM TIMBERQEM*

Everyone knows thai our world is becoming smaller and sroaJkr. We c:m smw reach Tokyo, or Santiago, from Europe in about 18 hours, h;ilf the lime it took ten years ago. Every year some 15% more people fly and sec countries they have never seen before. Even more people do not fly, although " it is cheaper than you think." but they sec other people coming into their countries. They sec something i>f the way nf life and prosperity of the people who can afford to fly : they sec things they would like lo have (hansclves.

For an even longer time many have known that their living was dependent on what distant populatkms bought from them. The Brazilian coffee planter and his employees know it. The metalworkers of Europe know thai thry earn part of their income because uf dicsel engines constructed for Argentina or India. The Japanese know thai they must build ships (or Europeans, and so on. Without such mutually dependent relationships incomes would be quite a bit lower

I here was a time when ruling groups everywhere thought lhat economic life could best be led 10 itself, and that bee enterprise and free competition would automniically lead *to* <he best of all possible worlds. But this is no longer believable f«r we have seen too many misfortunes resulting from free enterprise: unequal incomes, misery for the unemployed, the iick and ihe ofd; recurring crises with mass unemployment; crr.itii: fluctuations in the prices of coffee, cocoa and rubber; the richer countries becoming richer at a faster pace than the poorer countries.

We have kJirnl that freedom is only fruitful within a controlled framework. Income tax and social insurance were introduced 10 eliminate the extreme* of poverty. Budget policies were enacted to counteract economic cycles. Markets *were* regulated so as ro reduce *the most* vioJrnl price fluctuations, A very modest start has been made in transferring income from the rich to the poor countries rather than the i*her way round. We now have a complex system of state intervention wiihjn which freedom can exert its stimubtini: influence without unduly damaging human relations.

It is mostly the national governments who are organizing taxation, market regulation*, social insurance and so on. National governments are the most important power centers. Power has a lendsney to shift from local, state or provincial authority to federal or centralized authority.

Recognizing tit* need for world order

I lie iMHV)n>I systems of socUneconomic intervention arc Mitlkriently complex to require careful preparation, which we now call planning. Preparation is needed if a complicated mechanism has to be changed. This is especially so if changes Lire needed within long-term processes. A long time is required to build a dam and, if a start is not made on time, there may be a long period without electricity or with inadequate water for irrigation. Education also takes a long time. If the right education a I facilities are not created when they are needed, then there may be loo few engineers five or ten years laiL-r on.

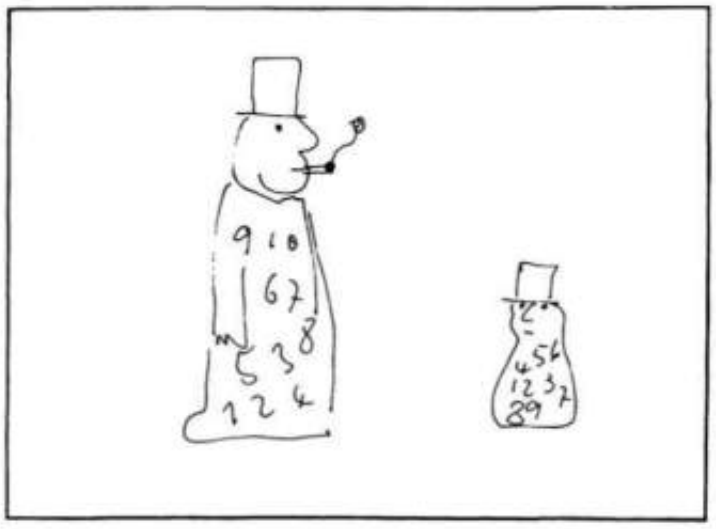
We must look ahead. We must set ourselves targets in order to check the efficiency of our policies. We muM coordinate the actions taken by various groups, organizations or ministries *n that they lit together. When the factory is creeled, the machines must also be ready for installation; the roads and truck* TO transport both raw materials and finished products must be available; housing for both the workers and engineers must He huilt. A great many factors often have to be accommodated into a balanced syslem. This is why planning has been accepted not only in eastern Europe and main-

J«t Tinberfrn is ... of development planning at the Rotterdam ... for Social Studies St* f S *tihrnuu, of thr UM OrrtlopmrM Fiaimag timtmitlrt. He* has **auth* 0/ (>n ihe T1w)ry of Economic Pol*y. B w w r f M** ...: Principles an**d I**(rt. Sh.pi/i| t»* WofW fcconomy.** The Design of Development *and* **Central** Planning

iand China, but in every large industry and by almost all governments.

National governments claim to be autonomous in many respects. While single citizens have to behave according to the many laws of the country — and law and order has taken the place of the jungle familiar from Westerns or from history books {at least, in a majority of countries for a majority of the population) — national governments claim the right of the strongest, " right or wrong, my country."

Somewhat wiser men have shown us that many disasters have been caused by this attitude. Other disasters will follow unless we recognize the need for international order. But governments, and their parliaments, are changing their attitudes ve.y reluctantly. We found that wheat prices could only be



A vf>ry modest start has been made in transferring income trom the rich to the poor countries, rather than the other way round... it we do not enter into a state of war with poverty we may find ourselves involved in other kinds ot war"

kept under control if there was an international wheat agreement which both governments and producers had to obey. We have discovered that trade policies cannot be left to the jungle, and we now have GATT, UNCTAD, common markets and the like under construction. But still, on so many occasions, governments behave like bad little boys.

We now have international institutions whose task it is to regulate on a worldwide basis what cannot be left uncontrolled. The International Labour Organisation and the Food and Agricultural Organization arc among the most venerable of such institutions. The International Bank for Reconstruction and Development and the International Monetary Fund were created after the second world war, prior to the central organization, the United Nations itself. There are others, Unesco, UNIDO, the World Health Organization and so on: they ere the beginnings nf what we must hope will, sometime, be the ministries of a world government. But be careful not to say so; for a large number of governmenis will show their bad-boy mentality. For the time being such international bodies have more modest duties which they carry out very well.

We are discovering the need for coordination at the world level, for looking ahead so that the pieces can be fitted together more precisely. This has brought us to the beginning of global planning, FAO is a pioneer: its Indicative World Plan is the first such attempt, the prototype version of which will be ready in 1969. The ILO is working hard on a World Employment Plan.

The U.N.'s Center for Development Planning, Projections and Policies (CDPPP) is preparing what could well be called < the framework for a master plan covering all such activities. This is part of the task imposed on it by assembly resolutions which request the secretary-genera!, in plain words, to prepare future development efforts which are an improvement on the present development decade.

1 like to speak of DD 2, or the Second Development Decade, as the subject of this coordinated undertaking in global planning. One of its most important tasks will be to create a set of coherent statistics which will enable us, year after year, to check the effectiveness of our operations. In business, everybody is subject to such checks: if someone fails to meet his goal, he must explain why; if he has exceeded the target, so much the better for him aind for all concerned.

The various international bodies should follow the example set years ago by the OECD countries, formerly known as OEEC (Organization for European Economic Co-operation). Periodically, each country's socioeconomic policy is thoroughly investigated by two other member countries and their findings are discussed in full plenary session: many useful suggestions have resulted from such a scrutiny. We can hope that in the future, at the international level, the performance of both governments and of international agencies will be examined from the point of view of benefiting common interest, that is, that the world at large (rather than at small) becomes prosperous.

The major task of CDPPP wili be to set some general goals and to indicate the main ways by which these goals can be attained at both national and international levels. The goals should not be ovcrambitious. because they will then be unrealistic. But they should not be realistic in the sense of being overcautious and without imagination, the realism of the ***status*** *qua.* As in every dynamic enterprise, there should be an clement of difficult achievement stimulating all involved to do their utmost.

Involved in other kinds of war>

I here is every reason lo urge the utmost effort. Too often the prosperous countries, and the prosperous strata of poor countries, take it easy without understanding the present emergency **situation. We** are faced with a tremendous challenge. Hundreds of millions of people live in misery: hungry and ill-fed; suffering from disease; living in dwellings that hardly deserve the name, or without dwellings like the two hundred thousand people in Calcutta who eat and sleep in the streets with no more shelter than their rags —true also of many in Latin America and Africa. If we arc not ready to enter into a state of war with poverty, we wilt soon find ourselves involved in many other kinds of war. I use the phrase war against poverty[1] to indicate the needed state of mind.

The advantage of having a plan for DD 2 is that we can Ihen **visualize** our " war goals" and concretely define ihc obligations of all social groups> irtciuding **governments.**

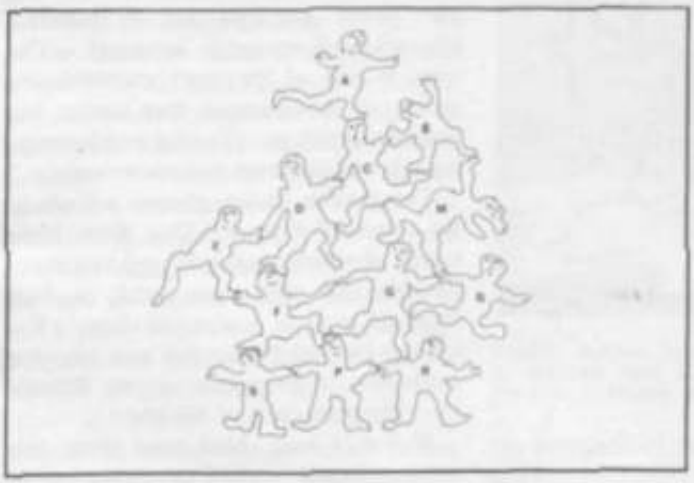
But the ctnit!r cannot do this task by itsdf. The cooperulion of all the specialized agencies is needed to find out what is rcalJy possible in the various fields; in agriculture, inductry. tr:idc. education, population pofides and sn on. The center's provisional framework fur a master plan will have lo be discussed with all the specialized agencies. Changes will be proposed and the center is seeded to .tec that such changes arc mutually consistent.

Thus, a complicated procedure of calculation and consultation will haw to be developed over the ticxl two yean, one of the tasks be ing to carry it through on schedule. It is ULII known ihiii one of the most difficult accomplishments is to be on lime and to also maintain a SET™: of proportion, in be able (o leave out details if the operation can he saved as a whole.

But before knowing what are details and what are not. itnc has to look into every little comer: this helps to explain the size of some i>f the international organizations, the large (juamiiy of paper consumed, the number of subunits, of meetings, of people, -The efficiency of ihc in tern at ion a l organizations *is* sometimes sevcrelj criticized, often based cpon comparisons with industry, Some of these criticisms may well be justified and, in anv caw. their operations should be continually scrutinized for the) arc financed by ihe national taxpayers.

Yet. a sense of proportion should guide us and we should try to understand ihc dimension of the problem. It is relatively easy to efficiently organise a business of fift> or a hundred persons for they can he seen at work. It *is* less easy to supervise an enterprise of 10,000 or lOO.lMX) employees.

The world ai large has a population of three billions, ihai *)$,* duee Thousand million. Thinfc oi three cubic meters of



***Organizing something in winch ait in* c>Ui*ni ot* ffj« *worm uti/ MQtvwt... H* M *hiqhty dtsirablr that all thm coordinators, and* rt» *coordinators of tha coordinafoff. rmmmn aw»r* of how th*. fieoptm at* the gr*»-riwi9 *Iml art baha#ng. ttmctmg *nd thinking"**

(imbcr. Imagine they arc MUM into little cubes measuring one cubic millimeter each. Now. imagine you want to sec all ihc three bfflfc* of those little cubes *M* once. Spread them out over the floor: you will need a space 53 incurs long by *55* mclcrs wide. Organizing something in which all the citizens of the world are involved means supervising lhal square of 55 by 55 mclcrs filled up with liny cubes of wood,

Not all citizens would be actively involved but, if we stick to a democratic way of dealing with our problems, ihc adult population would have to be consulted in one way or another. Such consultation would be at various levels: local, state, federal, national, continental or regional and. finally, global. And some such coosukatioa is necessary for we must bum how, far Instance, the individual farmer in Asia reacts to new possibilities, to the use of fertilizer, better sjeeds, more water and new > ark-lies of CTOpfc

The field workers of the international organizations arc fated with such problems; thc> often only really know what is going on " in the field " But it Ls highly desirable that all the coordinators, and the coordinators of ihc coordinators, and the coordinators of the coordinator.-, of the coordinators remain aware of how the peopic at the grass-roots level are behaving, reacting and thinking. This docs result in a network of relations which is, indeed, near the top, appalling in iiK Lomplcxity. Criticism which is not based on a knowledge of such difficulties is easy to make.

A naw **pf*** «« *lor* fJ» 'HVM(IH

But let us return to the joint operation of the U,N. family necessary iji order to enter the 'seventies with an improved development policy. What I would Hkc to advocate is an operation carried oui in Four main phases: firstly, two phases covering she framework for a master plan, the main features only; then, two phases leading to the construction of a more detailed world plan. In each case, the second phase would take into account command from .til levels: specialized ("sector "J agencies^ regional (" geo&raphicaJ ") age neks and govern men is. The framework would indicate the main features uhile Ihc master plan would cover regions and, in some GSM individual governnwms if large countries posing major problems arc involved.

The complete work should be ready by 1970 for submission lo the U.N. General Assembly as the hasis of the Second Development Decade: a decade in which we hope more progress will be achieved than is possible in this decade.

This objective is of such paramount importance thai all the energies of the United Nations family should be directed toward it.

It requires a state of mind of the decision makers involved which, unfortunately, does not exist everywhere. Our actions must be determined by the interests of the whole, all of us, KltfillmL We musi oweipot attitudes of narrow national thinking, of narrow departmental thinking, of narrow individual thinking. The world situation demands that national delegates think in tern ill ion ally and thai civil servants think interdeparlmentally, A unified operation is what is icupatuint. rather than the glory of a single agency, whether It be *v\o.* Unnco, the World Elank or (UPPP.

I know that miny renders, blown hy the culd wind of reality, will doubt whether such an altitude can he created. Much will depend on the leadership of ihosc directly responsible Thefc t.isk is f.ir from easy and *a* great deal of conrtgt wfll be needed. Let us wish them success in their efforts to be real leaders ami let each of us apply the same standards to our own work and responsibilities. ■

Once upon a time, four brothers lived by great river

Guinea, Mali, Mauritania and Senegal have joined together to develop the Senegal river basin. Robert N'Dao, who heads the four-country team, talks about this aim

by ROBERT CURT AT

Framed by the doorway, the river stretches away from Saint Louis into ihc haze of the dtIta. In his ofiicc, Robert N'Dao. secretary-general of ihe inter-governmental committee for development of the Senegal river basin, envisages the future:

" Down this formidable, wild river flow some 22,000 million cubic meters *tit* water over an average year, li represents a reserve of one million hectares of cu(livable land, enormous hydroelectric power potential and a thousand kilometers of navigable waterway. The river is one of ihe mosi extraordinary means of development that nature has bestowed upon us. Taming and harnessing it is our civieavoT and OUT adventure,"

The passion of the pioneer sounds in the words of Robert N'Dmt, from Mali. a man of aihktkr build dressed in a contfonabk suit with upen neck, a high forehead over a sculptured fatx[1]. Respect grows quickly for this man who has made the development of the Senegal river (he main task of his life.

It was a Jong, hard road *tram* July 14f>2 at Conakry when representatives of Guinea. Mali. Mauritania and Senegal Mgncd recommendations " I'> develop the potential of (he basin for ihc benefit ol *M."* to November i<»nS at NouAthitft. when the four heads of state of ihc countries bordering on the river formally declared that they wished to build (he

* Hubert < urut {• " journalist ,m ihf staff vf Til lune ik l ausanne.

future of [heir peoples around the river. A further difficult stretch led to November * l[l])fi7 at Bamako when Modibo Kcila. President of Malt, recalling the spirit of k **Nouakchott,** urged iht peoples **of** the river and the political leaders of the four Countries to find " l;irjy-scale solutions to our burning economic problems, "

After so many other appeals, this anguished plea hv a head of slate clearly shows lhai this part of Africa, a wedge into the Atlantic, is in ;i suite *at* urnler-dcvelopment.

All the conditions **of** lung-tt:rm poverty i **are** to be found here: 'the race between agricultural production and an expanding population; the unequal fighl against unfair terms of tTudc. the iron law of international **BMMKrcc** whieh leads the poor into **ever-greater poverty;** the **pmedoaifr** iKinily subsistence economy ai a primiini.' level, incapable of providing for a better life; the rigidity of social **nfflliHtifWl** and living standards so low that povertv can onfy perpetuate itself.

*Intolerable mtmtm of mft»ir**

In traveling through the cotmtrio bordering on the river it is impossible to contradict the authors of FAO'S* **rMUdl** able *African Survey* from whom we haw borrowed the foregoing lines.

The mask of undcrdcvctopmeni **thi** everywhere. It marks poverty as a habit and the smallest luxury as an insult. It marks lilt futility of disjointed effort-. It marks ihc national struggle against misery. Undcrdevdopmcnt brands the hondreds i>f thousands of people grouped in tribes along (he banks of the river, enclosed in ancient social structures in which power rests upon cattle ownership. 11 marks the peasants subjected to the vagaries of the weather and **to** the ravages of disease: to the terrible onslaughts of *onchocerriasis* which leaves whole villages Wind; 10 malaria which strikes throughout the hasin. It marks • million human beings condemned to ignorance for lat'k of **ritmoniTW,** teachers and money. This frightful burden of ills, due both Co nature and to man. weighs heavily on the Senegal river project.

Reliable statistics tell us that ihc average per capita income of the region, what would be handed out k> cat'h inhabitant if everyone received an equal share, is 575 a year. Try to imagine that on ihc first day of the year there is $75 in your pocket **knowing** that there will be nothing else lo livu on until the end of December.

Regional development centering on the river is an urgent remedy against all those conditions in which " poverty tends u> perpetuate itself." In November 1967 at Bamako, the project received ihc highest guarantees after rtavinp **proved** during the preceding t*o \ears. that it u.is M indispensable e lumen I in cementing together the Fiver Matcv **Bamako** was an early suge. but its aehieiement required men **tooted to dBvekfMKDl** of the hasin, men who could negotiate these first rapids with **ease,** Robert N Dao. who has been **ftiw** *fttftf* **Bttflff HBMI** l'hm **the** beginning, sums up the struggle:

" W hai is dcTiinnstrahly simple is all the **BKKO** dim"cult to carry through. We arc **UperteDdag** a^, many **difficoltks as** a sleepy administration or national susceptibilities touched on the raw. Nothing is more difficult than to convince people lh;il small, mean reasons stand in the way of our project. Finally, everyone has to agree on the future **use** of the **river** fur impuwed agriculture, power and river **navigation. "**

Robert N'Dao first tested the banks of the river and hacked out rock samples in **tbe** upper hasin as a young geologist. He knows the obstacles nature has put between the present and the future: the ndges that cannot be crossed 'withqut powerful modern equipment; the prevalent diseases; the climate which grips the **(NMtinti** :in d bends their hcadsdewn lo the ground, condemning them to sow too late when the floods have receded, hoping only that the sun and the insects will **lean*** thc-m pan of their harvest.

N DiO. **'*Ve** *will* **hBir« Jo** *siruggly without ceasing bvtorv* **m» ftrs)** *light bult receives Bleclricily wrtsted from Itto tivit,* **before** *the Hoods ate controlled and the Stored water reaches tha titat cultivated psf*

the founders of the European Common Market; even more because we are poorer. Our only wealth *U* the fuiurt-. what the signatories of our birth certificate called the common potentialities of Ihc basin.

" w witl have to struggle without **nmrim** before the first tight bulb receives electrkity **wrested** from the river, before the flixxJs arc conirotlcd and the jMfcd water reaches our firM LuItivalid plot.

'" We will **taWC** lo struggle against men 11 linM rxcitUM.- in an undertaking such H I'urs m.«hing i;t ntorc damaging than

In the close, stagnant air of the delta, men and women live and work very much in this way, as ik> their brethren in the valley. In spite of government **oflbftt,** dcspMc aid, a giant effort will have to be made before their condition can improve. Walter Lippman has**ffriOM**: "We know now, both in theory and in pracikw how to replace famine with abundance. "

Robert N'Uao. like so many ut us. Mih-trilw to this hope but he also knows just how (he long batik **of** development u.jll h;iu- (o be waged ihrnughoul the

Senegal basin: " Great ills call for great remedies. We must break the pmeaJ vicious circle of undcrdevelopment, in which *we* are forced to live on charity, for we cannol tolerate such a state of affairs. "

These re medics cover the following four points:

— Gouina, a dam capable of rcgukiting the river flow by retaining 20,000 million cubic meters of water. A feasibility study is being completed by a Swiss group who will shortly submit a report on the economic and financial implications of the proposed dam site.

— From Saint Louis to Kayes, a hydro-iigrkruliuraJ study of the basin, requested by the four riparian countries, is being carried out by an FAO team under ii United Nations Development Program (UNDF> project. Twq pilot plots for agriculture will be established in this area under the second phase of this project.

— A study is under way of the Senegal's main tributaries — Falemc, Baling, Baoule nod Bakoy — as they cross the M and ing plateau in the upper basin The discovery of important mining resources in this area has given fresh impetus in the whole undertaking.

— Finally, the navigability yf the ri\cr from K.ivcs to its mouth, representing about I (MX) kilometers of waterway, b under study as is [he possibility of opening up the continent (o the sea by breaking the bar at Saint Denis.

In Robert N'Dao we (fiKOVM *a* m;in who is not only a geologist, agronomist and economist but also a river pilot and a guide to the future. We sec with him the million hectares of potentially irrigable land, *A* marvelous reserve of bauxite lying on the frontier between Guinea and Mali, vast rice crops which could be grown as the result of controlled Rood* ing: all these are his HWpOM "f convfetim. And, since he has the knowledge, he does convince people.

A ma!/•#• *Mfrtemm victory*

Hc strengthened his beliefs in the United States and Europe where he saw what others have achieved in irrigation, river navigation and ihc production of electric power. He is one of those who believe, and who have every reason to believe, thai in the Senegal basin there lies an opportunity for a major African technical victory:

" We are going to set up irrigated plots of 500 hectares each, one at Mat am in Senegal, the otbef at Rosso in Mauritania. One thousand hectares, that's nothing. but they will provide *a.* Man for our tests.

"Priority number one ... *Gouma* dam"

I *he* people of the basin will begin to feel that they belong to a region, and to understand the African way of international cooperation. We shall also sel up two zones for animal husbandry outside the valley because we must put an end to the Frantic search for the last grazing grounds of the dry season.

" At the same time, there will be the Gouina dam. priority number one. AI lonn last we are going to start taming and using the river as a powerful modern means of regional development. All this will quickly follow efficient studies. Afterward, there will be the gradual establishment of o new granary for ihc worid. Everything is there. It has got lo be done And we arc going lo do it."

R<>bcri V Dan's faith is nurtured on reason. Like ihc Reverend Father de Brcuvery. of ECos<x's Resources and Iransport Division, who more than ten years ago launched Ihc idea of miiln country use of (he river's resources, he thinks that the new states HIC bound to quickly reach the ceiling of possibilities for development if they remain within their cramped frontiers, To enter the 2(hh century in force, it is necessary to want things in a big way and to achieve them on a similar scale.

International organizations, who have contributed nearly SJ2 million to various studies, are keenly interested in the regional development of the Senegal river. All the U,N. agencies arc anxious lo Mjpporl the integrated project, and this generosity has had to be coordinated at conferences in Milan and New York. FAO, which has a large share in the overall operation, maintains a mission at Saint Louis, whose chief, Jacques Groltx. has acquired remarkable competence in tttc problems of African agricultural dcvelopment.

A ftmmt and a Infirm

The Senegal night envelops the house by the river, obscuring the big map of the basin on the wall, while Robert N'Dao tells us aboul the interest thai the project has aroused abroad.

" Firstly, we had to come into being. But now we exist and interest goes far beyond ihe boundaries of the river countries.

" We represent a past and a future for those people of ihc river who have never let themselves be enclosed within administrative frontiers. They arc going to help us win the battle. It is *a* paradox, but they know that they do not know, enough. So they go at it, tooth and nail, lo £ain knowledge, and they are successful. They must be pan of it at all costs, I have lived with them for years. I have seen unskilled laborers become excellent drillers in s« months. "

Robert N'Dao has more to say about the future. J watch the smile on his face as he talks about new boats, the growing rkc. mighty dams, about what will be the beginning of happiness to iwo mill km pcasanis. rather than merely a way of improving production

And looking at this passionately simple iii;in, I iiuiie understand that he will nol like il>i, tribute and that he would never accept it without mention of (he men of H.miiiko, Nouakchott. Dakar and Conakry who. with him. form Ihe riser team. •

Twenty years in a second

A computerized *retrieval* . system, part of FAO's documentation center, means that the accumulated experience of agricultural development is readily available to everyone

EVERYTHING PUBLISHED ON THE OLIVE
Art *tlocttonic memory gii/os qutcX eccess 10 the stored experience Ol technical assistance*

by ***JEAH-CHARIES ABRtU***

An epidemic threatens cattle in ihc Far F.iisi and the animals must be immunized at once. One of (he regional experts remembers that *a.* similar oulhnijk had been *nucctssSuWy* dealt wiih in Madagascar. But he doesn't remember the formula o(the vaccine or In iv. it was produced,

A t-able is immediately sent to the MO Documentation Center. By return post, the center sends back micro cards containing information on the vaccine, abstracted from the proceedings of a mceiing held in Rome two years before.

I hi-, il *the* simplest, swiftest and most complete way of solving a problem of this **kJBd,** whether for an Agricultural specialist working in (he developing countries, u student preparing hb degree thesis or for an industrialist faced with a production problem.

From now on, f-AO can supplement the skill of its experts with the capability of *the* CiiniputtT ;jnd the *knowledge of* its memory hunk* in which lie the indexed experience of more than 20 *yean ot* technical assistance activity.

" Where there is activity, thetc is paper," cry the enemies of hureaocrncy. Bui in the mouth of Gerard Dubois. in charge of the center, il ceases to be a satirical phrase. Quite the opposite, for the service offered by the center turns hiihcno useless documents into valuable items.

The pnnoply of administration — notes, nrhiriN **lad *UtttmtmM*** — is not an cvi] in itself. Everything depends M

the way it is used: it can be left to lose Us value, carefully stowed away in a woollen stocking in a secret drawer, or it can be put at the disposal of mankind.

FAO chose the second road in 1966, The idea first occurred to Raymond Aubrac, a former engineer with ihc French Highways Department, while working on a project to establish sheep in arid areas of Morocco.

" We Jos! six months *and spent* ievtraJ million francs just preparing the plans for stone sheep pens, There was no wood and we made do with what we had. Two years later I met an expert who, for many years and without timber, had been building stone pens in another area of Nonh Africa that were much better than ours.. His plans and reports were lying idle in a drawer at Rome headquarters."

Many experts are daily trying to solve rural development problem* which have already been solved elsewhere: the waste runs mio millions of dollars a year.

The Documentation Center has a budget OJ* SI00,000, several offices in an annex to the main building and a stulf of a dozen analysts and indexers. The center is buOt around a computerized information retrieval system, in which references from FAO'S ISO publications and from two to three thousand documents (out of some 12,000 produced each year) are being stored. This modest but effective entry into the era of electronics has already avoided costly false moves and duplication of work.

Thm to**nguage** ***of tttm*** **computer**

The computer uses a language. It would have been convenient to use the index system of the FAO library, but decimal classification is unsuited to ihc multiple cross-index ing needed.

Such indexing is particularly valuable in order to preserve and use. all the information gathered on assignment. tor msiance one expert who warned to find out the home market for wood produce. so as to ascertain whether it was worth developing forest exploitation in Turkey, completed i thorough study on energy sources needed for the production of power and for healing.

This study is very complete and could be extremely useful but normally il would be hidden in a report on forrsl exploitation. By indexing documents under a great number of headings and subheadings, however, the computer will recall this study whenever such key words as heat, energy, power or heating are raised in connection with Turkey.

'[he index system consists of "descriptors" : words or groups of words, which define, without homonyms or synonyms, the concepts under which information is to be listed and retrieved. Thus, a very simple *language* hns been created; so simple that questions asked of the machine must be phrased very carefully.

For example, it is noi enough to **oft** the computer what has been published on olive cultivation in the Mcditerr;mi;.i' it is necessary to add the names of JII relevant Mediterranean countries.

Specialized inde**x«« *uvmltmbtm***

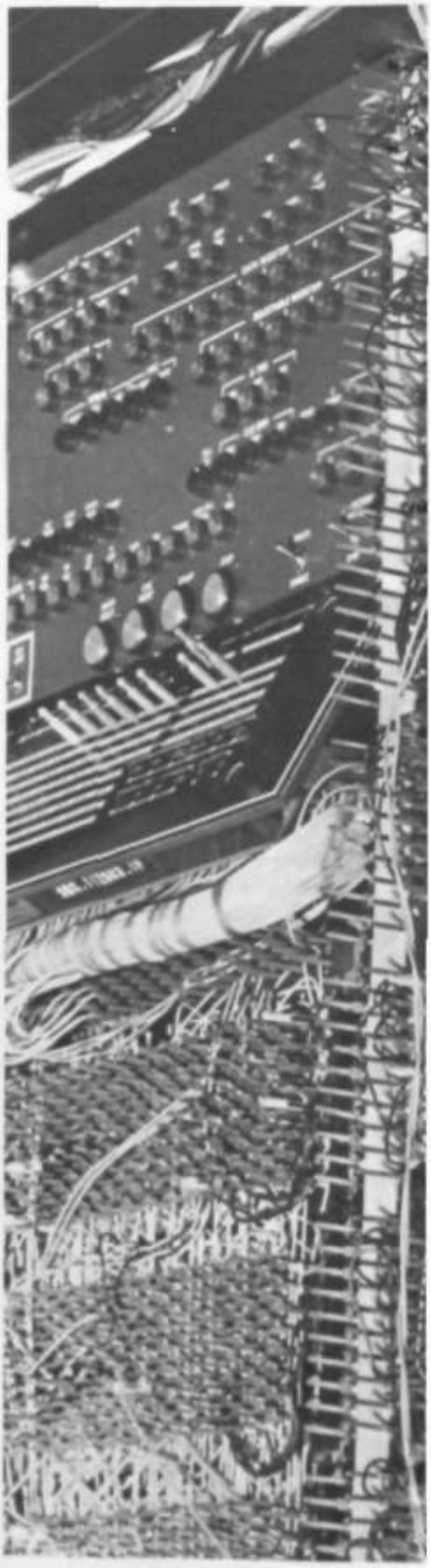
The questions sometimes seem bizarre: a government adviser in Laos once asked for everything that was available on the breeding of frogs. More usual customers arc. for instance, a pulp and paper company wanting to obtain details on the industrial processing of certain tropical woods, or a graduate student preparing a paper on nutrition problems.

The reply which comes back from the typewriter coupled to the computer is in the form of bibliographic references. Occasionally, questions that arc (oo vague or badly put force FAO specialists to spend time on research or to ask for additional details.

A monthly index of current production of documents w being published. h consists of two pans: one is bibliographical, containing summaries of the documents in their order of accession; (he other is analytical and lists in alphabetical order the descriptors and kc> wonfc used in the indexing.

Each month the recipients of the index can quickly spot the documents of interest IO them simply by going through the descriptors, Some institutes are already ordering about 40 documents each month in order to keep their collections up to date.

A cumulative index containing a more elaborate analysis comes out twice a year, in June and December **Raymond** Aubrae, now director of FAO'S Program Liais<>n Division, who helped Lo establish the center, explains: **"The** mere ti- of entry numbers opposite (he **dncripton**



and Ley words ilocs not, in itself, help with ^IcctUin of items, so we decided to **produce an analytical** index in which **descriptors (and key wordsj appeared in their context, reproducing all or part of the summary composed while indexing "**

Selection thus becomes a somewhat easier mil tier. This approach was made possible by adapting a spetitk information retrieval system known • twic (key words in context) for which prearranged computer programs exist

FAO marked its 20th anniversary in 1966. Twenty years of documents had to be stored in the computer's memory bunks. Specialized indexes arc being produced which catalogue nil of FAO'S technical documents, covering such Ik-Ms as forestry and fisheries.

Waiching the computer at woik processing QB0 of these indexes, one sees the tape implacably consuming ihe subject matter at a Me thai K inhumanly fast.

These indexes bulky as telephone directories, arc available w ihe public. They are divided into three pans bibliographical; b\ author; and according CO the KWir system. They make up a complete set of references to FAM'S entire work since its founding, from nutrition to land reform.

" It all isetnt quite simple but ii h.is called (or OOntidSftble work, " says Mr, Dubois. " FAO'S technical divisions have grasped its Wflftjnwi and helped us grtatly by selecting and collecting document Sometimes, though, we had to pla> detcciivc. tracking down a veteran who was hoarding the last copy of a document mil of print for nearly 20 years."

Mr. Dubois was not the first to undcrinke [his kind of search, though he may be the lasl. One day, when FAO was ten years old, one expert became wry angry. He was studying Iraq's natural resources. He asked for documental inn but received only two small pamphlets. " You are pulling my leg " be Band up, " K this all you have learned in ten years about a country with such fantastic nil potential? "

THE NAKED BRAIN OF THE COMPUTER
An information network wilt som* day tink thm continents, drawing upon lha **p*<t*nce of mtiot vrganitatiQns tnd dtsstmmaUng this material throughout thm world

Gut it was impossible to find other documents for him, so he had to (our I he offices one by one trying m lind wh.il be wanted. To his great surprise, he emerged from each talk with a rcpon, a bundle of correspondence, or the minutes (if a meeting, I IK eventual pile of documentation exceeded all his hopes.

Today, all of the **FAO** documents dealing with *a.* particular problem arc easily available. If they have been published and arc available in stuck, there is no problem. If there is only one copy, iL must be reproduced. To this end, the center uses micro cards, each sheet of which contains 60 pages of documents.

Am intmrnmtiommt mmtmrork

This is a most economical, quick and surv method of reproduction: mistakes arc impossible, and dispatch by airmail is not too expensive.

Requests can be handled for positive micro cards, which can be read on a special apparatus, negative micro cards which can be reproduced at will, or photographic enlargements of the micro cards large enough for unaided rending. The center will soon store it*. **0WB** archives on micro cards.

" In every country, it seems quite natural to turn to the authorities to timl ihc answer lo one's problems." says Dr. Aubrac. " Aren't the ministries public services? One forgets ull too often that organizations such as FAO are international public **icrvioes.**

" We are among those best qualified lo solve rural prohlcmv We have one of the finest libraries in this field, the **oral BKteaatVB doowneniaclofl** and a •great **nage** nr **ipethrtbtt.** Add to this the fact that we take a worldwide view of such problems **Wttfe** the help of prcscnl-day **Icchnical** resources, we can **lolvt** manv development dilriculties.

•' We would like the center to rxvt>niL- a luiistm point between bilateral and multilateral aid. Bilateral aid is sonic- times expended in useless L-tlorts fur bck of knowledge of what • beiQg done etscwhere; we can help avoid this problem. But »c UIMJ hope that it will be a dialogue and ttiiit. through our center, multilateral programs can profit by the experience uF bilateral aid.

11 We should like to forge an intcrnational nctwink covering exchange of

technical iflfonnttiOB on the development problems of food and agriculture. It would have to include those research bodies with long experience in this field from which we have drawn inspiration: ihe Centre national dc la recherche scienlifiquc in France, the U.S. Department of Agriculture and the Tropical Institute in the Netherlands, to name only a few.

" On the other hand, our efforts must also be directed toward increasing the number of specialized documentation centers. Already we have helped to establish *a* national documentation center in Morocco which will use IAO'S indexing sysiem. Similar efforts are planned for other developing countries.

"Studies on rural development have multiplied in most countries of the thinl world over ibe past few years. In many cases the results have not been publish^! and the original documents are in danger of being lost. It would be very useful to collect them together and lc increase their usefulness. " said Dr. Aubrac. " In Morocco this would involve translating the central vocabulary which has been drawn up in English to meet the dOCD-mentatkm needs of *HO.*

" But one thing Ls clear. In publishing our indexes. (K do not want to add yet amrthcT pamphlet to the nearly 2,000 periodicals which already furnish summaries of published art kits. Our aim is to explore unpublished material which generally disappears. The vanguard sectors, such as chemistry, nuclear science and molecular biology, art the only ones at present to Mac indexes of unpublished documents. We think that the science of development is sufficiently important. and in such constant evolution, that it •ho needs this kind of treatment.

Research rm**tt* confirmed

"It would meet a pressing need. For example, research has been going *im* m Morocco-over ihc post (5 years on the L LI r iv al mn of long-staple call on u\ing a <o/;ihlc pilol project of 100 hectares. Excellent results have been achieved, but so fir these have not been published Scientists in the Sudan, who have been improving long-staple cotton with great success for h*lf * century, do not know of the work of (heir MoFOGCM colleagues **As a rank, WO** highly **iparirifcwd** teams have been grappling with the same problem: they could have shared the job for they are both working jn similar ecological conditions. "

The center recently published a document indexing agronomic research projects in eight West African countries. The document was prepared as the basis for discussion at a conference on the priorities of agronomic research for economic development in Africa, held ai Abidjan in April under the sponsorship of the U.S. Academy of Sciences. These indexes enabled researchers to keep abreast of aJ) similar project*. They confirmed not only the importance of the results obtained but also the need to continue such research work.

Grmmt mmvimgm jron/frto

Savings in money and effort which could be gained through general application of this method are enormous. In worldwide agronomic research, perhaps 209 is spent on duplicated work: the I niicd States alone d n o l n $4(M) million a jntr to such research.

National und international documentation centers, research stations — the elements of a world-gird l ing information network for agricultural development — seem complctc.

It is now planned to extend indexing to documents dealing with problems of runil development and food production published by nongovernmental organizations. Here, lou, valuable material, the work of specialists, Ls not being widely enough used and is in danger of being lost. If ihis projkvt materializes, the results of work by the private sector would be integrated with the results achieved by governments.

Having pushed back the dark frontiers of disease and death, mart has become aware of another human failing: his terrible isolation, the barriers preventing him from communicating with his fellowmen.

This is why our century is, above all, the century of communication. To know everything, at once — this is the aim which distinguishes ours from preceding centuries.

As the modest embryo of a giant worldwide information network for development, the FAO LXKumentation Center mccu ibis mmt important requirement of our time. ■

A plea for intermediate technology

£. *F. SCHUMACHER*
give hi* vfawm to Gormldine K*mn*

When you ***launched tkt*** *Initrmediate Tech-* ***nobgy*** *Development Group in 1966. wtnii wherr you aiming at? Wfiai made you ftei that an intermediate technology was* ifj *important?*

A controversial attempt to increase the productive capacity of the two million villages of the third world

I'.h Schumacher, *itirtctor of ttt? Intrrmrdialr terhrtiitt'gy (iraup Ltd., u an* **irflmwir** *mi-riser i. :h, >' K. Salmiuil Cfmi Soafd.* **Mr** *was econofrin: aitviirr in itit Qo*tnuntntt* **"f** *Burma in i<H>2, ami nf India in 1966.*

In my VIL-W itic real problem ol world poverty, and thereby the problem of development, lies in the villages — perhaps **two** million of them. These villages find their populations muUipl>ing; *ihey* have noi jitii enough land, their present farming nu'thixl^ are **too Inefficient** to produce • proper livelihood. As 3 result, people are streaming off the land .tinl into the towns. This, in turn, is making the lowns quite unnunufcablc.

the high kvel of techmikigy that we have developed in the west can only function if there *t%* a lown in (lie vicinity, and moil o(the aid effort ha* ^onc into such tuwns. This means ihal ihc people

Tanzania says: yes, but...

Although aid is both needed and wanted, the country cannot allow itself to become dependent upon outside sources. The farmer is the key to self-reliance

*y *D£REK BRVCESOK*

Is a developing country really developing? What fields of activity are being **developed?** Who controls this development and who benefits from it?

Statistics, which admittedly may be quoted to illustrate almost anything, indicate that life, today, is hardly more secure or comfortable than it was ten years ago for the vast bulk nf inhabitants of the underdeveloped world.

Governments of the countries making up that world are young. They lack experience of administration and adequate manpower resources for the most fundamental services as well as needed capital and skills for development. Such countries **ate nearly** ;ill largely dependent on agriculture for their livelihood and their development: such agriculture being an industry composed mainly of smallholder peasam farmers.

The highly developed countries generally accept that they have a moral obligation, which can, of course, also be **justified** on' economic grounds, to assist in the development of tht poorer toun tries of the world; and they do so to a greater or lesser extent and in varying ways,

Tan2ania Lt one of these underdeveloped countries which we hope is developing. During the few years since our 1961 independence, we have gained some ex* pcricncc of the difficulties of development, of the ways to use limited resources and of how technical aid IH.LY best be used; also something of the requirements and hopes for foreign capital.

The government of Tanzania is a sodjlist government, dedicated to the formation of **a** trul> si*:ialisl society with ever-rising standards of living. This is a most inttrtilinj; philosophy hut also a most difficult one. as our friend. Professor Dunioni. has pointed out to us.

When *a* country is basically agricultural, the quickL:SI and easiest way of increasing the national product is through large-scale enterprise uiing nnxJcrn methods of produclkm. When a government has very limited resource* to instigate ihis development itself, even supposing that Mjdt is • proper function of a government, then it has to look outside itwlf. and usually ouliidc the country, for such activity.

ᐅ Vi M. **BtyCMOO,** *Utrmrriy* ***TmttUtidt*** **IrffefWr** *ft* Wifln *and Vttmmrttr and thru tt(Health* ***ami*** *Liihir.* n *tutw Minhtrr of Awuullurr* ***and*** Cooperatives.

who need aid most are simply being by-passed. Can we bring aid into (he rural areas so as to stabilize this position, stop the great drift into towns, do something about unemployment and banish the specter of world hunger by raising productivity?

The momen: you begin to think along these lines, you **asc** that an appropriate technology is required, something very much simpler than the highly sophisticated technology we arc using in the west. The term that we use is an intermediate technology.

What do you see this technology as ***being*** *inte.mediate between?*

It should he very much belter than the nonvubk- technology in the rural areas of the poor countries today. At present there is a gap, a huge gap, between these traditional primitive methods and the high-level technology of modern farming.

Take, for instance, harvesting equipment. This means cither the sickle or the combine harvester. What we want is to fill the gap between the two. Some thing better than the sickle but much easier to maintain and much sturdier **than** I he torn hint- harvester

Quite a tot oj work is already being done in developing countries along these tine-, Do you think that you have something different to offer[9]

We do not want to be different. We want **to** tackle a particular aspect of the problem that is **generally** neglected. Pw **Mtjf** i> a terrible condition, though most of us do not know very much about it. One of the drastic features of poverty is that you arc cut off. out of touch, unconnected with what is going on elsewhere. There is no communication, and the same methods **baVE** ti> be re-invented again and again all over the world. Our main job is to tackle the problem of commun teat ion.

In India some splendid solutions have been found ***at*** an **iottmediate** technology kind, but in Peru or, say. Tanzania, nobody knows aboul them — and vice versa, li is irugu in KM people struggling to find solutions to quite straightforward problems, which have been solved long **aaa mail** li i it else.

Further, we have research establishments, rxith in the. developing and in the aid-giving countries, wheTC solutions have been found using an appropriately simple technology. But these solutions are unknown to those who need them.

flew tin you Him to ***bridge*** *this gap?*

Quite obviously we cannot communicate with two million villages directly from London. Our policy is to set up local groups in the developing countries themselves. We have groups in India, Peru and Colombia. Negotiations are going on in many other places: Pakistan, CeyJon and various African countries.

We want the local group to do two jobs: first of all. to gather information on all the positive work already going on in the country, secondly, to receive and disseminate the **information** that we can puss to them from London.

•What we want is to tilt the gap between the two Something better ttisn ihe sickle..."

We try to feed these groups with information in an **caiy rtfmooe** form. Like the catalogue that we have recently published called *Tools h>r* ***Proptts,*** **We** are working on specialized manuals dealing with important everyday problems. At ihc same time we arc very anxious to get from the groups a feedback of what (he problems realty arc.

What son of nucleus do you form in these countries? h it round u governnst'tu cigrncy or private mdividuai\ who are doing particularly gmtd work in ih, field?

If you want io achieve anything in Unreal world you always kmfc for something that already exists. **KNM** growing point: a technical university; a group of private individuals.

[f you **ttk** me for a general formula, I would say that it has got to combine the three forces of society. 1 call them the A.B.C forces: A stands for administration — in this case, govern men: and international agencies; B stands for business, for industry; and C stands for the communicators, the intellectuals, the research people, universities and so on.

Setting up these groups is clearly the first step. The next, presumably, is to silt and sort out the information you ***receive*** *and* ***to*** *issue publications which can. in turn, he used by the groups, is* Tools for Progress *Jypical of what you are seeking to dp in this direction*[0]

I think it is. We have been talking for sonic time about the appropriate equipment for these two million villages. fVisple quile naturally said to us: "Well. **where** is it? Has it still got to be invented? Who is manufacturing this type of equipment? "

We started with British industry and found that what we consider appropriate equipment is being produced, commercially, today. There is no need to invent it: there is no need fur new designs. No one had hitherto gathered the information into a catalogue which could be easily used by people in the field to find oui what they wanted.

The catalogue lists manufacturers who arc producing down-to-earth equipment. 11 contains the names of British manufacturers who are prepared to help with the production **of** this type of equipment abroad, either as a joint venture or under license. Where a certain product has gone out **of** production in Britain, because the market fur jt is **ao** longer large enough. **Ihc** manufacturer has offered to make Hi blueprints available to anyone interested in setting up production in a developing country.

\">r *that you have established a ba\c. *tuu* 11 *ytmr tfroup aiming tit tackle next?*

W« are now bcc<tilling more specialized. Our most important project is an-">ttici pubin. (tii 111 dc.iling e\i:lusiuly with low-"M huiklint: rnclhods. There is ;i *4(b range **of** building **PKtBodi** but a

director of education, for example, who has to build 50 schools or 50 houses for teachers, has very little information to help him choose between the alternatives, particularly on really low-cost possibilities.

We are assembling a manual which will present a complete view of the alternatives that are available.

Another subject on which we arc actively engaged is water supply and storage. A large number of the developing countries are arid. Water is the beginning of everything. Until this problem is tackled, no development-effort can get off (tie ground. Here again, a great deal of knowledge exists in highly scattered form. Our aim is to bring it together into a low-cost brochure.

There arc many simple possibilities which could make a very real impact at the village level. The rainwater catchment tank, for instance, has aroused great interest in Botswana. Two of them have already been built and we are negotiating at the moment to get the very simple technique involved taught in primary schools throughout the country.

The introduction oj simple ***toob*** *and equipment could have an immense impact on village problems but this impact can only be felt tm the world tcvt'l if you can reach several hundred million people in the rural sector. The task is huge. Do you* ***let*** *yourselves working closely with government and international agencies?*

Time is getting very short. We must use every means available and must work with everyone who is prepared to work with us. The international agencies are doing excellent work, but they arc large and bureaucratic. There arc many things which they cannot do because it would be tactless. They cannot easily initiate action and very often musi wait for the local people td ask them for help. We arc extremely anxious to work with them and have so far been quite **moONrfU bui** we will not wait for them.

The network that is coming inlo being is **a** network of groups of individuals who **really want** 10 do vnncihing about the development problem and want to do it now.

We cannot, of course. VcacH two million villages in **one** throw but we can reach people who arc really concerned about the problem and we have to hope that there will be some snowballing effect.

We are trying to supplement our activity on the commercial side hy getting people to tackle the trading aspects and also the question of credit. Credit is a major prohlcm in poor villages and there is very **little** one can do about it from London. But, at least, when we gel people interested in appropriate equipment we now have good banking con**nctJOM** who will help with the financing.

I do not think that a small private group like ourselves can solve the world's problems. But i think that through out work people arc now becoming much more interested in this approach. 1 hope that *we* can persuade the big agencies •o work with us. In this country there arc the big money-collecting agencies like OXFAM and Freedom from Hunger. We are working very closely with them.

(Imrity can have an enormous impact in a small area, but tin-re is surely a ***very*** *definite limit to what it can achieve?*

My answer is both yes and no, I do not believe that the problems of development arc problems of money. It is more • question of giving the right kind of help and advice. Yog can waste an enormous amount of money on projects which are not appropriate to the conditions of poverty as they actually exist.

Let us assume that there are some two million villages that represent the **real** heartland of poverty today. You can establish a first-class wood work ing and metal-work ing shop for £.100. One hundred times two million is not an insuperable problem.

It is organization that is. perhaps, beyond us. It is intelligence, the application of intelligence to village problems, that is in short supply. If the advice given is the right advice and the equipment **•irritable** is the appropriate equipment, then finding the money to buy it is not such u prohlcm.

t think great mistakes arc being made in being too generous. People do not value a thing so much if they have not had to work for JI. You cannot assimilate any knowledge without your own effort. But the right information can be supplied free of charge — a form oi charity if you like. Our funds are very limited. Our contribution is to mobilize knowledge that already exists and make it available in the right places.

And this is the gap that you are aiming it) bridge?

It is a major gap at an a]I-important level. Many people assume thai I want to do away with all high-level technology. In fact, I am not concerned with this at all. I am concerned with the gap. Can we fill this gap? Because if we do **not,** then the main aid effort will continue to bypass the poorest and will not touch the rural areas except at a few points.

The scientists and research workers of the rich countries work on the problems of the rich countries. The much less numerous scientists and research

"...but much easier to maintain and much sturdier ihan trie combing harvester"

workers of the poor countries also work on the problems of the rich countries. **Our)** in I few special cases, often at the instigation of international agencies, *d^* the scientists and research workers of the rich countries apply themselves to the very humble and down-to-earth problems of the poor countries.

Our principle is to set up working groups of real experts on a voluntary basis to tackle simple questions: water conservation, transport, fish drying, crafts and trades: IIK UH>K .I village needs, from clothing and footwear to simple processing of agricultural products.

We want to make available detailed background information on technologies cheap enough to be of use and which can be applied on the inevitably small scak- that the village economy demands. *m*

But even if developers can be enticed in, is this really, what underdeveloped countries need-' Foreign capital, particu-Lirlv when it is private capital, coOKi in seeking profits which it wishes to export. In many cases It wfchea to make the profU in its own home country ur even, fur tax reasons, some third country. so prices and arrangements have to be tdjasted accordingly.

Lorirtg aantrot of thm mconomy

When taken too far, tfm kind of development can lead to a situation in which iho government docs nut control the country's economy. Rather, the economy becomes controlled by interests that may, at limes, rind themselves in conflict with the country's own best interests. Decisions may be taken which arc logical Imm the point irf view of the enterprise concerned, hut 'which may be damaging to the country, bringing about undesirable political and economic fesuhs.

Similarly, though to a lesser and much less obvious L'ML[1] nt, foreign aid. We all talk about " aid without strings" and most people in both worlds, the rich and poor, pay lip service to the ideal Hut how much aid is truly without cither economic or political strings? There is some, it is true, and men tCBQC to those who give it. but it is the exception rather than the rule.

In order to retain a country's independence of action it is important, when receiving or accepting aid, to balance up such aid as fur as possible ana" also (o keep the basic necessities and, wherever it can be done, the development of the tountry independent of it, In other words, the daily bread of the country slu HI Id not rely on outside factors, only the hope of getting MHIIL' butter and jam now and then.

Independence from these outside factors allows independence of national action and thu* berth honor and esteem. In an agricultural country. thcrefoa\ the government must enable the fanners to be providers of ihc J;<ily bread

When our first five-year development pbn was laid out in 1963, great emphasis was placed on outside Ctpl i! and skills to help develop all sectors of Ihc economy. Agricultural Ucvclopmcnl was divided Into two categories " transformation." meaning development using modern, usuaJly capital-intensive, mcth-

Essential facts on Tanzania

Uniltd R(public ol Tanzania consists of Tanganyika arid ihe islands of Zanzibar and Pemba Tanganyika lies on me easi coast ol Africa wilh Uganda and Kenya lo the north, ihe Democratic Republic ol the Congo 1o the west and Zambia. Malawi and Mozambique to lhe south Zanzibar and its sister island. Pemba. .are situated In ihe Indian Ocean aboLit ?5 miles off the coast, Tanganyika formerly a UN Trusteeship Territory kinder British administration, became Independent in 1961 and *was tttdared a republic, wllhin*)J» *Commonweatib.* in December 1962. The Zariiibar government Signed an act Of union with Tanganyika in April 1964. thus cresting the United Republic of Tanzania.

Julius Nyerere, president* of trio *United Republic at Tanzania

Government: an iiierim i niMIflithm hHTl oo a one-party •yatftm. wai introduced *m* l9B+ Th* legislative organ *m #m* mcamarai National Aaawnbty ol up to 204 mtnibn Th» PnMktwt la alartaa by universal aunrag* and a pf—iflfini »i>citon aiual

kn Holrl lUt^aW^BlhBBBF at^al AttB^MVaVutw !• MUaaW^aaaafti uut uv iitriLi wTPaw^arvPaw •'• nHwnVf 4 QVawmii nw

new Ass»mto*y nacHona Md in October IMS. Prandjrtt Juirus Nyerere was relumed to power and In weft oonaWuancy «*» O) two Tanzania African National Union (TANU) members was c*wn by *Xtm* wX»n Th* country u divided into seventeen regions, each with a commissioner Chwfa martins to hoW official posts must relinquish their iribal authority

Population: 12,12 million (esl in 1967} wilh an annual growth rale of 3.4%. Population density is W.B per square mile on the mainland and 347 per square mile on the islands (133 per square km., and 133 per square km. respectively)

Langua?*: Swahili and English {both official) and a number or tribal languages

Ar»*: 361.600 square miles (937,062 square km)

Land uaa (ID square miles/square km): arable (39.900V99.750). plantations (4.100/11.619). permanent pasture <3S 000 90 650). uncultivated {68,200/176.638): forested (141.5007366.435) other (73.100/109,329)

Ma}or natural fulurn and *tourcm** t>Of*»ti on Lake Malawi {to south). Lake Tanganyika ito tw«t] and La*« Victoria (to rwrrtii Liu partly in the savanna, partly in the tropicd tw—t ifgion nawonnm. goto, tm and saJl are mined**

Economic development: gross national product (GNP) was $684.1 million in 1964: Ol which agrlcuMwa wst *mpcrVbi tor tSMJ iMUon, mining and quarrying 1or Sl6 5 miHKjn manufacturing tor » 4S willan and commerce for $79.5 million, the Five Y«v Omtopmam Plan | 1 W 1 1 irmptMH an *»pfthdi1ur$ of about £246 million [S669 miHwnt**

AgrtcoHural towtoaawtt; UAIM CROPS iproducfaon in metric tons): sisal — 221,529 (1966) wigar — 990 000 (1«S). coOon Imi — S7 000 (1B*Sh coHee — M.000 |I965) cloves — ahipimrti «Or*i E39H000 f«10 0MB0Ol m 1^66 ANIMAL PRODUCTION beel mi. port, mutton and lamb production trow indigenous animals totaled 91.000 metric too* n IMS FffIHENGt PPJOOOCTM>* baan marketed fisti totaled 25.000 metric lons i 1906 Cunld h* UflU » 900 ton* m 190S FORESTRY PHODUCTION roundwood productMtn totaled 1VS62 000 cubic nwlm tequivater>t| in 1965.

Trade toUl imnhawW— tnjdt npofia (1*851 amounted to $179,400,000; total merchandia* (fad* mporu (1986| wnountad ID (140100 000. total agricultural e^porij (1965| anOMnHd K> 11*7*00000 MM agrtctMurM im ports (1965) amounted to 513700 000 aiaahdpan ol agncu«urBi asportft tfM&| ivit as follows lea (4.288 metric ions — *UZXfXtn* M*J (113,770 i*i«fic *tem* — MJW.O00} cotlon (2 615 metric tons - S3.419 000I. oottoa *QM1* m*nc torn — $24 000.000)

Fliune*: an banks w*n> na*anMtl*a M its? Twuama BMon^t to the Easi African C3ii—w*| and IP *— Atncan Pmalopwunl Bank. Foreign aid «i 1964 included S24 minor- t,om ih* NNamNbonai agjmcwt and tE iwWon M grant* •">! credits from ihe Unitwj SUN Oantopmani Fund —*txrwtm tot* 1WS1 include S2tT7 million lUmied KMigdomi. 15* mitiion ftlAMd SMMM). §73 mMon (Inawnift^ii r^veioprneni Association} Ol mribon loHiar «onign mnn|; Kit HHMKHI (li*aiiil MurcM); and S28 million iunaactinMj npranya}

Touri.m in t9K r*i*nu» tottlad appf«ri«mit| £2 MMQM *»* PMtan» Tanzania plans to spend E6 million ($15 million) over th« rwit tew years on tourism promotion

Communlca1i4n*: » network ol passenger and goods road services (2,611 miga/ 4.204 kms.) is operalerj in the southern high lands prowidinfl link* with Zambia and Kenya. Rail and harbor service* *Arm* part of th» Eav African Common Services Organization

Data *irom in, UN* Yearbook — r»(ns. *fAO Pmtttittia** Yearbook _ r»«« *fAO Trmas rttrtm** - 1966. Yearbook of Statistics — 1966; FAO Yearbook of Forest ... 1966 and 1967 „# (A* Economist's E.I.U. 1965 Report on East Africa).

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ods; and " improvement, " meaning development based on ameliorating the bask techniques of the peasant farmer.

It did not take us long to learn some lessons. Firstly, that capital-intensive schemes are also skill-intensive and that we were short of both commodities. Secondly, that we had grossly underestimated the capacity of the small farmer to increase his production given only the smallest of incentives and assistance. Thirdly, that foreign aid, and even more foreign capital, comes in where it chooses and not where you choose.

Mood to self-reliance*

We started out with great enthusiasm for planned settlement schemes, but it soon became clear th^t there were a number of sociological and economic factors which had not been given due weight: the return from such investment was likely to be long-term and high-risk. This is not to say that all settlement schemes are bad, for we have had some notable successes, particularly in the tobacco-growing areas; but it does show that great care must be taken. Some workers adapt themselves to such schemes better than others; a certain amount of experience is essential before large-scale expansion becomes possible; while certain crops, such as sugar, tea and tobacco, are much more suitable than others.

We learned also that our school-leaving youth looked upon agricultural work as a last resort, an occupation for the failures and the uneducated. Our school system was geared to produce good university students, whereas only 1 in 50 of those entering primary school could find a place in a university. This meant that 49 out of 50 had to re-enter an agricultural society having been alienated from that society and taught that to go back was an admission of failure.

These factors, touched upon superficially and briefly here, as well as others. have led Tanzania to readjust and reform its priorities and to form new policies. We arc determined to retain our newly gained independence. This means we must be self-reliant though not, as some people have interpreted, that we no longer want aid from outside. That would be narrow, stupid and illogical. We want aid very much, in many fields, but we cannot allow ourselves to become dependent on it, cither from one source or from a whole crowd of sources.

We seek a position in which anything we really must have, that is essential for our country's and our people's well-being, we should be able to provide internally or else be able to go outside and buy.

Practically the whole burden of such self-reliance falls on our farmers, in the absence of industrialization, mining or tourism. It is the farmers' efforts which must produce our food, our clothing and our shelter. They must produce surpluses for sale abroad to provide us with foreign exchange needed for both capital and recurrent purchases. It is they also who must provide, through their savings, the local resources for local industrial development, and, through their purchasing power, the local markets catering to an increasing range of locally manufactured consumer goods.

Gradually, of course, this picture will change, gradually industry will assume a greater importance in our national economy, and, more important still, in the everyday Jives of the people. Even so, a wealthy industry is one which is built on *a* solid base of local demand. This will mean a purchasing public in the farming sector for some time to come.

What docs all this add up to? As seen in Tanzania, it means that we must concentrate on supplying the farmer with the services and incentives he needs. This means on the government side, research and extension in both crop and animal husbandry. It means organization of the transport and distribution system. It means adequate credit under proper control. It means accurate forecasting of requirements for seed, fertilizer, insecticide and their availability in the quantities and in the places required. It means assistance to the farmers' cooperative societies so that they may properly serve the farmer and their organization, so that they may act as a two-way channel of communicalion between farmer and government. It means storage and crop protection. It means **vaccination** and inoculation campaigns, disease control and eradication. It means advice and assistance on **marketing** and many other aids and services.

And it means, at all times, education and more education. I use the word "education" deliberately because I mean more than just explanation, although explanation is very important in itself as par! of the education process.

It is not simply the farmers who need educating but also government. Far too many people working in, and for, governments are unrealistic and impractical. Too often they lie comfortable and snug in their central cocoon, too ready to solve problems on paper without asking advice from those who have experienced the problems at firsthand. This applies perhaps even more to the U.N. agencies because their headquarters are even further from the reality of the field than most central governments. Education must be a two-way traffic of information.

It is important that technical aid should be aimed at increasing the receiving country's capacity for self-reliance. Many underdeveloped countries, like ourselves, accept aid which creates a situation in which continuing aid is necessary for the furtherance of a particular project.

Often we overestimate our capacity to undertake certain tasks within a given time. Sometimes this is a financial failing but, more often, it is manpower shortage which is the missing factor. Aid-giving countries would do well to insist on on-thc-job training so that the receiving country is more likely to be able to carry on a project after the aid comes to an end.

Tragic wamte of effort

I his applies **to** personnel as well as projects: there should be a training clement in all technical aid posts as far as possible. This would ensure that a country continues to have a particular job done by local staff after the aid assignment is completed.

Often, technical assistance experts do not stay for more than a two-year period. This is long enough, though, for some jobs and, jn any case, is enough to allow national counterparts to be trained so long as they have enthusiasm and requisite basic knowledge. Too often experts come, drift along without proper guidance or a specific assignment, and leave with no follow-up.

There is little enough of **the** rich world's resources devoted to the assistance **of** ihc underdeveloped world; it is tragic **to** sec so much of it go to waste. Such funds would often be far **more** effective if they were made available to the **underdeveloped** country on a much freer basis. Aiding countries like \o us* their own personnel and their own equipment, 'lluv liVc la be able to clcarh

identify the project which they are helping. This can lead to much wasting of valuable time and effort in ihc kind of situation which is present in most uiidcr-developed countries.

The delays that often result are frustrating and. because of ihc changed circumstances, can render the original scheme less effective, Unfortunately, only too often the government of the under-developed country involved is as much, or even more, to blame for waslc and delays. It seems **to** be in the nature of governments, democratic ones anyway, that they arc unabk to lake decisions in a hurry. While the reasons for this can t* well understood, it docs not make the whole exercise **any** less frustrating to eager officials.

In Tanzania's Ministry of Agriculture and Cooperatives, we have always tried (0 identify and spell out tin: job thai an cs-Pcrt from ouisidc should be doing. At the same Ume. it is important not to (ic him too closely within tightly defined terms of reference, unless the job is very specific — not often the case in our situation.

One of the nun.! **blipuflMH** aids ld agri-cultural development i- the assistance thai can he channeled to the small farmer through the cooperative *>cicty. These societies **are** the basis of **Tanzania's** development program. Through them we try to reach the majority of our farmers, to teach them new and improved methods and to introduce them to new varieties and new crops. They provide (he channel for credit, both crop loans and longer-term credit. The farmer markets his crop Ihrough his society and the society is in the best position to ensure repayment of outstanding debts.

Here, **too,** farmers can meet together and learn to manage their own affairs on & col lce: i ve bas is. [nd i v id ual ly, of cou rsc, **they** may have been their own managers for years but. during this time, they may have been very largely at the mercy of dishonest and unscrupulous traders.

The cooperative is the organization thmut'h winch the farmer may invest The building up of his financial reserves **by pa** to primary processing of his crop, laler to more sophisticated investments.

We can show good examples in TanraniA of very successful cooperative development and of failures. The successful one* arc generally those which **haw bvSl** upward from the farmers themselves. Where they have failed it is usually possible to trace Ihis back to the formation of a top-heavy society led by sontc enilui siastic but misguided leader.

After having **had to** <>kc some rather drastic iclwn last year, the situation in Tanzania is now beginning lo clarify itself. Our job is now mainly teaching: teaching governnicnt officials in the Divisions of Agriculture and Coopersives and Community Development the fundamental concepts of cooperation and how to stimulate and ,is^i>i the cooperative movement. We teach the workers in the cooperatives, the managers, treasurers and secretaries, to be more diligent and efficient at their jobs. We leach the committee members how they should guide the progress of their society and took after the interests of their fellow farmers who elected them. We teach ihc **snail** farmer what a cooperative should be and how it can help him.

This is quhc a job. Luckily it is not necessary in the case of all societies, but the job is urgent and sufficiently widespread to mean ihat all our resources arc **ltKtched** to the limit. As each society **becomes** stronger and more efficient we try to expand its act is i tics into more and different fields: from marketing, transport, storage, processing. pro\i>ion of **credit** and simple farming requirements to (he sophisticated cooperative

I his is the development p;iih ihat we have chosen, for we believe that jt can **fulfill** our aim of creating a society in which there is equal opportunity Tor all and **a (air** return for labor.

Tanzania's **economy r«srs upon *ffricurtu« *ftom Mt to right:** *pulping coffee,* ***hawing paddy, and growing tomatoes***

Low incomes in the high Sierras

A young Dutch agronomist helps to introduce fertilizer to Ecuadorian subsistence farmers as a short-cut to higher crop yields and cash returns

by FLORITA BOTTS

More than half of Ecuador's five million people struggle for an existence on the bare, high slopes of the Sierra region.

These highlands are occupied by people ol pure, or nearly pure, Indian ancestry, speaking Ouechua. language of the Incas. and living in a sjbsistence economy

So great is the pressure for land that potato and maize-growing are carried on up to 4.000 meters. Higher still, sheep graze the grass-covered slopes.

It is a paradox thai people are so numerous and land is so scarce tn this mountain region while, in the fertile coastal belt, there is plenty of land but little labor to produce tfie cocoa co'^e bananas and rice which, together with sugarcane and balsa wood make up Ecuador's mam exports

More food is needed to sustain the Sierra people, according to the Andean Mission, a national rural development agency who have plumped for fertilizer as the quickest way to increase agricultural production

Over the pasi five years some 4.000 fertilizer demonstrations and trials have been carried out m the Sierras by FAO's **ItrWm** program working with the Mission.

Annet van Heisdmgen is a tall, well-built Dutch girl who would draw whistles any time she walked down Amsterdam's Kaivftfstraai. Annei. whose swifl of btond hair bestows a marked resemblance 10 "Ceres' herself (see *page* 66 *at this issue},* was bom in Indonesia 26 years ago She was trained m horticulture at Rijswijk, Netherlands, and previously worked as a Dutch volunteer in Colombia She was brought up on a farm and gels on very well with the Ecuadorian farmers.

Farmers are canny folk the world over ?nd musl be convinced *that whet* ffiey are *doing will help th&m and not* a *distant politician,* local traders or officials.

The first step *(below)* is far Annet to talk to the villagers before the land is sown or fertilized and to get one of the farmers to allow part *o! his tand* to be used for a village demonstrafjort.

Individual holdings are small and these farmers have been encouraged by the extension workers to form their own club where they can discuss mutual problems.

Gaining the confidence oT the farmer's wile is almost as important as winning over the husband.

Social workers like the one talking to *Annel* [itow *tstf)* (each ifw villagers everything from chicken-faising to school gardens in efforts to increase and diversify the kinds of food grown and eaten by the family.

Some of the fields *ata a* long way from the village and lertiliier has to be brought in by donkey. This area *(above center)* is 3.500 meters up in the highlands: fertilizer, originally shipped to Ecuador from a donor country, is provided for these demonstrations by the Freedom from Hunger Campaign program; *improved seed is loaned to Me* farmer by the Andean Mission, the cost being repayable out of proceeds from the harvesl-

Annet and an Ecuadorian co-work«r *{above* ***right)*** *Explain \o the farmers and* their families what fertilizer is all about. Fertilizer is not a magic formula. Annet explains *(right)* that fertilizer needs the right amount of moisture to act property, and that *it* wtrrks *best* » used tooe!hPr with proper cultivation of the soil, irn-n,pved s*eds and insecticides and pesiicides 10 g"ar(1 lh0 g^ro*ing crops

Results in Ecuador hava been promising: a 50 !o 100° increase in crop yields on the average, corresponding to an additional cash return to the tarmer oi twice the cost of his investment in fertilizer .

Through this program the farmers have learned the value oi fertilizer and the need (or new and improved methods and techniques, lifce the farmer *(above)* learning to use a fertiliier and seefl spreader. _^

The next step is to make sure thai fertilizer is available. &o far. (ertitiier of uneven quality is on sale only at the larger village^ The program i* about to enter its second stage with the start o pilot schemes in which good fertilizer will be distributed on credit through cooperative organizations, which will also assure a market lor the farmers produce.

vclopcd countries to speed up their economic development.

This requires a swift and steady increase in thar agricultural output, partly for export to foreign markets, in order to enlarge their prospects on the world market, but primarily for their own domestic markets where there is a real and growing need.

All kinds of policies have been designed and promoted to deal with this situation in the developing countries, ranging from birth control I which encounters serious resistance in many of the world's less developed countries) lo technical improve live n t schemes, farmers* economic incentives, redistribution of production resources through land reform programs, wider extension of agricultural credit to ntw sectors of the economy and improved supplies of modern agricultural inputs (fertilizers, improved seed, pesticides, machinery and equipment), etc.

Nevertheless, the results show that a vast distance lies between what the techniciarrt of the developing countries, using ;ilJ the international aid they receive, are capable uf accomplishing in the laboratory and at the experimental station or pilot demonstration farm level and what the farm **population,** as a whole, in these countries can do to raise its output, productivity and Jiving **Standards,**

Even with the aid of «very thing that **has** been proposed in recent years — planning techniques, project evaluation, modem technical training methods, pure ami applied scientific research — the **retttta,** from the standpoint of overall impact on agricultural production, have been slight.

I his is because the aspect which is most probably essential to success — *the motivation, mobilization and* ***orgml&tioa*** *nf the broad mass of the farm population tirwurd a dynamic upnnH'h to agricultural progress* — has been relegated to a position of minor significance. This *is* apparent even in **organinlboai** hairing worldwide responsibility for the progress .md production of the agricultural population, such as *i-M>*. which I reals I his very marginally. And this shortcoming *h* even more marked in many developing **COlitltflci** where the problem area is not ik-nli with by ministries of agriculture, development organizations or those responsible (or **tfac iBwHtfflI** of investment funds.

There are several reasons for this situation. Those who draw up development programs frequently seem to be-Jtcve in the existence of a jsort of automatic response between the amount of investment and the quantity of production, as though the economic system operaeed without the presence of a large number of people from widespread geographic locations, cultures and social and economic spheres who ultimately determine the nature of The relation between investment and production

Another, often unconscious, cause lies in the attempt to draw similarities between the industrial form of progress, which may be concentrated in a few

OWNING THE LAND IS NOT ENOUGH
*At Ihm tune <?l land tttotm 99^* of *tha Chilian farmers had practically no form of organization*

large production units in :iny country, and the agricultural form of progress. In the latter, operations must be performed b> thousands of production units gco graphically spread over a vast territorial area, usually lacking communication facilities, in each of which are people who lend to work independently. In such cases, the final result depends on the coordination and uniform reaction of nil these people.

The mere process of communicating production targets and **of** assigning the means for meeting these targets lo these people raises remarkably complex problems, especially in view of the shortage of qualified personnel arid of the many economic drawbacks in the developing countries.

Until special emphasis is given, at the international level and in the developing countries, to the ways and means of organizing and promoting, of motivating, mobilizing and training ***the*** *broad farm* ***masses, the present*** *sharp disparity between the technical possibilities for speedy modernization of agriculture and increasing agricultural output, and practical achievements, will persist, regardless of the progress made in applied scientific research and planning technique* and the abundance of financial resources for investment.*

This is the great challenge confronting all those concerned with the rapid agricultural progress of the developing countries <politicians, economists, sociologists, engineers and other technicians), Unless it is met, itiWill be very difficult to make quicker progress in the next few years than has been made so far,

Taking this as a working assumption, we mighi suggest some ideas which Chile, a country in urgent need of speeding up •Is agricultural growth rate, has recently been trying to put into practice.

Littim contmci with thm fmrmerm

The proportion of the farm population of C hilc's total population of *9* million is comparatively small, about 25$. In 1964, this farm population consisted of 35O.IJOO families, accounting for just over *2* million people distributed roughly in the following groups: about 3<),(HX) families were large- and medium-scale producers: about 7.000 families were cmployed by them as administrators or technicians; about 60.000 families were M II employed family farm producers; some 80,000 families were small-scale farnvcrs. partly living in communities and partly independently, but all self-employed, supplementing their own farm production by doing extra jobs to make a hare I King; another 30,000 families were tenant farmers; and about 14(J.(XHI families were wage earners uf various types, usually employed by the large- and **mettimt-Klk** landowners.

In Chile, the first problem arising when ihc land reform process was begun in IW5 was ihc physical impoui-

From isolation to unity

The achievement of the Chilean farmer

toy *JACQUES CM0HCH01*

One of the basic problems facing the developing countries throughout the world today is the need io accelerate production i>f food and other agricultural com mod it its in order to meet the rising demands of their domestic markets.

The rapid population increase (due to extremely high birth rates and fast diminishing death rates), the chronic and often acute undernourish men) of large sections of the population, the improvement in per caput income (thanks io the expansion of industrial and other income-carning activities) and the rising expectation of the masses for improvement of their living standards (resulting from the widely publicized image of the industrialized countries) all combine together to create a pressing need for the less de-

Jiltquo Chonchol I'hail I* *executive rire-pmidem of Chile's National tnttiiutr for Livestock Development. He has* ***wrtatn*** *several books on land reform and economic dti'ftop' ment in Latin Amrrka including* El Pesarrtillu Rconomico dt America Latin* y la **Re forma Agnna.**

bility of even establishing contact with these large farm masses which were supposed to be the subject of the reform.

Up to that time, the only organized groups consisted of _ the large landowners belonging to agricultural associations. These were actually social and economic pressure groups influencing the state authorities and the rest of the farmers. Traditionally, they considered themselves the legitimate representatives of the country's agricultural interests,

Thraa motivating forces

Yet, despite its power and influence, this type of organization included less than 2% of the country's rural families. The other 98%, particularly the large mass of agricultural wage earners and small independent farmers, had practically no form of organization, although the existing laws theoretically provided possibilities for the establishment'and operation of agricultural workers' unions and farmers' cooperatives.

These conditions led to the need to seek simple, rapid methods to promote the accelerated organization of the farm sector and to endow it with the resources and ability to play a dynamic roie in the progress of the nation as a whole. This was an indispensable first step toward arousing an awareness of progress.

This farm population hail an illiteracy rate of over 50% in some areas and average literacy ranged between 30 and 40%. Also, the isolated way of life and cultural values imposed by the dominant members of society fostered an attitude of profound individualism. It was found to be impossible to motivate organization of the farmers by **abstract** concepts of the advantages of mutual aid and solidarity, cooperative action, or farmer participation in the **social** power structure through organizations, etc. Therefore, it was essential to discover some simple, concrete ideas that could be readily crasped by the masses and would encourage them to organize, allowing, of course, for the specific situation of each farmer group.

Under the conditions existing in Chile, these motivations took the following forms; for wage earners — the organization of a union as an instrument of claims to social rights (better wages and working conditions, due "observance of the social legislation for the protection of farmers, which the laws guaranteed but which were seldom respected in practice); for the small independent farmers — credit facilities {membership in a small farmers' committee or a farm cooperative was established as a basic condition for loan eligibility under the programs for extending credit to these sectors); and, for both these groups — opportunities for obtaining cheaper provisions of their main consumer goods (through the organization of consumer cooperatives capable of supplying their members at lower cost than the traditional traders in the rural areas).

These three ideas: labor union demands; access to credit formerly unobtainable for lack of the traditional security required by the banking system; and cheaper consumer goods, proved to be simple enough and easily grasped by the farm masses. They were quickly organized, in only three years, into basic rank-and-file associations composed of families (between 20 and 200 families in each).

This first phase of organization has, itself, led to another advantage: the establishment of a milieu from which new farm leaders can arise. In the traditional, unorganized and individualistic community there were no such leaders because their emergence was physically impossible. The only leaders were the dignitaries (the large landowner, the local trader and the most highly educated person) who, as a **rule,** based their power and leadership on exploitation of the farm masses because they had greater opportunities for communication with the rest of the country's economic, social and political structure (the authorities, the banking system, wholesalers, members of parliament, etc.).

Emorgonce of **new** *leader**

Thus, as these new basic community groups began to organize (cooperatives, labor unions, small farmers' committees, etc.). it became immediately possible for new leaders, more genuinely representing the farm masses, to emerge and become capable of replacing the traditional leaders.

But. obviously, if the process of organization and social mobilization were to stop **at** this level it could not be consolidated, and there might even be the possibility of its backsliding to the former situation. In fact, in many of these base organizations which have suddenly sprung up there is a real risk that, as the first obstacles arise, their members may become discouraged and prefer to go back to the traditional system.

A climate of discouragement can arise: if the unions have difficulty, for whatever reason, in fulfilling the hopes their members have placed in them; if some of the business operations of the consumer cooperatives fail, due to their managers' lack of experience or attempts at boycotting by local traders; or if the credit or supplies of inputs the small farmers hope to obtain through ' their committees arc delayed, or only partly forthcoming. The more pessimistic members, or those who are more traditionally minded, tend to spread their gloom and there is a risk that the entire organization may be undermined.

Nood **for training**

Along with the organization process, immediately following the formation of the base organizations, there must be a large-scale training program for the new leaders and the farmer rank and file to arouse them to growing awareness of the significance of their organization, the inevitable difficulties in making a start, how to overcome them, the requirements for the organization to move forward, and the long-term advantages it can afford as it grows stronger.

This training effort can be implemented through a combination of media: short and frequently repeated courses for leaders and rank-and-file members; audiovisual methods; illustrated manuals; farmers' publications and radio programs. At first, the approach should be primarily social and economic, rather than purely technical. The new leaders must quickly learn the meaning of a union or cooperative: how to manage them, and their possibilities of action within (he framework, or outside, of the existing legislation; the farmers' position in traditional agrarian society and what they must do to emerge from it; the country's real agricultural possibilities, etc.

While this is necessary for'lhc leaders, it also applies to the rank and

fiJe. It is absolutely indispensable to concentrate a substantial amount of resources for several years on this program, especially human resources. It will call for imagination to find these resources and to teach training personnel as soon as possible. It is worth mentioning that in all developing countries a fairly large number of people can be found who, with a little additional instruction, are capable of doing this work. They are usually without university degrees or special diplomas, while many of them may well come from the farm communities themselves.

The need for a new step forward automatically arises as this training effort enables the base organization to become firmly established. This involves a transition to farm organization at a second and higher stage, capable of forming socially influential and economically effective units. The basic farmers' organizations, after all, consist of a small number of families which are not often in a position to provide positive solutions to social and economic questions indispensable to rapid agricultural progress.

Danger of dBpandancy

A few examples may serve as illustration. In the case of unions, collective bargaining at the level of one or a few farms is often impossible, and even undesirable. It must be conducted at the regional level, requiring a federation of unions capable of representing all the farmers of the region. As for the small farmers, as they begin to improve and increase their output they automatically encounter new problems which did not occur when they were marginal subsistence farmers. By this time they need modern equipment at low cost; they must have a marketing infrastructure which allows them to provide their own financing and to keep part of their production, without being forced to deliver it to the nearest trader the day after the harvest, or to pledge it even before the harvest is in.

All these requirements mean that the small farmer needs a group of services — sometimes even facilities for industrialization (milk processing plants, silos, concentrated feed plants, dehydrating equipment, oil extraction equipment, etc.) — which are economically impracticable at the small cooperative level, and which place those who control them in a position to determine the rules and the profit margins of agricultural trade.

Thus, as agriculture becomes modernized and more complex, and unless farm organizations take care, it will, sooner or later, become dependent on, or controlled by, those who dominate the important technical and economic factors.

Taking part in dovolopment

State intervention, because of lack of resources, administrative problems or ovcrbureaucratic red tape, may not always be able to adequately help the organizations in dealing with these new situations. Therefore, the farmers, without losing social and human contact with those immediately surrounding them {which can be maintained through their base organization), are obliged by the greater complexity of the development process itself to favor the ramification and extension of farm organizations to a second and third stage (through their vertical and horizontal integration covering many more farmers and activities). If they do not they will soon be deprived of any benefits they may have gained in the initial phase. Certainly, this is one of the vital problems confronting the new farm system of technical progress and development emerging in the land reform process in Chile, as in other countries committed to similar methods.

The rank-and-file farmers' groups (unions, cooperatives, small farmers' committees, settlement committees, women's and youth organizations, neighborhood boards, etc.), composed of comparatively small numbers of families living and working in the same geographic area who arc all personally acquainted, provide a basic point of departure for the application of the development plans and programs the planners may design in keeping with the country's needs.

Naturally, these plans and programs will never be more than a set of good intentions or documents to satisfy the intellectual concern of the planners and the international organizations, and will not have concrete, effective impact on the country's conditions, unless these groups participate both in the establishment and, particularly, in the execution of such plans and programs.

The existence of these farmers' groups offers, first and foremost, the major advantage of greatly simplifying contact between the managerial personnel of the development process and the broad mass of farmers. Certainly it is much easier to discuss and agree on action with one, two, three, four or five thousand farmers' groups than with several hundreds of thousands of individual farmers.

Secondly, as the base group itself develops its awareness of its significance as a group, of what it can accomplish and of what is available to it (in terms of resources), as compared to what each member possesses and can do as an isolated individual, this awareness changes the farmers' traditionally passive attitude into a far more dynamic approach enabling them to engage in the solutions of some of the most immediate problems weighing on the communities to which they belong.

In Chile, for instance, one of the typical problems of the small farmers was their physical isolation. Although the main highways and secondary roads are rather good, the third-class or smaller roads (giving many small farm communities access to the urban centers) are deplorable. Farmers are completely cut off during certain periods of the year when the rains make these roads absolutely unfit for transit. The farmers' attitude was traditionally expressed in requests, through members of parliament and local representatives of the central government, that such roads be built, repaired and maintained.

Joining in govornmont otfortn

Naturally, since the government's economic and technical resources were small, progress was extremely slow and the main efforts continued to be concentrated on the principal highways and secondary roads. Meanwhile, the farmers continued to wait for the state authorities to solve the problem for them, without shaking oil their passive attitude.

However, they soon realized, through their base organizations, the economic limitations of the central government, but that it could, nevertheless, increase its capacity fcr action considerably by

making agreements with the various farm organizations. By ugrccnicnl. the government would supply heavy equipment while the farm organizations would provide free labor (when not otherwise i-m ployed in farm work) and malcrbh (rubble, sand. etc.).

As a Tcsult. the number of small, new or improved country roads, linking the farm communities with ihe main roiid netwofk, increased remarkably quickly, and this work was accomplished at a cost to ihe national budget which was in keeping with the limited funds available to the government for this item.

The roads, which were the most pressing necessity, marked, oily 'he beginning. The effort was extended to other services: construction of schools and health centers; irrigation and drainage installations; airstrips for small planes; commodity sloragc facilities, recreation and community centers, etc,

Stratmgy of melton

All these achievements show that an accelerating dynamic movement toward the development process can be set off in the rank-and-file farmers' organizations by a kind of cumulative chain of cause and effect. Progress is impossible without these organized and motivated groups.

Another great advantage of group organization is that it enables the farmers lo participate in the establishment of development plans: the base groups and the representatives of the government can jointly analyze the farmers' problems, expectations, resources, possible new uses of these resources, the requirements for meeting these needs, and what the groups themselves can contribute to development carried out for their benefit — all in a spirit of action rather than in an abstract way, Plans and programs can then be designed: not only as broad overall national objectives, but as much more realistic goah **luted** on a region-by-Tcgion and com m unity by-community analysis of available resources, existing problems, the minimum rcquircments and nwJt appropriate forms of action.

Efficient operational plans and programs c;in **be fawn** up in <™s way which **are** based on ihe real conditions of the country's various regions and human population groups and its available economic and technical resources, etc. A **strategy** of action can be established which allows the plans to be applied in concrete form and adapted to actual conditions,

At the same time, such participation by the base community, in the determination nf both nutional and community **objectives** with in the overall plan.

SHARING THE OECISIONS
In only *Ihtee yaars timers' organizations* were *created composed of between 20 and 200 (Mmlliwt per unit*

creates a psychological commitment that forcefully motivates these.groups to play an active part in meeting the challenge.

Chile's experience in]967, in promoting encounters between farm base **Qffir-ntartJOM** and the various stale services {agriculture, health, education, communications, etc.) has proved remarkahle nut only from the standpoint of helping the farmers' organ bat ions lo mature, in their awareness of their responsibility toward the development process, but because it has also enabled many of the stale services to define their work objectives on the basis of a better knowledge of the real farm situation.

An indispensable condition for continuing the action, we have described is a clear social consciousness and a high degree **of** commitment by the managerial and technical personnel guiding the program (meaning not only the increase in per caput income, hut also its redistribution among the population H a whole).

These personnel members must be willing to break with many of the traditional society's values, social and economic relationships and forms of operation. Such an altitude means, o[course, ihat there will be a more or less violent conflict between 'hem (depending on their power and altitude to the change) and the influential members and leaders of the traditional society, especially in the rural areas wheTC the latter groups arc the strongest and most conservative. •

Unquestionably, the large landowners, the traders (who lived and prospered by exploiting the farmers through both their sales and purchases) and the dignitaries of the local community (whu acted as the mediators between the farmers and the authorities and other institutions of urban society, and based their power and influence on this mediating capacity) will oppose any change in the social, economic, and even the technical *status quo,* insofar as it will signify a loss of I heir power and influence. And all these groups of dignitaries will fight with every weapon at their command against those promoting change, including, of course, the state authorities.

The state musl, therefore, have personnel for the promotion of change who are not committed to the traditional power structure. These people can only emerge from the younger generation, whether professionally or technically trained or dimply gifted with an ability for social leadership. An entire strategy must be defined, in terms of the conditions of each **country,** to solve this problem {ranging from the discovery of people who can constitute the personnel to lead the process of change, lo training them and instilling in ihem an action mystique

This is :i b.isic problem for the developing countries to solve if it is hoped lo nrgantjte and raise the status of the farm populations which, in turn, appears to be an jndispensiiMc condition for speeding up development, achieving a permanent increase in ngrkulmrjl production, effecting a more equitable rcdislti hmiiKi **of** Ms benefits and rmxternizing society.

White collar research - a luxury

Rejecting the alternative of 'basic' or 'applied' research, the author proposes a middle way — 'meaningful' research containing both sociological and technological aspects and aimed directly at regional problems

by WILLIAM PA YME

The situation of animal production research in the tropics today is somewhat confused. In some respects there has been retrogression, in others progress. Everywhere there are hopes, dreams and plans.

Iii general, expatriate staff have withdniwn from tropical research centers and have not ye: been replaced by equally well-trained locally recruited staff, Some centers have been closed as a consequence, others are operating on a 'care and maintenance' basis while, al others, new projects arc being developed with the assistance of multilateral, bilateral or private aid agencies.

New methods of organizing animal production research in tropical countries must emerge during the next decade. If these are to be inherently sound and art: to assist such countries to develop (heir livestock production, it is important that all possibilities should be freely debated and examined and that policy should not necessarily be based on attitudes inherited from ihc past.

In many tropical countries research facilities were first provided by the former colonial powers, cither at special government stations or at ihe new universities. Private industry or foundations were the donors in a limited number of tropical countries, while (here were a very small number of regional research schemes, such as at Turrialba. Costa Rica, and at Muguga. Kenya.

Generally these facilities were limited in scale **and** concept. There was lililc

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WJ.A. Payne *van director far trrrrai yeori <>t the fiiut Afriiu* ***AfHodtun*** *ami Forriir? Rnrarctt OrfamztUimt Wit thri) worked in iht Philippine in the ttairr Training ami* **RMMM A** ***hiiritatf. He It the tonmhoi nf*** **,J** *standard* ***animal huibarydry tfrt***

cooperation among different centers. OT between research workers and producers in the countries concerned. Often, particularly in Africa and Asia, the major effort was concentrated on the control of endemic diseases, so that only minor progress was made in seeking solutions to production problems,

Nevertheless, useful results were achieved. Many endemic diseases were brought under control; indigenous breeds were differentiated; and an effort was made to select for productivity within these breeds. Useful in formal ion was acquired on the effect of environment, particularly climatic environment, on animal productiviiy; and • start was made in selecting suitable forage .species for different tropical environments and in studying how these could best be used.

The need for greater emphasis on training at all levels has now become very obvious.

In the past, expatriate research staff and many laboratory technicians **WON** trained outside the country. The small number of locally recruited staff who received professional train ing we re usually granted fellowships to study abroad.

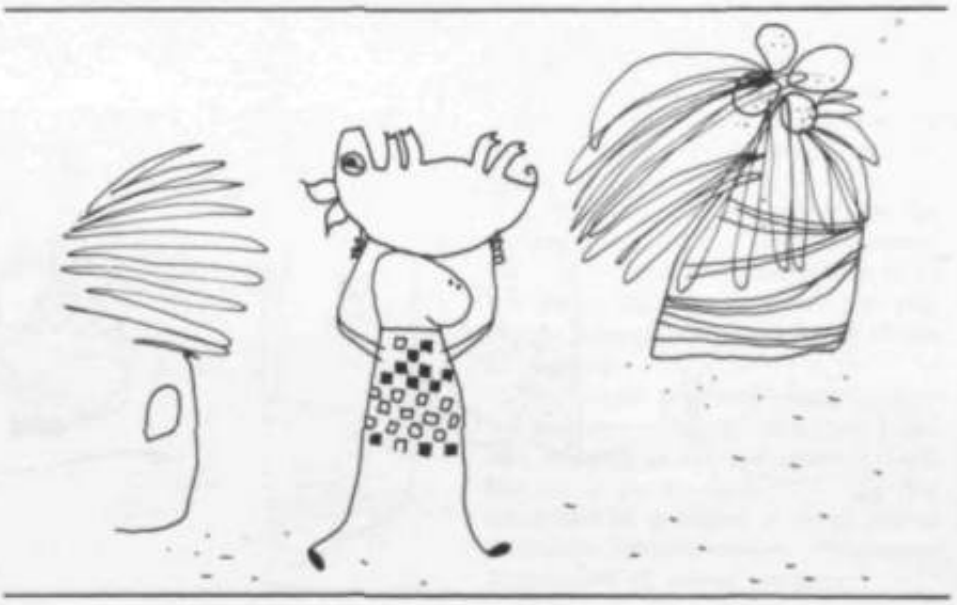
This situation hxs created many problems for administrators concerned with the organisation of training programs. At present, there is an overemphasis on the value of academic training and the acquirement of diplomas and degrees ratheT than skills. At ihc same time, academically trained personnel have a strong bias in favor of participating in research rather than in teaching or extension work; they consider that research is a more prestigious occupation.

Overseas training has acquired a snob value that is difficult to counter, or to eradicate. *It* seems to be fashionable today for the young graduate to have received some academic training overseas.

The majority of multilateral and bilateral aid schemes cater **to** this attitude by providing overseas fellowships; competition remains acute while the authority to recommend overseas training **HHtttitules** a subtle form of patronage thai is willingly exercised. Most researchers arc eager to accept overseas fellowships whether or not they have any intention of using their training wncc they return.

There is one other difficulty which arises when biologists *of* agriculturist receive postgraduate training overseas: such training usually takes place in an alien environment so that, only too often, Ihc experimental work has little Televancc to the work carried out in the national environment.

The need for greater emphasis on training at all levels has now become very obvious. It is necessary "to encourage and support training schemes in tropical countries so that adequate personnel can be provided at all levels in the future, Ii is also essential to assist research centers to recommence, improve and expand their programs by providing expert assistancc, equipment and supplies.



" My unc/B's *right,* there's a *future in* research"

It is generally believed that the very existence of research institutes or organizations endows prestige on the country in which they arc sited' Thus, applications for (he provision or strengthening of research organizations multiply at a prodigious rate.

I he number of such **BAimm** which •n operational or under consideration h> multilateral, bilateral and private aid **nrgU&Wtiett** is very considerable. The **EJaJted** Nations Development Program h.is already approved approximately 58 projects, costing S50 million, in the fields of forage, animal production and animal health training and research. It is difficult to estimate what part of this total sum will be spent on research but it **cannot** he less than $20 million.

Unfortunately, at present there is link cooperation between, and often a minimum of cooperation within, aid organi/;iiions in planning the allocation of resources for research purpose

Requirements for "meaningful' research programs on a national and on an international scale should be urgently examined so that resources can be allocated on a more ralional basis.

What is meant by 'meaningful[7] research? All ioo often research is rather facilely divided into two categories,- 'basic* and 'applied.[1] At present il is fashionable to suggest lhat any research carried out in a developing country must be capable of immediate application and be 'economically orient a ltd,' whatever the latter term may mean. It is often categorically stated that developing countries should not engage in 'basic' but only "applied' research: because 'basic* research is too costly; because such countries do not possess the necessary resources; or because the research can be more adv;miageously conducted in economically advanced countries.

This is tantamount to suggesting thai developing countries should not think about basic problems of animal production hut should conccnlTate their attention on applying knowledge acquired in completely different and alien environments, The disastrous consequences of these altitudes arc already apparent. Government agencies and new universities equipped to carry out control, extension

or teaching functions arc encouraged in engage in short-term, so-called 'applied', research that is sometimes meaningless and all too often a complete waste of effort and funds

The terms 'bask[1] and 'applied* should be discarded and (he developing countries should be encouraged to undertake ' meaningful' research that might include problems formerly catcgori/ed under cither heading. Research should be directly related, and ultimately applicable in practice, to the animal production problems of the country.

This suggests that "meaningful" research has both a sociological and a technical content: that the most brilliant and successful technical research will not be exploited to its fullest advantage unless it is sociologically acceptable; and that sociological research should precede, or be conducted together with, technical research.

Cmmm o thm wmtmr hmftmlo*

Sociological studies are needed to keep the animal production urienrtsis informed about what new practices the farming population wilt accept, not only immcili:iicly but — in view of the long-term nature of so much animal production research — for several decades ahead.

It is necessary to know something of the motivations of producers within contemporary society, and to make rational guesses as to what motivations will arise within one or two generations.

lixamplcs of mistakes made due to a lack of appropriate sociological knowledge can be multiplied indefinitely. When long-term livestock breeding programs are organised, it is absolutely essential to select for the type of livestock that producers will wish to raise, and lhat will produce the type of livestock products that consumers will wish to purchase.

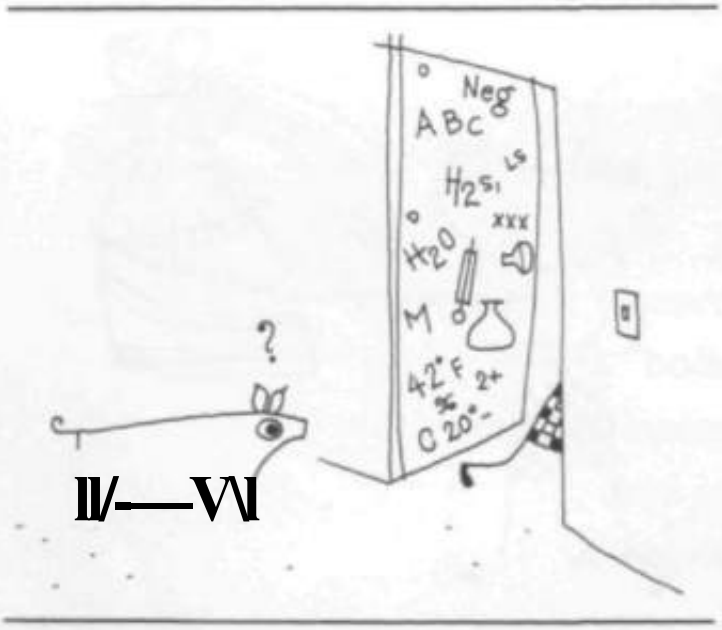
U is of little use selecting for single-purpose cattle, however productive ihcy may be, if producers will eventually re-*qofct* a double- or triple-purpose animal. Similarly it is no use selecting for a type of animal that fattens rapidly at an early age if consumer demand points toward lean meat.

Improving the growth rate and the size of most farm livestock appears to tic an OtrvfcMlS aim to most animal breeders and administrators. Howvcr, unless farm size and farm organization are radically altered, large animals may become uneconomic on small farms and the farmer may not be able io produce or purchase the fecdingstuffs required to take advantage of the growth potential of (he improved livestock.

During the last fifty years in the Philippines, the authorities have imported m:my Murrah buffalo bulls fn>m India in order to upgrade the smaller water buffalo indigenous to the country, the idea being io provide the farmer with a larger and more powerful work animal thai wi]| also produce more milk. Though the upgraded animal can undoubtedly work longer hours and produce more milk, it has never been accepted by the farmer; the indigenous water buffalo is smaller and therefore cheaper to feed, it is capable of carrying out the work on existing holdings (which have probably decreased in average size during the last fifty years), and it produces all the milk thai ihc farmer requires (in the absence of milk collect ion schemes that would make the production and sate of milk a viable enterprise).

Even if land reform and consolidation were instituted, M thai the average si/c of holdings radically increased during the next decade, there might slill be no place on the farms for an upgraded water b.f i ilo: the farmers mighi decide to mechanize.

Thus the sociologist has a very important role to piay in 'meaningful' animai production research. It is noi suggested lhai all research should be tailored to ensure thai it tits in with the sociologist's concept ol what is, or what will be. acceptable to the farming community. Technological changes based on research findings may occasionally alter the whole b.iMs of rural society. What is suggested is ili:u thi: sociologist should he an integral member of any research team and lhat



[1] *He's got me a grant and bought me my ticket"*

[1] *I've spent many long months cramming tor my extras '*

sociological data should be evaluated before decisions are'made as to the form, contem and direction of any major animal production research program.

Animal husbandry is.an integrated subject embracing many scientific disciplines; therefore, 'meaningful' animal producLion research musl be based on an integrated approach. So often in lite past, snonterm experimentation by biochemists, nutritionists, physiologists, animal breeders and paTa&itakvgwAa has been mnsidcred a substitute for an integrated research effort, simply because it was easier and cheaper to conduct, Unfortunately this splintered approach to animal production research problems is sometimes encouraged by vested interest* in specific scientific disciplines; also by the emphasis that aid administrators place on 'applied' research which, rightly or wrongly, is associated with the idea of short-term, immcdmK-utility research.

There is considerable confusion in defining the requirements for increasing livestock product^ il>. There must be adequate **Inoemfam** for the farmer, u suitable infrastructure, it writable credit and an efficient marketing system. I he furmer must be obit to educate himself in the necessary managerial skill* and be **KfviMd** by a knowledgeable extension service.

Research is required to cfmn the course along which the extension service should guide the farmer. For *cuatnpk,* a dairy farmer in a humid tropical environment where there has been no tradition of dairy farming must know whether he should manage his dairy cattle indoors or outdoors. Once a decision has been made this will guide the whole pattern of his investment, his managerial methods ;md ihc type of dairy cattle that he breeds.

Ai the present lime nobody can advise him as to which is the most suitable system. This can only be decided by large-scale integrated animal husbandry experimental work, conducted simultaneously at several different centers.

Is this 'basic' LIT 'applied[1] research[1].' It is certainly 'meaningful[1] research. Such research has rtot yet been carried **out,** and is not likely to be carried oui given the present situation, because work of this type requires the cooperation of many Kpccialists, the use of large numbers of dairy cattle and extensive facilities.

Or again, we **know** that under **good** management in the humid tropics a **Ane-**quarttr bred temperate x tropical type dairy cow is **likely** to he lhc most productive animal lo use, whcTcns in other ***torn*** where manage men [is not so good a haif-bred temperate x tropical cow would be the most suitahle type. Are we attempting to breed stabilized crosses of this type'* The answer is genera l ly no. because ihis would require large numbers of cattle, very large and expensive facilities and. pcrharrs. twenty years of breeding work. Aid administrators think in **terra of** up to five years* assistance and a relatively small alligation (if facilities for a very large number of so-calkd research centers that will concentrate on short-term 'applied' programs.

"At last, I'm on my way home: doctor at ORNITHOLOGY"

New *tropic**/*iwttraik cmntmrm*

There are three major environments in the Iropics: humid; arid or semiarid; nd montane or medium-to-high altitude. Within these three major types there arc many microenvironments.

The aid organizations, multilateral, bilateral and private, should cooperate to support and adequately finance six to nine major animal production research centers in the tropical world, two or three in each of the main environments.

These centers could concentrate on evaluating the effect of soil-plant-animal interaction* in their environment in order to find out the most economic anil productive managerial systems for all classes of livestock.

They would have to be interdisciplinary institutes employing first-class scientists enjoying exceptional research facilities of a quality and magnitude that could not be provided at small animal production research tenters, or university departments of animal production.

These specially selected centers should act as training grounds for animal production scientists from all developing countries in the region, and should form part of a first-class university. Scientific staff from smaller centers could be offered postdoctoral fellowships at the larger ones.

These major centers should maintain contact with nil animal production research in their ecological region. They should organize and assist in cooperative experiments so that new ideas and methods evolving from their research programs could be simultaneously tested in ii variety of microcni'imnmcnts.

The value of major research cemers of **ihis** type would be inestimable. If is likely that they can only be established if the Food and Agriculture Organization is willing TO lake the lead and persuade nF aid organisations to cooperate in an overall world animal production research **program.**

UNCTAD 2 - success or failure?

The outcome depends on the lessons that are learned. The next step: for the United Nations to launch a global strategy for development using the Marshall Plan approach

by ***JAMEZ STAMOVMNt***

UNCTAD 2 was considered by few as a success, by some as a limited success, and by many as a failure.

Such divergence of opinion is the consequence of different conceptions and expectations of the organization as a machinery for cooperation, rather than a misunderstanding over the real meaning of the decisions and happenings at New Delhi.

The international economic and financial atmosphere fli the conference was certainly not propitious for bolder action in fa\or of assistance to the developing countries.

However, there **b** ,i **grafl** deal thai one could say about "jinup procedure" and the progress of negotations at the rnnflinnnrr. One must jsk what results could have been **mUHfr'fiW)** enpected uhich were not achieved because of such factors **M ttme,** before putting Ihc entire biamc on an unpropitious atim(sphere. Ihis requires some recollections of the origins **Of I Nf TAP**.

I M almost the entire two decades of Ihc existence of MK- 1 foiled Nations, the major trading countries have maintained that the ope rational aspects of trade and finance could not he JL-JIL Ajth h> a LW -type international organization.

'1 hey have maintained that they should be carried out in an appropriate **OOOMdnl** framework such as GATT {General Agreement on Tariffs and Trade), IBRD (International flank U>r Reconstruction and Development) and IMF (International Monetary Fund).

This was the real reason for ihc n on acceptance of the idea of i in (International Trade Organization}, the opposition (to the point of nonparticipation by some countries) to cue (Commission on International Commodity Trnde), as well as for the resistance to the very idea of SUNFfcn (Special United Nations Fund for Elconnmic Development).

i :S<:TAO was mx created willingly. The participants

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t*ntt **Sianovflifc** ***was for sir*** **ynu-j** ***ihr dirtctor*** **W** ***'*«• Inuttuu for Itilrrnati,»mi BcOHOmkt and rotky in Beltradr; in 19f>? h,*** **WOJ dp-** ***F'witrtl fXKHfht itrrrtary nf (fit U \ BUM.....m (-,>mn,i*%mn /*" I.in,'(tf. tic has ptiblishrd*** **H W I I /KHJJll** ***whtrk tieat with ihr problem* <>t thr vmtd ttcnomy front the pitin' i>f rttW u) tht dr\rtitpirtf coun Men.***

to UNCTAD 1 will remember the bitter debates over the principle of "one country — one vote." A reading of the terms of reference will show that the conciliation procedure was elaborated in order to prevent the adoption of decisions affecting the economic or financial interests of the major trading countries without their consent.

Discussion of the Trade and Development Board, preceding UNCTAD 2, on the question of whether it should be a negotiating conference or not, will show that this basic difference over the role of the organization was not resolved.

The major trading countries see in UNCTAD a forum for international discussion where they are open to the impact of dialogue with the developing countries, and even to pressure by them. This process could lead to two positive tines of action in their view.

Firstly, delegates carry home the results of this dialogue and try to translate them, through appropriate parliamentary procedures, into autonomous political action: thus helping the gradual integration of the developed and developing countries.

Secondly, this discussion has a bearing on concerted international action not necessarily operated by the UNCTAD machinery but, in a decentralized way, by IBRD, GATT, FAO and other organizations.

There was, during the year, a slight evolution in this "debating society" approach, but it would be wrong to think that the position has radically changed.

The socialist countries do not regard UNCTAD as an operational agency in the field of international trade. They have repeatedly emphasized the importance of the general and special principles governing international trade relations and trade practices which have met with the opposition of the developed market economy countries. The trade relations of socialist countries with the developing countries are still mainly conducted through bilateral trade agreements.

Whole new philosophy of development*

However, the developing countries are pressing for the transformation of UNCTAD into a truly operational body. This was the meaning of their insistence that the conference be a negotiating conference und that it be a "New Delhi Round," parallel to the "Kennedy Round."

The Algiers Charter* was drafted in this spirit so as to lay the basis for such negotiations. The developing countries recognize that the negotiations cannot take the form of give-and-take, as in contractual negotiations, as the whole structure of UNCTAD rests on the recognition of the principle of non-reciprocity of trade concessions. However, they consider that an agreement on a joint program for development provides a sufficient number of elements for practical negotiation.

But even this type of negotiation did not really get under way in New Delhi, with possibly one exception: the declaration on ihe world food problem and. in some respects, in the financial field.

This is a matter of greatest concern. The historic meaning of the Algiers Charter consists not merely in the elaboration of a detailed program of action, but in the laying down, in unequivocal terms, of a whole new philosophy of development.

The cornerstone of this philosophy is the recognition by the developing countries that development is their own primary responsibility, and that it must rest upon their domestic efforts.

One cannot help but think, however, that the. forces of the past, with their attitude of confrontation, were stronger at New Delhi than those who recognized the new opportunities offered by the Charter of Algiers.

But all chances are not lost. An international conference cannot be judged by its formal decisions but rather by the effect of an exchange of views transmitted to their home countries by the delegates.

Major task ahead for UNCTAD

Raul Prebisch, UNCTAD'S secretary-general, was rightly disappointed that the conference did not pronounce itself on the strategy for development which he expounded with such vigor and persuasiveness. The fact that the conference has not adopted a resolution stating the main future lines for such a strategy should not, however, be interpreted as indifference to this task.

Judging the political will of the conference on the basis of ministerial declarations in the plenary debates, rather than on the basis of expert discussions in the committees, one could come to the conclusion that it strongly supported the main lines of a global strategy for development, and that the lack of a formal resolution was due more to the time factor than to substantive disagreement.

It is clear that the way for elaborating a strategy for development is open and that this is the major task now confronting UNCTAD.

There are several points on which such a strategy could be built:

... the determination of the developing countries to mobilize their own resources and to liberalize interiradc relations to the maximum extent possible;

... the decision of the developed countries to grant, in general, a nondiscriminatory and nonreciprocal preferential treatment for the imports of manufactured products from the developing countries —there is every hope that the inclusion of processed agricultural products will have its effect in the shift of necessary capital from the developed countries;

... the agreed upon calendar for commodity conferences. It is regrettable that the question of access to markets and a technique for the operation of buffer stocks has remained open, though the outcome of the declaration on world food problems gives some ground for hope;

... the financial discussions leading to an agreement on the yardstick for aid — it is disappointing that there was no agreement on the supplementary financing scheme though it was decided that efforts should continue.

Taking all these elements together, one can see that a decisive breakthrough has not yet been reached; though some basic lines have been drawn up for future action.

The development of an overall strategy should proceed

at

* *Charter: a series of recommendations on commodity and development financing and writ) preferences which were aaopted by the representatives of tiryclnp'iiK CIHUIIrifS a< "<" Ministerial Meetinr of the Group of 77 in October 1967 as a program of action for UNCTAD 2.*

hand in hand with persevering work on practical agreements in the major sectors: commodities; manufacture; finance; and transportation. Such an overall strategy without concrete action schemes would be senseless, but it should also be recognized that the operation of individual programs outside such a strategic framework would be just as senseless.

The elaboration of such a strategy should rest upon the cornerstone of a joint developed/developing countries[1] venture. It should provide a rationale for such cooperation and should be based on the long-term planning of this cooperation. A long-term perspective would open the way for an outward looking policy and would influence political decisions against concentrating on short-term measures which are too often inward looking.

*linking of domestic and international effort**

This strategy for development should adopt appropriate targets in the key sectors of interrelated international economic policies. A financial target was adopted by UNCTAD 2 and some progress has also been made toward agreeing on a target in the developed countries for sharing the increase in domestic consumption between domestic producers and foreign suppliers.

It should not be too difficult, in the light of the present trend, to agree on a target for manufactured products, either in terms of domestic production or in terms of imports, or both. Such targets would serve as political guidelines for the parliamentary organs of the developed countries.

The global and sectorial targets should then, of course, be translated into appropriate instruments and schemes, which is where agreements on individual problems fit in. It is to be hoped that the work begun in New Delhi can be accomplished through a permanent mechanism.

The basic point on which the entire concept and success of a global strategy for development hinges is, of course, the linking of domestic and international efforts.

Development is not only an economic but also a social and political process. There is little use in pumping resources into a country where there is no social change and where aid is dissipated in making the reactionaries and the corrupt even richer.

The scheme of supplementary financing, prepared by the staff of the World Bank, was not adopted by the conference. But its basic philosophy — ensuring the continuity of development plans by new financial action if the trade mechanism fails for reasons which are beyond the control of individual developing countries — was universally accepted. This idea deserves wider application.

Discussions on financial questions at UNCTAD 2 showed that the debt burden and the imposed conditions of aid arc among the greatest obstacles to faster growth in many of the developing countries.

The problem of tied aid was widely discussed: while international lending for development is largely tied, repayment is not tied. This leads us into a flagrant contradiction: the developed countries, with considerable production facilities and competitive power, secure for themselves the export outlets with tied credits; the developing countries, already in ;i weak competitive position, must search for convertible currencies so as to repay these credits. The way out of the existing situation can only be found through a new kind of payment arrangement.

What is urgently needed now, following the New Delhi conference and in the present world situation, is a new Marshall Ptan for the developing countries.

This plan would differ from the first one in being applied through the United Nations and in embracing substantially all the developing and developed countries, both socialist and nonsocialist.

The developing countries would present, in UNCTAD, an outline of their own development policies within the framework of such a plan; just as in OEEC (Organization for European Economic Cooperation — which later became OECD) the European countries elaborated their own plans for reconstruction and regional cooperation. These national plans would then be supported by correlated international measures.

Such a procedure would have several advantages as compared to the present approach:

1 it would guarantee to all countries an equitable international contribution, commensurate with their own efforts and needs;

>Z it would guarantee the efficient use of international efforts and resources as these measures would be directed and interrelated;

3 it would alleviate the fears of bilateral interference in domestic affairs as there would be a community of nations examining the performances of individual countries;

Tt it would provide developing countries not merely with assistance, by furnishing material and financial resources, but also with the opportunity of economic management and planning through friendly international discussion in a forum where the developing countries arc in the majority.

J it would stimulate efforts for the development oi trade and economic cooperation among the developing countries themselves;

O it would create the economic background for the elaboration of payment arrangements; and,

/ it would provide a framework for the gradual economic integration, on an equitable basis, of the developed and developing regions of the world.

Such an effort would require the increasing adaptation of the production structures in the developed parts of the world as well.

As the strategy for global development would be a planned operaiion. this would mean that the developed countries should refrain from increasing their production capacity in those sectors where they do not enjoy comparative advantages.

Such an exercise in economic cooperation goes on continuously among the developed countries. An extension of this area of cooperation and integration so as to include prin. Mcully the whole world is not merely technologically feasible but politically indispensable for maintaining peace in the world.

BURMA

• *Tractor* grmduatty replacing elephants*

An efficient leak and hardwood logging industry is vital to the Burmese economy. Forest products earn an average of nearly $25 million *a* year in exports Some 145.000 square miles of the country (57% of the lotal area) are covered by forests and 60% of the forest under harvest Is suitable for mechanized extraction.

Traditionally, timber has been hauled from the forest by elephants, but powered equipment is gradually taking over, Just before World War II, some 6.500 elephants were working *in* the logging camps of Burma When the war ended there were only 2 600 elephants left and this loss started the State Ttmber Board on the road to mechanization.

in the field
in he field
in tlif* fie ld
in tlhe field

From 1961 to 1966 over S3 miflion have been spent on equipment, according to an FAO lores I ry adviser who worked with the Board, This mechanical power can handle up to 225,000 logs per season, nearly a quarter of the annual timber output. However, the changeover will be gradual for yields per acre and climatic conditions are favorable to the use of animal power for timber extraction whenever possible

AUSTRALIA

• *Mmn - rHMt/n lormmtm: a growing wmaflh*

There are approximately 81 million hectares oi man-made forests in the world today and this area will double by 19B5 according to an FAO world symposium on man-made forests held in Canberra. Australia, last year

The symposium dealt in detail with questions of policy, silviculture, management, utilization, and integration of planning and financing. It passed 66 recommendations.

Among facts of general interest:

...approximately hall the total acreage consists of plantations in Mainland China and the USSR

...the most widely planted group are conifers — mainly pines — which make up about 70*/(F trie reported total.

...eucalypts am probably the most extensively planted of the broad-leaved species. Others widely grown are poplar ac*cn end t«k

I e fastest growing man-made forests can produce wood for fuel or poles in s to 10 years pulowood m 10 yean or evan less, tewfog* in '5 to 20 years.

ZAMBIA

• *Live fish airlifted across At He**

Some 250.000 live fish nave been airlifted from Lake Tanganyika to stock the wafers of man-made Lake Karma between Zambia and Rhodesia. 700 mites away The airlift wa$ the latest step m a SI million dollar UNDP (United Nations Development Program) proiect for boosting fisheries development in the Lake Kariba area. The 1.718-square mile artificial lake was formed by the damming of the Zambesi.

The fish selected for thjs venture was tJie small, silvery *Limoothrissa Miodon* which is tasty and a prolific breeder. Lake Kariba is naturally supplied with fish but scientists feel its fishery potential could be greatly increased by stocking it with choice outside species. >

JORDAN

■ *Underground water*

The UN. Development Program has increased its contribution to the investigation of sandstone aquifers protect *n east Jordan from S173.BS0 <o neaffy 31,400,000 while the Jordanian Government ha* uppM <is share from $1 620,300 lo nearly $4 aaWon.

Ultimate object of this major land md *ma\6t* utilisation project Is *to* bring water to a n»o»on covering 60,000 •quart Kilometer* «nd noted at present tor its aridity and poverty Urge tracts of trie region have bean surveyed both above and below ground and 66 wells have so far been dug In all. over 21 000 meters nave been drilled m the search for the areas where the underground water can besi be exploited for irrigation, stock watering and industrial and domestic uses

Most Ot me *worfdt mnn-maQ9 torasts ate coniterout, like* this planted *forest a! Rototua. New Zealand*

INDIA

• *Cutting losses in storage*

A five-year $1.6 million effort to reduce the large losses caused to stored grain in India by pests and fungi has started with the arrival of Gus Huysmans. an FAO agricultural engineer. The main aim of the UNDP project is to show focal manufacturers how to make storage units adapted to Indian conditions from local materials, and to encourage creation of a storage industry, A grain storage institute will be set up at Hapur. near New Delhi, while two field stations will collect and assess research results and evaluate the nature and extent of losses in storage.

• *Flying cheek on forests*

Initial conclusions of a UNDP forest inventory project being carried out by a joint Indian/FAO team indicate that central India should be able to support a pulp and paper industry.

A jet helicopter has been bought by FAO from UNDP contributions to help verify inventory work done in the course of the survey. The aircraft, which cost $100,000, is a five seater. It will shortly be used to transport members of the survey team to and from inaccessible parts of the forests.

The first part of the project — training a strong corps of Indian experts — will be completed toward the end of this year, when FAO experts leave them to carry on the survey.

• *Daily protein food for 23 million children*

Alarmed at the grave deficiencies in Indian children's diet, the director-general of India's Health Services has warned that unless successful efforts are made to combat malnutrition, irreparable physical and mental retardation may result for the two thirds of Indian children who are inadequately nourished.

A campaign is now under way throughout the country to give children a proper diet. As one of the first

New funds pledged for agricultural development

New projects approved by the governing council of the United Nations Development Programme (UNDP) lor the first half of 1968. Projects listed are those in which the executing agency is FAO; FAO in association with the UN, or its agencies, or the United Nations, itself, in fields of interest to FAO.

Afghanistan: To assist the government in establishing an organization which will coordinate and control the development of all water resources throughout the country. UNDP — $1,416,200; government — $1,020,000. (Four and a half years.)

To prepare detailed plans lor the development and expansion of irrigated agriculture in the Kunduz-Khanabad district (in the northeast) with a view to defining the areas investment potential. UNDP — $671,100; government — S289.0OO. (Two years and three months.)

Algeria: To strengthen the government forest service and train professional staff and skilled workers in the course of developing and executing a national forest utilization plan. UNDP — $1,109,800; government — S800,000. (Four years.)

Argentina: To strengthen livestock investigation and promotion centers and to train personnel in intensified livestock production techniques UNDP — S1.063.700: government — $5,006,000. (Five years.)

Bolivia: To survey the animal health situation and strengthen veterinary laboratory and field services, UNDP — $945,400; government — 51.769.000 (Four years)

To formulate and implement a program of groundwater development in the Altiplano. UNDP — 51,479,800: government — $1,159,000. (Four years.)

Brazil: To establish a farm planning and training service for the Mogiana region UNDP — $958,900; government — $1,350,000. (Four years.)

Burma: To carry out studies to develop the Sittang river valley, deluding general studies of the basin and feasibility Studies for the Yamethm and Yenwe Pyuntaza areas. UNDP — $2,179,200: government — $1,096,000 (Three and a half years)

Chlla: To continue and expand the training, research and advisory services of the Institute of Training and Research for Agrarian Reform. UNDP — S982.0O0, government — $1,671,000 (Two **and a** half **years.)**

Congo (Brazzaville): To plan and implement a regional program of rural development in the Niari-Loudima area and on **Ihe** basis of this pilot operation to define a nationwide program of rural development. UNDP — $1,399,500, government — $960,000. **(Three years.)**

Ethiopia: To complete the establishment of the School for Animal Health Assistants, Debre Zeit, by providing additional training, including field programs for Ethiopian veterinarians who will be assigned to take over its operation. UNDP — $991,500; government — $808,000. (Five years.)

Gabon: To assist the government in determining the extent and composition of the forests in the eastern zone and in preparing a forestry and forest industries development plan. UNDP — $1,348,200: government — $798,000. [Four and a half years).

Ghana: To increase production of food crops in selected pilot areas through extensive use of fertilizers. UNDP — $1,188,400; government — $1,450,000. (Five years.)

Greece: To undertake feasibility studies leading to the development ol forest industries, with special reference to possibilities in western Greece, with a view to attracting investment UNDP — $301,900; government — $410,000 (One and a half years.)

Honduras: To establish a forestry school for the training of low and middle-level technical personnel UNDP — $938,200; government — 31.009,000. [Five years.)

India: To develop sheep husbandry in eight states through improved sheep breeding, shearing, collection, grading, marketing and utilization ol wool UNDP — $1,634,300: government — $3,245,000. (Five years.)

Iraq: To complete the establishment ol the traq laboratory unit for the investigation of animal diseases and the training of veterinary field services through the strengthening of the Veterinary Faculty, University ol Baghdad. UNDP — $1046 300 government — $450,000 [Three years)

To assist in the preparation and planning ol a pilot proiec! for soil and water management and ,n training for irrigated land development and settlement UNPD — $203 800 qovernment — S350.OOO (One year.)

Jamaica: To conduct a feasibility survey to determine the economics ol production and the market prospects lor selected food crops UNDP -$110,400; government - S137.0OO. (One year.)

Kuwait: To assist in the establishment of **a center tor the** development of Kuwa,ts water resources, to test and evaluate equipment and materials (or desahnation plants) and to train the skilled personnel [illegible] government — $1 [illegible] 568,400, e years

steps, it is planned to distribute a new protein food, *Balahar,* among 25 million schoolchildren daily.

Also in the planning stage is the production of -100 million loaves of lycine-fortified bread. The first of nine bakeries, donated by Australia and Canada and set up by the Indian Government, opened recently and five more will be built shortly.

Says the health service report: "The cost of counteracting malnutrition by raising the nutritional levels of children is far less than either the cost of the resultant decrease in productivity or the cost of treating malnutrition."

DAHOMEY

• *New horizon* for fishormein*

Today over 3,000 fishermen operate off Dahomey's 75 miles of turbulent West African coastline as the result of three years' intense multilateral and bilateral effort to change and modernize fishing practice.

Until a few years ago the bulk of commercial fishing took place in quiet landlocked lagoons. Every year some 20,000 tons of fish were harvested from some sixty thousand acres of calm, brackish water.

Three years ago a new port .was built at Cotonou: the construction of these new facilities caused the sands to shift. The lagoons opened up, never to close again, and a large part of the fish population vanished.

This meant a new approach to fishing, new boats, new men and new training.

Many organizations have shared in the work. Outboard Marine (Belgium) S.A. contributed 50 motors worth nearly $20,000 to the Freedom from Hunger Campaign fishing boat mechanization project. The Canadian FFHC Committee gave over 510,000.

Dahomey's neighbor, Senegal, provided five crews of expert fishermen with their own canoes to prospect offshore fishing grounds and to train the Dahomeans "in line fishing.

Stronger and bigger planked

Lebanon: To further the planning of hydroagricultural development in Lebanon by carrying out irrigation feasibility studies and related pilot schemes. UNDP — S1.011.100; government — $2,378,000. (Four years.)

To complete the current survey and evaluation of Lebanese water resources and to plan their development and utilization with particular regard to agricultural needs and to the water supply tor Beirut. UNDP — S221.0QO; government — 5240,000. [One year.)

Madagascar: To promote development of the fishing industry by training personnel, undertaking trial and demonstration fishing. and carrying out marketing studies. UNDP — $966,500; government — $364,000. (Four years.)

Supplementary assistance for hydrogeological exploration in southern Madagascar, with special emphasis on the Morondava river basin. UNDP — $245,500: government — $129,000. (One year)

Malaysia: To assist the government in strengthening all aspects of its forestry planning and services as a basis for the development of forest industries. UNDP — $1,221,800; government — 5954,000. [Five years.)

Mauritius: To assist the development of the fishing industry through demonstration fishing and marketing studies. UNDP — 5396,900: government — $504,000. (Three years.)

To prepare feasibility reports on irrigation development, and to undertake supplementary studies of natural resources. UNDP — S406.400: government — $171,000. (One and a half years)

Morocco: Assistance in the establishment and initial operation of a center for the collection, indexing and dissemination of documents on rural and agricultural development. UNDP — $174,000: government — $292,000 (Two years.)

To develop a new curriculum for intermediate-level forest engineers at the Forestry School in Sale. UNDP — $1,051,700; government — $887,000 (Five years.)

Nicaragua: To assist the government in developing the pine forests of the northeast and to carry oul technical and economic studies for large-scale investment in the region. UNDP — $1,000,100, government — $1,551,000. [Four years)

Peru: To investigate livestock production possibilities and to provide training in livestock production and health techniques in high altitude and tropical areas. UNDP — $1,124,400. government — $2,175,000. (Four years)

Republic ol Korea: To assist in providing the expanding fishing industry with trained technicians to operate modern fishing vessels in coasial and nearby high seas areas. UNDP — $1,117,600; government — $1,459,000 (Four years.)

To assist in the expansion of the fishing industry through the provision of advisory services. UNDP — $121,100, government — $35,000 (One year.)

Romania: To improve, expand and strengthen research on plant breeding and seed production at the **Institute** for Cereals and Technical Crops, Fundulea. UNDP — $1,377,200; government — $5,800,000 (Four years)

Singapore: To assist in the development of new industrial fisheries through the training of fishing technicians. UNDP — $1,261,900. government — $1,481,000 (Five years)

Somalia; To carry out intensified mineral exploration in two zones; to strengthen the geological survey. UNDP — $776,600. government — $977,000 (Two years.)

To assist in the field training of veterinary personnel in the control of rinderpest, contagious bovine pleuropneumonia and other diseases. UNDP — $158,200: government — $374,000. (Two years.)

Syrian **Arab Republic:** To assist the government in implementing an agricultural development program in the Ghab region by helping to train personnel, establishing supporting institutions and creating permanent settlements. UNDP — $1,313900, government — $1,110,000 (Three years.)

Togo: To assist in preparing a comprehensive forestry and forest industries development plan. UNDP — $877 200, government — $580,000. (Three years.)

United Arab Republic: To complete the establishment ot the Animal Health Institute for the investigation of animal diseases and the strengthening ol veterinary teaching at the University of Cairo. UNDP — $961,400. government — $654,000. (Three years.)

United Kingdom, Fiji: To prepare development plans and feasibility studies for the rational utilization of forests and lor the expansion of torest industries. UNDP — $238,400: government — $200,000. (Two years.)

Upper Volta: To improve agricultural productivity by training increasing numbers of agricultural technicians and farmers. **UNDP** — $1,129,500; government — $1,243,000. (Five years.)

Uruguay: To study animal diseases and to train national personnel in animal health techniques. UNDP____$1 149 000 government — $2,215,000 (Five years.)

Republic **of Zambia:** To develop the natural resources of the Luangwa valley through improved wildlife conservation and utilization, and promotion of tourism. UNDP — $1.056400 government — $?,679.000 (Three and a half years)

Regional: Guinea, Mali. Mauritania and Senegal: To promote increased agricultural productivity through a comprehensive program of applied agricultural research and pilot demonstration rsee *article by Curtal in this issue).* UNDP — $1 850 600 governments — S788.000 (Five years)

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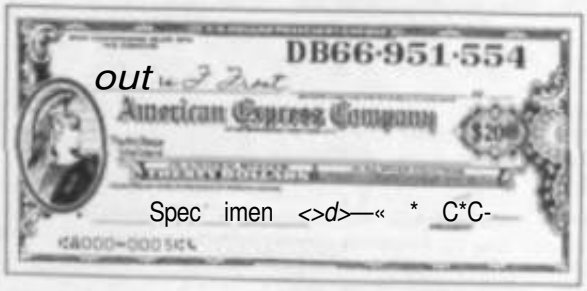

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vessels were designed to cope with the[1] force ol the surf. Norwegian and Swiss cooperatives. French bilateral assistance, United States AID and FAO provided a large part of the needed technical expertise and financial resources.

PERU

• *Tunnttlm through the Am/urn*

After a three-year survey of the mountain and coastal regions of Peru, FAO has submitted to the Peruvian government a large-scale project aimed at the agricultural and industrial development of the Pampas de Olmos region in the arid coastal belt. The course of ttv« river* would be diverted from east to west through two tunntAt to be driven 12 miles through the Andes

This project, nfftich will also involve the construction of a network of canals, power transmission lines and electrical power station*, will permit the irrigation ol nearly 90.000 hectare* of fertile land Given enough mater a wide range of tropical and subtropical products can b* grown including cotton nee sorghum soybean* groundnuts, oilseeds and alfalfa. Livestock could also be increased from the present 15.000 head ol cattle to 140.000, including more than 80,000 milk cows.

The three-year survey was carried out for FAO by an Italian firm, Itaiconsult. under a UNDP project. It included investigation into many aspects of topography, hydrology, geology, soil and water and marketing.

SUDAN

• *timing thm wmtmr hyacinth*

The water hyacmlh clogs up waterways, rivers and lakes all over the world. Ninety to 100 million tons of it invade the Nile every year.

Dr. E.C.S, Little, an FAO weed control consultant, has set in motion a pro|oct in the Sudan to try to control the weed try gathering it by hand land paying the workers with World Food Program food), drying it and spreading ll In the vegetable gardens along the N»K as mulch and tor weed control. Tests are also twtng c*m*d out to Me whether it make* good compost. wtute the use of the hyacinth ash. rich in phosphatt and potash is also under study It may also find use as animal fodder

Laie»i victim of the beautiful flower is the island of Jaw* where it is taking over a large Jake and stifling fish life. Dr Little has been assigned to Indonesia to investigate.

ITALY

• *SvbmtiiulB tar crntv*' mtommch*

Cheese specialists from 10 countries met in Rome in April at a consultation on how a wo rid shortage of renmn. used in cheese making, can be countered

Rennm. an enzyme from the fourth stomach of unweaned calves, is traditionally used to coagulate or set" cheesemilk. The available calf veil rennet, or stomach (ining, which produces it. cannot meet the industry's needs Delegates discussed whether artificial enzymes now being tried can be made to act as efficiently as nature's product.

• *Country guidmm far invamlorm*

To encourage foreign private investment in developing couniries. the FAO/Industry Cooperative Program is putting out a series of country studies — prepared by ihe FAO Legislative Branch — setting out in detail for the prospective investor the legislative and administrative measures taken by each country to attract and regulate foreign capital.

These studies deal anciusivwy with investments in agriculture. lorestry fisheries and related industries. The studies so far published concern Chile Guatemala, Kenya and Turkey In preparation are studies on Argenima. Coiomftta. Ghana. Ivory Coast. Madagascar and Morocco. Other 3tu<jt*« will also be issued later

PHILIPPINES

I Mow *fimhing vessel*

The He** *Hm, &•* ttish-built fishery research and training vassal, arrived in Manila recendy when she will take part m * <te«p-*** fishery development project financed over five years with nearly S4 million from the United Nations Development Program and managed by FAO.

The vessel is equipped for experimental trawling and livebait lishmg and is fitted[1] with the latest electronic apparatus and fishing gear for locating and catching marine fish. The 70-ton vessel began operations in April, joining another research-training vessel taking part in the project, the Japanese-built Maya Maya

Tho Mays Maya, *a Japanese-built research training vessel which it being* used *in the Philippines fisheries development project*

MEXICO

• *Changing Vi tilt dm* M*ezquital*

A number of food-for-work projects have been started m Mexico's Valie de Mezquital under the banner'of DESMI, a nonprofit organizalion founded two yea»$. ago to foster the economic and social development of the 400000 Otorni-speaklng Indians who live there.

These people, whose chronic malnutrition and extreme poverty are responsible for one of the highest death rates m the world, still depend on a primitive system of agriculture tor their living. Seventy percent of their land only supports the hardier type* of cactus lire.

One of their first necessities is water and three villages have been enrolled in a voluntary self-help community project to dig a 17-mile long canal which will bring into production 16.000 acres of arid land DESMI has also acquired a 120-acre larm, started a pig raismg program and next plans to build a small meat processing plant.

TUNISIA

• A model agricultural coflogc

The North African College of Agricultural Engineering, financed by the World Council of Churches, is due to end as a Freedom from Hunger Campaign (FFHC) project next year but the Tunisian Government has asked that the project, instead, be expanded and continued.

Located at Medjez-El-Bab. 40 miles southeast of Tunis, the oilege turns out every year about 50 specialized technical agents, several from other countries of North Africa. It is the only agricultural college in Tunisia that gives both technical and practical courses in mechanized farming.

These specialists, trained in modern techniques yet working ctosely with a peasantry still largely backward in its thinking, could become a vital force in the agricultural progress of developing countries. The Tunisian Government is planning to start three more colleges based on this model: one for forestry, another for livestock and a third for horticulture.

COLOMBIA

• Improving the Nutting industry

A four-year UNDP fishery development project went into effect in Colombia early this year. FAO specialists are advising the government on strengthening the fishery administration, developing the fishery industry and organizing research. The project, which costs nearly $2 million, will help to set up a national fisheries research and development center. Plans call for the delivery of a fully equipped fishery vessel for experimental purse seinina and trawling,and forresearch off Colombia in the Pacific Ocean and the Caribbean Sea

MANY NEW FOOD-AID PROJECTS

A recent count showed pledges to the UN/FAO World Food Program (WFP) for the period 1969-70 amounting to just over $120 million, some two thirds in commodities, the rest in cash and services. This total represents slightly more than 60% Of the target set at WFP'S third pledging conference held in New York at the beginning of the year.

WFP's governing body met in Rome in April to consider requests for food aid and to examine progress of operational projects. Projects approved, and agreements signed, this year have included:

... $534,000 to help farm settlement on an Afghanistan irrigation project (three years).

... $450,000 to help train more teachers in Algeria (four years).

... $436,000 to help rural development in the Central African Republic (four years).

... $5.9 million worth of coarse grains to help develop India's poultry industry (five years),

,.. $800,000 emergency food aid to Indonesia in the wake of torrential rain and flooding (six months).

... $876,000 to help expand a farm settlement project in Iraq (three years).

... $262,500 to help provide meals in Liberian secondary schools (three years).

... S240.000 to help increase milk production and stimulate livestock improvement in Niger (four and one half years).

... $480,000 to Pakistan to help raise production sixfold from the Karachi milk plant (two and one half years).

... $145,000 for vocational training centers in Peru (three years).

... $672,000 to help increase milk supplies and provide cattle feed in Senegal (four years), with a further $714,000 going to self-help rural development (two years).

... $270,000 to help provide meals for trainees in Sierra Leone (five years).

... $423,000 to help build schools and extension centers in Somalia (three years).

... S510.OOO emergency postwar food aid to Syria.

...$1,894,000 to Taiwan for an irrigation and flood control project ($1.2 million - two years; the balance - four years).

... $747,000 to help voluntary youth work camps in Tanzania (five years).

... $528,000 to aid the rural self-help movement in Togo (three years).

...$116,000 to help build small earth dams in southern Tunisia which will allow more cactus cultivation and, thus, more sheep fodder (five years),

... $840,000 emergency postearthquake food aid to Turkey.

... $198,000 to further help youth service camps in Zambia (two years).

...$484,000 to help build village wells, dams and reservoirs in Upper Volta (five years)

GHANA

• Thirst for practical books

To help fill the need for technical literature in Africa, FAO jointly with the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) has been operating a project for the production and publication of manuals and text-books.

Sixteen titles have so far been released, the latest being an *Introduction to Agriculture in Nigeria* by Professor Oyenuga, Seven more titles will be published during 1968, according toameeting of experts on book development in Africa, held in Ghana earlier this year.

KENYA

• 4-K clubs show the way to better farming

More than 60% of Kenya's population is under 20 and one of the major problems of tomorrow will be to keep the country's young people on the land and out of the slums.

One of the ways is through the 4-K clubs. The aim of the clubs: to provide young people in rural areas with sound advice on all types of farming. The ultimate purpose: to prove that farming is a satisfying and profitable occupation.

Modeled on the North American 4-H clubs and started with United States funds. Kenya's 4-K clubs now receive backing from the Freedom from Hunger Campaign (FFHC) through the Unesco gift coupon program.

There are over 1,100 4-K ClU*DS scattered throughout the country with a membership of some 30.000 mostly boys of school age. Club leaders are all volunteers who receive their training f'om Ministry of Agriculture field workers under an FFHC plan, also financed with Unesco gift coupons.

The lour Ks stand for Swahili words meaning unily. self-help, better farming methods and Kenya.

Incomes Triple for Resettled Kenya Farmers

The Mwea/Tebere irrigsnon settlement lies about 60 miles northeast Of Nairobi, close to the foothills ol Mount Kenya, some 4.000 feet above sea level, it was started in 1955 to settle landless families from the Central Province. By the end of the lirst development period in 1960. 5.000 acres of soil had been prepared. and divided into single acre units suitable lor rice cultivation and had been provided with complete irrigation systems. The project involved a great deal of earthworks, mainly canal excavation and land levelings

By 1960, 1.200 landless African families had been settled. It was upon these foundations thai the United Kingdom FFHC project was launched in 1964 at a cost of some S450.000. By the end of 1967 more than 2,000 additional acres had been developed capable of settling a further 500 families comprising about 3.500 people. A reception center to handle the rice produced on the new extension was completed in 1S6S. An efficient development team has also been built up and ife services will continue to be used on a further extension of 3.000 acres to be financed by German (Fed. Rep.) lunds.

All the newly settled farmers have built their own houses in a series of new villages On the settlement. To achieve this, a major difficulty had to be overcome — the newcomers were practic a l destitute. An arrangement was therefore made with a commercial bank for them to be granted Si 40 house-building loans, repayable in three years from crop income and unsecured except by reputation of the settlement. By the end of 1967 ihe farmers on the extension had received housing loans totaling some $55,000 and so far not one settler has defaulted on his repayments.

The irrigation scheme depends Ort water from two rivers rising in lh& Mount Kenya foothills. Water pours through an Intake canal tram the Thibt rivet

By the end of the 1968/69 season when the whole extension will have been fully operational over its entire surface for at least one crop. it will have produced since inception 10.919 tons of paddy with *a* (gross value of S750.000. An optimistic estimate of the annual wage In this area for unskilled Tabor working six days a week throughout the year {such steady working is, however, unlikely) amounts to Si 15.

Tenants on the Mwea/Tebere scheme earn an average of S350 annually.

In the words of a senior agricultural officer in Kenya, the setting up and operation of this irrigation scheme have been " nothing less than an agricultural and social revo*ivtkrn." When tt\e settlement* started, very few people in Kenya knew anything about rice production. With the exception of two senior agricultural officers seconded to the scheme, everyone from senior officers down to the most junior member of the staff had to be trained locaffy. Not only is the crop new to Kenya, but there is no tradition of irrigation in Kenya. An immediate task was to find men who could absorb the basic rudiments ol technology and who also had the personality and the leadership to pass on their knowledge to their juniors and to the settlers themselves.

The people settled under this scheme are a rural proletariat. They have come to these lands with nothing, most have never engaged in anything but the lowest subsistence farming. Now. almost suddenly, they find themselves on an irrigated holding. They are taught to grow a crop they have never seen in more water than the/ knew existed. They have become members of a team working within a highly organized, centrally controlled agricultural system. They are the targets of a concentrated program of agricultural education and information.

Like many other counlriea in Africa. Kenya is faced with a formidable population expansion and with land hunger. This scheme provides a partial answer Irrigation brings new land into cultivation. Just over ten years ago. Mwea.'Tebere was a semidesen. seasonally grazed by a lew caitie. Today. It supports some 15,000 people

in the field
in the field
in the field
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Asian Drama by GUNNAR MYRDAL

This is not a book like other books, which will be read and then put away on the shelf. . Gunnar Myrdal's *Asian Drama* will live with us whenever we contemplate, discuss and argue about the problems of Asia and other underdeveloped areas.

It is a synopsis of all the manifold factors • which have created south Asia as' it is today, and which will shape its future. It is an honest book, written by a w^jtern economist who knows the difficulties of objective evaluation and the possibilities of bias, and who feels a compulsion for searching his own soul. It is written on the basis of worldwide experience and with the same methods which made Myrdal's *An American Dilemma* one of the most profound social analyses of its time.

The book will help Asian governments to understand the uncertainty of their present position, which is difficult to defend against the evils of the past and from which it is difficult to ensure the way to a better future. Myrdai says, in the chapter on agricultural policy, that the Asian countries now have the worst of both worlds: they cannot realize agrarian reform and cannot carry out efficient agriculture. In another chapter he talks frankly about the corruption which marks the atmosphere of south Asia (and other underdeveloped regions).

The developed countries will recognize the not very flattering role that they have played in south Asia during the last few centuries, and even today. Myrdal stresses the weaknesses of their present policies and their bias in evaluating the reality of south Asia.

One of the great advantages of Myrdal's inquiry is that he brings out the divergency of western and Asian values and the great differences in development. When the western world understands this fundamental aspect of the development problem of Asia — and when western vested interests, looking for profitable solutions, discipline themselves or arc disciplined — then there will be hope that European and American aid and advice will be useful.

Gunnar Myrdal says that, generally speaking, the western approach is abstracted from most of the conditions that are peculiar to the south Asian countries and which are responsible for their underdevelopment and for the special difficulties they meet in developing.

The unique importance of Myrdal's inquiry is the decisive questions which he poses to himself, to the reader, to governments and to the international agencies.

The central concern of *Asian Drama* is with the problems of economic underdevelopment and development, and with planning for development. The starting point of Myrdal's study is recognition of the fact that pure economic analysis can never be successful. Distinctions between "economic" and "non-economic" factors are artificial at best. The only worthwhile demarcation is between relevant and less relevant factors and the line of demarcation will vary with the characteristics of the environment in the study.

The whole inquiry has a strong institutional emphasis. The starting point is the incontrovertible fact that the basic sociocconomic structure of south Asia is radically different from that existing in advanced countries. The problems of development in the region call for induced changes in the existing social structure as a continuous development. As this structure docs not change spontaneously, or to any great extent in response to economic policies, far-reaching institutional reforms become necessary.

This point is of utmost importance since the bias for purely economic solutions is very strong in the official policies of bilateral and multilateral programs.

Gunnar Myrdal writes: "The essential first step toward an understanding of the problems of the south Asian countries is to try to discover how they actually function and what mechanisms regulate their performance. Failure to root analysis firmly in these realities invites both distortions in research and faults in planning."

If the United Nations organizations, particularly FAO, were to draw one conclusion from Myrdal's inquiry, it would be recognition of the urgent need for an intensification of institutional research in order to ensure proper guidance for development programs. It is not sufficient to assert qualifications and reservations meant to take into account factors left out by conventional economic analysis along western lines; what is needed is a framework of theories and concepts that is closer to the realities of south Asia.

A study by Gunnar Myrdal always begins with a set of selected value premises. Any such study must look at the problems from ihe standpoint of the interests and ideals, norms and goals that are relevant and significant. Myrdai has selected new values directed toward modernization. This "modernization ideal" was impressed on the nations of south Asia at the dawn of their independence and has become the official creed, almost the national religion; Myrdal sees in it one of the powerful strengths of new nationalism.

An important element is the need to apply modern technology to increase productivity. Other elements which he feels should accompany such modernization include social and economic equality and improved institutions and attitudes.

The last is the most striking for it comprises the ideal of a social revolution aimed at the creation of the 'new man,' the 'modern man* or 'citizen of the new state". Such a man, he feels, must be efficient, dedicated, orderly, punctual, frugal arid honest. He must be able to make rational decisions, be prepared for change, alert for opportunities as they arise, enterprising, cooperative and. most important of all, he must possess integrity and self reliance.

The chapter on the problems of labor utilization is of the greatest importance for all students of south Asia since it places the industrialization issue in its proper perspective. Myrdal states that only intensification of labor in agriculture can take care of the population's surplus during decades to come.

He says that a variety of institutional pressures have coalesced to induce spreading of the workload, while both traditional and modern factors have operated to restrict the members of the population regarded as legitimate job claimants. The net effect of these forces has been

to suppress growth in output per head.

With respect to the population problem, Myrdal does not believe that conditions in south Asian villages are particularly favorable for awakening a desire to limit the number of children. He rightly recognizes that the setting of Asian life is such that children arc expected to fulfill obligations to parents more than parents to children. However, he forecasts dramatic changes in Asian governments' interest in the population problem and feels that by the beginning of the 1970s government programs for family limitation will be in fprce in all south "Asian countries.

In .his prologue Guryiar Myrdal writes on the concept of drama and explains why he chose *Asian Drama* as the title for his book. He draws a distinction between the classic conception of drama and real-life drama. He says: " In life, while the drama is still unfolding — as in the practical phase of a^study, when policy inferences are drawn from value premises as well as from premises based on empirical evidence — the will is assumed to be free, within limits, to choose between alternative courses of action. History, then, is not taken to be predetermined, but within the power of man to shape. And the drama thus conceived is not necessarily tragedy." We can only pray that it may be so.

Erich M. Jacoby

Asian Drama, An ***Inquiry*** *Into tin- Poverty of Nations,* by Gunnar Myrdal.
Twentieth Century Fund and Pantheon, New York, 1968 (three volumes, 2.284 p.), $8.50 for the **three** volumes.

Other reviews of ASIAN DRAMA

Herald Tribune

Swedish economist Ciunnar Myrdai contends that economic development efforts in south Asia will not succeed until there is a social revolution.

Aid from the west can be of only marginal help, he believes, until countries such as India carry out radical reforms in agriculture, education, population planning and similar areas.

...Basically he believes thai the Asian countries have been mistaken in attempting to adapt western approaches to many problems deriving from their particular historical circumstances.

He is especially critical of education, or what he terms "miseducation," and contends that the emphasis must be on quality rather than on mere quantity.

"Throughout south Asia there is a traditional contempt for manual work, and the educated tend to regard their education as the badge that relieves them of any obligation to soil their hands," he writes, noting that this attitude "is a very serious obstacle to development."

Western countries err in their judgments of Asian socialism, which is a "rather vague term for the modernization ideology," Mr. Myrdal asserts. It applies mainly in areas where there is little private initiative and nowhere has it extended to the collectivization of agriculture. Nevertheless, economic inequalities have increased since independence...

The Times of India

...Professor Myrdal is right when he says that the western concept of employment "has little meaning in a society where, in the absence of a dole, the pressure of economic distress forces everyone to find some means of support, where the labor market is not fluid, where many persons of working age are disinclined to engage in physical labor and where standards of work performance are very low."

What holds down labor input and efficiency is not lack of capita] but lack of stamina, ignorance and the deadweight of tradition.

Again, Professor Myrdal is not the first 10 point out ihat "without any technical innovation and even without investment other than longer and more efficient work, agricultural yields can be raised substantially."

But who is to provide the stamina'.' Very often the tenant or the sharecropper is not even sure how long he is going to stay on the piece of land he tills and he is afraid that the more it grows, the greater will be the rent he will have to puy. So he just does not put his heart into his work, much less invest in the land he tills.

Professor Myrdal is not the (irst man to say that absentee landlordism must go. The planners have said it for 18 years. But no party has been able to muster the will to define "personal cultivation" in a way which will make it impossible for absentee landlords to resume land only to lease it out to tenants or sharecroppers.

Professor Myrdal is a radical. But out of sheer frustration he concludes that radical land redistribution, however desirable, is not politically feasible in south Asia today. So intead of paying lip service to the slogan "land to the tiller," he tells us, we will do far bejter by making "a deliberate policy choice in favor of capitalist farming."

Those who invest in land and make a good job of it must be allowed ^'to reap the rewards of their efforts." Atfcentee landlords must be penalized by "heavy taxes. And nonfarming nonresidents must be barred by law from acquiring land.

The government, is, of course, too timid to admit in so many words that it has made such a policy choice. It is inhibited by all that it has said in the past. But a choice on these lines is already being made, particularly in areas where the new agricultural strategy is at work.

For the first time those who have money know that investment in agriculture, if made with care, can be more paying than in industry.

...Professor Myrdal almost despairs of the system. "Under the present southeast Asian conditions development cannot be achieved without much more social discipline," he writes, and adds that "an authoritarian regime may be better equipped to enforce social discipline." But then even he is careful to point out that the existence of even such a regime "is no guarantee of this accomplishment".

...The question here, as in most democratic countries, is how to make the system more responsive to the true needs of the people. As far as India is concerned the people will accept a far greater measure of discipline if the political parties do so. They have to pyt a curb on their greed and their petty rivalries and achieve some sort of consensus on issues which have a direct bearing on productivity and efficiency.

Only when they do so and limit the area of political conflict will the open competition for power become meaningful. Until that happens there -will be no escape from mushy thinking or mushy planning.

African Economic Development

by William A. Hance

AHUIJMS and forecast arc [he economist's major weapons- Let him rejoice as he opens Mr. Hance's book, for pages 220 and 291 offer magnificent tables listing the symptoms of the ills afflicting Africa: aridity, political uncertainty, lack of roads and tribal rivalries — 33 countries, 10 parameters and the patient is analyzed. Then comes the¡ treatment; agriculture, tourism, water power, each remedy marked from I to 4, Finally, the short- and long-term prospects, duly weighed and ready for the computer. Jf everything were (hat simple, what happened to Kansas and Oregon two centuries ago?

The reader knows from the foreword thai this book is based on notes prepared by a study group dealing with United Si;iics foreign policy. A good half of the chapters, written more than (en years ago, have been compiled front documents rather than field investigations. **Fad!** and figures are plentiful, though in very extended order lite a disjointed course of physical, economic and political geography (North and South Africa arc absent, and countries such as Nigeria. Senegal and I Miry Coast are given only *J* **few** paragraphs).

Nevertheless. Mr Hance's book is worth reading despite its ovcrambhious title and lack of homogeneity. Indeed, it includes integrated studies on three big pilot projects for development of the vasi continent — the Gezira-Managii irrigation network in (he Sudan, hydroelectric development of ihc Volia river in **ObfIM** and I he iron mining complex in Liberia.

The Sudanese irrigation system, covering about WHU>X) heel a res. has made ihr Sudan one of Ihe World's leading producers of long and medium-staple, cotton.

The Akosombo Dam, the aluminum plant and Ihc port of Tcma have turned Ghana into one of the world's principal producers of aluminum, Libcrian mines are among the foremost suppliers i if rich iron ore for the iron and steel industries of Europe, North America and even Japan. In each case, total investments amount to hundreds of millions of dollars. The author examines the vicissitudes of such financing in the light of fluctuations of world politics and the effect on the infrastructure of the country and its general development femployment, living standards, balance of payments).

Sun, water, earth and the peasants' labor in the Sudan, the power potential of the Volta river in Ghana, the riches of the subsoil in Liberia are supplying the developed world with raw materials and art[1] giving Africans a fighting ehance. Here are three examples of development in which Africa is furnishing its riches in the form of raw material to the industries and consumers of the rich countries. They arc well chosen as examples, considering their technical success and their value.

Bu; from the point of view of long* term strategy it is important to analyze how some of these undertakings threaten to increase the vulnerability of the countries benefiting by them because of growing indebtedness ;ind unsettled markets.

To achieve greater independence. I i beria will ha\e **to** procevs her iron ore one das. creating a nig African iron and vied industry and selling machinery lo \frka and the world Likewise. Ghana which, incidentally, uses kilowalt-hmirs to process imported aluminum and docs not u-t **exploit** *h^T* own bauxite, will Me day have to produce aircraft bixJics and engines rather than aluminum inunls.

This poses the problem, among many others, of market size. Mr. Hance's book devotes a very instructive chapter **to** the integration efforts of hast Africa. Kenya. **UfUdl** anil I ;m/iini:i arc endeavoring to set up a viable regional economy amid a thousand difficulties, of which politics is not the (east important.

Strategies defined by the Charter of Algiers, which **pdMCM** the great merit of having been drawn up by qualified rcpresemaiiu-N of the poorer countries. illustrate and conclude the data supplied by a hook such as this; which justifies their fundamental claim to recognition and independence.

Taking this into account, Mr, Hance's hook can serve as reference if African leaders will forget his too frequent objeclions to the Africanization of the supersi ructurc.

Raymond Aubrac

African Economic Development **by William A. Hnnce,**
Frederick **A. Praeger, New York, 196? (326 pJ**

FAMINE 1975

h> William and Paul Paddock

Population expansion and stagnant food product ion in* the underdeveloped nations arc on a collision course. Serious fa mines and **ftOCOfnpanyfelg** civil disorders arc inevitable by 1975, With DO possibility of producing the needed food and no other production m finance importation of it, the hungry nations will" have to rely mainly on the U.S.A. fur supply of food on noncommercial terms, state the authors. But cien the massive production capacity of the United States will be inadequate and hard choices will have to be made as to who does and docs not receive food — in other words, what people and what nations may survive?

Statistics and analyses developed in Part I show that the relationship between population and food supply in much of the developing world is alrc.uh unfavorable. People &TC hungry now and by 1975 will be starving — a time of famines, perhaps lasting for decades, will have begun. The authors argue that a past tendency to underestimate population increase and overestimate food production suggests that famine is nearer **•ad** Jikciy on a more massive scale than some estimates indicate,

While medical advance continues to lower the death rate, (he birthrate remains stable or rises. For a varieU nf reasons, hopes of substantially limiting population .growth are something for the future. The authors dismiss Ihe possibility that any of the already ku.mri means of increasing food production can li.ue sutlieicnt impact by 1975- They conclude their analysis of the situation in the hungry world by looking at factors outside the agricultural sector which affect food production Here, (00. 'hey find little ground for optimism.

The pos>ihle contribution of the developed \uirki m iDsvttting famine is considered in Pan II. Poinitkil suppliers an.- **the** U.S >V, (iinada, Australia and •\rgenlina hut, to date at least, only the United States has shipped substantial quantities on a noncommercial basis. This position is seen as continuing due i<> Ihe likely availability of commercial markets large enough to absorb the production of the other three countries.

Given the situation of insufficieni United States food supplies to meet the needs for shipments to all the hungry nations, the authors in Part **[I]** of their book give their views on how the decision should be made as **to** which nations receive food. Drawing an. analogy with (he situation at an overextended field medical station in wartime, the authors propose their system of " triage." Wounded coming to such stations are classified as: (I) can't be saved and thus no point in medical attention; (2) walking wounded, in pain but can wail for treatment; and (3) seriously wounded but can be saved by prompt medical treatment.

The real merit of the book is that it draws attention, in dramatic terms, to the increasingly serious population/food supply problem and this is the first step in bringing about action to deal with it. While the various aspects of the prohlcm are extiemely complex and difficult to quantify, there can be no doubt about the general conclusion that famines lie ahead — only the liming and extent arc debatable.

Unfortunately the tent of the book is interspersed with rather **objective** judgnii-ni-v. or at least judgments based on inadequate information, on what countries will do, fuo examples, one from the developing ;ind one from ihe developed world, are illuvti,iti\c: (I) United Arab Republic, p. 48 44 — "The Aswan Dam is only a delusion of progress; its new land will he farmed in the same old u:,ivs bj the same old fclahins procreating ;is always without effective **official** support lo curtail faniiK size;" (2) With reference to the **Contribution** of Canada. Australia and Argentina to feeding the hungry nutimis. pages 130 and 131. "(c) Even if they could afford generosity at that level, these countries have not yet developed within their governments and Lin/enry a sense of moral duty, and (his comes slowly There b little evidence that this ousts today even nt a rudimentary level. During 1962-64 Canada shipped only 100,000 tons of wheat and Australia only 50,000 tons on u noncommercial basis, insignificant amounts in comparison with (lie 13,500,000 tons shipped by the United States on a nonco mine rein I basis during the same period." Such judgments can' lead to a slightly more pessimistic forecast than may be justified.

More serious, however, they do not add to the reservoir of goodwill among nations which is absolutely essential in dealing with crises of the magnitude predicted by the authors and, eventually, in achieving a better world for arl^Nor does an unfavorable judgment, valid or invalid, necessarily lead lo the kind of **action** needed to improve the situation.

It is ihe third part of the book, where the authors put forward their proposals as to how the U,S.A, should deploy its food resources in time of famine, that is most contentious. Here, the authors stem (o be advocating on the part of the United Suites the nationalism they deplore in the developing countries. One wonders, for example, if it would be in the best interests of the United Slates, in time*, of widespread economically, politically and socially disruptive famine, to reserve fur itself the decision on how its food supplies would be shared with the need\ nations of the world. Is it possible thai the authors underestimate the degree ol internationalism prevailing in the **Uottod** States in suggesting that it would do so?

It is to a considers We extent the time faetor Luge I date 1975 — which leads in **the** extremely pessimistic conclusion ol ihe book, (ji)vernmcnti in the newly **developing** countries arc acquiring increased **experience** and are also increasing!) appreciating the need to give higher priority to agriculture in their development plans and allocation of resources. Their capacity to make use of the findings of studies is. in effect, increasing. Then, too, action initiated in a number of developing countries, including India, in the bM few years may begin yielding results even before 1975 and thus the crisis may he on a lesser scale than predicted by the brothers Paddock.

D.C. Kimmtl

Famine IV?* **by Will tarn inj Piut Paddock Utik, Brown .nil Company, Bmion. (276 p.)'.**
VBLJU

Weather and Agriculture

Edited by
James A. Taylor

Tht primary demand for weather scknoc came from agriculture until the sudden needs of aviation in wartime and in peace gave a very expansionist impulse to meteorology.

Those of us who are concerned with food production arc, on the one hand, grateful for a tremendous progress in weather observing, reporting and forecasting which could not have been achieved without this outside influence and. on the other, envious of the amount of attention given to this upstart and vociferous consumer of meteorological information.

A result of (his new situation is a fairly widespread lack of exchange between agricultural and meteorological services, especially in developing countries.

Efforts are now being made lo remedy *this,* greatly facilitated by a growing desire on the part of national meteorological service* to diversify now that HM aviation pressure is relaxing. Nowadays meteorologists tend to be physicists and mathematicians, rather than naturalist*, but geographers have also come to the rescue. A shining example of the effective help they can render in the development of agricultural meteorology is the work of Dr. James A. Taylor al the University College of Wales in Aberystwyih.

Yearly symposia have been held there since 1S58 on various aspects of agricultural meteorology and. from their proceedings (Memoranda 1-8). Dr.Taylor has selected some notable contributions rearranged under the headings of: The Environment; The Hazards; and Productivity,

This is an excellent boot, Eis contents apply primarily to Wales and. more generally, to lemperate regions, but there is nevertheless much in it of benefit to anyone concerned with the rational development of agriculture in wanner and drier climates.

For instance, the elimatic factors which favor the incidence of sheep liver fluke or of potato blight are sensibly :he same .ill over the world; and the upper air currents which carry the spores of reafa affecting eereals are part of a global atmospheric circulation which can link the Atlas with the Caucasus.

Developments in ecology (an integrated consideration of all the factors of the environment) and In operational research {ivhich give dimensions to hitherto subjective impressions) discussed in this book, lend themselves lo extrapolation for wort in developing countries. However, the process cannot be automatic. Sensible adaptation, which requires local knowledge as well as outside know-how, is essential.

LAM. Cocbemé

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ceres

Ceres was adopted as the name of this review because of its close association with agriculture, particularly the growing of food crops, *Ceres,* the Roman version of I he Greek goddess Dcmetcr, has its equivalent in most languages just as *Ceres* herself, symbol of agriculture and representing mother earth, has her equivalent in most cultures.

Roman copy or *a Greek statue at CERES* of *the ith century B.C.*

By the beginning of the Roman Republic, Sicily was known as the center of ihe worship of both ***Ceres*** and lur daughter Persephone. *Ceres* herself was then considered as the most ancient and venerable of all [he gods, and goddesses. During the famine which [he Romans suffered after the expulsion of the Tarquin monarchy the dictator Tulio Ptwtuniio consulted the Sibylline books which advised that the worship of *Ceres* should be established in Rome. A temple to *Certs* was therefore built in 493 B.C. on the Aventine hill (near the present site of FAO). *Ceres* was then regarded as the goddess of food grains and patroness of The corn trade.

Ceres also adopted Triptolcmus. the son of Celeus, and initiated him in the arts of agriculture- He became identified as the Jcity of agricultural crafts, and in some legends is named as the inventor of the plow.

The attributes of *Ceres* are chiefly connected with her position as goditess of agriculture and vegetation: ears of com, the poppy, the mystic basket (ka-|atfa(M) filled with flowers, corn and fruits of all kinds, the pomegranate being especially common. As the earth goddess she is often associated with the snake, myrtle, asphodel and narcissus.

Letter to the Reader

Raising over a million dollars in nix years to hetp thirty leper colonies is not enough lor Cardinal Ledger, Archbishop of Montreal. He is leaving his high office and the affluent society to go and tend the lepers in Africa. "Beating the drum to raise funds is easy, it's going down there that's hardest." he .toys,

This is an example of self-denial, ***of*** *starting over from the ground up, that commands respect. The Cardinal is sixty-three years old.*

Two authors appearing in this number of CERES deal with the vow *problem, but from a different point of view. Jan Tittbergen and Jan ft Stationik believe that development is only possible through the establishment of a global plan. "Coordination and cooperation." they say.*

Those convinced of the need for action to help the underprivileged of the third world, honest citizens of the industrialized societies, gravitate toward the kind ***of*** *immediate and personal solution chosen by the Cardinal. Action, especially if followed by results — however slight — is far more satisfying to the individual fltan the most brilliant theory.*

One of the most frequent criticisms of aid efforts is that local and uncoordinated action is like pouring water info a sieve. Aiding ten families, or a village, to produce more cassava, or rice, falls far short of the takeoff of an entire t • <- iitmiy. tn other words, the act of charily may swihe the giver's conscience, but not the recipient's anxiety for the fulure.*

tVhat should Rr *do then? Which is the right choice?*

Above all, we must not try ***to*** *"hide behind one's finger," as an old Creek proverb puts it. Tn evade reality through \>randii>se plans would he as harm I ill ti\ nut liming a plan at all. The integration of all the \ignificani elements within the structure of a global development plan, handled with realism* ***but*** *with the visionary's faith as well, seems the only effective course open to us.*

The elaboration of a plan that will be useful to billions of people is an arduous task. We can see from the outset the quantitative problems: fathering an enormous volume of statistical data on a country-by-country basis; analvzing it; ami **dfafermMHg** *the order of priorities and* ***objfctbvs.***

Yet the qualitative aspects are no less complex. Understanding by the planners of the poorer countries' present and future needs, and of the resources which are, or may be available to meet these needs must form the basis for this development plan. Who can produce such a plan if not the countries themselves, working within the United Nations.

Moreover, now ***that Am b*** *hope of an imminent end to the conflict in Vietnam, the positive factors favoring a world-wide plait acquire a new element; the possibility of art immediate or at least rapid, shift of the forces of destruction* ***to*** *forces for the advancement of the underdeveloped country.*

Economists are the first to realize that reality U more complex and more uncertain than the forecasts and target, planner, work with. Unfortunately, the pessimists amo £st 'hem tunrnot often been proved wrong . The prospect of pe^e should now give the ***optimhU*** *their turn.* A Birt

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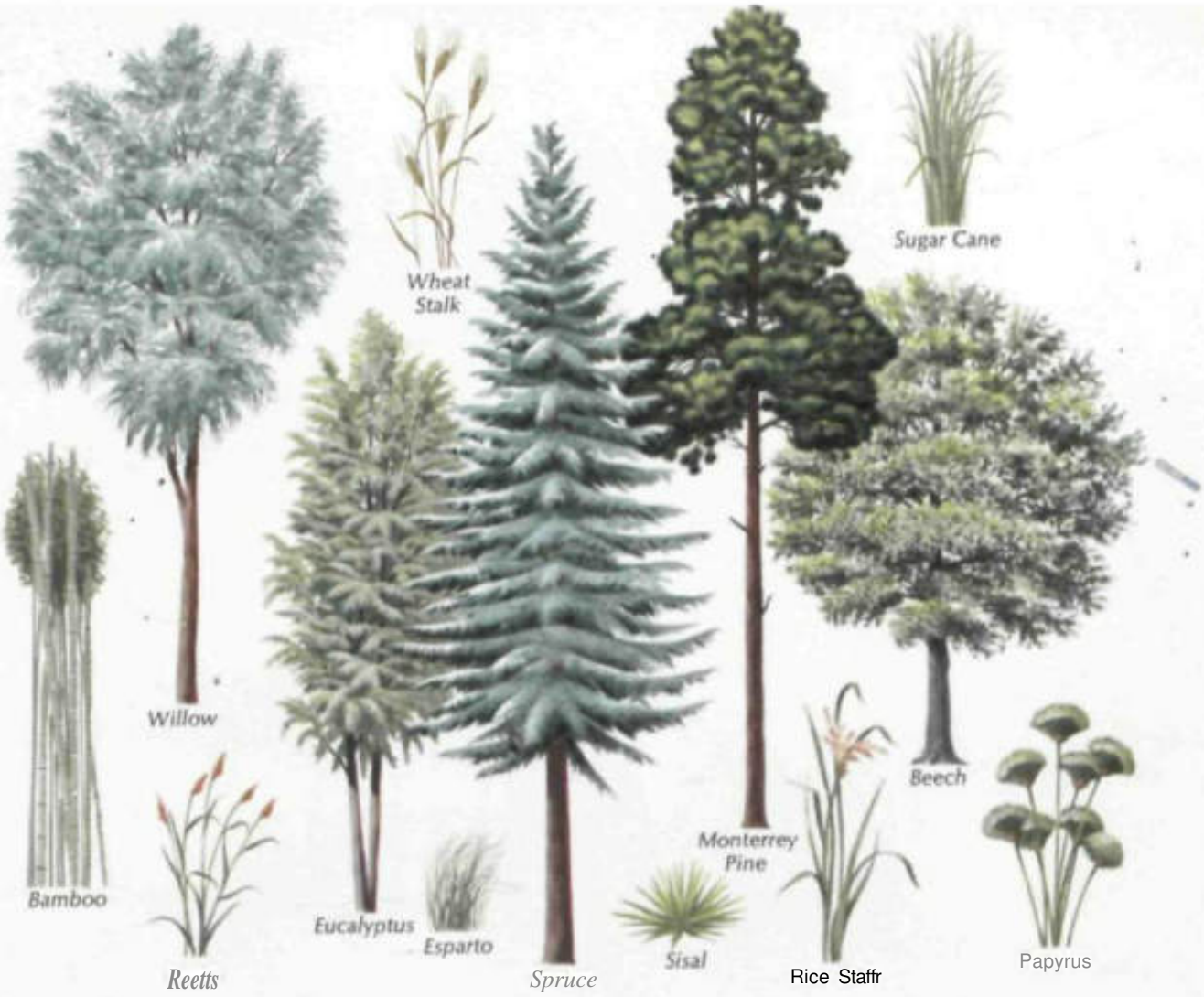

RAW MATERIAL FOR PAPERMAKING

Including the trees and plants illustrated above, some 20 different species of softwoods, hardwoods, reeds, grasses, and agricultural straws and *ca.no.* have been used for pulp and paper production in mills built by the Parsons S Whiitcmore-l.yddon Organization. While in theory any vegetation under proper treatment will yield cellulose fibers, careful study and analysis are necessary to determine what species are economically suitable for industrial processing.

Experts in the planning, construction, and opera lion of pulp and paper mills, the Parsons & Whiltemorc-Lyrfdun Organization has a 115-year history of specialized service Jo pulp and paper *manufacturers)hTougho\it* i In- **world.**

The Organization's technical and commercial staff h;is fulfilled contracts for the construction of 43 pulp and paper project* within (he past 10 years. These mills, built for clients in 25 cuun tries, represent a total capital investment of U.S.$962,400.000.

Parsons A Whitlemore-l.yddon's own mills in North America nnd Europe, with a total annual production capacity of 850.000 Ions of market pulp and paper, provide an important background of experience, know-how and training facilities for the turnkey projects of the Organization.

For further information on the Organization's global mill construction and pulp supply services write to fhn neares] offjee *SOT a copy oi* "Crowing with *the Paper* Industry Since 1853".

THE PARSONS & WHITTEMORE-LYDDON ORGANIZATION

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. .. and that means double trouble for cotton pests, because Shell's powerful new organo-phosphoras insecticide Azodrin works *two* ways.

By contact, immediately destroying insects on the plant surface.

And sysiemicaily, by penetrating foliage rapidly where it kills sucking and chewing pests as they try to eat.

This sophisticated* dual action makes Azodrin by far the most wide-ranging insecticide yet devised giving *condnutrig* control over *more* pests *more* effectively. Azodrin has already been employed with outstanding success in the United States and CentnJ America, and is now proving world-wide to be one of the cotton grower's most powerful allies.

Suddenly pests thai took a bite out of profits arc losing their appetite.

For further information or supplies of Azodrin contact your Shell company or Shell chemicals distributor. Shell works today for your more profitable tomorrow.

Shell Chemicals I (sum]

CERES
VOL- 1. NO- 4
July-August 1968
Published bi-monthly by the
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From f.me Jo *time, CERES wifl issue a special report on major aspects of development, such as regional integration and the role of private investment. These reports will attempt to give an objective appraisal ol the topic while. $t the same time, raising live, controversial issuas. Our first special report is in this* issue — India '68.

f Ml Vtrt: Henri

Why bring out a special report on India when agricultural production has been modernized and the vagaries of weather no longer weigh the balance?

Or is it still the same old story: record crops when the raj/iif: Come at the right time, otherwise dependence on rapidly-shrinking world grain reserves and tight money markets? Has Indian agriculture changed and, if so, how? Is it possible to transform technology without a metamorphosis ol the entire social structure?

Amtrfr Stogtt Cheema

We cannot ignore India: its enormous population, its dominant role in Asia, its insatiable thirst for capital and skills, its vast potential as a market lor manufactured goods. India demands our constant attention.

Four grtides in this issue give some ot the answers to these questions and cover some aspeefs *ot India in transition in '68.*

The government's intensive area development program, in which resources lor agriculture are concentrated 6n 114 selected areas, is described by Claude Moiay *on page 26. This program is a gamble — in which there is little alternative choice — which weighs the possibility ol doubting agricultural production and creating development 'poles' against potential social and political unrest in the less-profHable. low-priority areas.*

Gilbert Etlenne

Two such development areas are compared by Gilbert Etlenne *on page 39, He suggests that socio-cultural obstacles to new methods are retarding progress and that there is a need to change existing social structures.*

Bihar State — associated in the eyes ot the world with famine conditions — may soon produce a surplus, thanks to irrigation water and improved seeds supplied under the program. A.S. Cheema, *on page 37, foresees that more attention will have to be paid to problems ol storage and credit,*

Hans Kristensen

A multilateral aid program has introduced higher-quality flocks and more efficient wool marketing fo a depressed semi arid area not included in the intensive program. John Williams, *in the picture story on page 32, describes the changing tile ol the nomadic shepherds of Rajasthan State.*

How much waste in there in aid programs? H.J. KristinMn *discusses this controversial issue on page 44 and pleads tor g[1] eater coordination between bilateral and multilateral programs.*

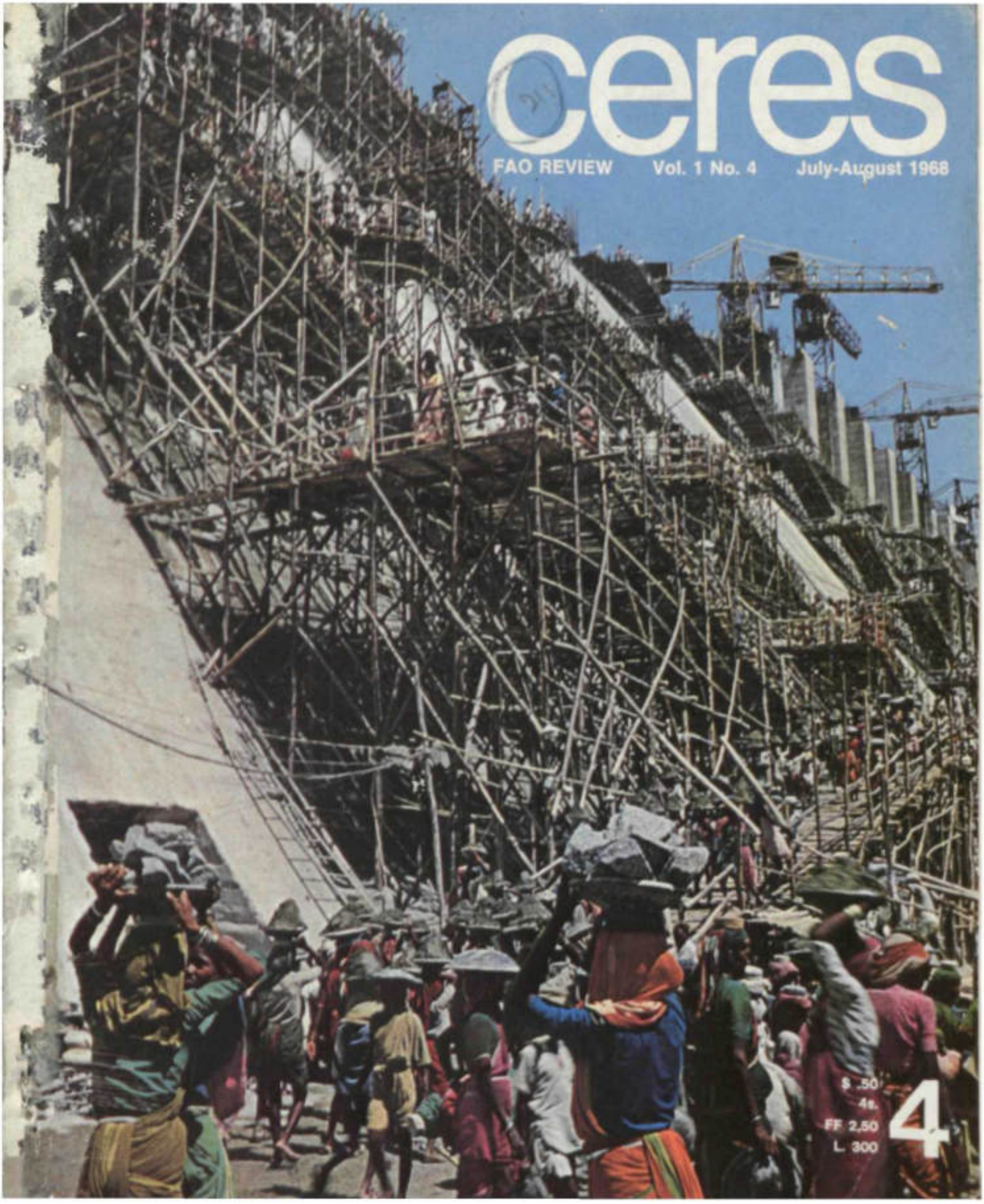
Pavel Flalkovsky

The article on page 47 by Pavel Flalkovsky, a *Soviet engineer who was project manager ol a large multilateral aid project in Ceylon, offers some candid comments on waste — of both time and opportunity —* as *well as summarizing the accomplishments of this projec'.*

This issue starts off (on page 191 with a philosophical look at the development process by Paul-Marc Henri, a man *who has worked tor most ol his lite with bilateral And multilateral programs. He comments on the vanous k>nd$ ot aid the n**d lor a world strategy the role ot private enterprise and summarizes the mainspring* ol *development*

Hans W. Singer

Articles m our last issue on some ot these aspects — on a *proposed global development plan by JMH Tmbergen and on posi-UNCTAD by Janez Stanovmk — are discussed by* ***Ham linger*** *on page 51. Dt Singer. instrumental tn aufictung the UN.* ***Development*** *Decade, believes that we are on the right path bul thai national and international aid programs must &e coordinated more closely.*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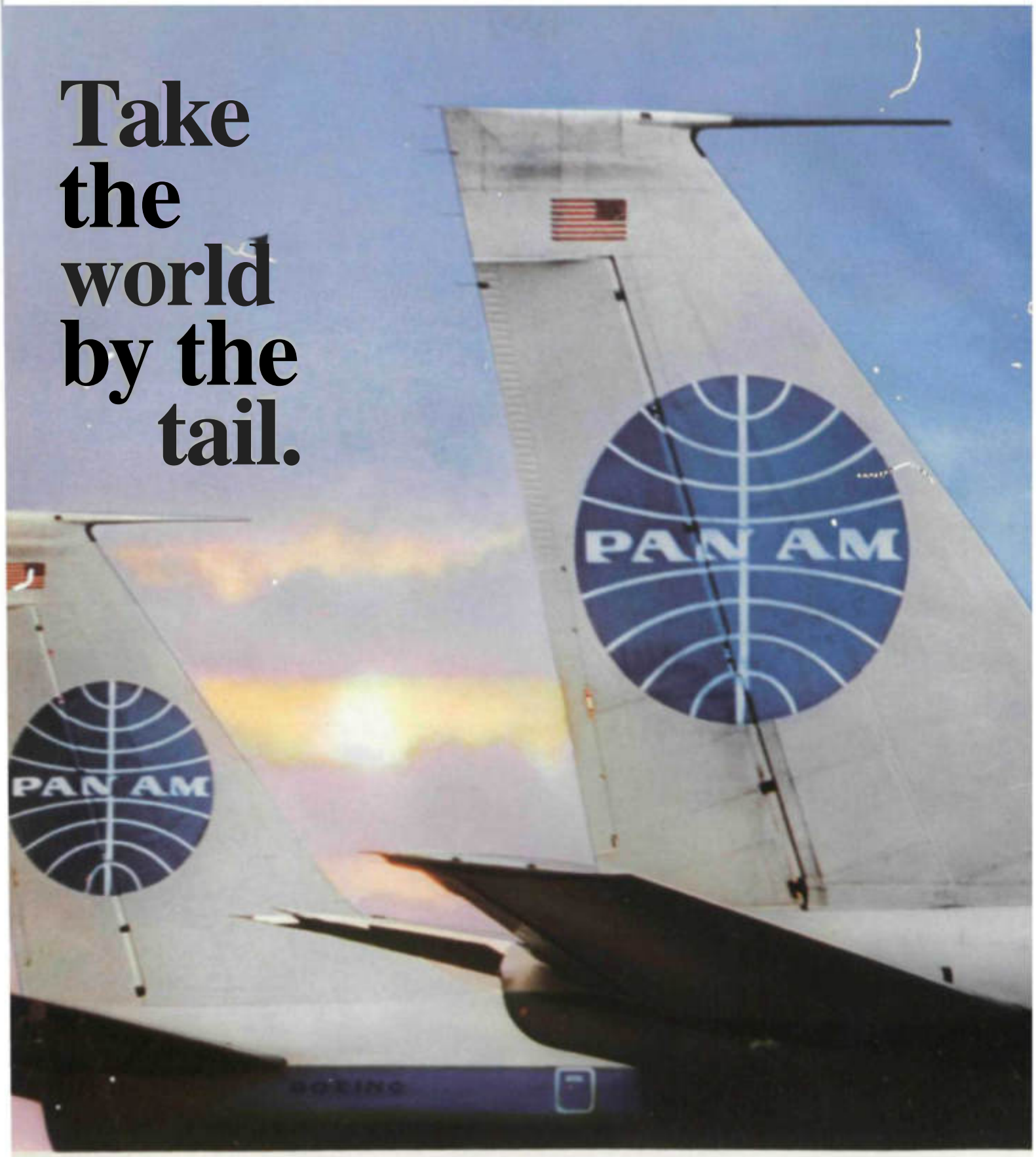
Take the world by the tail.



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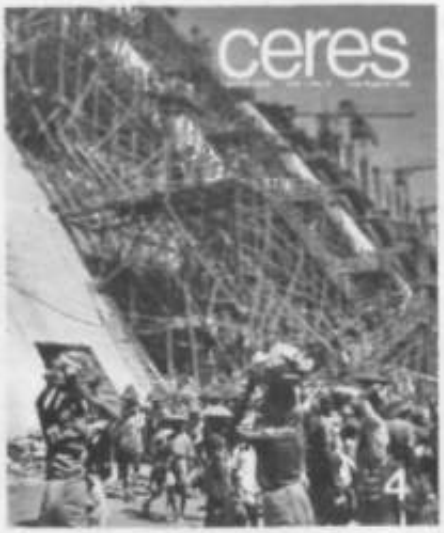
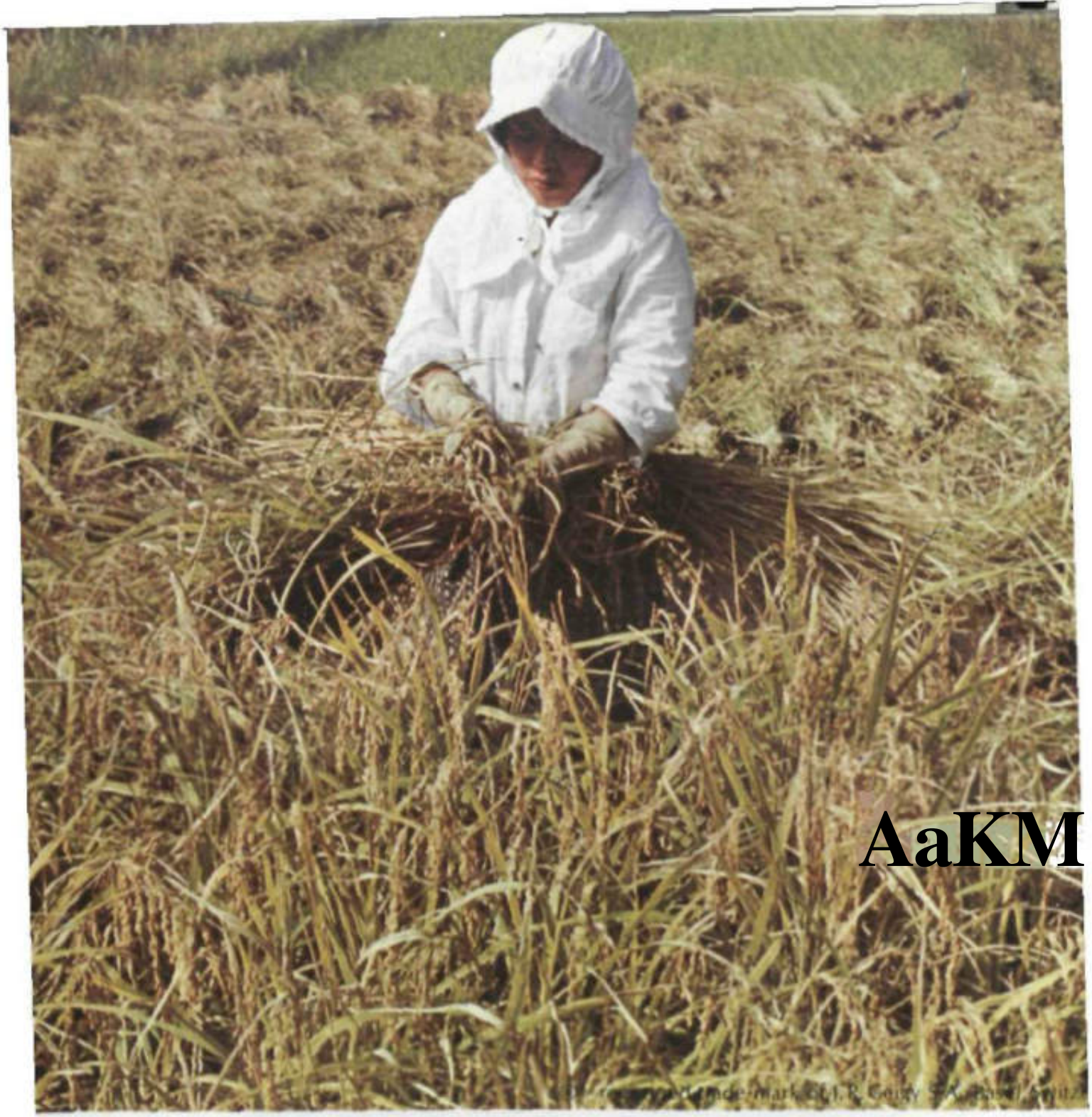


The mass of humanity is India's major natural resource. 520 million people must not only be fed but also gainiully employed.
Here, a natural combination of the two as human fabor helps to build the Nagarjunasagar dam on the Krishna River (photo: A Rttet)



AaKM

The Daily Bowl of Rice

Every second two babres are born.
One of them in a rice-eating country.
More mouths to feed mean hunger.
It's not eoough \\y>*K* to pUm more acres.
Bigger and better yields also claim **for**
effitteni pe^t control.
Between planting and harvest.

CeigyS contribution lo raise the yields:
Basudin* insecticide, hr^nd *ai* diatinon in
granular or liquid form.

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Creators **of Chemicals** for Modern Agriculture

LATIN AMERICA

• ***IDB iamna to ffnanam rtnmlt-Mcmtm irrigation***

Mexico has just obtained a $426 million loan from IDB (Jnler-Aroerican Development Sank) to finance 560 medium-sized irrigation works covering an area of 212,000 acres and benefiting 12 million in* habitants.

The overall national development plan calls for an investment of $3,335 million 1o Increase the productivity of 750000 acres of arable land.

This latest loan is in addition to $165.5 million borrowed in 1967. Together, the two loans are sufficient to finance 48°/* ol the plan's first phase. Over the next four years, a further $1,225 million will be inveaied in the construction of 960 small irrigation networks covering an area of 22,000 acres.

• **Wot** ***Jtni mtigarcmnm and cigarm***

The Cuban government recently decided to decrease the country's dependence on sugar as the main export commodity by encouraging the production of other crops.

Crops which are completely new lo Cuba, including asparagus and strawberries aimed at European markets, are being grown on an experimental irrigated farm covering some 3.000 acres. Vines have been planted with the aim of producing Cuba's first wine.

Some 150 million coffee trees have been planted in the Havana region.

• ***Playing for High mtakmm***

Colombia has been granted $33,5 million in aid tor the coming year by the International Monetary Fund. This opens the way to negotiations for a further $200 million loan from a bank consortium comprising the International Bank for Reconstruction and Development (IBRD), the Inter-American Development Bank (IDB) and the U.S. Agency for International Development (AID).

ASIA

• ***Food aid ootintarm cyclono damago***

Emergency food supplies — including maize, wheat Hour and oil — have been sent by the World Food Program (WFP) to some 24.000 people left homeless and destitute in the Mauritius area in the wake of two cyclones.

Monique hit Rodriguez Island, close to Mauritius, at the beginning of the year. It decimated the matze harvest and destroyed two houses out of three. At the end of last year. Carmen had already destroyed 60% of the harvest and left four hundred people homeless.

The government of Mauritius has distributed building materials for house construction while the International Red Cross, France, the United Kingdom, the United States and other countries have also offered assistance.

• ***Smit-mmfftolmmof hy W7O: Aymb Khan***

By 1970. Pakistan will be able to meet her own food needs and will no longer require foreign aid, President Ayub Khan announced recently.

He stated that rice production this year had increased by 14%. totaling n million tons. Wheat production **for** the same period was 5.400.000 tons — an all-'ime record.

• ***Population control to mntaim mxport****

The population of Thailand is increasing by one million people a year at a growth

General Netr ***Kr>e/nayott:>n***

rate of 3.1°/o. Unless this rate is slowed down, the country will lose its position as the world's leading rice exporter, stated General Netr Khemayothin, secretary-general of the National Research Council, recently,

• ***Uncmrtain financing for A OB'* loan fund***

The Asian Development Bank, fresh from awarding its first regular loan — $5 million to Thailand's Industrial Finance Corporation — is now wrestling with problems of financial support and of restrictions which have been placed on this support.

The success of this regional bank wtll largely depend upon the amount of its agricultural development fund for " soft ' loans (long-term loans with little or no interest charges). Some pledges towards the $400 million target figure have been forthcoming — Canada $25 million, Denmark $3 million. Netherlands $1.1 million and Japan $100 million — but the major pledge of 5200 million from the United States ts still stalled m Congress and in any case**l will wily be** released in amounts equal to the total contributions of other member countries. Canada has stated that the i.rs! use of its pledge (apart from interest) must be for Canadian goods and services.

Canada also wants to contribute $600,000 in technical

There are many ways to get more food from earth. The simplest is to provide the crops with the right nutrients without useless waste.

Feeding the **0001 b** «*= there are lots of **good** fertilizer brands to choc-e ***ham.*** To avo.d waste **,s another puir of boots. Ong a { ™ J * * g £ ;** ular fertilizer can prevent this. In a SuFau. for **instance,** the plant **nutria* totod** in a.definite **chemical** structure b) a ™*mj*»J?" •rive ihe crops the right amount of f«*u]l "* (fetal moment. The ^r.mular sh[>e of **Sefefert** allows easy and even broadcastmg and. Bt the same time, avoids their being swept away by wind or washed away by rain. Being more eon-S U d . they are less bulky: **this** meansiessin transport, storing and broadcasting eKpcnses. Even the package can be special: you may find Seifafert granules packed in **waterproof** plastic-basis **so** lhal, should it be **DOCttNfy,** ihe\ can be safely stored outdoors.

SEIFA

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assistance, one sixth in grants and the remainder in interest-tree development loans to finance preinvestment feasibility studies on projects involving Canadian firms.

AFRICA

• *130,000 torn* of fmr-tHiimr m y*mr*

The first fertilizer plant for French-speaking Black Africa has been inaugurated at M'Bao. near Dakar, by President Leopold Senghor. of Senegal.

The new plant, usipg phosphates from Taiba and Tnies, win produce 130.000 tons a year. This will enable Senegal to export fertilizer to neighboring countries as domestic consumption, at present, is about 60000 tons.

The plant was linanced by the European Investment Bank, the Central Economic Cooperation Fund, the French *Aid and Cooperation Fund.* the National Development Bank of Senegal and the International Finance Company. Several French enterprises and a German enterprise have cooperated in the construction Of the factory.

• AirWtpi *towarmit hm-twmmm EEC* antf £• *Atrtom*

The July agreement signed by Kenya, Uganda and Tanzania raises to twenty-two the number of African nalions associated with the Common Market

The agreement provides for cuts in customs duties between the three countries and the members of the European Economic Com muni* ty (EEC). For commodities moving from Africa to Europe this will mean the almost total abolition of customs barriers, though if imports ol coffee, cloves and canned pineapple become too high they may be subject to Quotas.

For goods going from Europe to Africa, the three countries are allowing cuts ot 3 to 5% on 59 products representing 15% of. these countries' European imports,

• *Thm lour cornmr* of* IJM» *tfemmrt*

Algeria and Tunisia — and two countries. Mali and Niger, separated from them by one of the world's largest deserts — are jointly studying the possibilities and ad-*vantages of a modern road* across the Sahara.

A preliminary survey costing $50,000 has already been carried out. tl concludes that construction of the highway would require some 5100 miilion investment.

From Algiers, the proposed road would lead to Tamanrasset. 1.160 kilometers

to the south, where it would split into two branches: one to Tahou in Niger, 950 kilometers away; and the other to Gao in Mali, 1,070 kilometers away.

At present, north - south trade does not exceed 10.000 tons per annum: it is estimated that it would have to rise to 50,000-75.000 tons per annum to make the road a feasible economic proposition

Can the volume ol trade amongst the four countries be expanded to amortize the cost of this giant project *> This will be established by a study to be carried out by the Trans - Sahara Liaison Committee. The study will cost $293,000. of which $241,900 will come from the UN Development Program, the rest to be paid by the four countries concerned

• *Africa MHI important* cfsm**

The Zambezi River in Mozambique will soon give birth to a giant hydroelectric plant expected to start operations in 1974.

It is to be built at Cabora Bassa and wili be the world's fourth largest with an annual output of 18,000 million kilowatt hours. The Aswan dam produces 10,000 million kilowatt hours. Electric power wilt be available for cities as far away as Pretoria and Johannesburg.

This amount of power will make possible the exploitadon of deposits of coal, copper, *bauxite and titanium* Enough water will ba caught and held to develop 2.S00.000 hectares of farmland aurrounding a M0 - fcllomatartong artificial lake

Th* Zamtwzi win be made navigable up to tie frontier with Zambia irrigation and land reclamation and development will allow some farmers to settle in the area.

The project will b« financed by foreign loans to be repaid by proceeds from the sale of electric power. The first phase of the projeci is to cost about $240 million. Three consortia — including Swedish. German, French, United States Portuguese. Swiss. British and South *African Interests — are* competing to carry out the project.

• *Cmrbm o* foreign. owned firm**

A recent pohcy statement by President Kenneth Kaunda. of Zambia, places majority shareholdings in 24 foreign-control lee" companies — mostly retail outlets and small lirms — in the hands of the state-owned Industrial Development Corporation

President Kaufltfa

The big copper mining companies are untouched tor the moment, except for new restrictions on the amount of capital which can be exported.

Despite this protectionist trend, President Kaunda has urged continued foreign investment in ihB mining, forestry and agricultural sectors

NORTH AMERICA

• *t l,0OO million it,. craamo in tomn cm&Mhi-tlty*

The lending power of the Inter-American Development Bank {IDB) was strengthened m June with a 5412 million contribution from the United States as its share (42%) of a Si thousand million increase in IDB capital This amount, agreed to last year. will increase the "hard loan' lending capacity from the present $2.15 to $3.15 thousand million.

• Mar* *money in thm third wttrt* kitty*

The developing country members of the International Monetary Fund (IMF) now have substantially increased drawing powers as a result of higher quotas and moderate withdrawals. The aggregate quotas of the developing countries rose from $2.9 thousand million tn 1962 to S4B by the end ol 1967 during the same period withdrawals increased by only W79 million

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EJtaS? you, ^s you, head.
HiSi There's no uncomfortable jet
noise. The engines by the tail leave it behind.

It's extras like these that make our VC10 an extraordinary jetliner. The VC10 serves USA, Canada and the Caribbean, the m<
East and Africa It <*»» no moi. to t.y in. Paying comptimems • up 10 you.

BOAC

•VER THE WOHLD BOAC TAKES GOOD CARE OF YOU

• ***World Bntftc'm amarch for morn money***

The World Bank is having some success with its recently-launched five-year lending projection. A liltle more than $600 million a year is at present being lent to the developing countries: it i& hoped that this figure can be raised to more than $1,000 million, and this means finding new ways of borrowing money from the world's money markets.

The new World Bank President, Robert McNamara. has gained assurance from the Federal Republic of Germany that it will buy same $200 million in World Bank bonds before the end of 1969. Japan has decided to increase its pledge to the World Bank consortium to help Indonesia from $60 million to $110 mil* lion. The Bank recently borrowed S15 million in Saudi Arabia and hopes to find capital in other oil-rich areas.

There is also some possibility that three Eastern European countries — Romanta. Czechoslovakia and Hungary — may join the World Bank group,

OCEANIA

• ***A poor 1BB6 llkaty to follow an mxG*tlont 1997***

Asian countries lace serious setbacks to economic development because of the economic problems of the United States and some western European countries, according to the UN. Economic Commission for Asia and me Far East (ECAFE), which met recently in Canberra.

The Asian region as a whole showed a probable incrnase in gross domestic product frorn about 4% in 1966 to 8% in 1967 las! **year** 1967 was a year of agricultural recovery for sorw **counties** and a somewhat less-pronounced jnriustria recovBry (or others according to the ECAFE report

The situation still **ramaim** precarious, the report warns however, and such problems as devaluation and balance or payment deficits could retard the export prospects of many Asian countries, Ofi balance, and on a cautious view, international trade in 1968 is likely to remain rather stagnant.

EUROPE

• ***Can OATT hmlp olomm I ho*** Bi-flip»r*(y ***gap?***

A Swiss, Olivier Long, has succeeded a Briton, Eric Wyndham White, as the head of GATT (General Agreemeni on Tariffs and Trade)

Qhvier Long, new head ol GATT

His main task will be to consolidate his predecessor's achievements, those long-drawn-out negotiations which led to the Kennedy Round agreements for the lowering of international customs bar* rierS With this result achieved, ' like (he mountaineer checking his foothold,' GATT intends to study measures to facilitate trade between developed and developing nations through a system of special concessions.

Mr. Olivier Long, Ambassador in London for the Swiss Confederation since 1966 **thinks that GATT hat an important rote to pt»y In narrowing lfte** prosperity **gap**

• ***Trade*** **p*** ***amongmt*** ***•Group of*** **77*** . \ me **United Arab Republic and Yugoslavia r*c*ntry signed an agreement** on trade expansion and economic cooperation This provides (or the exchange of special tariff concessions on customs duties involving over 500 products Of export interest (including processed and semiprocessed fruit and vegetables).

The three signatory countries have left the agreement open" on a basis of mutual benefit, to any developing country which is a member of the " Group of 77 '

• ***Boormat pommibtUty ot a breakthrough***

There have been highly encouraging reports, recent->y, *about* nevoluffQnary devef oprrtents in agricultural production and the possibility ihat the world food crisis may be approaching a. solution

[1] These reports are circulating at the same time that other voices predict disaster as a result of inevitable famine. In view of this, it is necessary to take stock ol Lhe situation and evaluate the implications." said FAO'S Oi rector-General. A.H Boerma, *in a* statement in June on the world food situation.

" It is indeed true that we may be on ihe verge of *a* breakthrough in agriculture. According to FAO s preliminary estimates food production in 1967 rose by about 3% in the world as a whole and by almost **fl*A** in the developing regions, Although these figures reflect the faci that the two preceding years were bad, the 6% rise in **the** *developing regions* is nevertheless unusually large. Not since 1956 has there been an increase approaching this magnrtude: and (hen it was approximately 5%.

" Several factors were involved. One was much better weather. Another was thai a number of government* in the fast few years have been placing greater emphasis on agriculture in ***thmk*** development planning, and finally, fftrougft new advances m f Jam breeding, there has b**n lhe introduct«jn of high-yielding varieties of cereals suited to wide areas ol the tropics and subtopics. In some places, such as India and Pakistan, the yields per acre of rice and wheat in certain localities have been more than doubled. ..

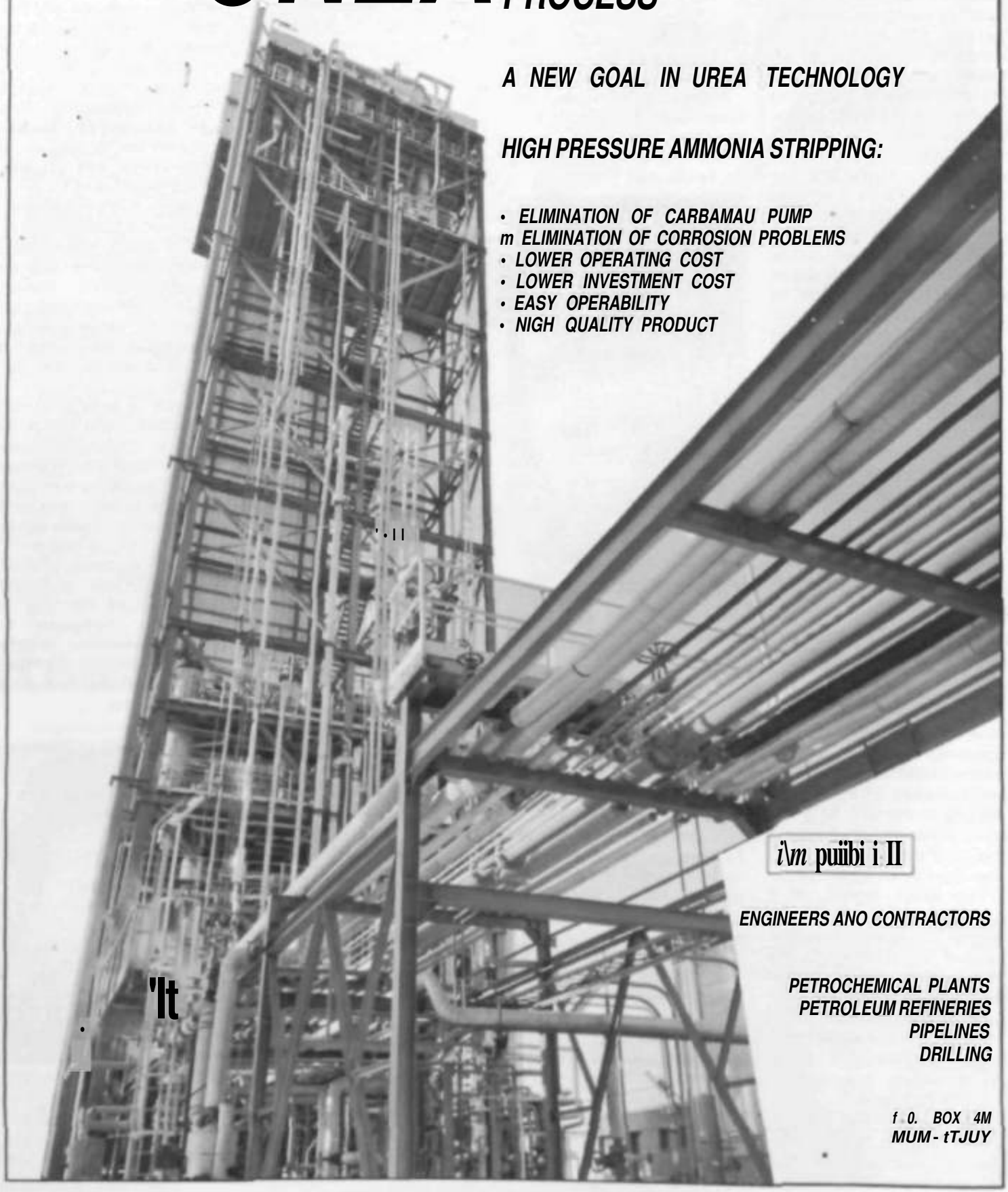
" We are now able to say that there is real hope, given the right conditions and provided the right steps are taken in the right sequence, that the food situation can be transformed at least in southern Asia, which contains the world's greatest concentration of people and where famine has so often stalked the land...

" As production increases, governments and farmers will be faced with storage problems lor which they are not now prepared Storage involves rodent and pest control, which is very difficult and without which much of what is gained can be lost," Mr. Boerma warned. ..

[1] There is another complicating factor, and that Is the threat of continued uncontrolled population expansion, which could make a mockery of all the benefits that technical progress holds out for mankind." he continued "To prevent this, lamiiy planning should become a buili-in component of the vast **In*** frasiructure necessary for sustained economic development. Otherwise the **fears** expressed in toe past could still coma true. ."

Francisco *Atiumo has take a fiva-yQar post MS* ewcuf .. *tector* of (he *World* food *gramme Mr Aquint}^ trom El Salvador was formerly'technical manager* of *ttm tnmr-American Development Bank*

UREA STRIPPING a new SNAM PROGETTI PROCESS



A NEW GOAL IN UREA TECHNOLOGY

HIGH PRESSURE AMMONIA STRIPPING:

- ELIMINATION OF CARBAMAU PUMP
- ELIMINATION OF CORROSION PROBLEMS
- LOWER OPERATING COST
- LOWER INVESTMENT COST
- EASY OPERABILITY
- NIGH QUALITY PRODUCT

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PIPELINES
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opinion

daring innovations needed

From an editorial in Times of India,

From lime to time serious-minded men take a hard look at tomorrow and make logical speculations based on current trends.

What they sec often startles the little-informed, which, only shows thai all too few people have been able to appreciate the implications of the new technological revolution ushered in by breakthroughs in cybernetics, genetics, climatology, molecular chemistry and biology.

Even those who. in an abundant measure, enjoy the benefits of this revolution have not always correctly assessed its impact on human life, manners and thought.

A group of agricultural experts who recently peeped into the future confidemJy forecast *thai in* another 30 years we shall have push-buuon farming. This is nol mere fancy; all their argumctus are based on facts known today,

Science, they say. will win Ihe battle ;iiMinst climatic vagaries and pests. Fifteen-ton yields of wheat per hectare (four times ihc normal today I. kittle embryo (replantation, electronic harvesting of crops, tinted nutrient release with Ihc help o(chemically dressed fertilizer pellets, automated multipurpose machines which will do all the dirty work on the farm, and other sensational techniques arc envisaged,

Tomorrow's farmer, *in* ocher *words,* will no longer have to toil hard in the relentless sun or despair of unpredictable or unfriendly weather.

The husk point here is that it is not circumspection and traditionalism hut during innovation that will bring :ihoui this further revolution and eradicate the specter of famine as effectively us some of the bacterial scourges bave b«n overcome.

But all this to what end'.' That is easily answered. First of ill, the very possibility of such a transformation in 30 **yetft**[1] time will eliminate the fear that man will outrun his food resources; it will iiiMi remove the persisting threat of iilohul hunger...

...Not all our problems will be solved of **course,** but it will certainly mean turn* ing our back on tho current mood of pessimism and helplessness.

too much of a good thing

From **The** Food Problem of the Developing Countries, *by Thorklf Kr'tstensen. secreniry-gi-nerel of OECD.*

...If **loans** ohtiiincd from abroad are used for good investments they should further, and not jeopardise, development. How, then, can the debt burden become a threat to further progress.'

There are various reasons for this- In some cases the investments undertaken are not good, or the capital inflow is used lo support an economic policy that permits consumption to grow too fast, so that *productive* capital « *not crested lo ihv* extent the foreign borrowing would have permitted. In fairness, it should bo added that tying of aid sometimes forces the borrowing country to buy capita) goods that are tixi expensive, relative to their quality, or to buy something that it is DM desirable *u>* imcM in at ihe stage of development which the receiving L-ontry has reached.

In other cases the rate of interest is loo high. This problem is probably less important because pood investments will normally yield a higher profit than even the market rates in the tending countries. The case for *tow* interest rates <s strong, however, because they introduce into the loan operation an element of grant, and **then** are very good rcaions for this *as* an act of .solidarity between rich and poor nations. In fact, it is regret table that grants do nut represent a larger part of the total flow of aid.

Very oftm ihc period nf **repayment** is far too shon The development effort is something that bring* about many of its results only in the course of some decades, or even gene rations. In the long run every good investment will increase the export capacity of a country, but often it may be in the very long run only.

ThU brings us lo what is probably the core of the debt problem. If the gross How uf aid is not increasing fqrever, the day will come in many countries when the annual amount of repayment is larger than the inflow of new aid. This means that many developing countries will become net exporters of capital to the rich countries. This docs not only appear paradoxical. It will also be felt lo be socially and politically harmful, and even unacceptable to public opinion in the donor countries, unless the receiving country has been particularly successful in its development efforts. In many eovntries population growth is likely to keep the income level rather low for a long time to come and, when social solidarity becomes more international than it is today, rich nations will not want to impon capita] from poorer nations.

The rescheduling of debts that is now diking place in one country after another will probably, in a number of cases, imply thai loans on hard terms are converted into loans on soft terms and then, eventually, into grants.

Today, nobody can tell lo what extent this will become necessary or desirable. The *important thing in the* near *future* is lo keep the doors open by lengthening the repayment period of new loans and by contributing to rescheduling of old debts when appropriate. Debt service should, ai far as possible, be prevented from hindering the necessary imports of food or of developing goods.

A developing country can, in many respects, be compared with a new enterprise that is building up its productive machinery by means of capital supplied from **outride.** Now. the capital supplied by shareholders is not to be repayed ai all. li remains in the company. Siimlarjy, *much o(* tfrc capital imported by lew developed countries should not be repayed. It should remain as a good inwstment.

I-his will happen if capital inflow increasingly takes the form of private investment instead of official Joans. Every sovereign countTy has it in its power to take measures that will prevent this from leading tti foreign control of its economy »nd yet make such investment attractive.

west-east trade

From the Laiin-AmerUan edition oj The Economist.

...So far as Latin America is concerned, ihe only real prospects ic can hope for come from increased trade *ith the socialist countries which aie, or are aboul to become, importers of agricultural products and food commodities. The drawbacks arc difficulties of transport and problems of obtaining spare pans.

Furthermore, l!ie Soviet system'being what it is, both parties arc obliged to use western currencies; and such currencies are expensive for Latin Americans. The real value of credit depends largely on the value pla^d an *the,* .products of the socialist countries by the countries which purchase them; and this is equally true for the countries with cent rally-planned economies when they buy South American agricultural surpluses. An attempt is being made to get round these disadvantages t>\ a proportional mixture of trade and barter.

Moreover, when a Lai in-American country signs *a* contract with a socialist country, it has no way of estimating the actual net price it will receive for its products until it has negotiated the sale.

There is another difficulty: large-scale imports by socialist countries create deficits in the trade balance. Therefore, the Latin American countries are obliged to capitalize their credits: Brazil, for instance. h;is been able to amend its bilaieral contract with the Soviet Union to include the right to use its credit in other eastern European countries; Argentina amassed S50 million in credits but found nothing th;tt it needed to buy in eastern Europe.

To sum up, any serious analysis must lake into account two significant factors: (1) the real possibilities that exist in the socialist countries for absorbing prini;ir>. and sumc stcondary, production from **Latia** America: *(2)* the proportion i,f t-x-ports ihat the socialist countries arc willing to finance using assistance credits. Clearly, the future growth of the eastern turcipean market mainly depends on the growth raics of the planned economies and. in **the** hn.il iinaly&b, on the decisions of the pLinn<:

down to the bare bones

from the New York Times.

A Congress that is bent on cutting the fat out of this year's federal budget is down tg the bones of ihc foreign-aid program and still hacking.

The House Foreign Affairs Committee has slashed $600 million from the administration's $2.9 billion request and Republicans arc gunning for further cuts when the authorization bill reaches the Hpusc floor.

The committee's reduction is already too much — much too much. The aid agency is even now operating tin .1 budget substantially below the 1 % of gross national product pledged for the U.N.'s Decade of Development.

Any further cut in American foreign assistance is likely to be multiplied by similar reductions in the aid contributions of other developed countries which have tended to follow the United States lead. This would aggravate a critical shonage of international development resources when the gap between rich and pnor nations is widening dangerously. It could destroy the hopes for agricultural progress raised by the success of new "miracle" seeds and precipitate development crises with serious political consequences in such key nations as India. Pakistan and Brazil.

For all its faults, foreign aid has been a viial factor in preserving hope and political stability in wide areas of the non-affluent. m>n-Communist world. It would be false economy for Congress to cut deeper into Aiti's already "bare bones" budget.

fastest growth in history

From an tiriicte in Business Week.

What hope do the underdeveloped nations of ihc world have of catch in £ up with the 20th century?

In the more advanced western nations, ihc general pubfk considers the outlook grim. This view is ^lill shared by some economists, including Gunnar Myrdal. whose deeply pessimistic book about the future of South Asia was published recently *(see Ceres No. 3. paw 60).*

But Myrdal appears to be in a distinct minority among his fellow economists. FOT one of the big ch;ingi-i> in the profession in the last few years has been the emergence of con side rarite "hope for the underdeveloped countries. The men best qualified u> speak for this optimistic pottion belong 10 an elite group of economists at Harvard's Develop men I Advisory Service (IMS).

"The growth rates the underdeveloped tountries arc turning in are the fastest in history," says Raymond Vernon, director i>f Harvard's Center for International Affairs of which DAS in pan. "And a down countries could double those rates in five or six years." adds colleague Richard V. Giltx-n

...Between 1950 and 1965, real gross national product in the underdeveloped nations rose by an average of 4.7% a year, CNP growth in the U.S. from 1870 to 1913 is generally considered to be tboUl -i'i . Wh;il * more. DAS believe* thai the standards «f measurement often understate the true rate of growth.

many ways of betrayal

From a joint stdtcmtnt by tht bishops of Chilr.

In the spirit of the Encyclical. *Pupa-Uvrum progrtrssut.* we, the bishops of Chile, wish to draw attention to the two following problem[1]-:

Firstly: an urgent appeal must be launched to all those who transfer a large part of their incomes abroad "without thought of the manifest wrong" ihey do to their country It must not be forgotten that there are many ways of betraying one's country and this is by no means the least serious.

Secondly: in confronting the complc* problem of the flight of specialists we must differentiate between the motives which prompt such acts, although we must refrain from making superficial generalization*. However, if a speciali^t's emigration is motivated solely by the desire to increase his income above the level of what is really necessary, then this is a wilful limitation of the Chilean community's destiny. It is unjust because it involves a usurpation of rights: engineers or doctors may be belter paid in other countries, bul thev were trained at high cost in Chile so that they could huild up the country or care for the thousands of children who have no medical services.

Chileans have the right to enjoy the benefits of sach effort, and .to demand that right. Certainly, specialists should he paid in proportion !o their rcsponsihiliics and duties; bul they cannot etpeci the same advantages which they might find in more developed societies.

If our own specialists abandon us while, at the same lime, other countries send us specially trained people to help us overcome our difficulties, the result is both confusing and contradictory.

A document PBceaffy drawn up by many bishops of the third world contains a statement that concerns all Catholics: "Christians arc normally called by God to live their lives in their own land, among their own people, in solidarity."

CREDITS

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RICE

commodities

Japan **hat** announced **thai** she **ptoM** to Apart 225.000 memc ion* of surplus rice to developing countries out of a rice stock estimated at nearly 2 million tons. The United Slates ha* become the world s largest rice exporter (1.638,000 tons in 1967). The Philippines recently shipped 5 600 tons of rice to Indonesia. the first "official[1] rice exports (Or a country which seems well within reach of self-sufficiency in rice Some 40,000 acres of land have been opened up in Malaysia's Sarawak State under a Si million fund to start irrigated rice production.

All these events illustrate the changing world pattern of rice production and exports: new producers are coming to the fore, some countries are about to reach self-sufficiency and demand is rising rapidly in others. The severe world shortage of rice over the past two years has been eased by a substantial increase in 1967 rice production. The volume of international trade in 1968 is expected to be slightly above the low levefs of the preceding two years though, as demand is still strong, prices are likely to remain relatively high.

Worfd production Of paddy (rice) lor 1967 is estimated ai a record 180 million metric tons, according to FAO'S study group on rice, wtiich mat recently m Rome. This estimate, which does not include Mainland China. North Korea or North Viet-Nam, represents a 13% increase over the 1966 estimate of 160 million lons and is 5% above the pfwwus 1364 record level of 171 million tons.

More than four hfths of the overall increase has been in the developing countries and is due to increases in both acreage (due to higher prices) and yields (due to favorable weather and improved lechniques) Some oi the delegates reported that the developmen! of new high-yielding varieties had opened up possibilities of increasing production.

World rice exports for 1967 were provisionally estimated at 6.8 million tons (milled rice equivalent} compared with 7.1 million tons in 1966. **The** volume of world exports in 1968 is likely to be slightly higher than last year, according to the FAO sludy group

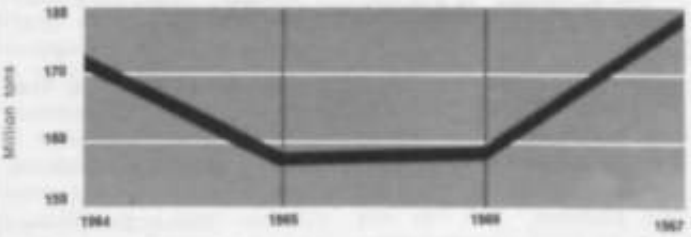
Record crops in Ceylon. India, Pakistan and the Philippines more than oilset declines in Malaysia and the Republic of Korea. Output Increased in Burma, Cambodia and Tarwan. though not in Thailand. Production in Latin America, Africa, the Near East and the centrally-planned economies was also higher There were record Crops in Japan, the United States and Australia as wsll as increased harvests in France and Italy-

Main land China s exports of rice in 1967 have been estimated at slightly more than 1 million tons, about 13%« lower than in 1966, according to" figures compiled by FAO. This decrease was due mostly to lower sales to Japan, Ceylon and Hong Kong which more than offset increased imports to Malaysia and Singapore. Mainland China, .nevertheless, ranked as the world s Third largest exporter of nee. after the United States and Thailand: its share ol total world rice exoorts amounted to one sixth lor the second successive year.

The 1968 outlook for Mainland China was equally optimistic The 1967 rice crop has been estimated at about 8% higher than that oi the previous year, and rice exports for 1968 were expected to be maintained well above the 1 million ton level. Mamland China's export earnings lor nee in 196? wero estim«i-

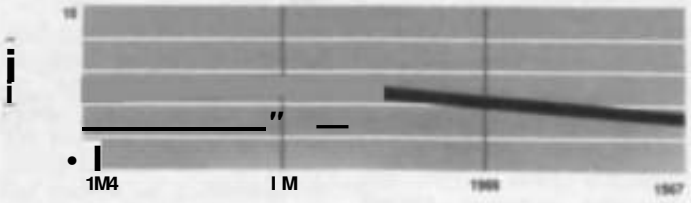
World paddy production

Etctutting Utmiand China, North Ko'tt mta NOW Vittratn



World rice export!

Milled ***net equivalent — ittclutjtng Mainland China, North Korea and North Vietnam based on tetv/ns t/om importing countrm***



ed to have reached an all-time high of $165 million, due to higher prices on the world market, compared with S154 million in 1966.

The supply and price of rice in late 1968/early 1969 will be determined by the size of the 1968 paddv crop. Acreage allotment in the United States, now the world's biggest exporter, has-been increased by. 20% and Australian production is to be maintained at the previous year's level. Given normal weather, rice output *in* Asia may be expected to resume the long-term upward trend, especially in view of new varieties and higher prices.

TEA

India and Ceylon, the world's two largest tea exporters, have agreed on a common approach to marketing. The two countries will set up a corporation, or consortium, through which they will collaborate in blending, packaging and bagging tea for overseas markets.

The agreement is the outcome of a series of meetings which the two countries have held since September 1967. Promotion and advertising will be stepped up and a fixed percentage of export earnings will be allocated for this purpose. The two are also in favor of continuing the work of the Tea Council in the United Kingdom and of promoting tea through Tea Councils in other countries.

Ceylon and India, together, produced nearly 600.000 metric tons in 1965, according to FAO statistics, more than half the world total of 1.160,000 tons. The two countries exported 430.200 metric tons in the same year out of total world export tonnage of 613.000 metric tons.

Total world tea production by 1975. outside the centrally-planned economies, has been estimated at 1.32 million tons, while demand has been estimated within the range of 1.14 to 1.20 million tons. Thus, while production will rise at the rate of over 3% per year, demand is only expected to rise by a little more than 2% per year. This gap may be reduced by the proposed new methods of marketing and tea promotion.

UNCTAD

Various resolutions were passed at UNCTAD 2 which helped the cause of development, over and above the general agreement on 1% of the gross national product (GNP) being a reasonable aid target.

Some progress was made on such aspects as: preferential tariff arrangements; shipping, insurance and tourism; and regional economic integration. Agreement was also reached on a program of negotiations and consultations involving 19 specific commodities, including:

Cocoa: reconvening of negotiating conference aimed at an international cocoa agreement.

Sugar: negotiating conference to lead to an international sugar agreement.

Oilseeds, oils and fats: FAO and UNCTAD secretariats invited to complete a study of possible solutions to trade problems (by end of October 1968) to be followed by the establishment of an intergovernmental consultative committee if considered necessary.

Rubber: International Rubber Study Group and its consultative committee on natural and synthetic rubber producers, together with the UNCTAD permanent group on synthetics, to hasten implementation of measures recommended by an UNCTAD exploratory meeting on rubber in December 1967.

Sisal, henequen and abaca: informal arrangements — conducted under the auspices of FAO's study group on hard fibers — to be evaluated and further steps, including the possibility of a forma) agreement, to be considered.

Jute: informal arrangement — under the auspices of FAO's study group on jute, kenaf and allied fibers — to be continued and strengthened. Possibility of a buffer stock scheme to be explored.

Bananas, citrus fruit, tea, wine and cotton: various interested bodies — FAO's study group on bananas, study group on citrus fruit, consultation on tea, and ad hoc meeting on wine, as well as the International Cotton Advisory Committee — were asked to transmit their conclusions and suggestions for remedial measures to the UNCTAD committee on commodities with **a** view to arranging intergovernmental consultations.

Pepper, tobacco and shellac: commodities studies were called for these items, for which no study groups exist, to be followed, if necessary, by appropriate intergovernmental consultations.

WINE

The first major step toward setting up a continuing international forum on industries based on the grape was taken in late June by a 26-nation ad hoc consultation on wine and vine products It was recommended that FAO establish a formal study group to deal with problems besetting international trade in vine, dried vine fruit and fresh table grapes.

The proposal will be considered by FAO's Committee on Commodity Problems in September. If approved, it would be charged with providing " a forum for consultation and studies on all aspects" of these products, including the economic aspects of production **and** conversion of vineyards to more remunerative crops.

Among the matters the group would consider would be prices, trade barriers, distribution systems, ways of improving wine quality and possibilities of increasing trade and consumption. One important investigation would be on th'j problems of wine stocks, particularly in relation to Algeria, Morocco and Tunisia; at present Algeria alone has a surplus of some 14 million hectoliters. The proposed group would also analyze the situation for grape juice, dried vine fruit and table grapes.

In reviewing the marketing prospects for dried vinefruits, delegates noted that the best prospects for trade exports in the future for raisins and currants, which also suffer from surplus stocks, lay in the Soviet Union, eastern Europe and Japan,

COPRA

World copra production fell in 1967 to 3.2 million tons. 250,000 tons below the 1966 level. This was mostly due to a sharp drop in Philippine yields resulting from insufficient rainfall during 1966. Indonesian production improved marginally, but there were declines in Ceylon and in New Guinea.

The 1967 shortage resulted in a sharp increase in the price of coconut oil **in** western Europe, the United States and Japan which, together, account for about 80% of world imports of copra and coconut oil.

Prospects for 1968 point to another year of reduced output, again on account of the Philippines, due to insufficient rainfall and typhoon damage. The long-term outlook is also dependent upon the Philippines. This country has. however, proved **to** be the most dvnamic among coconut-producing countries and acreage has increased some 62% from 1957-65. Philippine copra production should soon begin to show **a** sharp upward trend and **by the late** 1970s **should top** 2 million **tons compared with** the present level of 1.5 million **tons.**

Development means willingness to participate

A man who has spent his life directing bilateral and multilateral aid programs is interviewed on the motivation and philosophy of development

by *PAUL-MARC HENRI*

Q> What do you think of ihc effectiveness of devd»pm*ni :»<!•'

I recently read in •• **n n u** an extract from one of ibe debates in the United States Congress. One of the questions asked was: " How much has the United States **contributed to** iitlernaiional aid"[1] " The rcpis --tilled that U.S. aid programs Marling in **1941 lad** including the Import-f *pon* Bant jnd the Marshall Plan, had **gtveil** iiwj> ihc vtBRfScrm^ !ot*l **of** $90,400 million, not counting miriLiry aid The countries *whwh* **tud** rrccred most tnclodrO **the** UmletJ kinudom IS7.7CXI milli.mJ ;iml **Prance (13 100 million)** The **deidoptng** Cymric* un the !isi ranged from Upper \olta f S*J milliom ii> **The Gambia** ($1 million*

^ mure **tpncifc** 4i»d searching qucMhsn might he ' U hat has been achieved h\ thoc viivt surm"[1] " 1 would rcplv Ihjt monrj *pcnt b> an internal tonal prt>- **p;im.** liki.- ihc I niu-iJ **N d k m DerttopmnU Progm** UMJP). is not simply an **btveatmmi** jitktinp **n nesnsrabk poreenuge** i>f proht it is. (irsi and fofemost, ibe expression '>< ^ wjllinj:ncs\ to pariiupau;

1 k>t:] th.ii this is **tapHUUH** 11 is urn |usi **I** miittft of potukal inicreM. Even (hnuph. now and then, ihcrc m:is he minor lap^s tif printiplc. irK amtmnts upcm tire nc\L*i ink-nded **to** be pan of a political program *Un* the bonefii of :my one countr> Bv **(kflmhion.** vsc .ire ubliijcd to ^ork in .ill countries throughout (be world **tod** u_ **do,** except for Mainland {"hina. Ours *i* an international program receding IIK- uill i>i **ihe member CDaatrtn to** contribute io iheir common developmcni. it is not un investment to obtain *a* specific ;ind inimediuie interest.

There is ii pt-rmaneni diehoionjy in the philosophy of partieipiilion in the **United** Naiions: un ihc one hand. % a nous criieriii kiscd on the 'mosi cflcdive ust'; on ihe other, ihose criteria which are not really economic but which reflect a general **dflrilC** 'to do something.'

h 'doinp something' an excuse for what we have failed u> do? — a sop to i) guilty conscience over *ihc* hupe military budgets thai burden (he world economy? — the prifc of fear? There has been some tali of transferring money spent on ar- **muneati** (o develnpnient — it *h,* in fact, an official tenet of ihc United Nations — hut *we* live in u dualistic world and the idea has little chance of acceptance. I hc-

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Paul-M»rc Henri, ***fitrttirrly Memory uf ihr CommiuUt* for Ttrhnicul (\n>prruii,m • m Africa <i4Hit)t of ihr Sahara, is aaihlfUtt adrHimilroHv and *aocimlr dirtclor itf fJND^t Hurrau of Operations and rttgtmmmlnii***

Bilateral and multilateral aid

fnvatmatl *and pre-investment*

Releasing potential ***energy***

The dialectic (tf bilateral aid

lieve that what we arc doing cannot be analyzed, cannoi be broken duwn into politically, economicaliy or philosophically'motivaied ends. But, at least, we act.

The development of international programs is astounding compared with the prewar situation. It is a major historical phenomenon. Kvcn if the amounts involved are relatively insignificant they are. nevertheless, enormous compared to what was negotiated before ihc war.

Q. Mhai K the reform- value of bilateral ami »l multilateral programs?

I was administering bilateral aid to countries outside the French community before I worked with a multilateral program. At Chat time. I had certain views on Hie problem, more recently, teeing it from a multilateral standpoint, I have different ideas. In any caie. I think ihe question » wmewhat irrelevant.

FirM. k-i u^ consider the question **ol *tSoc&mun.*** Three years ago in Washington, V\JII **Rests*** -.aid to me "When >v>u t\in prove to me that aid in multilateral form is more effective than bilateral aid. HI recommend in the right quarters lha; *OM* cotucibuuon la the United Nations, be increased. " But that's not the point. Our experience in Ihc field is not enclosed in a vacuum. Bilateral and multilateral aid arc often motivated differently but both deal with a living environment : they are constantly interacting. Effective ness, in the true sense of the word, is not necessarily the best criterion and there is no effectiveness in the commercial sense.

We try, for instance, to establish a connection between (he proportion of costs for investment and prc-investment. We work it out this way: we lake the existing investment and then, counting backward, determine the prc-invcsiment necessary for undertaking the investment. We decided, empirically, that we would give I to 2% to prc-investment, and, therefore, 98^ to the investment itself. 1 find this form of calculation fascinating but, of course, it's completely wrong since the decision to invest has already been made in advance and ihc pre-investment is dragged in afterwards.

True, when the Special Fund was created our experience tended to prove, and may still prove, that investments were loo often made without pre-in vestment and that, us a result, they were often faulty or unsuitable. Bui to also assume that we need only undertake pre-investment studies and that investment will automatically follow U nonsenw.

Investment depends on many more factors than a mere prc-investmcni study, Insofar as such a study is successful and results in implementation it is already part of a complete and integrated decision-making procedure. We don't automatically touch off a trigger mechanism by **nrjfag;** "Here's a study — lent! me 10 million dollars. " It is true that we are more likely to get 10 million doliars by submitting a good study than none at all; yet there have been eases where we advised against investment and. three months later, the government borrowed 40 million dollars, although naturally under unfavorable conditions. I find it difficult **to** judge the whole pattern of effectiveness.

What is important, however, is the release of potential energy resulting from technical assistance or pre-in vestment efforts. It is significant ihat there is now a sort of major interest in development all over the world, a keen awareness of the **need** fur **devetoptneni** and, often, of its pitfalls,

This is mostly due **to tugs-scafe** technical **mkttUKC** operations. When I say large-vcak- 1 am nol **exaggerttbtg:** ihe> **m** not **to** be compared with those begun 15 or 2\> \cars **ago** We are oniy now rtfap'me the fruits of a new realism on the part of governments over the possibilities of investment and **of** mobilizing both domestic and foreign **raooron.**

Only now have they acquired a keener awareness or ihc time and space factors, of the negative factors of development and the necessary counter measures. This new awareness is due. to a large extent. io the pationt, hidden educational effects of intcrnalional technical assistance.

Frequently, bilateral donors become impalkrnt with inadequacies or outright failures of their ***tU*** program, cannot resist preaching **to** the recipient amnlrv. "[told you so. You shouldn't tavc done this or that. . . you should have organized your land reform. . . " riors, can be extremely irritating.

At the opposite extreme, though stemming from the H U M latitude, hut fur demagogic reasons, there has been a readiness to dispense with conditions and 10 give whatever is asked for. which is equally reprehensible. I think Ihat a truly reciprocal relationship — the chccfc and countercheck afforded by commissions and sub-commissions — with all thc^ necessary apparatus of democracy, which seem on the surface to be costly in time and money, bring us closer to an objective evaluation of reality.

Q. To vihul extemt can development tic to RI rolled?

The World Bank is rather rigorous in its decision-ma king process. However, by iiiinlwim: the various limitations to development and by stressing ihe pnihk-im of reimbursement it avoids over-optimistic predict inns.

It has introduced a healthy note of realism 10 the preparation and conditions for loans compared to iht- way loan* were- handled e\en in Europe, between the two world wars, above all b\ Germany There has been a veritable loan craze and certain developing countries have not hern ciempt from it. Vet the craze was restrained by the constant.* mmcijrac* oarfc. realism of ihe W orld Bunk. I feel if there were any honors list-for realkai the Bank should reach., first prize.

By now, ihank\ to detailed inaUws and a ttcady tepravement in statistical methodology and in practk.il. technical meata of aasevong Baton! resources, we have acquired a considerable knowledge of economic phenomena.

We are much belter qualified to judge ihe physical and objective limitations to development than we used to toe We now know practically all the negative factors and forces opposing development: *v/c* art thoroughly acquainted with the problems of population, soil erosion, water and air pollution and the misuse of mineral resources. Still, sonic aspects continue to elude us — usually those leading 10 a positive ratter Ehu • negative interpretation. We can only guess at these optimistic aspects.

There are the still-undiscovered resources, fifteen jears ago no one dreamed thai Libya possessed oil. for instance. Technology b undoubtedly opening up new channels to needed rraOTOt*. Oun b truly a time of transition: *we* can imacinc anything and everything wnerr the future *k* concerned

We can say thai the world B heading for dtsaner tweuusc of the sheer inadequacy of resource* in proportion to popyhrtm and our inability to organise a rescue operation, yet we mod *who* agree with Piul Hoffman that there an exceptional opportunities to recoup our siluatitm. provided *e act with sufficient taci and skill keeping in mind the need for an overall approach (though ugid mensural will, *ip,w fmio,* engender countcr-foru^l.

The leaders in all countries .ire in exactly the wme position. We can, from tintc to time, find e\ery onr of them expressing completely pessimistic views.

It musi be admitted that the present administration of public affairs and development docs not work, or works badly. In I%<> many developing countries, following the development models, believed, in pond faith, that it was only necessary to *et targets, make *toot* approximate assessments of their lin;al resource*, estimate 'he difference and say: "We ha\c this much, you must gh.c us. that much. " Nigeria's plan, and thnse of many other countries, were established this way. But every year the demands on foreign aid grew larger in relation to supply. Trie developing countries cried: " You promised this. . . you haven't *done* it. . . we are not responsible for our failures. "

This was a painful period with manv crises. Undoubtedly Indonesia's and NiRCfia'i tragedy, and others I could mem ion. were Ihe result uf this siiuaiionr their aims were extanicK ambiiious and now they can m> longer even function properly.

Q. What arc thr motivations of dtvclopnwB*:

We must distinguish among the different types of projects we support. Some are optinutjc proiecii, openinf up new perspectives' and leading to new solutions. Others arc project* appfrd 10 aystemt which are already virtually wiped nut. where the factor* p p g p nt, the decay of ibe *tOCkty,* threaten to OUtwelffa the dc\elopmcnt (acton. The c^uilihriuin is unstable and international action can only

The attraction and danger of loam

The rtaiism of the World Hank

A disastrous t>r an exceptional future?

A piH/r understanding of objectives,

Some pi^gCts win (Ifhfn lose

help tn balance it: Ihc absence or inappropriatcness of akl may lend to a downward spiral anil complete collapse.

J don't know which will prevail, the positive or the negative forces. What I do know ts that, in ihc final analysis, ihc force which drives development is provided **by** the will. By will I mtfan the firm intention, from an international point of view, not to be paralyzed by the debilitating powers of bureaucracy. They are considerable and are inherent in any organization, whether civil, political, military or religious **There** are also forces of scepticism and destruction within government themselves :ind the impatience of the younger generations who are ready to demolish the established vvrgaiuzavwrrs which vw longer w>uk. Nothing, has. ^t; bc<ii\ prepared (v> tuckle these enormous, unresolved problems, in this respect ours is a dangerous time, bui there have been pJenty of ages like it

Q. In what form should aiil hi- given?

Development implies, by definition, un inter-disciplinary approach. It does noi concern merely inanimate objects but living beings as well. As everyone knows. in any plan, even a physical one, you always have problems of feedback, of correction and adjustment. We may also say that, by definition, any system [hat works is one where the feedback i> sufficient lo allow the mechanism to adapt itself lo new tasks.

Development must constantly be addpted

When there is no feedback the result is entropy and, sooner or later, the system stops functioning. That is. if we fail to constantly correct our operations (and by 'we' 1 mean governments as well as internalional organizations) we are in constant danger of finding ourselves in a condition of stalis, or static balance, and. often, even profound deterioration. In the case of the mulU-discipUnary approach., I believe we must submit to an imperative need; we must apply system analysis to a given situation while remaining fully aware of **tfae** inherent limitations.

We are dealing with the fate of millinns of people, free units possessed of an independence of thought and action. They behave even less predictably than meteorological phenomena. We cannot continuously feed all these variables into a computer. There are limits **to** mir analysis but. nevertheless, we must define an objective. An engineer at (he California Institute of Technology, fur inMancc. reccnt-\\ suggested applying s>sUm analysis **to** ihe U?*ii p^n ioj **Hew** YofV. He proposed tht following study first construct an ideal model of ihc city as you would like it: compare it with the present plan, and then, sector by sector, analyze the differences between the re;il cit> and the model, hinally, assuming the model is accepted as the ultimate goal, rework the final plan through a scries of sector studies. NaturaJK this is a hypothciicai plan, but the tltcorv behind it is sound.

3.5 thousand million people

We know what we want: 10 enable 3,5 thousand million people in a dynamic state <f population growth to co-c*ist within *a* limited area.

Human socirty is a dosed system

The world is a closed system, at least at the moment. In a closed system, by definition, all negative and positive actions and aspects must cancel each other out. **Cbatequealty,** by examining our **qnfcM M** a whole, global in the true sense of the word, we can readjust the national plans, which are organic units oc building blocks of decision. themseKes based on other blocks with even wider **objoctta***

Q. How should development be applied to a cnaslutly ehangiaf world?

We can reasonably assume that tUeve will be a worldwide **iMitilir**%*i»* **HjV 111** network in Icn years — it is being organized at the present time We arc already **rrirtJBj** national projects to international objectives and, logically, in 10 or 15 yean a practically complete **tytfHH** will ***txM*** on a worldwide sealc. wiih all the necessary feedbacks ami correcti^e mechanisms. We can prcdiu ilun such a system will al&o be created for the world's air communications In these sectors the application of Ihe principle d*«s not encounter much resistance

*National **projects,** intwutfioniit objectives*

On the other ham!, mailers are nut going ;it all well so tar as the organization at **the** prtpuianmVs. **mem of nfetfetam bcoaenaed** This question is complicated bv problems of Ifadf. Ion-i^u exchange, currencies and economic dispiirmet. Wdhu: the old system, one lives wilhin i structure of co-c\istence rather ih<in inleT-ptneiration, Apart from ihe Mark and immediate problems of subsistence, there are educational and sociological questions — jn -,ht<Tl. progress has broken down

Everywhere we come up against an earlier system, so solidly nxiti'd that we find ^LI tint *only* at the regional level hut even ai the national level. Here too, we are confronted by *an* accumulation of faults, or if not strictly speaking faults, of the overwhelming dominance of **Bll** archaic system.

, When western Europe colonized A merjea it was a system i us line its own logic on virgin soil. We have now reached a remarkable point in human history when it has bccoflic impossible for co-cxisnng systems to ignore each other. We. are forced to set up a system of inter-penetration. Th$_L$- difficulty is that most of the decisions concerning biological, ecological and other factors lie in the national sphere anil will *continue to do sa.* I d(; *flat, and absolutely* **cftBSOt,** *see any* **foflfBfttffrBflJ** *authority* issuing binding orders in **(hen** fields.

li will become necessary to compromise between the will of national units and the needs of the international system. **Viewed** from thit. standpoint, the action of the international organisations becomes meaningful. What we call the Indicative , World' Plan or the World Employment Plan arc simpJy attempts to define a common objective for the system.

*The **transition** from co-existence to inter-penetration*

Tin- force of inertiit vj the former systems

Q> Can pafionaf initiative* and uspiratiuiiv he reconciled willi :I **v«f<i* ***strategy'.'***

I believe that the U.N. Development Programme is moving in Ihis direction We have drawn the **BttentlOB** of governments to the fact that whatever decisions 'hey make at the national level have an international impact. They set off forces and counter forc.es. correcting and readjusting forces which, unless guided in the right direction, have a negative effect.

International trade is a classic example. I uncc asked a mathematician: "If you *look* a: *the* payments *balances* of *sU the* wurfcTs *countries,* frienr are virtually no creditor nations. The deficits are larger than tht credits. How dt> you explain this in a closed work) system'-'" The answer was that the total sum should be aero hut, in fact, il rs not because the vectors do not always move in the same direction, We have u system of dynamic imbalance.

The example of World trade

It can be explained like this; while **fee** absolute volume of foreign trade is inertasirte. the participation of the undcrticvi-iupcd countries ii decreasing. The more developed pan **ol** the **QtfMn ••- nqwrfnsdl|** phemwnena of o*rr-product ion, while the less developed **part b** experiencing under-production **and** uoder-nmvjmption. This is not a **nt* phewmewtt but it** « no* **imkiaf place in • far more** integrated world. (orucijucMlv. **the mutual tfeoduv and reperomiom are** much more immediate. The pusAiMlitic* **of** correction **arc. however, abo** ***tar*** **more** developed.

Thf imbalance. are more obvious today*

It is true that **UnflM** Vistiom panicipotkni in aid to **lf<rlnuii.i>f** accounts for oiily *19%* of the total amount being speoi *UK* this purpw*. Roughl\ **^aaidd^** out of the ^7,(MK1 million annually *going* to the developing countries — as an **absolute** liguj-e, *not cminling ihc rdmhuTbcrwnl* of loons — the intcrnatitinul wMom. that is (he World Bank Group and ihc UNDP, account for only $1,000 million. Il must •» mentioned, however, thai most of this How of capital is artificial: consisting mainly of compcnsiitions in order to avoid a worsening of the situation

For instance, if a certain country gives SIUU million (which, moreover, it does not have itself hot borrows elsewhere") to provide goads or equipment, it knows very ^well that it will not be reimbursed wilhin, say. twelve years, but it believes that new balances will he created in that time which will enable it in gram a new loan. It « quite natural, and I am not criticizing ***tbk*** way of doing (hings. *i* am merely saying that it is **a** difficult way and accumubics apparent deficits.

A (hod of loans

Q* U **Ibere a** »ork) develop**" policy?

Our situation is noi altogether clear **and** the decisions remain wholly artificial. ^{Bv} definition, a decision *n* **artificial,** otherwise M would be living in Adam Smith's **Butane.** Therefore, we live in a universe of artificial decisions. 1 discretionary world where, in most cases, exchanges arc mainiaineo" hy specific tinds of discretion. Thc who|c prot,tam ^ |o decide whciher *m* should accelerate in our pres-<W direction toward vaMcr, more distant **bortoOS.** Sbtnitd we go further stilt, or *<op Of change **dinette?** Should we stick to palliatives, which is what we ire doing all thc time now. th/oufh banking and credil channels, bilateral agreements in barter or other forms? O do we intend (o apply realistic renwdies for instance.

*The **whole** system of compensations rests on an* a priori *assumption*

to create a large-scale in crease in the developing countries' purchasing power?

Whatever we undertake musi fit into one overall plan. In short, if we arc willing to help maintain ihcsc <irlihi.-bl and discretionary movements ami increase them, we wil) be contributing to development. It doesn"t matter that, taken separately, project by project, the inpuWmipui ratk) is impcrfcvl. What docs mattei is tlw whole, the overall pkiure. and not the particular action. This does not mean that we shouldn't employ rigorous methods of analysis, We need a certain discipline for every move we mftke.

However, the point is not fn any one action, but in the whole. If we contribute io these different curreMs, we are participating in development. If. on \/ic other hand, we create opposing current*, we arc against it.

Q, What role can **private** capital ptav in ihi\ iiictli:iimm?

What is meant hy private capital

Private capital already plays a sizable part which is not often correctly analyzed. We interpret private capital as movements of international capital but there arc also substantial movements of national, or marginally international, private capital as in Brazil and India.

Il must be clearly understood that when we speak of private capital we mean all of it, not just international private capital, such as that of X, a large company which is interested in establishing n subsidiary in another country. The real criterion is the role of private capital in each country. I feel that jn most countries the role of private capital should be increased. However, (he supply of private capital itself depends on government decisions. Take the United States at present, for example: the supply of private capital has been reduced by a policy of **taxation** and distribution of costs and profits resulting from other external factors. We might even say that as Jong as private capital continues to operate within these limits it will not have the- same opportunities for expansion as it has had in recent years. In the same way, in a country like Brazil, the relation between government and private capital is unstable and uncertain, with inflation also playing a large role as a factor of adjuslmenl-

National policies ortd privatt capital

In western **Europe, too,** there are countries where one can predict with certainty that the future economy will be mixed, that is, based on both state and private capital: this has already happened in many places.

We arc moving toward the kind of world where the relations between the slate and the private sectors will be extremely numerous and complex. Our analysis of any future private **capita]** movements as part of the movement of official international aid will have to take into account the mixed character of the operation from **the OUISCI.**

The advent of a mixed company

Private capital is often crilici/ed. We say to government: "What you arc giving is not aid — il is an encouragement to your exporters and bankers," In that sense even aid provided by governments is private, On the other hand, certain governments employ private channels in order to act discreetly and avoid political commitments.

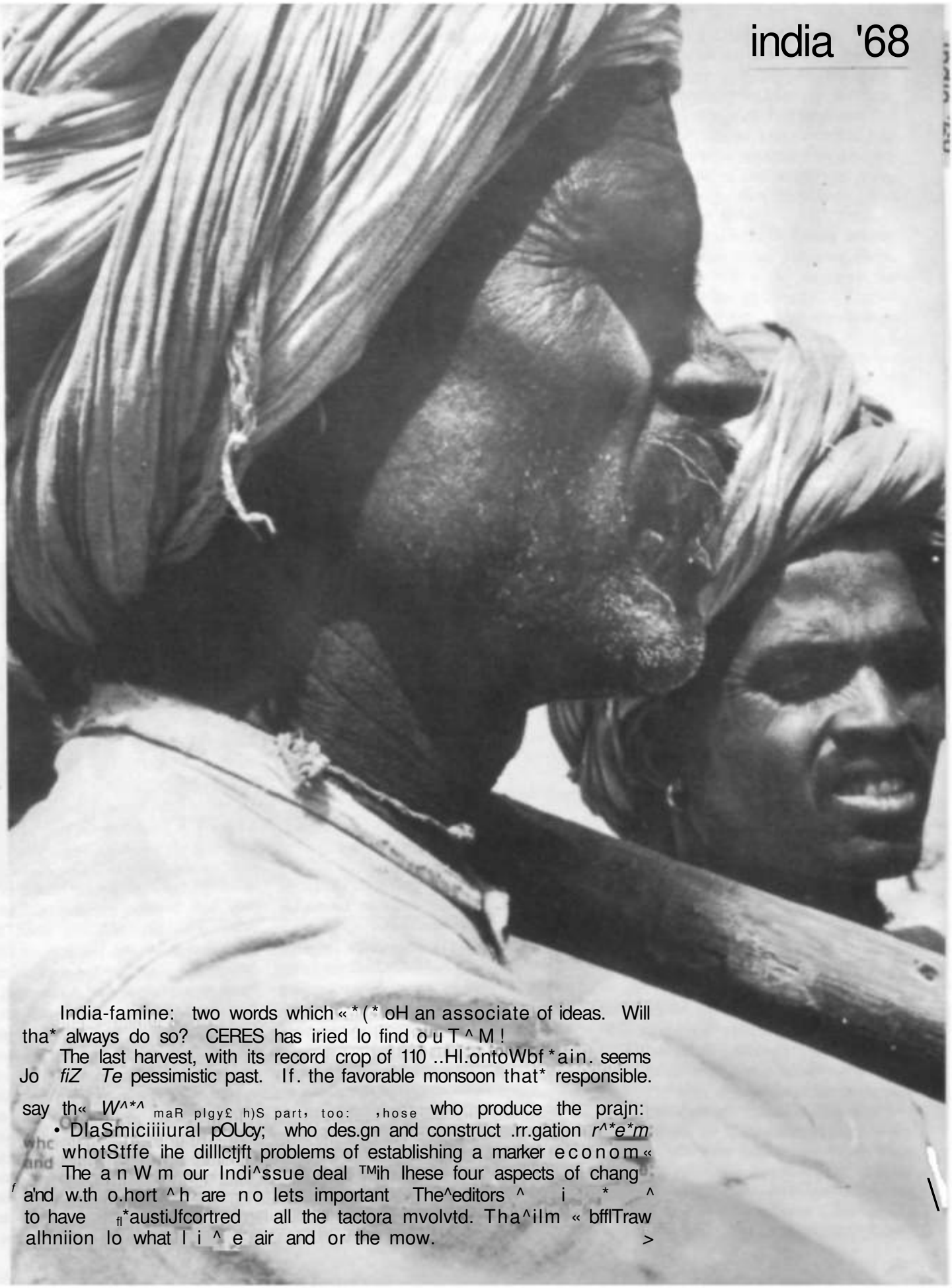
Private initiative ii irreptactrahfr

What do we mean then when we say that, in *a* period of transition, multilateral aid offers more advantages than bilateral aid? If we mean that private decisions las distinct from the general political position) must continue to play a role in development. I would agree because this is still one of the besi mechanisms Tor adjusting to circumstances as we find them, 11 is not a perfect mechanism, II needs im prow me nt but, so far. private initial ivi* is si ill, unquestionably, the most flexible and effective means uf adapting to the changing needs of consumptkm. Il is ihc best solution for handling **COOMOKf** poods and even for certain capital goods. I hcJkve everyone **ftfrea** with this **gVM** in **RMM** *todUB** countries it is considered that certain economic sector* should be left to individual initiative.

*The dialectic of **f*rnaif tnitiativr and \tate ttmtrui***

Hire too we can upplv **the** swan analysis concept, It would \v visionary to suppose itint the **adjustment!** re^ultine from individual decisions of a private nature would be enough io run the world The **(flcparttfel** .ind imbalances arc too great, **•ad** tin- **adaptive mechaafan** of private **krithdvc lead io increase** ihem. But if we iry. in one way or another **to OoanpMMtt** for them by govern merit decisions, we I hen have a situation of near equilibrium **and** private initiative again comes into irv own.

india '68



India-famine: two words which « * (* oH an associate of ideas. Will tha* always do so? CERES has iried lo find o u T ^ M !

The last harvest, with its record crop of 110 ..Hl.ontoWbf *ain. seems Jo *fiZ Te* pessimistic past. If. the favorable monsoon that* responsible. say th« *W^*^* maR plgy£ h)S part, too: ,hose who produce the prajn:

• DlaSmiciiiiural pOUcy; who des.gn and construct .rr.gation *r^*e*m* whotStffe ihe dilllctjft problems of establishing a marker e c o n o m « The a n W m our Indi^ssue deal ™ih lhese four aspects of chang a'nd w.th o.hort ^ h are n o lets important The^editors ^ i * ^ to have fl*austiJfcortred all the tactora mvolvtd. Tha^ilm « bfflTraw alhniion lo what l i ^ e air and or the mow. >

Enough wheat for export?

An important choice has been made: government spending is being channeled into selected areas as the quickest way of increasing production

by CLAUDE MOISY

Today, Shri Jagjivan Ram, India's Minister of Agriculture and Supply, radiates confidence and satisfaction. This year, the official estimate of his country's grain crop is 95 million tons, 6 million more than the record set three years ago.

But, sometimes, good news carries its own dangers. Coming after two years of shortage due to droughts in the main production regions, this unprecedented success has prematurely convinced many people that, after twenty years of stalemate, India has finally solved its agricultural problems.

Optimism is at a new high. Speaking recently before a gathering of farmers in a village near Delhi, Mr. Jagjivan Ram unhesitatingly declared that the world-wide famine, which the experts predict will threaten the world by 1975, will not affect India. " Long before that we shall certainly produce enough to feed ourselves and. if all goes well, we shall have a wheat surplus for export."

This is the theme that the Ministry of Agriculture's information services stress and vary with mounting enthusiasm in articles on what they now call " the Green Revolution."

For the time being, the rigorous *Economic Survey,* submitted by the government every year along with the budget, is more reserved: "the large increase in grain production for 1967-68 is chiefly the result of favorable weather conditions as compared to the two preceding years. However, a considerable part of the increase can be attributed to the governmental measures taken to raise the production capacity of Indian agriculture... Assuming the crop season proves normal, India will have passed the critical stage... and it will be possible to rationalize the food economy and reduce the recourse to imports."

Now agricultural mtratogy

What is the new agricultural development strategy? How was it arrived at? What are its chances for success and its hazards? These are some of the questions which have recently assumed enormous significance for Indian public opinion.

The Agricultural Intensive Program (AIP) is based on a fact which may run counter to many westerners* preconceived ideas, but which the experts do not challenge: if Indian agriculture is stagnant it is not because the **350** million Indians who work cm the land are la/y or backward, but because they kick the means to work more effectively.

The new strategy, therefore, consists of making available the technical means for achieving higher productivity to the greatest possible number of farmers, by providing them with irrigation, high-yield seed, chemical fertilizer and pesticides.

Until now — that is, until the severe food shortages of the'past two years —• agriculture had never seriously received priority in India's development plans. In a country where over 70% of the population depends exclusively on farming the land, the Department of Agriculture's allocations, up to the end of the third five-year plan (1965-66), never accounted for more than 9% of equipment expenditures whereas industrial investments often came to over 20%. Irrigation outlays fell from 9.26% (I960) to 6.5% (1966).

In fact, in the period immediately following independence, agriculture was unfashionable. Nehru's India surrendered to the spell of heavy industry, like many other former colonized countries once they had become masters of their own fate. This situation was soon further complicated by the problem of bilateral foreign aid which always goes more readily to prestige projects. As a result, India now has a steel industry with an over-capacity of about 50';; while it must still import two-thirds of its **fertilizer.**

There is another factor which works against the development of agricultural production. An admirable desire for social justice, after centuries of feudal exploitation, gave rise to the oversimplified idea that agricultural progress required each Indian farmer to possess his own small plot of land. We have witnessed •*i* proliferation of family farms too small

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lo make ends meet, even if the necessary financial and technical means enuld. by some miracle, have been given them.

Moreover, we have seen private cspkal. that of the former large landowners and local dignitaries, turn away from agricultural activities just at the time when stale funds were being directed toward other priorities. The palliative of agricultural credit **cooperatives,** which was timidly introduced, only produced disappointing results. In a system which, for political reasons, operates without obligations or sanctions, too large a share of credit, cx-, prided[1] by favoritism, was sidetracked into aon-agiiculturaf expenses: purchases *of* consumer goods, costs.of weddings or religious ceremonies.

It must be admitted that, throughout rhis period, the small financial and technical means made available to agriculture were not put to optimum use either. A counter to the practices pursued for **fifteen** years. Putting efficacy first, it concern rated the development factors (credit, fertilizers, selected seed, pestjddes) on those few already-favored agricultural areas which were best qualified to obtain results from Them.

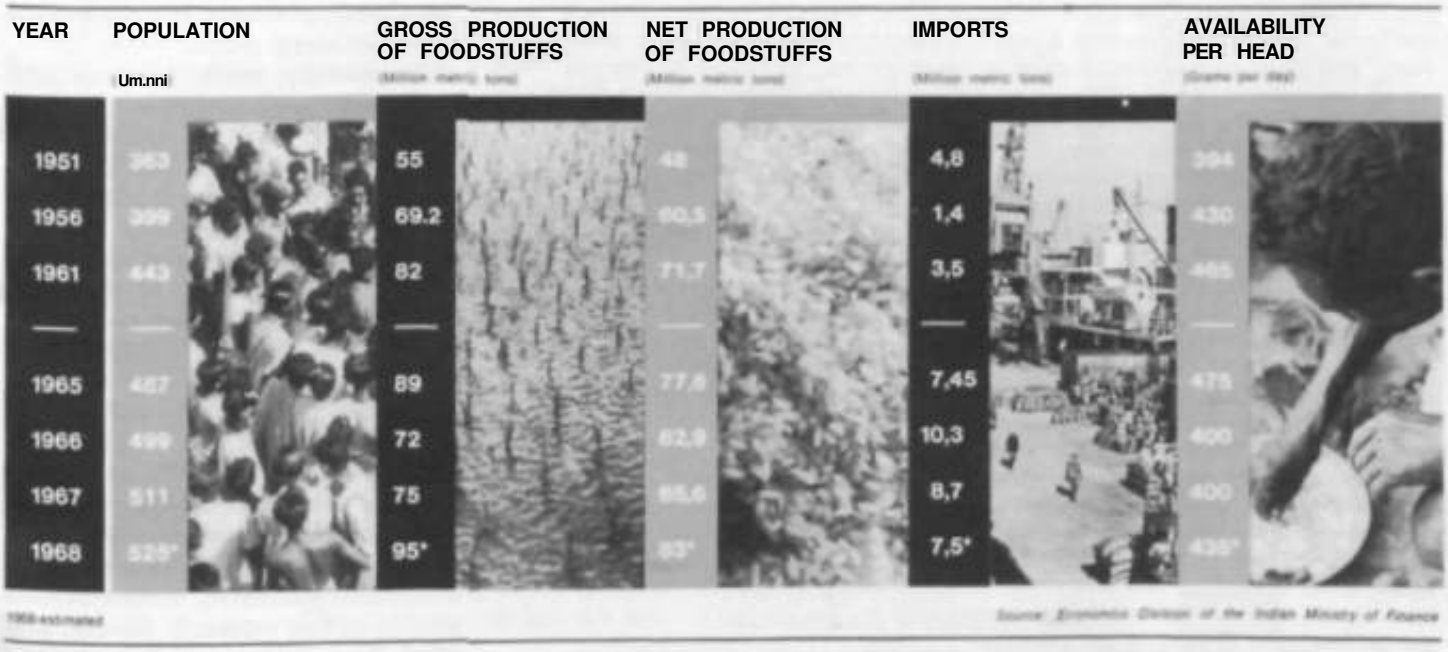
*SHU 4mmmn*mmt am exports*

"' Doon'i iliv adoption of the package program as rhc basis of the government's agricultural policy mean ihc sanctioning of inequalities existing between producer regions? " asked critics of the system.

Certainly *the* controversy that was to break out on (his question in the Indian government and ruling circles in 1964-65 did not stem from political motives alone. The members of the Plan Commission, inclined, to dogmatism, were thoroughly convinced lhal a balance in the rate of million tons the following year. This meant a set bat-k ol tun years. And it was all (he nmrc acute because the country, economically weakened by the September I%5 war with Pakistan and the suspension of foreign import crcdils that went with ii. was in absolutely no position Co deal, through its own resources **done,** with the shortage that threatened, first Orissa, and then Bihar.

It was a rude shtn:k 10 Indian leaders, to find that, after three five-year plans, agriculture was still at the mercy of the harvest and. when it failed, of United States food surpluses. This psychological factor was decisive.

The United States wheat tmports — presented as exceptional and temporary measures when the first P.I.. 480 agreement (deliveries payable in Tupccsj'was signed in 1956 — had constantly increased Such imports had risen from 2 mil-



concern **for** equality, vimelimc not free from a strung dose of demagog), provoked a tendency to split up irrigation budgets and to assign fertilizers so thai ***tnetytmt*** **giM** His **iban** I he importance of maintaining a regional balance wnhin 'he central government of New Delhi, and a balance among the diMricts within each *•*, loo often lc;id to an atom i/iit ion of ercdhs and capital goods which undoubted ty injured their effective nets.

We ean hardly wonder that, in this **peftkal** conical, the packigc-prograni experiment aroused many iJoutHs. It w." based on a pragmatic approach running **economic** development had to be maintained between the serious **fevdl** of **wejety.** I hey felt ihal **oooceamdag** the **ISl si** improved agricultural pruductii.n jri a few prixilened iirea* might offer short-term advantage, but thai it could **Involve** inliniuMy greater danger **to** the aiunlrs^ **MOW twlllinn fa** ihc lon^ run.

I he debate would slill be going on were it not fur the catastrophe of the iwo successive drought years of 1965 and 14MI. **The** country was literally on Ihc brink i>f economic disaster. Grain output, which had attained a record ft9 million ions in I9M-65, abruptly fell lo 72 .....tuns in **1951 to** 4 million in 1960 and ***am*** 5 million in **1964,** according to **(be** otiiuul M.ili-itks n([IK- Ministry of Agriculture F he\ reached 7 million tons in Whf> and 10 million in I<ta7, followinp the jireai droughts.

Ever>K>dy agreed that the situation could continue no longer, above all the Anicrtcans themsdve*. whose surplus stocks were becoming exhausted In India the 'assisted' imports under the P.L. 480 were criticized more and more violently, in Parliament and the press, as Ihcy proved more and more indispens-**•bk, N<H only the Sociilfc and Com-**

An Indian opinion on P.L 480

" Beginning in August 1956. India entered into a series of agreements with the United States providing for the import of surplus agricultural commodities, chiefly wheat, under the United States Public Law 480...

" A major objective of the special economic aid under P.L. 480 was to help newly developing nations meet the strains of the transitional period and enable them to stand on their own feet.,. The P.L. 480 aid was first made available to India at a time when she was beginning to feel the strains of this developmental effort on her food front. The inflationary pressures generated in the economy during the subsequent years could not have been contained with the help of domestic production alone, which had not been increasing steadily and fast enough...

" 3y themselves, these are solid achievements on the credit side. However, it is necessary to assess the role of P.L 480 in India from the point of view of long-term perspectives and policy... It needs to be recognized that these imports were meant to help tide over difficult periods. For India it was meant to provide the necessary ballast to her food policy over the difficult years of development. It is not an interminable flow, in the context of long-term policy. Therefore, any rise in consumption, aided by P.L. 480, which cannot in the long run be sustained by India's ability to produce at home and/or buy from abroad, would not be real and helpful. Nor can a price policy based on such a short-term approach be sustained in the long run. and be conducive to development and growth.

[11] Judged from this point of view, India's food policy in the context of P.L. 480 imports would appear to have been far short of the desired,.. In the first place, large additional imports have become a normal feature of the Indian food economy.. . There has been no significant effort at stock-piling: whatever stocks are there would not suffice even a year's requirement of imported grain on which the market has now become dependent for maintaining the related levels of price and consumption... Secondly, the pricing and manner of distribution has resulted in a very much larger consumption of wheat and wheat products in urban areas. A large part of this has been by middle and high income groups... In an economy where food supply is not plentiful, to put it mildly, the justice and propriety of subsidizing consumption of such classes is not at all clear.

" Indeed, there appears to have been no effort made to price food grains appropriately at different levels. Even the government's price policy has refused to take advantage of the differential preference of the consumers for red and white imported wheat. The large and assured supplies under P.L. 480 appear to have created almost complete dependence on these, as can be seen from the fact that some efforts in regard to internal procurement, price regulation, etc . were made in the case of rice, while none of these has been a serious feature of the wheat policy.

" In regard to measures other than prices, there is evidence of a lack of sense of urgency. In general the needed structural and technological changes in agriculture, and the larger supply of new inputs have not been undertaken at an urgent pace. Specifically in food grains, the relatively greater attention to rice than to wheat is an indication that large P.L. 430 supplies have created a sense of relaxation. In all this, the sense of urgency, spurred by the realization that P.L 480 is not an unending stream, is not evident.

" It suggests, therefore that India cannot afford to be wasteful in the use of P.L. 480 resources, nor can it relax on its oars, thinking the P.L. 480 breeze will blow for ever. The imports under P.L. 480 can play their proper role only in the context of a more realistic price policy and a more judicious use of these resources on the one hand, and a sincere and much greater effort at increased production on the other."

impact ot Assistance under PL. 480 on Indian Economy, by Nilakanth Rath and VS. Patvardhan.

Asia Publishing House. London (for Gokhale Institute of Politics and Economics. Poona), 1968, 202 p.. 45s.

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Cumulative value of United States agricultural exports to India (government and commercial for the years 1954-55 to 1965-66 under PL 480; $3,171 4 million
The Food Aid Program 1966 - Annual Report on P.L. 480.

munist leftwing, but those within the governing National Congress Party itself, denounced the hcaviy dependent position in which this regular recourse to surpluses placed India vis-à-vis the United States, At the same time, the orthodox financiers of all sectors of opinion were uneasy at the inflationary effects of a system whereby the local currency product of the sale of grain imported on long-term loans extended by the United States was coming to occupy an increasingly large place in the national budget.

It would be pointless to deny that the United States used food aid to influence its relations with New Delhi. But it did so mainly t;) convince Mrs. Indira Gandhi's government that it must change its agricultural policy: to give agriculture higher priority in the national budget as compared to industry; to produce more chemical fertilizer as rapidly as possible; and to use it on a massive scale where this could significantly increase production immediately.

Paradoxically, these American pressures, which were immediately denounced by the left, were in line with the views of those who wished to free India from United States influence. In that critical hour, as pragmatism became the chief hallmark of the policy of Jawaharlal Nehru's heir, the then Minister of Agriculture, Mr. Chidanbarum Subramaniam, finally overcame the reluctance of the Plan Commission.

Aid to soloctotJ aroas

In the middle of 1966 the go-ahead signal as given the new agricultural strategy which Mr. Subrumaniam, swept out of office by the D.M.K. Tamil rcgionalist party's election success in his own state of Madras, would soon no longer be there to apply.

Agriculture's share in the 1966-67 budget rose to 12.1%, as a first result, reaching I3.29r in that of 1967-68. If the credit appropriated for irrigation and community development is included, one fifth nf the plan's resources will now be devoted io agriculture and related sectors.

The Agricultural Intensive Program, broadly inspired by the American package program, has been gradually established. Its objectives arc ambitious. It has set a production target of 125 million tons of grain for 1971, so that India may then be able lo feed itself.

To meet this target. 114 selected districts, covering about 37 million acres (out of a cultivated area of 227 million acres), arc to be given high-yield seed (Taichung Native 1. Tainan 3, ADI 27 for rice; Sonora 63. Sonoru 64 and Lerma Rojo for wheal). and a concern rat km of almost *2* million tons of chemical fertilizer. In addition, 210 million acres. Or almost all the cultivated land, is to be progressively treated to combat the insects and diseases which habitually destroy *20%* of the standing cmp.

How far has ihcr program gone? The govenimen! itself admits in the 1967-68 *Economic Survey* that the htpinning ha* been slower than expected. In the first year (1^66-67). 6.2 million acres were to have been sown with " high-yield " seed. Actually, less than S million acres were sown. Et is unlikely lhat the E5 million acres target for-1967-68 has been met — the real figure is probably somewhere between 10 and 12 million acres.

There was a similar lag in the use of fertilizers, for which the distribution methods and the consumption targets were over-ambitious in view of the supply.

Recently, Mr. Jagjivan R.ims Ministry organized a seminar in New Delhi, assembling outstanding personalities in the field of agriculture, to bdct slock of the application of the new agricultural strategy. The prevailing trend was optimistic in the light of tlit early results, but mtincautious regarding the outlook for the future, The discussions between those working in the Meld and the bureaucrats brought out some weaknesses in the program's execution.

The program's progress was slowed down, they all admitted, by the insufficient number or the incompetence of the intermediaries between the agricultural lechnk-ian in the laboratory and the firmer in the field. Too often, the distribution of the high-yield seed, fertilizers and pesticides still suffers from the skmncss" uf rural bureaucracy, pclty local qitarrds and the lack of qualified agricultural extension agent-.

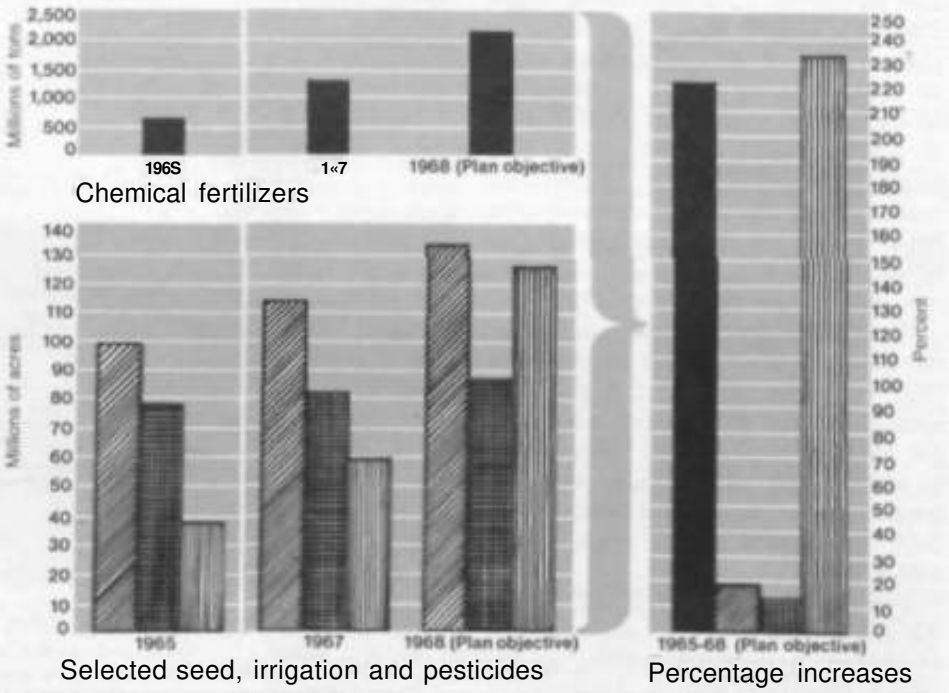
An or^ini/cr from (Jltar Pradesh pointed out that in many Ullages theoretically covered hy the program, the **Ugh*** yick) seed had nui arrived in lime (before 15 June for the summer sowing and I? October for the winter one), and the farmers had to use the tradiiional seed which, ohvKiusK, does oof respond as well lo fertilizer

Thc repcrcussions of the political instaHiiiu prevailing in many states in northern India (which the Minister of Agriculture is inclined to minimize) were highlighted by the director of agriculture in West Bengal, The frequent battles that broke out between landlord* and landless peasants at the lime of the rice harvest I;M NnVLTiilvr aiul IXaiiil'Li, be printed out, did nothing to create a favorable atmosphere for the normal development of the program.

csiimate lhat the 95 million inn «T crop expected this year exceeds the present stocking and maintenance \ itii.-w. **This** IHL-.HIS that **the** rsitc u(1M-.-. :ifLcr ihe harvest, officially assessed a: " in the preceding years, may be e\t-n higher this year.

But I he most serious wea)c point in the new agricultural policy is the inadequate output of chemical fertilizers. This aspect of India's agricultural problem is all the more significant becausv

Dramatic rise in agricultural inputs



In general, the absence of storage facilities for fertilizer, selected wed and peslickJes i>n :i village :ind even village block scale still acts as a brake oti the successful operation of ihc program. Thus, the already overloaded adniintsJrativc machine niu.fi hear the heavy responsibility for getting **ncfe** supplies delivered everywhere in tinw for their optimum utili/alkm.

The slates usually lack the slocking and transport infrastri»ciurc required for quickly speeding up the agricultural intens AC program. Many experts even it reflects most clearly the political reservations and consider a lions which, too often, hamper the best of economic intentions.

Although the sacred cow plays practically no part ai I his Mage of agricultural development, nevertheless, even lodaf, the Indian farmer lives in ihc "cow-dung" a|ic. It is curious in note, in **pmlng,** that the righiwing traditionalist Hindu party, the Jana Satigh. unquestionably one of the rising fortes on the Indian political Kenc. has openly ipnken out in

Essential facts on India

India forms a natural subcontinent, flanked by the Arabian Sea and the Bay of Bengal, with the Himalayas to the north. Its neighbors are Mainland China and Nepal to the north. Pakistan to the northwest and Surma to the east. East Pakistan lies wholly within Indian territory, except for a short frontier with Burma in the east. The Constitution of India was inaugurated on 26 January 1950 on which daie India became a sovereign democratic republic.

Government: The Union of India comprises 17 states and 8 centrally-administered territories. The President is the head of the Union, exercising all executive power on the advice of ministers responsible to Parliament. He is elected by an electoral college, holds office for five years and can be re-elected. The Parliament of the Union consists of the President and two Houses: the **Rajya** Sabha [Council of Slates) and the **Lok Sabha** (House of the People). The firs.t of these consists of not more than 250 members, each state's legislative quota being elected by the members of the state's legislative assembly (with 12 members nominated by the President). The second consists ot not more than 525 members elected by adult franchise. The states' governmental machinery closely resembles that of the Union: all have bi-cameral legislatures except for Assam. Gujerat, Kerala, Orissa and Rajaslhan (uni-cameral). At the last general elections, in February 1967, the Congress Party was returned, with Mrs.-Indira'Gandhi as Prime Minister.

Population: estimated at 520 million (1967) and expected to reach 550 million by 1970/71 and 630 million by 1975/76. Between 1950 and 1966 the population increased at the rate of 25% per annum. Population density is 424 per square mile/163 per square kilometer; 82% live in rural areas: 85% of the population is Hindu with Muslim, Christian. Parsee and other minority groups. India's family planning program's target is to reduce the birth rate from 41 to 25 per 1.000 within the shortest possible time. To reach this target 50% of the present 90 million couples in the reproductive age groups in India should practice contraception regularly, rising to 70 million in 1970. The third development plan (1961/62-1965/66) provided S57 million for family planning and the projected fourth plan provides S306 million (highest priority after agricultural production).

Language: The Constitution provides that the official language of the Union be Hindi. English continues as an associate language. About 180 languages (exclusive of dialects) are spoken in India.

Area and land use: total area (1964) is 784.3 million acres/326.8 million hectares (including Kashmir-Jammu and excluding Goa, Daman and Diu). Of this total, 51% is classified as arable and under permanent crops: 4% as permanent meadows and pastures; 18% as forested land: 5% as unused but potentially productive area; and 227n as built-on areas, wasteland, etc.

Climate: ranges from temperate to tropical with an average summer temperature over (he plains of some 85"F/27"C. There are heavy monsoons from June to August but annual rainfall varies widely: in 1966. for instance, between 666.4 mm and 3.2112 mm.

Economic development: the economy is predominantly agricultural. The most important products are tea, sugar, cotton, groundluts, linseed, jute, rice and wheat. The principal minerals are coal, iron, manganese, copper and bauxite. The chief industries are colton textiles, jute, iron and steel, sugar refining and chemicals.

Five-year plan*: the first plan, inaugurated in 1951. covered a total investment (government and private) in the region of Rs. 38.500 million and concentrated chiefly on agriculture and irrigation. Under the second plan (1956/57-1960/61). total investment exceeded Rs. 70,000 million with the major emphasis on heavy industry and trans-P°r1 in the third plan (1961/62-1965/66). a program of Rs. 116.000 million was envisaged with Rs 75,000 million in the public sector. Actual public sector expenditure is estimated at Rs. 86,300 million over the plan period, deficit financing accounting for the difference between original estimates and final resources available. The emphasis during the plan continued to be on heavy industry and transport. The fourth plan (1966/67-1970/71. ran into difficulties and an interim annual plan lor 1966/67 was drafted. The crop failure further worsened the position and the fourth plan has been postponed until April 1969 (and will cover the period April 1969 to March 1974). During the interim period the Planning Commission will draw up annual plans. Growth of national income in 1966/67 is estimated at 32% while in 1967/68 it is expected to go up by nearly 11%. due largely to a 20% rise in agricultural production.

Agricultural **development:** agriculture contributes almost half the national income and some 40% of export earnings. The average farm is less than 5 acres in size. About 84% of the cultivated area is sown to food grains. 10% to oilseed and the remainder to other cash crops. Main crops (1965 - in metric tons) — tea, 365.000: sugarcane, 117,606.000: cotton lint, B47.OC0 {official} and 997.000 (ICAC); groundnuts. 4.022.000; linseed. 503,000; jute. 805,000; paddy, 45,921,000, and wheat, 12,290,000. Animal production (1965 - in metric tons) — beef, veal, pork, mutton and lamb production from indigenous animals. 535,000; cow. goat, sheep and buffalo milk. 23.029.000. Fisheries production (1966 - in metric tons) — nominal catch (liveweight), 13.674.000; marketing fresh, 9,698,000; curing (sun dried), 1,582,000; curing (salted). 1.415.000; freezing. 262.000, and canning, 78.000. Fish imports in 1966 totaled $330.000, exports totaled $171,230,000. Exports ot forest products in 1966 totaled 551,000.000.

Trade (1965): total exports amounted to $1,821.6 million; total imports to $2,990.1 million: total agricultural exports amounted to S690.9 million: total agricultural imports to $1,041.5 million. Breakdown of agricultural exports was as follows: raw sugar (272.500 metric tons - S22.9 million); tea (199.365 metric tons - 5241,4 million): raw cotton, other than linters [41,220 metric tons • $22.4 million); and jute (26,046 metric tons - $6.5 million).

Foreign aid: external assistance is extremely important in financing economic development and covering India's endemic payments deficit. The Aid India Club, a consortium of countries and agencies that agreed to assist India during its second plan balance of payments difficulties, provided the bulk of the foreign exchange requirements of the third plan ($5,472 million between 1961/62 and 1965/66). Last year, the consortium agreed to a $900 million non-project aid and in May 1968 the United States gave some $225 million as its share of this commitment ($100 million to be used for essential agricultural requirements, the rest for essential industrial commodities).

Education: each state is responsible for education under the overall supervision of the Central Ministry of Education and. where possible, is both free and compulsory. In 1961. 72.2% of the population over 15 years of age were classified as illiterate while 91.3% of the population over 25 had completed less than primary education. 62% had completed primary and 2.5% had completed secondary and above. In 1962, an estimated 40 million children were enrolled in 367,676 schools for primary instruction; 13 million pupils were enrolled in 76.816 secondary general schools; 300.000 were enrolled in 2.769 secondary vocational schools: 150,000 in 1.150 secondary teacher training colleges and 1.207,511 in 2,633 institutions of higher education (of which 36,000 were studying in the field of agriculture). In 1962 the public expenditure on education totaled Rs. 4,365.720.000 representing 2.8% of the national income.

Labor: in 1961. the working population was estimated at 188.4 million. There were an estimated 10 million unemployed (75% in the rural areasl in 1966. expected to rise to 14 million in 1970/71.

Communication*; the transport system is well developed but large areas of the country are still inaccessible by rail or modern road vehicles. Railways (36.200 mites/58,200 kilometers of track) carried 205 million metric tons of freight in 1965/66. There were 595.000 miles/958,000 kilometers of roads in 1968. 250.000 trucks and 7o!ooo commercial buses. Three government-owned shipping corporations and a few private companies operate a total of 1.54 million gross tons of shipping.

NOTE: Pre-Juhe 1966, 1 rupee equaled 0.21 (!; post-June 1966, 1 rupee equaled 133 *f*.

SOURCES: *Europa Yearbook, Demographic Yearbook. Unesco Yearbook. FAO Trade Yearbook, FAO Production Yearbook. FAO Yearbook o! Forest Products, FAO Yearbook ot Fishery Statistics. The Economist s EIU Report on India*

its electoral program against the use of chemical fertiliiers and in favor of natural **manures.**

When India became independent in 1947, the ust' of chemical fertilizers was virtually unknown. Even by I960 it had **reached** the trifling figure of about 20(1,000 tons. We need look no further to explain why the yield per hectare in India has risen only 20% in 15 years.

Danger of priority*

There have been substantial efforts in both the state and private sectors io increase domestic output of chemical fertilisers $o that the success of the new agricultural strategy need not depend on an excessive volume of imports, which would be ruinous to the scarce exchange reserves. But, at present, output falls short of the estimates. In 1967, India pro **duccd** only 400.000 tons of fertilizer despite a plant capacity of about 700.00U tons. Nearly 1 million tons have had to be imported to meet the rise in consumption required by the intensive program.

Theoretically, various projects now in the planning or execution stage should triple production by 1971, It would be more reasonable to assume that the output will be doubled at best. The recourse to imports will continue since the program foresees that, by that time. India's total consumptinn should come to 3.5 million tons.

It is constantly observed that one of the obstacles holding back **the** execution of projects necessarily involving private foreign investment (mainly American) is the Indian government's reluctance to allow foreign firms too much freedom, either in the conception or **raanifcment** of fertilizer plants. Conflicting views. within (he government itself, on the advisability of authorizing US. companies to import liquid ammonia from the Persian Cuff for fertilizer production, has already delayed several large projects.

Everyone recognizes that, in two or three years, local naphtha resources will no **longer nflcc** to meet both the demand for nil products and those of the expanding fertiliser industry. But an instinciiu-iiiis(rust, combined with a fear of being accused of selling out a key sector of the nation's economy to foreign interests, frequently leads the government to refuse the concessions requested by future in-**vestm**

Yet the long-term social danger men (uuicd earlier persists. In spite of his optimism over the gains made in less than two years, Mr. Jagjivan Ram realizes that thu program may run into serious obstacles unless the spirit and concept arc modi tied.

In the application of the new agricultural policy, 'he concern with **efficiency tuu** led to priority being given to thus lands capable of getting the maximum results out of the concentration of additional technical equipment. These arc usually the largest farms which already have the advantages of operational irrigation systems and adequate financial **resources.**

had little success. Therefore, the national budget alone — which already has a large deficit — would have to undertake the financial effort needed for expansion of the agricultural program.

The government has no choice. The chief danger of the course to which it Is now committed is that, even with a crop of /»> »r nil) million tons, the risk of famine pockets in the regions left out of the program cannot be excluded. Indeed, during the two drought years it was amply demonstrated that the shortcomings in the nationwide grain marketing and distribution system left the regions where the **ibortttgc** was worst, destitute, even in the

Il the green revolution is to succeed, more modern methods will have ta gain acceptance

Should the government, in its attempt to gain all chance[1], of success, pursue this type nf selection fur a few more years, the gap between the large agricultural enterprises of the most produc-IIVL- regions, on the one hand, and the small family farms of the underprivileged ones, on the other, wilt automatically grow wider. The same disparity Ihreat-***tm*** tn arise even within a single district where the smaller holdings, fur lack of the necessary **ftmnclfll** means, will continue **to** be left out of the intensive development program.

The Minister of Agriculture proposes to give fresh impetus to the **Cooperative!** to forestall this danger. But, because of the hud reputation of the agricultural credit **OOOpcntivM,** ihe efforts already m.ide bj the government in past years to convince the commercial hanks to demote parL of their loans to these agencies have

immediate vicinity of surplus areas.

Such a situation might also become a grave threat to the social and political balance of India's rural areas. So far. their comparative loyalty to Ihe Congress Party has kept them as an element of stability in the country's political life. The pro-Chjnese Communists have already been able lo exploit the frustration of the most neglected backward tribes to provoke minor peasant uprisings, snia **li-mit** "Jacqueries." in West Bengal. Oriv sa, Bihar and Andhra Pradesh, during ihi- past year.

An agricultural development policy thai would continue to neclcct the " unprofitable " f;irms (that is. over half the rural population) could undoubtedly increase production to 120 or 125 million ions in JV7I. But this "Green Revolu-) lion '" must not be allowed to touch off another, different one.

An auction

Modern methods of grazing, shearing and selling wool have been introduced into Rajasthan; the nomadic shepherds are changing from a subsistence to a market economy

by JOHN WILLIAMS, photo by TOMAS S£ltHET*

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Rajasthan, in northwest India, is a scmi-dcscrl region. It seldom rains, but when it does the two-month monsoon **HMhtt** away ihc good soil During the other ten months of the war the sun dries the ground far below the surface and bakes the green plants. The temperature ranges from SQ"C to freezing.

It **leased** impossible to break this cycle of desolation five years ago *hcn David Scott, an Australian, arrived in RajaMhurt **to** head the P\o side of a joint India/FAO team earning (tut *a* **United** Nations **Devdopmeai Program** {UNDP) project Their assignment was to rationalise ihe local wool indu-.tr>. Faced with this vast area and the enormous numbers of people involved, they applied ihcir efforts on *A* limited **teak** in the hope that their work would spread.

Scott and his team of Australian experts brought with th.Tii a miraculous grass which they were actually bringing **bad** to End lit. a century and a half after it had hecn exported from that country: buffalo grass, which grows on even the poorest soils.

In the 14th century, when **CUKb** were imported lo •\usiralia from India, they arrived complete wilh their saddles. One of these saddles fell lo the ground in the desert, the sun L-r,.t<:ked the leather and the buffalu grass seeds, used as stuffing, spread i>ver ihc ground and spruuicd. By a frequently obstTM-d phenomenon of imoJuiiiwi, as *the grass* flourished in Australia it disappeared in India. Five years ago, *a.* new era began for the shepherds. With the new *gtuss.* the sheep grew fatter, ihc (lecec thicker.

Sheep are shorn as much as three (imes a year. Always in debt, ihe shepherds cover Ihcir most urgent needs by selling wool to chance buyers, [merest rates constantly increase their debts and they arc caugbi in a vicious circle **which,** desp**ta** all their efforts, only makes them poorer, never richer.

John Williarm 11 *London* ***ntitttr*** **(»/** ***the*** **Melbourne Herald.**

in the desert

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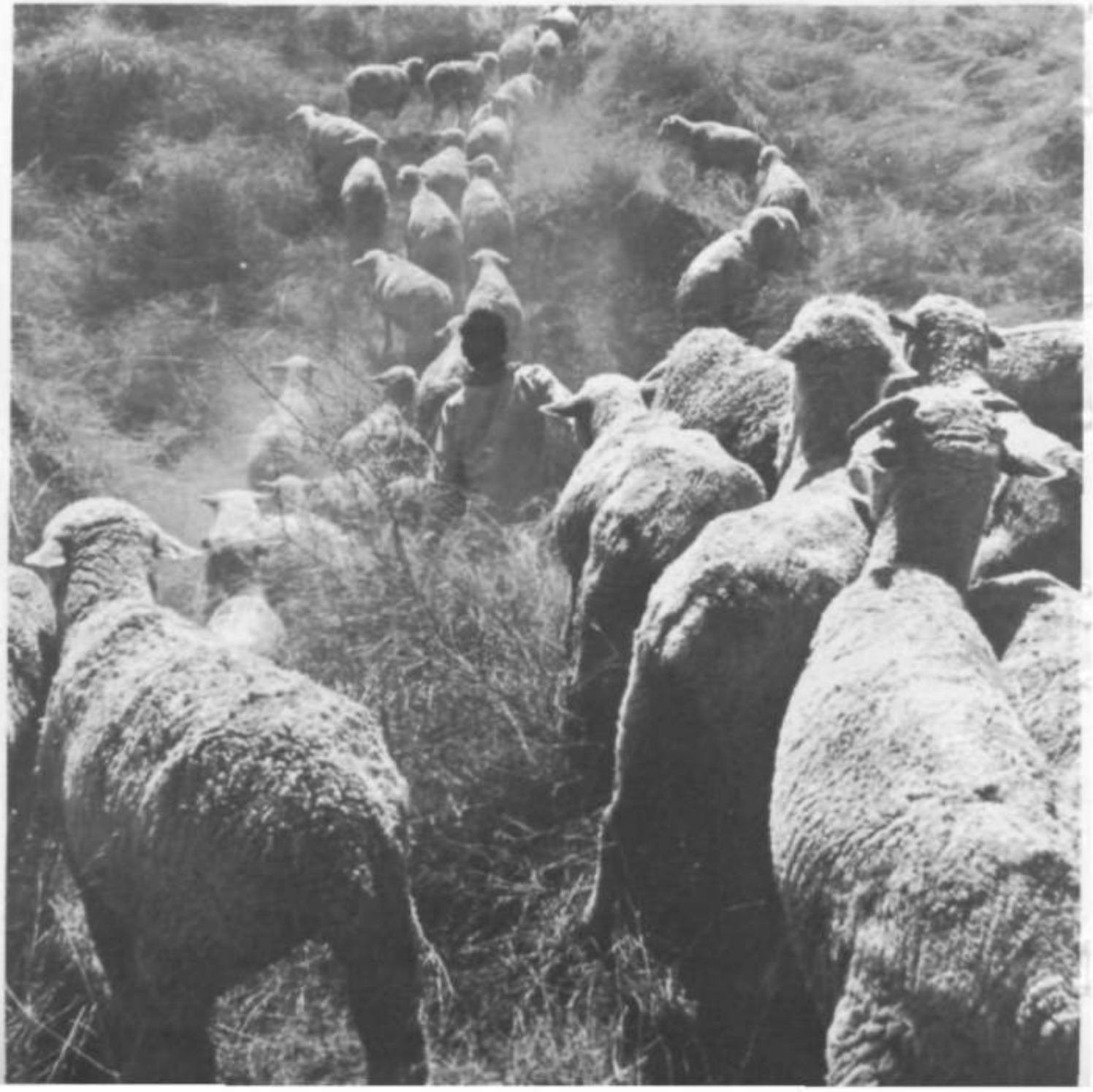
The nomadic shepherds, constantly traveling in search of scanty pasturage, have never received any education or twin inc.

Experts taught them to distinguish 100 different wool qualities meeting **tatenuitana]** standards whereas, in the past, they had considered woof merely as wool and nothing else.



The experts first concentrated on the improvement of **wool** quality. They opened vocational training centers, teaching ihc shepherds *to care (or their animals* to practice* ***tdecttvts*** breeding and lo improve (heir shearing methods.

When ii modern ***ft&K*** eerier was established to auction titf the wooJ it started a real revolution.

The wool market is in the hands of a host of middlemen, from the village grocer who trades flour and rice for wool m 'he broker who supplies the woof rjrifl. Eartt of them **CBtell** a itztabk protit (u family of wool mcrthanis is reputed to make as much as S2 million per year). Those who make the Icasi are the shepherds,

As the shepherds heard bids seven times higher than **the** prices **(bey** *usuuih* obiaincd fi>f their goods, they discoua-d **two new** uonccpis: price and quality. The kilo of wool they [ha]d sokl at bciwccn 2.5 and *1* rupc« in (963 sells for 5.3 rupees today. The incfion at ftrsi *confused* Indians by it* speed, hut they quickly adapted to it- At Jaipur it formerly look a day a n j a |ILL|f t,, sell 80 bales: now thousands art sold **off in a few hours.**

Outlets are available immediately, since the Indian wool industry still has to import at high cost the quality wools it needs for local **manufacture.**

Here, as **eisewhtn ,lhe** concept of quality is indispensable in **meeting** the competition uf synthetic fibers.

The shepherds" education and training, reorganization of silcs methods, sheep selection :md toil reclamation must all **br tarried** out together.

Yhh could mean thai in the course of a Few years the transition *am* b<; made from a subsistence to a market economy. ■

Water invested to bring in the greatest interest

The package approach - water, fertilizer, improved seed, tools, credit - could make Bihar self-sufficient

*by AMLMK SIMQH CHEEM**

Water, improved seeds, ferttlirer, pesticklcs **are** the key words in any vocabulary of agricultural development. Even in India, which has to import such enormous quantities of food, these same key factors have been responsible foT considerable progress: a near-doubling of fmxl production over ihe past IS years.

Irrigation projects have been giwn high priority in India's five-year plans. One such project is centered on the Kosi **river,** popularly known as the " river of sorrow." in Bihar State, close to the Indui-\cpal border,

The project is aimed at l;iruing the Kosi by completion of 150 miles of **lftVaea** and *A* barrage near I,. 4.(MNl feel long. A **canal** system ha-, been started which should irrigate more than 2 million acre& b> 1970-71. **The** project is aKo du signed to protect a 100 inile-wide strip of land from annual flood inc. A hydroelectric Maiinn. capabk of generating **20,000** kilowatts, is in an advanced state of construction

The use of Kosi water started in 1464-65 when fS.(HX) acres were irrigated during thi- *Kharif* (monsoon) **MMl1** This was extended to 60.000 acres in 1*J6S 66 and to 200,00(1 acres in 1966-67, By the following year some 350.000 acres wen: being irrigated during the *Klwrij* and a similar area during the *Rabi* (winter) and summer seasons. Thus, the total acreage under irrigation in 1967-68 amounts to 700,000 acres. Some 2.000 tube we lts are also being dug to irrigate I further HXUKJO acres

The area undcT annual irrigut ion should total some U million **tCfH** shortly and shuuld reach *2* million acres hy 1970-71. according to the project manager. About 50% of the cultivable area of the Purnca district and S5[r]J of the Saruirsa dislricl will benefit from the Kos.i canal after completion ol all the distribution s>stems, including the Rajpur branch canal.

Ihc intensive area deiclopmcnt pro***ptaa*** h.is **been introduced** into sections (>t **[be** Purnca and Saharsa districts. **The** ,tri.-.i development **commlttiotMtf** coordinates the activities of the irrigation and development departments An extension agency - which provides guidance, facilities, funds snd incentives to the farri-OT works at the vill.ite. block and **ditttia** levels to help brinp about rapid tratisformation of agricultural production. Meeting!; and Otiimnstnitions have pro\-i-d to be *the* best way of bringing entension mclhixis to the Ltiliivators.

Land development will he requited for optimum uw; uf the irrigatkm water and a reclamation and development scheme

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A.S. theem* *U agricultural pro**** commissioner wit. the Indian Ministry o Food, Agriculture, Commmlir Development and Cooperation.

has betn approved by the Agricultural Refinance Corporation, Reclamation is being carried out by the cultivators themselves and. so f;ir, about 60,1X1(1 acre si have been reclaimed out of a target area of 300.000 acres.

The* level of agricultural production in This area was traditionally very low, Large-scale flooding did not permit growing **Crops** during ihc rain> season, **mcepl** on high beds where paddy and ma be **were** cultivated. The construction of river embankments and a canal system has changed all this out of recognition.

High-yield ing varieties, **together** with the use of irrigation water, have brought about a significant upturn in crop **yields** per "acre, Takhung Native I paddy and Lerma Rojo Mexican wheat were introduced only two years ago but, aJready, p;iddy yields have gone up from 0.3 to 2 tons per acre, while wheat yields have increased from 0.4 to 1.5 tons per acre. These varieties, together with multiple cropping, arc enabling Kosi farmers to reap an average of 3 tons of ft**! grains per acre per year as against the 0.5 to 0,75 ton per acre that they achieved before the project started.

The acreage under high-yield ing varieties has increased rapidly. The area under high-yielding paddy rose from 30,000 acres in 1966-67 to 120.000 acres this year. Similarly, acreage under the new dwarf wheat varieties increased from 10,000 acres last year to 100,000 acres this year: there was also considcnihk-expansion of the area being cultivated with hybrid maize.

Another notable innovation in cultivation practices has been the change in the farmers* cropping patterns. Prior to the Kosi project, cultivators used to grow one crop every one or two years: farmers are now taking in two to three crops each year. Cropping patterns at present are paddy or maize in the *Kfuirif* **MM0O,** wheat in the *Rubi* season and paddy in summer. Most of the irrigated fields have a two nr three crops usage. That these patterns have changed so dramatically and so rapidly is due to the availability of irrigation water and high-yielding varieties.

Jute is normally cultivated in the low-lying lands. The intensity of cropping **b** likely tti increase here, too, with the **further** development of irrigation, for **the** area is ideally suited fur ***two*** <> thru: crops **a** year

Two* or *three crops wrteie one grew before — hybrid sorphiim on land irrigated by the Kosi

There has been heavy use of agricultural inputs in the project area. The use of improved seed, for instance, has grown from just over 2,000 tons in 1964-65 to nearly 29,000 **tOOS** this year. Application of fertilizers **bat,** similarly, risen from just over 1.000 tons in 1964-65 (o more than 22,000 tons this year. Also pesticides, the use of which has increased from 200 liters of liquid and 175 quintals of powder in **1964-65** to nearly 12,000 liters and nearly 4.000 quintals.

M<iru machinery has h;id to be brought into the area in order to ensure that multiple cropping is a success. The demand for improved plows, hand-hoes, thrashers, scrappers, sprayers and dusters is rising rapid 1>

Irte river o! sorrow may yet become the river ot happiness tor th« Kosi termers

The demand for agricultural crcdil has gone up commensurate with the growth in agricultural technology. The cooperative **organizations,** which WCTC weak in ihis particular area, have shown signs of reviving: more than Rs. 10 million were **advanced** to the farmers during 1966-67. **•nd** the demand is much greater this year. It is expected that more than 90% of the loans will *be* repaid in full.

The economic condition of the farmers h;is much improved, evidenced by *a.* 400% increase in the business of the Life Insurance Corporation of India jn the area. Sales of cars, jeeps, scooters and transistor radio sets have increased considerably. House building activities are **evidgSL** A number of graduates — lawyers, professors and doctors — have found it my re lucrative to work **faB-tfaoc** at agriculture.

The rapid progress achieved so far has, however, posed a number of problems for farmers and administrators alike:

...Considerable marketable surplus has been created. Facilities arc needed — good communications, warehouses, marketing centers and processing industries — to deaJ with this surplus.

...The use of high-yielding varieties necessitates an increase in agricultural inputs — agricultural credit, fertilizers, improved seed, irrigation watcT. tractors, power and pesticides. — which the small farmers cannot afford. Organizations arc needed which can provide credit, rent machinery and olfer marketing facilities.

... Farmer* arc gt-nc rally overdoing irrigation and are creating u danger of waterlogging the soil, as happened in the Punjab where drainage became necessary following excessive irrigation.

...The project is aware that it must create opportunities for iht kind of cap-it.il investment which can help build up a sound agricultural development program.

The Kosi river project will provide irrigation, electric power and Hood protection to more than 2 million acres of Bihar Stale. If properly handled il could **create** a major food producing center in .i **me** which is **tyauajmUM** uiih famine both inside and outside India **fUlWlty. i! !• expected** iii.f **dM ernjoct** area will **attribute** tit\irr> h...! **oj** 'hix **petrt** additio rs.il fmnJ (rain* **pawn** n- Hilwr Slate, **rheit** la **r*Cfl HM** pOSMhi.ih ih.tl Bihar **wffl** piiv* veil **MlBckHL'j** and ha\e an excess **ol** lood crops wilhirt a lew vcars, •

Manchala and Pilkhi - techniques are not enough

The negative attitude to manual work, the right to own the land are among the sociological factors which can influence progress

hy GIIBFRT ZTilHHt

r-cw of the world's developing counries are so widely mbiundtrstood as India. Apes, cows, raw, the funeral pyres of Benares and, of course, beggar* are thought *xA* **fit** India's typical features: while its starving masses arc supposed to be constantly increasing. It ihts how h is?

Take two phases of the food production-population race, 1951/1961 and **1961/1966.** India won the **But:** production MM well ahead of ihc rise in population and (he growlh of food imports was cheeked India I mi the second phase: the population growih rate accelerated reaching 500 million in 1967, production remained stalk for three ycMrs. en joyed an exceptionally good year in I4M 65_b but was then hit by lwi> successive waves of severe il rough I. Tht result was a sharp rise in grain imports, with totals tripled reaching In mi 11 inn tons in *Vihb* 6? 1 hough **ntou,** the situation was not as dart, ***tt*** it appeared lor production statistics were too low

Since 1967 India has entered a ihiril, vitally important. phase I-a r-reaching trends are emerging in the rural areas as government measures to promote agriculture become more **effective.** Thus ihtrace is far from *O\KT.*

The word " famine " in India, judging by past eupcriencc, means wholesale deaths numbered in terms of tens and hundreds of thousands, or even a million. By tins definition, thanks to American grain and the Indian authorities' **effort!** to distribute it, there was no real famine in 1966/67.

Although this is somewhat reassuring, it in no way lessens the seriousness of the long-term outlook. In ten to twenty years, when India will have a population of 600 to 700 million, all foreign aid. together, will not suffice in the event of **•even** natural disaster. The need for a sharp rise in production is urgent.

It is **oftm** said of India that no progress is possible without completely upsetting the present agricultural structure. 11 must be admitted that within the existing social and political framework it is difficult to foresee any profound changes. But these structures do not constitute a major obstacle to agricultural progress.

White one can sec a proliferation of liny, and therefore uneconomic holdings, BM often forgets that mosi of ihe land under cultivation is divided into farms which :ir<\ or could be. profitable. The smallest farms range between a little over three acres to ten to twelve acres in size, depending on types of soil, irrigation and crops, hut this does not give a complete picture The farmers' grasp of farm management, closely linked to the **HMi** swem. muM also be considered Where the castes **eserdw** a decided influence on agriculture, as in Andhra state, then development is comparatively simple. **When** the dominant castes do nut engage in agriculture, as in Hih.n, then progress is in it impossible but it is slower.

Shareoropping *and tenant* fa*TMing arc another source of misunderstanding:

Cilbert Fitkrtne *it professor of* ***development txorttttnh i at ihr (itatlutitr Inititutt oj littrr-MICOMtf Sfutliri. in (ienna. He ii ihf uulkttt*** *of* Studio in **Indian** Agriculture *and uihrr* ***books on lieveltxpmrtil.***

contrary to certain highly debatahle opinions, on a national average a very **luge** portion of India's bud is cultivated by farm owners.

Physical conditions are another basic variant. Enormous stretches of thtc Deccan consist of poor soils exhausted by onwion. where rainfall is low and the irrigation potential slight. On the other hand, the Ganges basin, the Coromandel delta and the southern pan of Gujarat contain good alluvial soils. well watered by rains, and here irrigation could be greatly- expanded. These regions will play a decisive part in the battle for agricultural development. This explains why only about half of Jndia's 330 districts produce a grain surplus,

India has carried out pioneer work in community development and administrative decentralization **(Pmrtajwri** *Raj)* in order to arouse givaier mass participation iit agricultural expansion, but it has had to learn some bitter lessons iri the process. A multi-purpose approach was, at first, overemphasized. Agricultural strategy has had hi gradually change so as to establish an order of priority in productive activities.

The package program formula was introduced in I960, involving a special .jifon in the potentially rich regions where progress could he quickest. Thi-. has meant combining the major input factors to the utmost extent: small-scale irrigation, fertilizers, selected seed, and pesticides, all accompanied by an extended agricultural credit system.

It is natural that such a policy has **taken** time to spread in such a vast country, Progress was also, hampered hy the exceptionally heavy natural **dfaMUS of** 1965 and 1966, and the large-scale opcr;!iki[i;il phase only began in 1967.

Manchal;i is a typical village of the Krishna delta in the district of Guntur. Its population was 1.426 in 1961; the total area was 783 acres, of which 266,4 were cultivated; the population density was *ItKI* per square mile. The *Kapu* arc the leading caste. There are only a few *Htirijtutx* (former untouchables). On the other hand, (he majority of landless agricultural laborers are drawn from the *Yanadh.* of remote tribal descent who in at Ibe bottom of the social scale at Manchala. The area, as a whole, is irrigated by canals issuing from the Krishna river, dating back to Sir Arthur Cotton's Ijm-sc-ile improvement works huili in the middle of the nineteenth century.

This water, and **the** quality of the alluvia) soil, permit intensive rice **cultivation,** However, water is only available from June to January, providing a paddy crop which now totals 2,5(10 lbs. per acre or an increase of 50% over about 15 years. During the dry season some 45(1 acres arc used for raising chick peas

II msy soon be gone. Pumps m»y take *the place* ... *water-wheel driven* ***by ammat power ro irrigate rice-Holds in Utiar*** *Pradesh*

giving extremely low yields (310 to 360 Ib/acre). Ahout 148 **KTM** are suited **to** forage and fiber crops.

The two largest landowners have 30 acres ci*eh, There are alioul 30 farms measuring between 4 and 20 acres: ihe remaining 140 holdings contain less than 4 acres each.

After many days of close observation two striking features emerge: the high quality of the technical methods used; and the comparative prosperity.

[was **at** Manchala in the period when the paddy was being transplanted: the men pull out the **sprouts** and the women transplant them, in rows of ten to twenty.

Almost all the farmers are familiar with chemical fertilizers and even the owners **ol** ti."-s i run three **acres use** ihcm regularly: many use pest itides, In **1963/** '<4 I met h.irdly any small-farmers with sullicicnl means to buy chemical fertilizers in Uttar Pradesh or in Ihe C'auvery delta in Tinjor district.

Last year, a tew farmers tried sowing the new Taicfnmg Native 1 rice variety, but it was not suited lo local conditions

and proved unsatisfactory. Another variety, IR 8, seems more promising, although it has not been used at Manchala.

Living standards of the medium-sized farm owners are high, naturally enough, but the very small-farmers and the landless workers are also far better off than those in other regions I visited. Almost everyone cats three meals a day: rice with peppers and vegetables, sometimes a bit of meat, fish and fruit. Both men arid women appear to be in good health and live in a normal way, a far cry from the harsh poverty I found in Bihar.

The *Yenadis* and the *Kapu* landowners spend between two and three months a years on rice cultivation. The rest of the time they practice all kinds of small trades which provide free rein for their resourcefulness: besides rat hunting, they make chignons for sale in the cities, help in the textjle factories (riding their bicycles to and fro) and work at terracing of the land. Wages for rice cultivation in 1967 were usually three rupees for men, two for women.

Agricultural credit operates mainly through cooperatives. A cooperative society was formed at Manchala in 1964: it has 21 members and, in 1966/67, granted 2,000 rupees on short-term loans. In addition to this very small amount, credit in kind is extended to farmers under the Intensive Manuring Scheme, even though they may not belong to the cooperatives.

Unsatisfied **demand for** *fortitizor**

Manchala is part of the Tcnali block which covers a total area of 103 square miles and has a total population of 108,194 (in 1961). The package program formula has gradually spread in Andhra, reaching 144 blocks in 1966/67, of which Tenali was one. However, the program docs not advance easily: the increase in output of chemical fertilizers falls so far short of the demand that some cooperatives engage in a flourishing black market, a widespread phenomenon through Andhra and other states as well.

As for credit, the funds granted in medium- arid short-term loans show a downward trend between 1964/65 and 1966/67. In the latter year, Andhra did not manage to use **all** the funds loaned to it by the Reserve **(Central)** Bank. Many societies arc already so far behind in their payments thai they cannot obtain new loans. Another, though less important, cause for this trend lies in the adverse climatic conditions which prevail in some parts of the state.

Credit **against future harvest***

A new " crop loans " formula was set up in 1966 to improve credit and avoid losses. It aims at broadening the conditions for cooperative credit by no longer accepting only land or land mortgages, but also future crop harvests, as security. In this way, production can be stimulated while the small farmers can obtain loans which they were unable to get due to their lack of means. This type of credit is granted in three installments, two in cash and one in kind in the form of chemical fertilizers. The system was meant to be applied throughout India beginning with the 1967 *Karij* (monsoon) season, but, welcome as it may be, it has met with inevitable problems in execution. I did not find it widely available, in Andhra, Bihar or other states.

Another marked trend that emerged from my talks with people in Tenali and Guntur was the growing awareness of agricultural problems. In 1963/64 I was struck by the extent to which community development was still unable to shake off the multi-purpose approach.

What arc the prospects for the future in the Krishna delta? The Nagajunasagar dam was inaugurated in August 1967. **The** area it irrigates is not yet being entirely utilized since many canals and other improvement works must still be built. Meanwhile, however, the stored water will be used during the dry season making possible a second paddy crop. Afterwards, the underground water table will provide a similar reserve, thanks to pump operated tubcwclls. The first of these, which I saw at Manchala, produced excellent results due to a very quick rotation of rich crops: paddy, sugarcane, vegetables. The dynamic nature of the leading castes favors increasingly wide use of these possibilities.

The village of Pilkhi lies along a secondary road leading to Muzaffarpur. the district capital. It had a population (in 1961) of 2,471 and a total area of 1,210 acres. The population density was 203 persons per square mile, and (he cultivated area (including 64 acres of orchards) covered 1 (HH) acres. In **the** monsoon season, paddy is the main crop. together with maize; in the dry season, wheat and some barley are grown. Small quantities of sugarcane, tobacco and peppers are grown in a few places.

Large landowners arc comparatively numerous in this region of India. A leading landowner, *Bhumihar,* owns 100 acres at Pilkhi and 200 elsewhere: another possesses 200 acres. About a third of the cultivated area in the Muraul block, which includes Pilkhi, belongs to farmers owning over 50 acres. At the other end of the scale, there is a proliferation of farmers who own an acre or less.

Why is the present paddy yield only 800 to 1.000 Ib/acre on these fine alluvial soils? Firstly, along the middle course of the Ganges and in the delta the riverbed is lower than the field level. It is impossible to build gravity-flow canals like those that existed even before British rule in the Punjab and the southern deltas. Irrigation using pumped water from the rivers was only begun after the end of the last war, following India's independence.

Forbidden to touch the plow

I wondered whether the farmers could have bored wells as they have done in Uttar Pradesh and in the Punjab; but I saw practically none. This is where the human factor comes in.

For centuries, Bihar was one of the seats of Indian civilization. **Life** was easy, the area was not highly populated, and the land was fertile. Normally, the rains were sufficient for rice cultivation, the moisture remaining in the soil even provided for a crop in the dry season. So why bother boring wells? Moreover, the high caste ***Bhumihars*** and *Brahmans* observe the taboo forbidding them to touch the plow: they take little part in agricultural work and use low caste labor.

From the **19th** century onward, the comparative balance between population and resources (which had only been broken previously in times of extreme natural disaster) was permanently and increasingly disturbed. The population began to grow but no one did much about it: the result was increasing poverty. At Pilkhi, scenes of Indian poverty arc widespread among the families of **farm** wage workers and very small farmers. Social tension is high, and during my talks with the poorest people discussions quickly grew heated. Many of them

barely get two scant meals a day.

Ihc dfifectl in technical methods used in the area arc striking. The rice fields are *ksdly leveled so thai share is too* much water in one corner of (he field while in another the sprouts arc dry Only a single hoeing is performed during the growing period of the paddy. The apathy of (he upper castes even seems ID have spread through to the lower ones. At Pillthi, even the *Chamar* (former untouchable) women do little agricultural work, only picking forage grasses to feed ihc cattle The transplanting of the rice is performed by three or four men who work in a disorganized way in sharp con-

The'* >s no question at lafners' acceptance ot fertilizer as a short-cut to higher returns

trasl to the rows of women in the rkc plantations of the Krishna area.

One might think the situation desperate but the outlook is slowly becoming brighter. The 1966 drought shook agricultural life from top to boliom. Both rich and poor were finally concerned about the problem of the water supply. " What di> you need most'.' " 1 as ted, " *Pant, sinthai* " (water, irrigation) was the farmers[1] aulomalk reply.

Until 1966, ihc state lube well which had been installed at Pilkhi in 1954 had hardly been used: now it no longer meets the demand. The new varieties of wheat, mai/c and rice need more.water. Soni<•' of the landowners are beginning to pull their weight as they see some of the |][\< **nmbi** of ilk- pilot plots.

The new crap varieties arc beginning to attract attention, Mexican wheat sown at Pilkhi on a test plot of 4 acres in I yfi6/67 proved successful. In 1967 the area under hybrid *MA\/C* totaled Ml acres, c«mpar«J So *22* ar«s in J966. Meanwhile, the first paddy fields (Taichung Native I and Magina) are spreading in the midst of impoverished riee plantations. The maximum yields in the initi;i] stages come to about 2,700 Ib/acre for paddy, 2.500 for wheat, and 2,700 for maizc.

This trend coincides with the advance of chemical fertilizers, and is equally marked at both the block and district levels. The authorities can no longer meet all the farmers" demands for the installation *of private pump* writs bet.'jjj^L- there Is not enough drilling equipment.

But Indian agriculture, as a whole, can hardly be judged on the basis of only two examples, however contrasting. Let us l<ink brief}} at a few others.

Ihc Oiiuery delta in Tanjore district resembles the Krishna arid Crodaiari delt;t>, marked bv irrigation works and rice cultivation It differs, however, in many .ireus of the delta because of the prevailing influence of the *Broftmans* who are *n<M* as enterprising as the *Kapus* of the Krishna delta. In 1964 I saw Ihat jfcc package program had made far less progress in Tanjorc than in the West Godavari district, ihough these were *the* first two districts to adopt it in I960.

Nevertheless, despite a less enterprising spirit and a great deal of share-cropping, between 1964 and 1967 the Tanjore farmers have built many small tubewdls for use in the dry season when the canals are low. Of the 3.000 they have put in. 2,000 iirc now in operation while 1.1)00 arc still waiting to be connected to IIK-electric grid.

Two crop inmtead of an*

There has. Ken another change in methods as weJl. Formerly ihc local jMddy vjricl). **Maftft;** bad a long growing season lasting from Auguu to September. Now it has been replaced b> *a* quick- grow ing sarich Um *2* [•: v.k ing two crops on the same land within the same period

The southern pan of Gujarat, the Jutinhabited areas of the Punjab and of western Uttar Pradesh *r<: making equally qukk progress The village of Khandoi. in the Bufjndstiuhr district between the Ganges and the Jumna rivers, *a* u good example of this trend, h has a population of 1,227 (1961} and a total urea of 6H0 acres, of which 618 art under eullivafiorj. Since 1964 when I left, eight new private tubcwells have been installed by farmers owning 15 to 35 acres, in addition in the distributary L\in:il, the State tubcwell, other private tube we I Is and oxen-drawn wells, all substantially improving irrigation.

Tests earned out in 1966 with hybrid maize proved unsuccessful because of the poor quality of the seed used On the other band, the Sonera and Lcrma Roja Mexican wheats were very successful on the test plots. In 1967, farmers were planning [o plant most of the wheat-growing area of the village, 1^0 acres, with these selected seeds: this should raise yields from 1,150 lb/acre (with the local variety) to over 1,800 lb/acre initially.

While consumption of chemical fertilizers is increasing, there have aba been some serious setbacks. The Third Economic Plan originally set a total consumption target of: I million tons of nitrogenous fertilisers (N), of which 800,000 were to be produced in India; 400,000 ions of phosphoric acid (P^O.J, all to be domestically produced; and 200,000 of potassium (KjO). In 1965/66 output of the first two totaled 344.UOO but by 1966/67 it had unly reached 453,000 tons, Imports have risen sharply since 1965 to fill part of the gap.

Since J967/68 production has entered a new and important phase. Many of the factories under construction are almost finished, and when they begin* annual production capacity wilt reach 681 .(KK) tons of nitrate fertilisers (N) and 419,(XX) tons of phosphate fertilizers iPi-Oft). But despite these advances there will still be problems jn organization of pri»dui.iion. The big question is whether the recent delajs will be made up in lime **far** Ihc 1970 71 output to reach :he planned 2 million tons of nitrogenous feriili/er* iNi jnu 1 million tons of phospho- •:. **KttOVO**

DkIvSndoa problems must also be considered. The government IILIS freed this sector, withdrawing the virtual monopoly it had granted the cooperatives, enabling priMitc enterprise and *cettpent*tives alike to participate in the marketing of fertilizers. Nevertheless, bottlenecks iim.un. of which the following is an c*-

• *Cf. World Rrport, Crra No. Z*

ample: I lie government-operated fertilizer **factory** nt Sindri in Bihar in August **1967** hud 2CMUXK) tons **erf** ammonium sulphate reserved for the local govern-*ntcm, which failed to haw it delivered,

Production of selected seed is another rapidly expanding sector. One example is the program of the University of PantnagaT in Uttiir Pradesh. H is directed by D.p. Singh, former under-seeretary uf ihc Plan Commission. As a higher civil servant, and a man of strong character, with a thorough knowledge uf agriculture and fann life, he is managing Pantnagar , remarkably energetically. More and more *of* lhe uJiivcj-sJi/s 1 million acres *arc* Short- and medium-term loans granted hy Cooperative societies totaled 4 billion rupees in **Hib/(yl,* compared to 2 billion in 1960/41 ($1 - 7.50 rupees).

These efforts rcflcet a greater awareness of agricultural problems among the authorities, a definite **wUtiSgQttl la** invest in this sector and **to** release foreign exchange needed for the import of equipment the trend toward eun cent rat ing production factors in areas where **progress** is particularly likely is showing results.

Another signifieanl development is taking place it! ihe farm level. In a great many regions the problem is no longer one of stimulating the farmers to nuxkrn-

The untouchable plow — social and cultural attitudes towsrd iatm inputs can make **or** ***break governmental plans lo expand tgncuitutal production***

being used to increase the new seed varieiius Between 1965 oft and l[u]rS6 67 the area under hybrid mai?e increased from 300 to 3.00(1 acres Mexican wheats and **paddj** rejiiMi'rcd **dmQar** increases. Puntnagar is launching activities on a large **leak** with the aid of the **World** Bank and **FAO:** in five years 50,(Kill acres are to be used **lo** increase seed, which should meet the needs of Ultar Pradesh and other stales as well, Other research stations arc also more active,

On (he *pestkide fnuil. lint, tin;re* **bm** been progress both in research and utilization. Smali-scalc irrigation works are gaining ground at a steadiJy accelerating rate. In !<>6o/67 no fewer than **200,000** pumps were invtalkd beside **rfven** ;uid wells, and 2(i,(«HJ tubcwclls were **bond**

The Reserve Bank and the **cooperative** banks arc expanding incif activities. **bat** their methods hut of meeting their intrcasiniils pressing demand[1]! for ferlili/erv, pumps, seed, etc. The rale **of change vftrisfl widely,** .^ can be seen from the two examples I have described in Andhra and Bihitr. but it Lv significant to note that even in a lethargic **AatC** such U Uihar ;i similar change is taking place.

\ icwing all these fuels **HQgBtber** one can stale that, providing the present agricultural **KrCtegJ** i-. coniinued and the political situation *iit.vi* noL deteriorate uw far, *Ittdui is* rt(t(ffeittfing (fWanJ famine. *All* those fumpett-nt in the field **wfaoffl** I niel, whether Indian or foreign, shared ihi> opinion, especially those working with the J-'urd and Rockefeller Foundations and U.S. AID. There is a fair chance ihat in l[l])n7 /\H production will be higher than in 1964 65, dcspile unfavorabfc natural condilkms.

However, it is important not \o •• from one extreme lo ihc other in iht light of these encouraging obser\annns and assert, as some pro mi n em Indian** have done, that the country's food (IL'K I will have been eliminated by ITU and that they will soon be able to export grain. These people dangerously underestimate ihc problems of execution. Development appears compiiralively simple **viewed** from their ofiie.es in Delhi or Bombay, In the field, all prgbkms run into a multitude of practical problems.

t have already **cited** some examples in discussing crop loans and could add many more, Tor instance, the use of the addiijonal credit planned by the Reserve **Bask** far demands based on high-yield varieties was disappointing because of weaknesses in the cooperative structure, overcomplicated formal procedures and lack of coordination. " Accidents " have occurred, like the failure of Taichung Native 1 in ihe Krishna delta and of hybrid maize, in 1966. in western Utter Pradesh.

These growing pains are hardly surprising in a country stretching over 1.2 million square miles with 565,000 villages. Any idea, or decision, lakes some lime lo reach the Tank-and-Rle. But what counts, rather than the arbitrary[1] fixing of J970/71 as the end of the food shortage, is the realization that a far-reaching trend is und^T way. Regional differences in pace do not mailer, provided the nationwide growth niic overtakes and keeps ahead of the population **rate.**

This strategy might be challenged on the grounds thai it is antisocial, since it benefits miinh the more favored regions and the middle classes of farm society. Wages of the agricultural workers arc lending m NNI: in the comparatively advanced regions like (iuntur. but only by stages after intervals of lime.

Can we approve such an agricultural potic>7 Yes. for this is ihe only way out. e\en from the social standpoint. Con**cantrertpn** of investment in the most b:ickw;ird regions and among the poor-esi farmers would inevitabh \U>w down **the** growth rate. Unless production picks up quickly, providing the government with needed reserves, there is a risk that famine may indeed strike some dav Should I hat happen, it would not affeci the rich or the middle class farmers so much as those who live on a tiny plot, or have no land ai all.

The waste in aid

The future will bring greater demands on aid, necessitating even closer cooperation at all levels

Ay *HAMS J0ROEM KRISTEMSEtt*

Much has been said over these past few years about the need for increased **Mafatanoe** to the developing countries in i lie ticid of agriculture. **Dfecusskxu** ai UNCTAD *2* showed that the 1ʳr goal docs not meel the need* of developing countries.

Recent onto I Organ i/:i lion for Economic Cooperation and Development I statistics nn assistance **to agticoltttre** disclosed !hat Lhjs **tnfHHWll to** Sʳr of total **trilateral** assistance, and 18% of total multilateral asMsumee. plus the indirect benefits fmm assistance In infrastructure which may often be of substantial importance t» agriculture, not least in the marketing of commodities.

These figures give a somewhat clearer picture of the progress of events **ova** the past few years, but they do not tell us whether such assistance is contributing to a bulitneed development **of** ihe **fallout MCton of** the economy of the countries eoncerned-

a wnni in know cxen more than this As the planning of agricultural development becomes more accepted, it slum Ed become possible to define the need", ot assistance in the agricultural Held and u> outline priorities. It should also be possible to establish the rote of agriculture *in tbe caataa* **of genets!** •"tpinwlr development. We can twily hope thai **(hi** nmhitRius work being undertaken by I \n\ Indicative World Plan for A^ricullural Development (iwpj will ^vc us t^- need cd answers.

There is another task which is as important ;is efforts to **Sugmeo)** ihe present level **of** assistance. Are we — both developed and developing countries us well as the **intemMiona]** tirjiani/ations—doing *n*\ **we** can to make assistance as effective as possible?

Let me begin with an obvious statement which is all too often forgotten: there is a percentage of waste in alt human effort. We must carefully scrutinize the ways in which things arc done bui we must also remember thai there *Ut* dL-tintie limits to the efficiency of any **performance**

The bulk of efforts aimed at making assistance as effective as possible must come from the country concerned, and **efficiency** in **leal** administration is **therefore** a key element. Assistance from outside UMi.ill) comes from a large number of more or less unrelated sources: hilakral **nmiifnnru** from individual donor countries, multilateral assistance from a \nrielv ol partially interlinked intcrnation-,il ortLini/Lilmns Dm presents a risk ihat assistance is jihen piecemeal with DO consideration being pi\en to priority needs.

The usual response, **wheatVW** lack of coordination of aid efforts ts discussed, is ifui this is ihe resptmsibiiity of the recipient country, and that only the counlr> can say what are its **priority** needs in the agricultural tickd. This would be true if the country concerned had the people **UMJ** I he machinery Ui **define** and execute a sound development plan of suflieiontK lorif-rangc character: bm. in pra^tice, very tew countries can all.tin Ihis standard.

An important element in **outride** agr)-cullurat .tssislaiKv slunild. ihercfore, con-

HJ. KriMcnvm *it* ***camuHar*** M *the liaahh MIH-i\Irv ttf .Agriculture, rmni.tlfrfti rrprctciimivt' int the lhim\h HiHiiit fin Ifth'tiiat Cotiprr-* ***uk/m*** *f'fh* ***Drrttopinji Comma*** *ami t huh man ttf ()f < li i an •• >WIMI irn AyiauilUre.*

sis-i of strengthening the administrative machinery, particularly at the planning h[;i£C. Let us be realistic and acknowledge that people able to carry out such »work are not easily found, even in the industrialized countries. Useful work might he **done** by the FAO **country** representatives in iheir proposed new set-up, in which one of their main functions will be to nssist in planning ugncu1lLir.il development.

Ll is my opinion thai a good deaf of coordination will be undertaken from the outside for years to come. But such efforts*must be in close cooperation with LllO recipient country, What we need are practical solutions to practical problems:

Multilateral and bilateral aid 13 improving nee- *growing* ***areas*** *its* ***West Africa***

we do not want situations where outside forces try to direct development.

V\.i\s of ensuring coordination i't **agri Cultural** assistance will vary greatly .uncording to the type of aid and the practical problems involved: financial assistance, often part of more penerah/ed aid, falls in one group; technical assistance normally knds itself to a different procedure; white r«»d aid liijs somewhere in between. The sheer size of a particular ;mi effort may welt influent? the practical > approach.

All Ihis leaves the ques'ion **of overall** coordination hanging in ihin air The answer for hA<> tnay be the iwp, but, in gene nil. the best (hat can be offered is art *ml hm* approach **to** individual cases.

(mirdinalion efforts in **the** lield of financial assistance arc, and should be. centered around the World Bank group. I bis **wofk** ciilK lor high-kvti competence and it is important thai the World **Bank expets** he full> utilized. **Comuttia arnQgNilSBtl** between **major** *demon* are becoming of **increasing importance** and **lbs** W, orlif Bank **group** fan **wide** inrTuence in this context, I K .uMi'i." •• !.... on a bilaieni! II.IMS r •:. smaller donors **HIGMt,** though, that greater efforts must be exercised at overall coordination.

One **of the** first arrangements for coordination in the field of financial **illlJiirnnri** to agriculture was the I9f>4' agree men I between tBRI) **[lltffftnlrignwl** Hank for Rco'lisfruction jnd (3e\elopnient) and HAO. This >et • pattern for further activities, but it should he realized thut **Ail** particuliir **agiWffWB**[1] can only work in *a* satisfaetor) way if **PAO taint** part in all phases — and this calls for wcll-qualitied e\perts iind, accordingly .for a larger budget.

I fie **greatest** risk of dissipating «id efforts is found within the field of technical assistance. There *is* no need to lalk ahout errors, often it rising from ul tempts io impose an inadequate or incorrect melhtxlology upon the recipient country. I.ei us mention, mstcad, **rifles** which are inherent in compel it ion between bilateral donors; in the giving of assistance to one particular slugc of a process (leaving the remainder of the chain to itself) and in training ptiipk without afterwards giving **them** the funds to put their new knowledge 10 practical use-

Strangely enough, it is in the technical assistance lie Id that the willingness to coordinate --^M\hince seems (g be at its weakest, pimkruliirly on the part of the major bilateral donors. The resufts arc sometimes shocking: stories abound **about** ihe duplication of effort between bilateral expert missions

This problem is partly a question **of** the efficiency of the international organizations. Criticism is leveled mainly from two angles: such organizations are expensive; and they have not solved the problem of coordination among them-**tttvM.** The first point seems to me of **lesser** importance, but the second touches upon a sore question.

Ag+ncim at* a>*oa«-*purposes*

FAO, which should be at the center ol coordination in the agricultural field, is MM yd fulfilling this role. We hope that the present rcorgani/atinn of FAII, and the iwp, wilJ put this iigctiL-v in *-A* belter position to shoulder this responsibility. But it is **BCt** enough, many aspects of iLiKultural problems are, at least partly, MlL- responsibility of other agencies such as Uncsco. ILO (International Labour Organisation), WHO (World Health Organization), UMrno {UN Industrial Dcvclopmem Or^ani/aiu.n), or of the United Naiions ilsclf And let us frankly admit it- the United Nations has not, so far, manajfed to solve its own coordinalion problems

Rather thun wailing for perfection af the international oTgani/aiioni — we shall never gel Ihal **far.** partU because of the sheer pressure of work — let us see how **technical mriitmca** can, in practice, be coordinated ihrou^h I AH.

It is quite L\i¡i¡L-ni that small donors, who are nowadays rapidly increasing their aid efforts, h;nc ;i particular **tolenai** in **teekinj advjoe ami Hrirtuce** from international organizations. The preparation of projects **calb** for conskierabte knowlcdjff trf conditions in the recipient countries. Advice from an international orga-

niz.ation often allows a shortcut, resulting in boili **Incretned** efficiency and **lowered** costs. These countries all have ;i serious shortage of expertise. So far, comp;ir;t-lively limited use has been made of such **international** facilities.

*Hybrid aid project**

Sweden and Denmark arc probably iho *iv.o* countries which have gone furthest in iheir cooperation with PAO.

In the case of Sweden, it is interesting to note that efforts have been concentrated on a few major projects. An FAO study on agricultural **cooperative** credit in Li number **of** countries was financed from funds freely made available by SIUA, the Swedish International Development Agency: one result has been the detailed preparation of a large integrated[1] project in Afghanistan, ako wholly financed b] **SIM**. Such assistance is based **upon a** policy which combinci bilateral assistance

Danish authorities this means, *Inter alia,* increased aid without any major increase in administrative activities in Denmark. One of the laT^t-r private aid agencies, the Danish inlcr-Churt-h Aid. is also partially using **PAO** channels in its work.

Clearly, the employment of FAO expertise may vary greatly: financing **projects** through **FAO* (with** or without providing the experts needed); using FAO project proposals in hilatcral assistance; or, more modestly, using FAO as an information cejitcT fi>r hilatcral activities in the agricultural field. Even the last possibility Ls used sparingly by mivst donors.

It may be argued that such information assistance is ensured within the recipient country from the i M resident representative and. possibK. the FAO country rep- **Fesenfftttve,** But I have doubts both as to the extent to which this is actually happening, and •nether ft *h* enough. considering **the** centralized character of an organization like F*O

fortsts aft a renewable resource which can be managed to perpetuity. Colombia is using multilateral technical assistance to attain self-sufficiency in forest products

to a very limited number of countries with assistance through international organisations benefiting a wkier **group of** counlrkv

The concept of muili-ni projects was introduced ;i few **y e n** hock in Denmark. The Danish Board for Technical Cooperation with IX\doping Counlrks has financed a number of Ircedont-from-Hunger project proposals, mostly by prtv-\iding the funds and *i* or expertise through **FAO,** As csamples may be rucnlkmed a rural youth project in Liberia. **COMIluc-**(ion of bore holes in Malawi and a dairy development **center** in India. To the

[t is worth mentioning that President Johnson's Science Advisory Committee recently expressed the wish that FAO be increasingly used as an informational and coordinating agency. It is to be hoped that ihis will start a new approach In **thai** problem, particularly on the part of the iiiajof donor countries.

Let me add th;M in Denmark it h considered quite natural to keep FAO informal about all major bilateral **acdvibei** in the fidd **of** food and agriculture, as well as where advice is needed in the planning of projccis.

Why do we not try out such information and coordination activities? The United Nations Development Program/ FAO have provided a partial basis for discussions on the three countries of East Africa (Kenya. Tanzania and Uganda) *lh*rough the East African livestock survey of 1967, Kenya has maintained contact with a number of donors: why not al-(empt a broader exchange of views at regular intervals involving FAO, OECD and other inter rested organizations[9]

Foot/ mid is mmmfmmt

Food aid. which is a special — and hiipefulh a short-tL'rm — \crsion of financial assistance, is probably the field in which coordination,h*B so far been most **satiafactorirj solved** The reason for this is **obWota:** 95'/ of bilateral food aid stems from one donor country which has, at the sume time, been very active in promoting the is ^o VWirld FOAXJ Program.

But this is no guarantee for the future. Il surplus's — in the Common Market countries, for instance — become a permanent feature, will the tllident machme-r> of the **World** Food Program be used as it should'.' Recent discussions contvrning wheat deliveries under the three-year. 4,5 million Ions Food Aid Convening warns against having **too** high hopes , Ihe bilateral approach appeals to many.

My conclusion is that we are not doing our best to ensure that our aid efforts in MlL- agricultural field are used to minimum effect. Donors maintain little ccntaci he (ween themselves and they do not profit **unoagh** from the expertise of international organizations, to which they arc (he major contribute v

I hi> problem will be greatly aggravated unless new attempts at coordination and integration of assistance arc made.

Assistance in ih<? agricultural field will become a very complicated business over the next 10 io 20 years. There will be a continuing :ind inmMMng, need for short-term foocl aid. This must be intimuu-ly combined wiih assistance to promote **load** agricultural production, bath through the provision of production requisites (imported and kvally produced) and by means of technical assistance.

If donor countries do not improve the means of coordination ihcy will find themselves faced with a **McioM** situatii>n. Lei os try |0 find practical Miluti*ins, beginning now. B

Diary of a Soviet engineer in Ceylon

by PA VCL FIALKOVSKY

Do the *large* dam projects take sufficient account of the social consequences of change? What is the best way of carrying out such projects?

Eight hundred years ago in Ceylon, **King I'Liinkr.iHinKdiii I decreed thai "noi** even one drop of rainwater will flow into the ocean without being made useful to man."

An idle boast, perhaps, but it reflects the level of agricultural engineering attained in **andeM Ceylon** which reached *w>* **height** i" the 12th cenlury and **hM** not IVLII **w p m d** since

flic uncient L'ivitiytitions were centered OH the northern plain where the art of irrigation **tai beet) (netted** back to at least 5<X) B.C. One uf I he earliest of the so-called tanks — which are actually **Lake-sized** r_L'M.T\i.iirs kept filled by ri\cr diversion — was btiiJi in 300 B.C. and can still be swn near the ruins of Anu*ratlhapvm. the* oid *capita) city.*

These civilizations decayed under the impact of war and disease. The land gradually f_c l] into disuse and reverted to jungle. The reninams of the population, plagued by malaria and typhoid fever, fled into the mountains and settled there.

Ttniay. population is rising sharply and. with ii. the need for **food,** satisfied only by expensive imports uf foodstuffs. **There** is an **evident** need to increase agri-iLiliui.il **production,** particularly in the dry **zone 10 that people** could be resetlied there from t!ic overpopuialcd wet zone. This need is becoming mure and more acute each year and *is.* the driving force behind the M aha we I i Ganga development project.

This is the project which brought me tt> Ceylon three years ago as the **PAO** project manager, heading a (cam of **•gTOfKHotat,** soil scientists and engineers.

SiiR-ir then our team of FAO and Ceylonesc spteialists has carried out an **irrigation and** hydroptwer survey. We then produced a muster plan for development *at* **the FOgiiD** — involving dams, power stations, tunntb, **o m b** and hundreds of thousands of acres of irrigable land — and, finally, a feasibility study for the first phase of construction.

As a *Soviet hydraulics engineer it was* interesting to observe at first hand the larger kind of U,N.-sponsored development project now being carried out by national and international experts working **together** in many **coontrin** of the third world, and **to** S^L- the economic and social problems which they somciiiiK-. generate and which ***tut,*** perhaps, even more important than the technicjl ones.

P.O. **Rllkovsky** *•« „ *annuitant with UttRP! FAO proifcti in Sffim,*)'«jK"iVi<t *and Crylon and has titO wurlrtl with* **MiCMU** *Scrltt Inktiicul wtsixutKt pn>tecu. He it* **/Ac** *uuttmi of* **ii-Vffu/** *HiHiki (in irriutilitin and titntt rttiamalion*

Wmt *Mf *tiff rommt*

Ceylon lies lite a pear-shaped drop in the Indian Ocean, some 100 miles **MM** of the lip o(India. A mountain range. **rhfatg** ti> **HOW** HtXK! (eel, covers Ihc southern bul^i.-, falling to a vass coastal

plain which encompasses the northern purt of the island. Ceylon is some 25,000 square miles in iirua, **rough!)** equivalent to Ireland, Panama or **Sierra Leone.**

Ceylon is divided into two zones by the effect of the twice-yearly man si Kins The southwest monsoon is partly screened by the mountains and, as a result, rainfall is very unevenly distributed bciwcen the two zones. Thr wet zone, in the southwest, receives 150-200 inches of rain Fall a year and covers a third of the land area, on which live three quar-

tcrs of the population. I he **remainder** of the island, the dry ***taut,*** receives 30-75 inches of rainfall a year and agricultural production is largely dependent Upon irrigation.

At the present time, enormous \>!-inu-s of sitt-laden water flow into the sea. It has been estimated thnt the **Mfthwmti** (ianga itself, (which means, Jilerally. "big sandy river"), has a flow of 6,5 million acre-feet at its mouth, enough to irrigate nearly a million acres, most of which is lost without being **Mod**

Main crops arc paddy, [ea. rubber and coconut. The Jasi three com mod Mies ucouni for nearly *V5%* o(the country's c\ports. Proceeds pay for most of the **imported Foodstuff: rice chilics,** onions and milk products.

The cash crops are grown mainly on large estates, such as iln- tea estates in ihe **westers** basin. near the town of Kaniiy. The bulk of the population arc peasant farmers, living in mud-walled, palm-leaf thilched village houses, with a few acres to cultivate on a share-cropping basis. The diet is mostly rice, with Li **fen** vegetables cooked in curry, dried **Bah,** tropical fruits and, occasionally, meat and milk products.

Agricultural production has risen conxiderabi) in recent years. In fact, due to the efforts of **gOVecOfiMOI** and aid agencies, such as the f-rcedoin-frorn-Hunger program to increase fertilizer use, **rice** production has risen to the point where rice imports ha\e steadily decreased over the past few years. L:\cn so, adverse terms of trade and population growth 1*2,5'f* per annum) h;ne counteracted this progress to the point where real per capita **income** has hardly increased.

Population growth and ***\ncnuu*** in income ;irc expected to raise demand for fiMMi dose **to** *% per annum. Agricultural production **will** have to be greatly increased if the country's economy is nm **to be warnped** t>> increased lood imports. It *h^* been estimated that if **rinmwttf** production was not increased, such food imports, **might account** for as much as SX40 million per annum by 1990.

Attention was drawn to the Mahawdt (.ianga us a prime source of water for **pOWBT** and irrigation in 1[1]JM by an IBRD (International Bank for Reconstruction and Development) mission, Separate surveys were carried out the same year by i sow {United Stations Operations Mission) and Canadian Hunting Survey Corporation. Discussions between Mo, i NTH' (United Nations Development Program) and the **Ceytooete** government went on for ncarh two jears **befcn** the I;NW project (inall> became operational.

[he ultimate aim **of** the **project** is to produce food, cash crops, agricultural raw material for industry and **electrical** power, kiili/.tiimi of the **project ovn** the fle*t **thirty Jfsan** should wive the country's food and **power** problems. It would also hring large volumes of unused water and **enOtnOUi** areas of unused land into production. :md would **provide** employment **lo** a million **people** in agricul-**tun** and industry.

More than a million seres of laivJ an bQ irrigated

The project was supposed to be carried oui over four years It was, in fact, concludcti in iluee years largely bccau« the Ccy lone sir greatly increased their assis* lance to the project. At one point, half of the entire survey department was working with us.

As it was we lost a great deal of time collecting statistical data which was essential to the survey but which was not envisaged as part of our task. It is not unusual for survey projects such as ours to spend the rir^i year on pre-survey work which, sometimes, could have been carried out in advance by the country or by *I-AO.*

I he project area covers nearly half of the country and shows on the map as a stain which colors (he northern end and the lop of the central mountain range. It extends **over** some 10,000 square miles, including more than half of the dry zone,

WhMI kirn of tmama *r>m burnt7*

I lie international team included five experts from the Soviet Union, including myself. Altogether ihere were 14 on the no team including British. Dutch. Israeli. Japanese .ind Swiss experts. The toini team included 15 (*c* lonese experts under the direction of Mr. K.S. Cookc, an irrigation engineer who was co-manager. More than 200 (evloncsc agronomists, **eogiaeea** and technicians worked wnh the ti-ani for most of the time.

I he ei'inrHVvjtion of **teUM** to carry out such projects raises s<ime interesting quc\ !i^HI^ Ihert- is, for insi;tnee. the relative **efltdeac)** of international, national or sub-contrat-ted **team** All our work was done by our own mixed team, apart

The second phase follows the first without interruption, bringing water to 2.10.000 acres from storage reservoirs constructed during the first phase. The third and final phase provides for irrigalioo uf 342,IXKt **acres** in the nortli-ccntral part of the island and completion of h\-dropower development.

The Ccylonese government has decided to stan construction in 1%9 of (he barrage and irrigation canal system which forms the first step in this long chain of development. The contract for final engineering specifications has already been awarded. The World Bank is interested in **investment** and has ^-rif another mission to Ccyion to investigate. The French bilateral aid program may also help the project.

l"am an engineer. From my point of view iherc was a problem — the need to greatly increase food production through irrigation — and a possible solution — storing and using river water for irrigated agriculture and power production. As an **engineer** 1 enjoyed helping to pur the two together in the most professional way possible.

Wkmt happens next?

So many of the large engineering **projects** tend 10 neglect the end use aspects, and uurs is no exception. There was no budget for pilot irrigation projects, experimental farms, or basic research into problems of credit and marketing. An IBRD team of extension and marketing specialists has, however, just visited the area and there might be a LTNDP project to cover KMW of these aspects.

The first phase of the project will mean considerable resettlemeni from the north in order to cultivate the new land. The problem is that, although paddy rice has been the traditional crop of the area, the soils arc of excellent quality and woutd be much better utilized growing cash crops which will bring in higher returns to I he farmer.

The ***CtykHMM*** have had little experience in growing these new crops and there will have i" be a great deal of exlenskin effort in order to demonstrate these new methods. At the same time, there will have to be a considerable investment both in skills and capital in establishing settlements and building up an infrastructure of roads, schools, stores and clinics.

The team sociologist carried OUT a study of previous colonies, one of which was Marled almost thirty years ago. He found that, generally, yields were below lhe national average, that improved seeds and insecticides were -used by only half 6f (he farmers and improved paddy practices by only a quarter. No particular system of crop rotation had been adopted iind there was a very low standard of animal husbandry. He also found that most of the settlers earned less than S4(X) *a.* year and that two thirds wtrt in debt. Most of them felt that they were tacking veterinary, education and health services.

He recommended that priority should go to those settlers who had had experience in growing needed crops and that colonization officers should be given more ex tens Kin training. He also urged youth schemes, and the availability of good housing, drinking water, stores and dispensaries.

Of course, he only studied three communities. At the same time, if these established settlements lack such essen-Mais it emphasizes the need for a great deal of planning, improved extension services and capital investment which must go into the new settlements.

The project has been designed so that it fits in with Ceylon's own five-year development program. Even so, it is only feasible if certain conditions are met. There has to be a progressive increase in the rate of land development during the first Tew years so as to build up the capacity required to develop 20,000 acres of new land annually. Settlers must be provided with all the production requisites Ihcy need — improved seeds, fertilizer, pesticides — in such a way that they can buy them when they need them. An im pie mental km agency must be established and there must be a network of extension services. pilot farms and experimental centers,

We engineers have done our work as best we can. Ceylon needs this project but skill, energy, drive and money are needed to carry it out. This seems to me to be ihc hig gap in our present attempts at international development. Proposals are k'ft to the vagaries of international financing and political decisions, or lo sometime* inexperienced, or ill-equipped, national effort. We have organi/aiktns lo carry <>ut natural resource and prcinvestment surveys bm we lack a satisfaetory follow-up procedure •

from water nbw pouting useless!)/ into the SM *H&rft, an existing rssetvou scheduled to* be *improved*

from some geophysical investigations which were subcontracted **to** a French firm.

There was a language problem, though we managed alright with interpreters. Our working language, between ourselves and with the Ccyloncsc, was English. I personally prefer the **International** team because there is an intermixing of training and disciplines. One can compare various viewpoints and decide on the best approach.

Need far full-time economists

Our team was large but should have tx-uri larger. We should, for instance, have had a full-lime economist advising on the technical recommendations, [t is not sufficient to rely on occasional visits from consultants and it is a waste **of time** to wait-until the project is finished before subjecting the results to economic analysis.

I realize that dams are sometimes built which are uneconomic and that, if some economists had their way, there would be no dams at all There has **to** be a compromise between I he two and it might as well be done while the project is in progress.

The value of short-term consultants is rather dubious as we found that it **took** our own experts three months to understand the problems involved. I sec little use in consultants who come for a shnrl visit io advise and recommend, unless **they** are on very specific assignments.

1 do not believe the argument that large consulting companies have no contact with the country in which they work: they can have as little or as much contact as any internal ional team. My main objection *is* that most consulting companies use the same system of short-term visits by high-level consultants, and, again, such visits seem to **me** of dubious value.

It is. however, probablv better to use subcontractors for detailed studies. OUT own team suggested lining the canals **to** prevent seepage, for instance, but the detailed costing would best be done by a consultant subcontractor.

We are facing a worldwide problem to find good experts, no matter whether for national or international teams. **PAO** has difficulty enough getting good men foT its; own headquarters stuff and this is certainly a good argument against decentralization into regional offices, and for an interdisciplinary, intcrdivisional approach to field **project*.**

I also feel that project managers must be primarily scientists or technicians who can understand the problems involved and who arc in a position to assess results as they come in. It is undoubtedly helpful to have administrative slatf hut I cannot go along with the view that the project manager should come from business administration or industrial psychology.

More than a million acres

What did the project team find out? We found that by regulating the flow of the Mahawdi Ganga, its tributaries and the Maduru Oya, it would be possible to store some *ft* million acre-feet of water, in 15 multipurpose reservoirs, sufficient tu irrigate 7(HMHK) acres **of** paddy, or 1,300.000 acres of cotton, groundnuts, chilies and other high-value crops, on **a two** crops per year basis,

At ihc moment some 25O.WX) **i C M** arc partially irrigated from available rcs-L-r\oir water. **The** survey team fminU that there were some 650.0UU additional acres of good land which could be irrigated, with a further 570,000 acres which should be reserved for forest use,

We found first-class soils and favorable conditions for irrigation. The master plan calls for 40 hydroelectric plants with an installed, capacity of 917 megawatts and a potential average annual ouiput of nearly 5,0()(> million kilowatts.

Flood[1] protection was another aim of the projcLt and we drew up plans to stop inundation around two townships in the upper reaches and over some 200 square miles in the lower flood plain and' delta.

Ihc cost of land clearance, irrigation, drainage, flood protection, land development and power stations has been estimated at Rs. 4,664 million. Total capital eosts. including such items *is* pywer transmission lines, comes to Rs, 6,703 million, about SI, 125 million.

On the other hand, the total vaiuc **of idded agricultural** production at world market prices, following completion and development of the entire project, has been estimated at Rs. 1.240 million, plus **another** 110 "million for value of power generation. This means that ten years at full production could wipe out the preceding thirty years of financial drain.

Even so, this is far too rich for Ceylon's blood and financial aid of this volume eannot be visualized in ihe forseeable future, The project has, **therefore,** been broken down into three phases covering 27 years from 1970 to 1996.

A feasibility report has been prepared covering the first phase which, in itself, consists of three major subprojects. The first of these would consist of a concrete barrage upstream at Kundy. Water would be diverted through tunnels, canals and interconnecting rivers to being some IIXMKX) acres already under irrigation to an all-year-round basis, also adding a further 84,000 acres.

The second sunproject would include a high dam. second largest in the project, and would allow 74,000 acres of **irrigation** in what is now jungle area. The third envisages the largest dam, or mu lti -Storage reservoir, in the project which would bring another 76,000 acres of new land into irrigated production.

Altogether, this first phase would improve 144,000 acres and would add IK4.000 acres of new land- Hydroelectric installations would **pfodicc** some 1,000 million kilowatts per year

Debate on the next development decade

Further thoughts on a global plan for development and on the success or failure of UNCTAD 2

by HAMS W. StMGCR

Jan Tinbergcn's article in the last issue of *Cures* reminds us once again of his status and of the tremendous contribution which he has made (0 development **aOQBOmJa**

\Wulc I **cannot** really disagree with anything he says, there are two **aspects of** his article **oo** which 1 would take a somewhat different attitude. To start with, he **Mem to** imply tha: ;ill has not gone well with Development Decade I. Certainly we have not done as well as we might have hoped: hut the current fashion of talking of u " decade of frustration " is somewhat **iuJfIQQUtcd.** although it may serve useful political purposes in reminding us of the continued urgency of the development problem,

Jl is true that progress in I he development decade of iht 1960s has been slower than in the preceding deradc of the 1950s — judging by **tfas** Oenur.il Assembly's standard of a national income rise of 5% per annum — but we must immediately make two reservations:

...FirsUy, our knowledge of national income statistics in developing countries is h> no means sufheiemly **pndtt,** IT sufficiently **idvmoid, to be** certain th:it **I pewth** rate of 4'* **U>4M** '< per annum. **rhMTi•*—»•*» of 4a tattf** 1%(K. i*. really a deterioration compared uifh ihc slalisik.il ***pamA*** ralci of 4W txt .*!%• per annum characteristic of the early **19501,**

...Secondly, there is **eonWanbtB** duubt whclher the hallmark of national income growth is really **ihc** best index of the progress of underdeveloped countries. When we substitute other more direct indiuatnrs, such as improvement in the literacy raic. increases in [lie stcxrk of educational capital within the population, or health indicators such as the incidence!; of certain diseases, the picture of the 1960s is by no means one of slower progress than in the 1950s; rather the

It is a deterioration in (he international position of the developing cuuniries. rather than a deterioration of internal **taeUMI** within ihetn. which accounts fur the apparent slowing down of the growth rale of aggregate national incomes.

The terms of **trade** • the relaimnxhip **bctMMfI** prices which the ptx>rer countries obtain for their exports and prices which they **hsvo** to pay Ior their imports — ha\e shjrply and almost continuously deierior;iieO during the I960.S.

A: I he same Mine, the volume of their imports, consisting mainly of primary coinniodilies threatened rty **lymfaeUc** substitutes and not in highly elusiic demund. has failed to keep in step with ihe increase in **voluaw** of world trade in general The developing countries' share in total **world** trade has contjnuousK diminished

Aid in nominal terms has stagnated at ihe same lime and, in real terms, has sh.irph declined in relation to **the** national inconk- ot the richer countries. And ihis in spite of the unanimous resolution of the (n-ru-rul A^scmbty____accepted by the richer countries themselves, who have indeed tried in **OKD** (Organi/^tkw for Economic ***CoopttMikm*** and IX^clopnicnl) and other organizations lo carry out the intention declared in this, resolution — to devote ITr irf ihc rising national **hWOOMt** of the richer countries to aid.

H.W. Sin err it ***rconomir*** *ndrhrr on d*vt\apm*** *phmninw » tht United Nations and* • w»/™w *in ihr grtulualt* /otn/fT *<>f thf N?<* *•t far Social Knrttnh. Sew YorL. Hr* (I *the <inltt>T "t* Imcrn*- Unnal Development. Growth **'mm) ClUAfC** ond *a nnrtt>f of other*

A rough statistical analysis leads one lo the conclusion I hat, in the absence of this deterioration of international relations in the developing countries, the growth rate of national income in the underdeveloped world as a whole would have been quite substantially in excess of the target of *5%.*

1 cannot help but think that this peculiar combination of the 1960s — faster internal growth than in the previous decade hindered by unfavorable international factors — is intrinsically more encouraging than the opposite situation would have been: slowing growth of internal capacity compensated by favorable international factors.

*Two-prong*d MtlMCk: global and mmttamml*

In the long run, it will be the *internal* capacity of the developing countries for growth which will count: the international situation will not, and cannot, continuously deteriorate to the disadvantage of developing countries.

This leads me to my secand reservation concerning Professor Tinbcrgen's article. Despite all the emphasis that is placed on the limitations of the nation state as an instrument of international and development policies, we cannot disregard the objective of creating and strengthening national identity as a force in development, nor can we disregard the crucial rote of national governments.

It is because of the progress which we have made in national planning, and in the development of more coherent and better national policies ioward development, that we find a strengthening of internal capacity for growth inside the developing countries. The planning ideas of Professor Tinbergen himself can take no small part of the credit.

Yet these national procedures and policies are still **Ofir** pable of very considerable improvement. The development of 'global* strategies should not place us in the position of paying 'ess attention to those improvements in national planning and policy formulation that are still crucial factors in the progress of the developing countries.

Good national planning must be comhined with international action designed to stop such factors as (he deterioration in terms of trade, the concentration of exports of underdeveloped countries on commodities with a low growth potential, the effect of their increasing indebtedness, the erosion of aid in volume as well as quality and the strain on international monetary liquidity.

There is no contradiction between the two approaches hut the continuing importance of good policies and good planning procedures inside those individual nation states which constitute developing count Ties. **dBMfWM OOMtUl** emphasis.

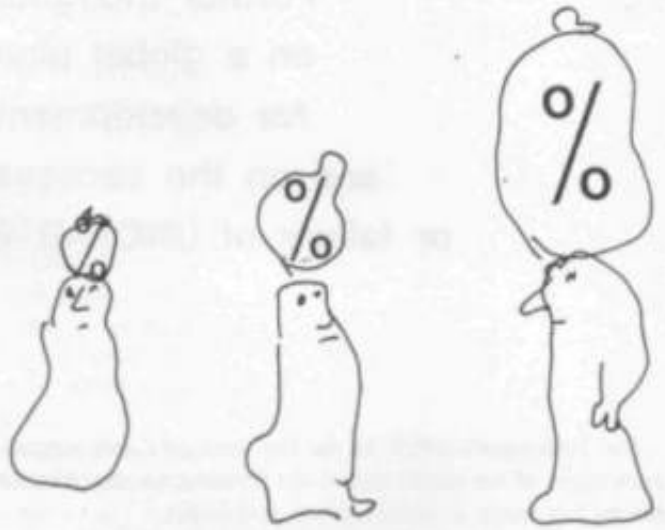
There arc also important tools of international cooperation, such as financial aid and technical ass LM a nee which, at the present time, fail to make the full impact which they could have as ihe result of better planning and coordination on u national basis.

Our attack must be two-pronged: the supra-national, or global approach, must be synchronized and **hwilfffll**ed with the national approach.

In one sense, however, the description of the 1960s as a decade of Trust rat km and retrogression is accurate. It is clear that the target laid down by the General Assembly, a certain growth rate of aggregate nalional income, is less appropriate than a target of per capita income wouid have been. Rsseniially, economic development is concerned with (he welfare of the people: our objective should be some index related to people.

White the rate of growth in *aggrtzatr* incomes has been slowing down, subject to the statistical uncertainties already indicated, the rate of population increase has been speeding up. Here also, our suite of knowledge does not permit us to be quite sure to what extent the data represent statistical reality rather than illusion. It is at least possible that recent figures reflect better coverage of new births and a fuller coverage of the existing population.

However, taking the figures for what they show, the combined effects of the slowing down of the rate of aggregate income growth and the speeding up of population growth, has resulted in a situation where the growth of income per capita



*" . . , Firstly, our knowledge ot national income statistics in developing be certain that a growth rate ot **4*1*** to **4'f/fi** par annum, characteristic growth ratms ot 4°h to 5°/° p9t annum characteristic of the marly* T950[1]

is now only at about half the rate of that of the earlier 1950s: ,<murul I ii *& per annum as against *i%* in ihc earlier period. On this basis we arc half way back to stagnation.

Again, however, if we ask ourselves what the rate of per capita income growth would have been in the absence of unfavorable international factors, my own estimate leads me lo believe that the per capita growth in the 1960s would **hmv** been faster than in the 1950s, even if we accept the data showing a speeding up irt population growth.

In any event, the emphasis on per capita incomes, while providing solid ground for an unfavorable assessment of QeviHopmcnt Decade I. also places the emphasis on the popul.ilion element, and thus reminds us strongly of the significance of family planning as an addition to more traditional approaches to development.

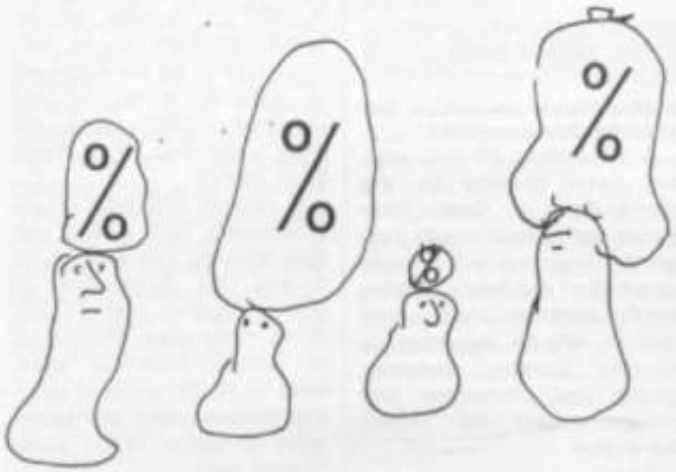
The **trick** bjf Jane/ Stanovnik,* with whose baste concepts and objectives I find myself in utter sympathy and indeed complete idcniity. allows me (o develop these comments a little further, and in a different context.

His bask point provides a striking parallel lo what I was trying to **MtabtU** a little earlier in relation **to PfohMOl J** m

UNC rAO 2 Smrn, „t **FMfcw?"** Art *pot** **JO** *itf* Ctm ***He*** **I**

bcrgen's article. It is now fashionable to proclaim UHCTAO *2* as a failure, as " an i NCTAD "f frustration." In RDM respects (his is undoubtedly true, yet lei us nut underrate ihu- ^it^iiificance of Mr. Stano\nikS observation that one uf the main values of such confrontations is that they result in new views which [he delegates take home tti their iwn countries, and which help, often in inciinyihlc WMS. in shaping future Jecisions.

We halt gradually learned in development economics that the biggest impact does noi necessarily Qg in lhe t.mpfeie and dramatic concrete capital prn|ects V*e have, insicjd learned to attribute more and mure importance tc ih;i' Tnetenths of the iceberg which is invisible, the human investment, intangible, not easily quantifiable (in spite of many valtaaj cflbrtt at ^uanlification) and yet mure important (as we now know and can even prove) and more fundamental than thr



trios is by no **meat*** *sufficiently precise, or sufficiently* sdvaiMed, *to >e later 1900's. it realty a deterioration compared With the statistical*

capital investment.

When we speak of en " IINCTAD of frustration," are we not making the sanij n&teks in identifying development with concrete tangible happen!ngs?

Mr. Stanovrik like PfofaaM linbeiisen. -.peaks of an "overall orates <>f development." As he deacrfoei It, this consists of (he interplay **bettHMa wpff**** targets **nabtfaq to** the growth of incomes and ,iid and trade, and more concrete sectional UfgptB relating to industry and agriculture. I his. Wihole series ol lurrciv. RgF«gttE ^d MKtnrtil, ll tln.-n u. interplay in its I urn wilh lhu nolkmal efforts, national achie\cmen is and njitnnjl targets ot the dtvelnpinj; COmttdM

Mr Sttaovafll tBtpbaifaa lhat natinndl elTori und Mtiaaal pulicics are more fundamental ED development, while the international tar^eis iind polkfci lire derigWid 10 create a fovorahk scUinji in which indispcnsablt natinu.il effoti Ls gi^en a maximum ctanoB '" succeed.

Uui tfae HDtslion which I want to rai>e is whether, here again, we are not in danger of underrating ihe potential ;im! Khteveaieaii of wtau has happened since Development Decadc t w;^ Inached wme ievta or eight years ago,

I ei OK' explain this. We have established the t'i lid target and iflevfeabt) qaertknw .irisc. such as: should not trade concessions to underdeveloped countries be counted U part of ihis I*/r akl (arpei".'; should tied aki be really counted as aid when in some respects it resembles trade more than did?; what about supplcnwnlary financing which, in fact, provides a direct bridge between trade and aid?

DDt: taut/mark ot international cooperation

Scm in the liphi. the wnplc targcti of Development Decade 1 are found to conuin the perm ot the fJotwl strategy which »c arc »«king. Th» » indeed rccopiucd by Professor Tmbcfgrti. *ho calb the I** aid tarpci A " landmark ol imoraaaioBri coopefa»i--r U *k tm* ^ut il is also more than that: it is a poim o(depanure toward newer and broader efforts.

Mr. Suntnruk describes the approach to economic development as symbolized by UNCTAD as a joint venture of "developed and developing countries; Professor Tinbcrgpn would, no doubt, fully accept this sis practically identical to Ms tHWetneul lhat the approach to development must be on j supra-national or global tmfe. I still prefer (o define the profess of devclopmeni as essentially a national \cniurc. which can cither be frustrated by lack of intern at ional cooperation (as happened during Development Decade II or which can he fK-fpcd fiirwarJ b> luppfc—Of> MKmtiaoal action *(K* we hope will happen during Development Decade 21

When I ajaj Mr Staamsflc'k propoial lor a Marshall l'ian approach to the devdopinf cnuntrm, and *hen I read his description ol the proposed prweedure b> which the developed and de\t!i'pmg countrie* would captain to each othci thuir mutual prohtcms and concessions. I could not help being slTuck by the similarity between what he proposes and what is actually happening within international consortia and consultative groups.

It is true that in these groups the recipient underdeveloped country is in a minority position, whereas Mr, Stanovnik emphasizes (haL *he* wanis lhtr diveussion in take place within the United Nations where the developing countries tumid be in the majority 1 am not certain how imponant thai distinction rcallv b KcctniK, a coanitadvc group met *rCpttSCnling* the entirt- new I jst Mntjn EcODOiaic fommvi' ntty the developing countries an no) in the minority ai such meetings

Is ii not worthwhile to plow further alon^ the familiar furrow of *iht* Lunst^rtiuiu ^nd ninsuliative gmup technique on • imliofKil basis' \^hy not build on wfaal we have got? Why in it dewlop these grojps into diKusaion foruiDs in which trade ;is ajajj as .(id tan be ili\cussed. nni u> mention technical iissistaOCe, CrOMfiH *>f ldbne« and tCChnolQSJl and questions Of international migration

Ihis would, in no way. deflate or iuperst-de ihc value uf liMuder international (fiacunkmi in forums ^uch as ihe United Nations, t sf i \n, the International Bank or the international Monetary f*und. It docs sectn to me H provide a natural alternative, or at least a complementary approach.

National planning, contortfal and consultative groups, i M i AM. t!li*Lil strategics, world btdkatfve plans, largcls l>ir the dcvclopntcnt decade — atl these BTC not diffcreot themes. I hey arc bul variations on lhe same theme.

in the field in the field ;n the TIPld in tlie fie ld

ZAMBIA

• *Frozen elephant* **for dinner**

A game-cropping project *in* Zambia is providing badly-needed protein to combat widespread malnutrition, preserving wildlifp species .and fostering an important money-making industry - tourism.

The scene is the Luangwa valley in eastern Zambia, one of the richest game areas in thB world. Il is, however, overstocked with elephants. buffalo and hippopotami to Ihe point where vegetation cannot support the animals Over the past two years, 1.000 elephants have been killed and taken 50 miles through the bush to a modern abattoir at Mfuwe. the project headquarters. The carcases are cut up, chilled and transported in 50 lb blocks in refrigerated trucks dOO miles to Lusaka where they are sold.

Last year. *278* tons of game meat was brought to Lusaka and this year production will be even higher. Experts have estimated that it will be necessary 10 reduce the elephant population from 23,000 to 6,000 while some 12,000 buffalo, and some 5.000 hippos will have to be culled.

S7.5 million is being spent by the government en expanding tourist facilities, including a 400-bed luxury hotel at Lusaka and a 100-bed lodge in the Luangwa valley itself

COSTA RICA

• ***Boot and banana** on World Bank** *crsdit*

A 53 million 20-year loan has been granted **by the** World Bank to **Costa** flic* for an agricultural credit program The io?n **will provide** one half of the funds **noeosd** for the program under which credits will be extended to farmers growing bananas, cotton and p ire apples and producing beef cattle, mostly for export

MALAWI

• *IDA loan* he In Irrigated agriculture*

Agriculture accounts (or almost half of Malawi's gross national product: the key to its economic progress lies in agricultural development. Two zones have been selected for priority development using United Nations funds and technical expertise. One is the plateau area of the Lilongwe. Oowa and Dedza districts (where population density is the highest of thB central region) which is suited to intensive production of crops and livestock: the other • lies in the hot, humid lowlands of the Shire Valley below Chikwawa in the far south.

The International Development Association (IDA) agreed *if* 1968 to provide an interest-free loan of £6 million to carry Dut development of 500.000 acres in the Lilongwe region along the i m « **tuQgctted** by a World **Bank report**

A wcond IDA loan of ap**proxfrnctaty S3 5** mil lion was •i*o **grwitad (tin year to increese** trw production of tainted cotton over 171,000 acres m me lower Shire area, to include improved practices on 22,000 acres of existing farmland and the settlement ol some 15,000 acres of new [and.

Still being investigated is ihe irrigation potential of **a** furiher 130,000 acres of the lower Shire Valley The first development area ol 10.000 acres has been selected and work is proceeding on the engineering drawings (or an irrigated agricultural development project, The report on this first phase should be completed by the end of 1968; the final report on the eniire 130.000 acres will be ready by May 1969

Wildlife can, urwtor *certain cimtitiona. ynto more protein pet pound Inart ttomesttc cattle Qame<roppmg* of *elephants buffaloes* ***and*** *nippos is resulting tn* mow *meat in Zambia*

ECUADOR

M Rain furoxt *will in-crmmm** **export** *marntngm*

An investment of $10 million over the next five years in forest mdusines in the rain forests ol northwest Ecuador may eventually bring in an estimated $20 million *a* year tn the couniry's foreign earnings

A iomi Ecuadorian FAO

team has begun a pre-investment study of some 3.460,000 acres of forest in the northwest after completing an extensive forest inventory and an aerial photographic survey of about half the area, The government has now signed contract concessions with 14 locally-based companies to develop some 1 million acres of forest land.

IRAQ

• *Food aid being timed ttj hmlp lmnd rBiaftn*

Additional food for settlers improving land being opened up under Iraq's land reform program is being provided by the World Food Program (WFP), The farmers are planting trees and windbreaks, building storage facilities and roads, desilling irrigation and drainage works, establishing fruit tree nurseries and vineyards end developing the livestock Industry Cost Of the food aid is $876,000.

CEYLON

• Onions and *Chi fie* in the highlands*

Some 6.500 acres of high land will be used for the irrigated cultivation of onions and chilies with the help of a S2 million credit from the International DeveiopmentAssoctalion (IDA). The government is providing a further $1.3 million for the four-year scheme,

ITALY

• World fimh catch noaring Urn limit

Fishery experts recently warned that the world cannot expect to catch more than two to four limes the annual output of types oi fish now commonly harvested from the oceans.

The FAO Committee on Fisheries, meeting in Rome, was totd that estimates of potential catches of these fish range from 100 1o 200 million metric tons a year,

If **commercial *fishing continues* ID increase a l *the present* /ate *trie oceans will* (m *Y'6W"'Q their lull potential by 1988***

and even these could only be realized if there were succesllul agreements on International management and protection measures

The present world marine catch is about 50 million tons. Annual catches have been doubling about every ten years. If this rate continues then the present known resources would be fished to the limit in 1$ to 20 years. Catches could then only be substantially increased by shifting to other, as yet unused, marine resources, such as krill — the small shrimp-like fish on which whales feed — plankton and other similar marine animals and plants Estimates of krill potential alone run to more than 50 million tons.

• *Training local people to omrry on*

The tour Mlsereor-supported projects in Madagascar, costing altogether more than $700,000. have in common an integrated approach to rural development. In each area of operation a pilot zone has been established where the particular problems of the region are identified and tackled

In Ankerika, in the northwest, primitive agricultural methods were pinpointed as the chief obstacles to good farming. Over the past five years farmers were taught how to train and use oxen for plowing, were introduced to improved tools and were demonstrated irrigation techniques for rice production in the dry season. The project has been so successful that ii is being extended for another two years.

The most pressing problem in Sampona. in the south, is lack of water. Various solutions for trapping and conserving rainwater were studied in the pilot zone as were ways of protecting the soil against erosion and introducing dryland farming techniques. This project is also being extended for another two and a half years

The third project is at Androvakely, in the west, where improved varieties are being introduced end better storage methods are being developed to reduce food losses. As in all the Misereor projects, local artisans are taught to make and maintain improved agricultural implements and local people are trained fur extension work.

This year a fourth project got underway in the Antanimarina area. Improved methods and equipment for rice production and processing will be introduced over the next three years

Primitive farming methods, such as trirs **enclosure** *lor ZBbu* **califs. are** ***being discouraged in*** **rfte** *pilot areas supported by MisarSor in Madagascar*

New projects established with FFHC funds

GHANA: A new type of collapsible poultry house costmg S90 (as compared to S400 for standard models) has been specially developed for (he pilot bacKyard poultry project to wtiich the Austrian FFHC Committee has given $9,700. Feed for the hens is being supplied through the World Food Program.

CHAD: The poultry scheme supported by Swiss Aid Abroad (SAA) to the tune of 5136,757 (reported in CERES No. 1) has been extended until April 1969. A plant which will convert waste from a nearby slaughterhouse into feed for poultry is being built near Fort Lamy at a cost to Swiss Aid Of $55,000.

PHILIPPINES: A freshwater fish culture development project supported by the Australian FFHC Committee ($62.J54) has shown ihat at least 3,000 kg of fish per hectare per year can be produced in freshwater ponds (6 limes greater than present production). As a result, 31 private projects, covering an area of 600 hectares in 10 provinces, have applied for assistance

TANZANIA 1 800 drumt DM Own dttWOuPO to farmers' coopera* v*t in Dooome, Inng* and B M*#J# to popula t e a *storage mtrtoO which m •conamtcaUy* and tachnicalfy within me grasp o* ail d r n m This protect wes supported ty Si 7.405 (frv*n by tn* Austrian FFHC Committee. A day care cent«r has t m n opened at «h# Mu&oma home economics training center, supported by SJDA (Swedish Interna<<onAl Development Authority) lo the tune or S1 056.315 An advisory counai. composed of regional representative* of all mtmttnH concerned wrth women s programs has been jet up to ensure more organized conlatl between regional officials and the center

LESOTHO: A $20,000 program to teacn agriculture and home economics to rural young peOpM rs being partly linanced by th* U K s Christian An) (S12.26S) The money will be used to strengthen existing youth clubs, to start new clubs and lo tram government extension staff and youth leaders An associate expert, made available by Finland, will help with vegetable gardens, woodwork shops and fertilizer trials and demonstrations

CAMEROON; A project to assist young carpenters has *been* adopted by Entraide et Fraternite (Belgium) for S5.200.

DAHOMEY: Further funds have been received lor the animal draft power project (described in CERES No *2}* $20,000 from Fonds national pour la cooperation au developpement (Belgium), and $29,000 from Misereor (GermanyJ

The Canadian Freedom From Hunger Foundation has contributed $6,000 toward the fishing boal mechanization proiect.

The U K. Oxford Committee lor Famine Relief (QXFAMf earlier this year donated $10,000 for a cenier to teach illiterate Dahrjmean boys and youth-club members to grow crops and raise animals Four more centers are to be set up under a three-year FFHC project lo whi^h the Government as part of its back-10-the-land campaign, will contribute £37 000 ot the total 595.000 cost

IRAN: $32,000 has been donated lor the second phase ol the Ousadj project by Nebula, Novib and WCC-Netherlands.

PARAGUAY: The World Council o(Churches has contributed $5,000 to a real to res ta l ion project.

SENEGAL: Entraide et Fraternite (Belgium) has given $5,200 for a hay-making and cattle-teed ing project.

PAKISTAN: The vaccination campaign to eradicate Newcastle's disease and fowl-pest among the 20 million poultry of East Pakistan — to which O X F A M donated-equipment for producing vaccines — has shown excellent results By (he eid o' 1967 half of East Pakistan had been covered and the percentage ot immune bird* rose from 17% to 68" Tie program will be expanded this year and the Austrian FFHC Committee has donated S17.6OO lor additional laboratory eauipment Tie lr-sh FFHC Committee has donated 596 300 to pay for the laying down of sprinkler irrigation in Rawalpindi while the Danish Board has given $52,500 lor the control of animal parasitic diseases in Comilla.

Tamai,a frte *%coutmd* oil drum will pro... i -r.gnr *storage al low cost to termers* cooperatives

GUATEMALA: The Csthofic Reiiel Services seed project has changed d-ptary habits n ih Nahui^ region A CRS gram of nearly Si 000 provided seeds tor carrots peas, radishes cucumbgr beet and broccoli

KENYA; Three U K FFHC proec!s tn-almo £78,000 will $oon become operaUve The largest r£4g OOO; ts to provide mobile veterinary units to serve AIncan smallholders who own European cattle The aim to prevent losses of meat and milk from cattle diseases Another proiect (E24.000) is for the impiovemeni of gram storage at farm and village level where pests can devour as much as one third of the crop Also £6.000 has been allocated to train small traders to proteci their grain and to supply them wJth simple storage protection equipment.

VENEZUELA

• *S 5.4 mi than for better timhing*

A five-year fisheries research and development project for Venezuela got under way this year. The project calls for international experts, fishery surveys and experimental fishing as well as the framing of Venezuelan personnel in research and fishing techniques. FAO is managing the project and is supplying a fishery research vessel for experimental purse seining and irawling in the Caribbean Sea and Atlantic Ocean, Venezuela is paying for more fhan $4 milflon of the $5.4 million UNDP project.

FERTILIZER ***PROGRAM STARTS UP IN ASIA***

Demonstrations of how to apply fertilizer are being carried out in 25 countries under the FAO program financed by the world fertilizer industry. Latest developments:

...In Kenya, a country-wide program of trials and demonstrations on maize and other crops will start in September.

...In Tunisia's northern region, trials and demonstrations on wheat and citrus Crops Started in June.

...in Ethropia, the Danish government is financing a pilot fertilizer credit and marketing scheme to begin this coming summer.

...In India, more than 1,0QQ tons of urea fertilizer, supplied by the U.K. fertilizer industry, are being supplied to community development blocks in Uttar Pradesh.

...In Indonesia, the Centre d'Etude de l'Azote has agreed to give $30,000 to start a ferti Fizer demonstration program.

PHILIPPINES

• ***Better cowm and*** *more* ***milk reported***

Farmers at the Philippine Dairy Training and Research Institute have reported that milk production per acre has risen by about 200% in the five years since the FAO/ UNDP project started. The number of artificial inseminations to improve private herds has increased from 150 in 1963 to 7,000 last year.

DOMINICAN REPUBLIC

• ***Haw*** *'forent* for old*

A Si million UNDP forestry project aimed at restoring the lost forests of the Dominican

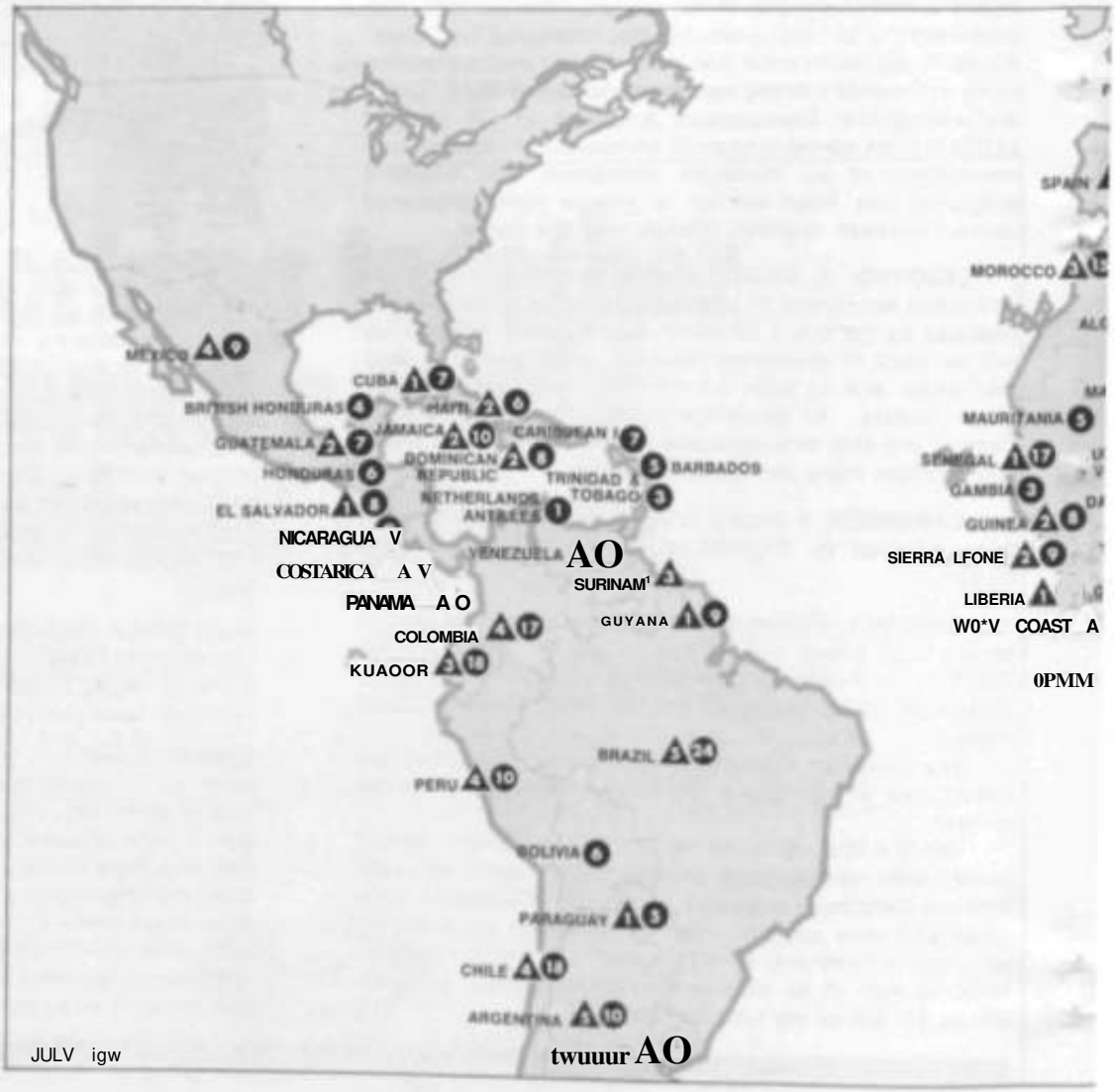
Current FAO projects

A *ON Development Program (Special Fund)* projects

0 *All other technical assistaitce projects being carried* our *by FAO: U.N. Development Program (Technical Assistance): World Food Program, Freedom-trom-Hunger Campaign; Trust Funds; FAO UNICEF and other joint projects.*

REGIONAL **AND** INTER-REGIONAL PROJECTS
|not included on Wi* map)

Africa	A©
Latin America	A22
Asia & the Far East	A16
Near East	©
Pacific Territories	O
1 rtier-regional	A©



Republic will soon be fully operational. An inventory of the country's forest resources will be carried out over the next four years, together with the establishment *o)* demonstration areas, and of the country s first forest training school

SUDAN

• *Food aid* ***helping to tottlB*** *Ethiopian**

Nearly $1 minion-worth of food aid is to be used to help feed 20,000 Ethiopian refugees living in campj at Kassala and to rewttte ihem some 300 km3 in from the border. The project will help sustain refugee families until they reap crops from land provided by the Sudanese government The World Food Progj-arn (WFP) has already provided $344,000-worth of emergency aid.

INIGERIA

• ***Canadian**** *train Nigttrianm* ***to man*** *the* ***dam***

The drst dam on the Niger river, at Kainji about 300 miles north of Lagos, is being internationally financed by loans from the World Bank ($72 million), ftaly ($22 million), the United Kingdom ($12 million), and the United States (S6 million).

The Canadian government has provided a grant of $1.4 million and $167,000 for technical assistance. A team of experts from the Ontario Hydroelectric Power Commission is to oversee the running of the efectridty plant and will also train 200 Nigerians to take over the plant at trie end of the three-year project

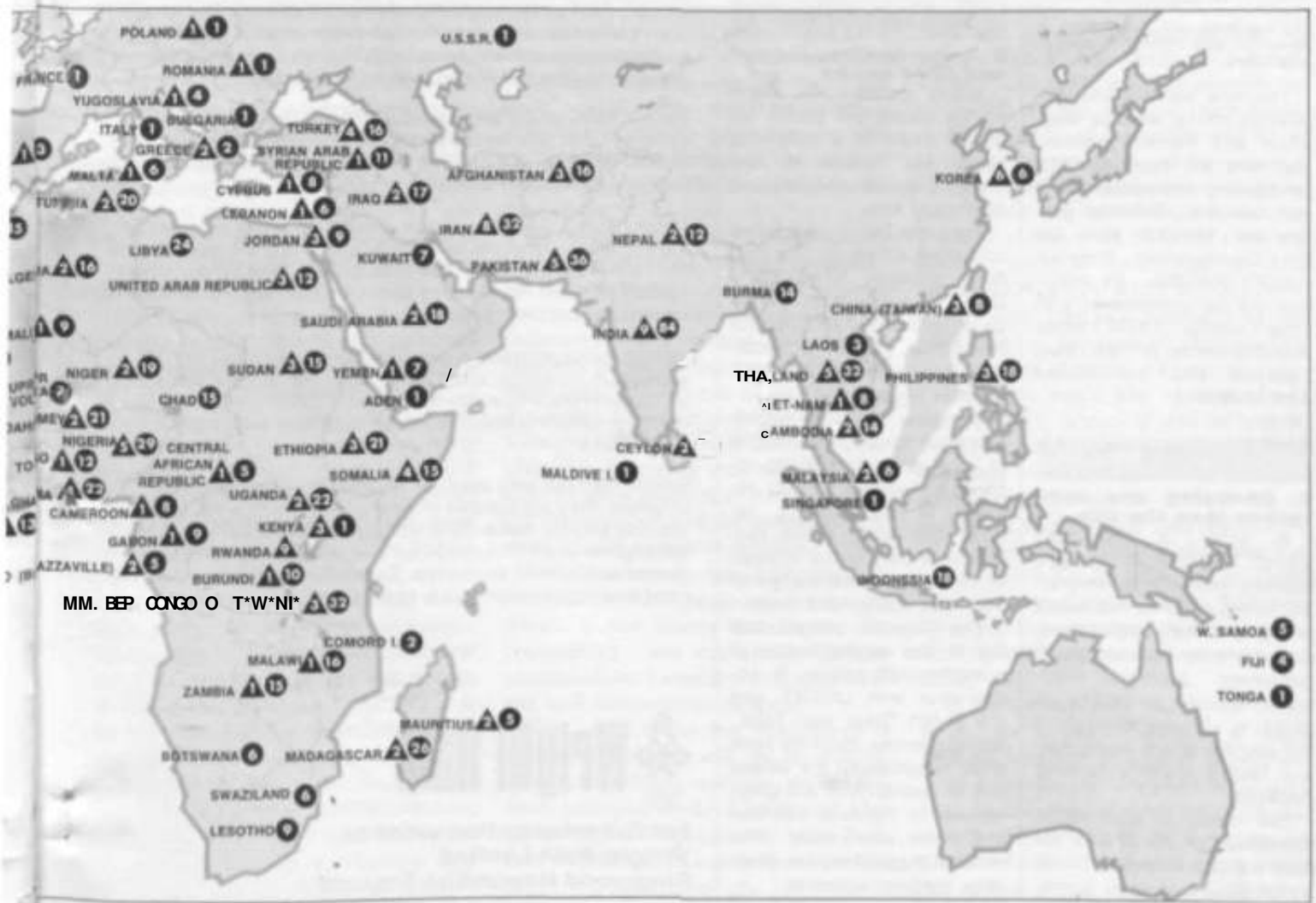
CHILE

• *1.OOQ trainttom* ***far agrarian*** *reform*

A loan of 3660,000 has been granted by the Inter-Ameritan Development Bank (IDB) to (he Agrarian Reform Training and Research Institute, established under a UN Development Program (UNDP) project.

The second phase of this project was recently approved, which means that the present training, research and advisory activities will be extended and expanded till the end of 1970. '

So far, nearly 1,000 Chilean technicians and professionals have undergone training at the Institute In the fields of sociology, project planning and farm management, credit and cooperatives, rural labor, agrarian fegisfaiion social and community development, and training methods and extension (See the article by Jacques Chonchol on page 41 of CERES No. 3).



Africa and the Common Market

by P.N.C. Okigbo

The rollcr-coasmr relationships between **VariotO** Africa': countries and the Huropcan Economic Co rum unity (EEC) and between African states not associated wiih ihc Community, arc explored in this book. 11 is undeniably a topical book at the present linic in view of current negotiations to renew the Yaounde Conventian.

Mr. Okigbo is one of the best of Nigeria's university teachers and economists. He has been an economic adviser to the federal government for many years. In the latter capacity he negotiated special provisions for a privileged agreement between Nigeria and the EKC which was signed at Lagos in July 1966, but which, unfortunately, did not come into force because uf the constitutional crisis and the secession of Biafra. He was made a member of the African Scientific Council in 1963.

Mr. Okigbo devotes three **Qbaptert to** the EEC machinery and the principle, governing (he Convention of Association with African **countries** with the aim nf enlightening Anglo-5a*on readers. He might, perhaps, be criticized for being too didactic and for giving insufficient emphasis to various political problem* which have marked the growth of **uao>** ciatkw between African countries and the **Commodity** of the Six.

Mis book docs refer, on the other hand, to the delicate problem of stabilizing ihc prices of raw materials, which was the stumbling-block during negotiation-. on the second European Fund und **over** the new **Convention** of Association whith came into force for the 1964-69 period.

Negotiations, among (he Sin, and between the Six and the A^k:;m countries, took a very long time. France had **KJtwd** ihe problem of price **rtabffiatiofl** in :• very simpJc way; by creating stabilization funds and letting her former colonies benklii bj higher **prices** which protected them ajiainvi **Bwctaatioitt** in the prices of i lie main tropical products. The French market w:iv, also a preferential arca'for Mriciin and Malagasy produce.

Other countries, such *as* ihc Netherkinds and the **Federtl** Republic **of** (krmany. would not grant unqualified prcf**emicn to** African produce because of **possum** from their traditional customer, in L.atin America and the **Middle** I .isr. Hrancc, therefore, had to undertake **to** gradually abandon the system of higher prices, at which the African slates asked (or some compensation for the losses caused by ihc relinquish mem of this system.

The Yaounde **Convention** provides for the creation of a HJHC for the free traffic of goods, including free access by the associated states lo ihc Common Market, on the one hand, and the opening-up of their markets to the products of the Six, on Ehc other.

As head of Nigeria's delegation to EEC. Mr. Okigbo deals with the problems of association of other African countries, particularly Nigeria, with the EEC, His book contains two excellent chapters showing how Nigeria ha* to compeie wiih the **BB&MOdMed** slates in the field of various products, such as cuixia. pulm-oU. **peoadfloti** and limber.

Mr. Okigbo thinks that, under present technical and administrative conditions, the agreement between Nigeria and the European (omtmmm poes Ivvond the framework i-f a **prcfcfcMal Mac aad** corresponds to the **niiblnhtncot** o(• **free** trade **KM** M the **cod** o* his **book, lie** hopes that **riitcwwwi** over rrtrw*] **of** the ***Ywom&H*** *-xvtmkm* ***miU*** **dm** the principle of *&* free tndt area over the principle nt assocJaiian, thus, echoing one *at* the firsi **Hrywrina** . i *-he* Briii»h government on I his European problem.

Unfortunately, the flaw in Mr. Okigbo[1]* work, as in many books on present-day Africa, is thai history flows faster than commentary: one can already imagine renewal of I he Yaounde Convention without such fundamental changes,

I his is not to say that TIC got iat ions in [he coming months will not be diUkult. In fact, the African countries, particularly I IK we belonging to ihc African and Malagasy Organi/ation **(OGAM),** have pertinent **ertddm lo** pre.scni **to** the Six, whkh is not emphasized enough.

The **OCAM** countries are dissatisfied: they think that the dauscs of the Yaounde Convention have not been sufficiently **observed** Imports by the Sin from other countries of ihc third world have been much greater ih;)n [hose from the African and Malagasy countriev

I In; most typical example is imports of hananai from Latin America, the value of *v,*hieh is said to have soared by nearly 644 between 1964 and 1966, as against an increase of about 1J % in sales of African bananas, OCAM also harbors a griev•**Ni** ajjiiinsi the Federal Republic of Germany because German importers prefer to continue buying from their traditional sources of supply.

The second criticism by the African countries refers to the prices of tropical products which have been constantly dropping over the past ten years. For instance, the price of a ton. of bananas (Ivnry Coast), which was SI31.32 in 1958, fell lo $87.39 in 1965. a drop of 34%. Cameroon's cocoa sales declined by 55% in the same period.

At the **H E** * tune; remuneration of farmers' work has declined between 1958/59 and 1965/66. For example, in a " rich " country such as Ivory Coast — where K7% of I he coffee and *!% of the eocoa arc produced by peasants on small holdings — income went down from $0.47 per kilo of coffee in (be |y5H 5') season to $0.30 in the 1965/66 **MMBJ** cocoa dropped from SU36 a kilo in WK 59, to $0.22 in 1965/66.

The third criticism, incidental to the **other two, *a* the CDOSUM** deterioration **of the ICfIH of mdb A** ton of Ivory Court **cdbc woold** boy 18 tons of œ~ **meat in 1965, cowpwcil with** 24 tons in **1958.** A **loo** of **Ivory Coat** cot on paid **for about 14 lou of «mc« in** 1965, as **•film lome 20 torn in |95&. A** Ion of **CiMeiW men** bought only SOti meters of cloth in 1965, whereas the same ton ui.uld buy 2.71H) in I°6I>. It **h** regrettable itun Mr. Okigbo did not dcai with lliL-sf problems, but he lacked data gathered by OCAM at the end of 1966 and during 1 *J(S7.

In the last analysis, what or AM wants K Ihai ihe slogan " fair trade is better than aid " should bt; applied in practice.

Ai all events, Mr. Okigbo's hook gives food for thought and poses problems, Alihough ihc statistks in his book SITC no km per conclusive, one tannol but praise hit anal) sis ol the important problem **d**

JORDAN

• *Network of* ***animal*** *health centers*

The network of animal health centers in the Near East has been expanded with the establishment of an Animai Health institute at Amman. About 25% of potential animal production In Jordan is lost each year through disease.

The L&b&non unit SfXZ -J'ze* jn detection ana control Ot poultry *diseases*

The new Institute wifl emphasize animal disease diagnosis and vaccine production and will have facilities for training and research. It will cast the Jordanian government £446,000 and the UN Development Program (UNDP) $810,000. its activities will be coordinated with other similar UNDP - aided establish merits in Iran. Iraq, Lebanon and the United Arab Republic.

TOGO

• *Chnosing* ***the land*** *rather* ***than*** *I ho city*

In order to encourage young Togolese to become farmers, rather than emigrating to the cities in the hopes of white-collar employment, the government-backed youth movement, Jeunesse Pioniere Agricole is selling up clubs in villages throughout thB country where young men are taught modem farming methods.

The center of agricultural operations of the JPA is the farm training school at Glidji, about 40 miles from Lome. The farm has 100 acres under cultivation. Poultry, oxen and goats have been supplied by Israel as the first phase in teaching animal husbandry. Fcod is provided for the first year of operation by the World Food Program. The students receive a six months training course and then return to their villages to put into practice what they have learned.

The JPA encourages youths to form agricultural clubs in upcountry villages, some of which are run on a cooperative basis. In Togoda, in southeastern Togo, 50 Glidji graduates have reclaimed 150 acres of dense bush which is now about to produce its first crops. Efforts are also being made to include girls in this pioneering work.

DAHOMEY/NIGERIA

• *Ittveatigating taboos* ***and food*** *habits*

Mixed gardens, in which ail the plants are grown together often in a semi-wild state. are typical of the humid tropical lowlands of southeast Asia

They are being introduced into West Africa for the first time through NEDERF. a Dutch Foundation, which has given more Ihan 3500,000 lor two home garden projects: one in Dahomey and the other in Nigeria.

This year, a Dutch sociofogist will spend nine months at each project studying local lood habits and their relation to superstitions, taboos and other social factors as a part of the attempt to encourage consumption of nutritious indigenous foods.

The Nigerian project has led to the establishment of a rnothercraft center, in cooperation with UNICEF and the Dutch 'Gast aan Tafel.' Women whose children have been hospitalized lor illness due to malnutrition are given lessons in hygiene, nutrition and home economics. The children themselves are given daily medical attention.

Inter-African trade.

Any observer of African problems cannot help realizing how small this volume of trade is. Imports of African products by the Equatorial Customs Union, which groups the countries of former French Equatorial Africa, totaled only 7.7% of total imports in 1965; exports amounted to only K.6%,

As Mr. Okigbo says, the problem of the African common market caxinoi be taken as a whole. It must be tackled on a regional basis. This points to the experience of East Africa and of French-speaking countries in West and Equatorial Africa.

He ends his book with an analysis of prospects For tightening economic and commercial bonds, and voices the hope that African economic integration will come about soon. En this he foreshadows the initiative of Moktar Ould Daddah. President of the Islamic Republic of Mauritania, who organized a first meeting of heads of state of English- and French-speaking countries in West Africa at Monrovia in Ap-il.Ti'?, Co discuss an economic community. The next conference, to be held at Ouagadougou, will show whether French- and English-speaking countries are really anxious to coop* crate, and whether an African common market is feasible. There is no doubt that a very long road ties ahead.

Guy dc Lusigrum

Africa and thr Common Markttt, **by P.NX". OUgbo,**
Longmans. London, 1967 **(183** *p.).* 27». 6d.

NO EASY HARVEST

bj Max F. Millikan
und ⊳a%id Hapgood

Of making many books — on world agriculture and its relation to the ominous problem of world hunger — there is no end. It is perhaps one sign of an awakening world conscience that it should be so. In the course of the last few years there have been numerous admirablc publications in this held; some have been coldly factual and scientific, others have set out deliberately to create alarm and apprehension in the reader and, by so doing, perhaps to perform a service. The subject, after all, is of vital concern to everyone alive today, and it can certainly be numbered among the most important of the many problems confronting our bedeviled and harassed world.

No Easy Harvest carries no apocalyptic pronouncements of impeding doom. It is a reasoned, well-writ ten and informed presentation which tecocni/cs the magnitude of the problem, but which avoids both polemics and hysteria. It is chary in its approach to economic forecasting, and it tries — for the most part very successfully — to indicate the paths which must be followed if the underdeveloped countries are ever to move out of their deepening slough of despond,

The authors went about their (ask by consulting specialists in a wide variety of technical fields: ii is interesting to note that — in uddhk>n io agronomists, soil scientists, specialists in plant production, fertilizers, water conservation, pesticides, land reform, agricultural economics and other relevant subjects — they included anthropologists. &ociok>-gisis, and psychologies. Such experts arc all too frequently Ignored by agricultural planners, though they can undoubtedly make a notable contribution when great schemes arc being formulated which arc likely to affect the lives and I he social conditions of tens of thousands of people.

Having picked the brains of all these experts, the authors were then successful in persuading the U.S. Agency for International Development, in cooperation with the Center for International Studies at the Massachusetts Institute of Technology, to establish a study group to deal with problems of agricultural productivity. The book is in Large part a product of that exercise. It is a volume which will be d interest to everyone concerned with the complexities *9S* agricultural development. It will, with benefit, be consulted by specialists. It is unfortunate that its message is unlikely to reach those who arc not already converted to its thesis,

The scope of the book is wide and it involves searching examinations of land reform, the rice areas. Ihe rain-forest tropics, the monsoon regions and the high altitude zones. It avoids cliches and euphemisms: an underdeveloped country is precisely that and should not be dassifted as " less advanced " or given any other appellation which might tend to detract from the grim realities of the situation.

Recurrent themes include the imperative necessity of improving and extending education at all levels, and the dangers of transplanting technologies to environments in which the ecological circumstances may militate against their success. The authors comment soberly: " the long record of failure in such transplants **b** a warning that the process is not as easy as it appears. Time and again, crop varieties, cultural practices, credit schemes and organizational patterns have failed to produce the expected results when introduced into a new environment." To that brief list they might well have added breeds of exotic livestock, the introduction of which too often results in cosily and even spectacular failure.

The authors draw attention to the fact that — as is very right and proper — all specialists regard their own specialization as the most critical to any form of development. The standard prescription is " Do something about my factor first — and the others will follow. "

Animal production scientist* will feel that it *is* a matter of regret that the book Joes not deal in greater dcplh with animal

husbandry and the importanl and no **lot** easy harvests of meat, milk, and GggJl 'The integration of linstock into patterns of agricultural development deserve*, attcntion in an important work of thii nature.

The formidable list of en pens who contributed to the substance of ihe book includes many professors, senior government officials, international civil servants and representatives of foundations active in the underdeveloped areas of the world.

With such a wealth of in formation and informed forecasting before us we may veil *ucry the statement of St. Thomas Aquinas that " a shepherd who cannot read Will know raon about sheep than the wisest bookworm " It is aniong today's great tragedies that there are so many shepherds who cannot read, and so relatively few wise bookworms.

No Easy Harvest his a' useful index, a lack of which is aJl too common in books of this type. A selected general bibliography, in addition to the scrupulous references which are made throughout the text, would have been of value to the serious student. The anonymous **HtM** is to be commended for an effective jacket.

The message of the book is summed up in its final paragraph: " The key to agricultural development Ik* less in any specific projects than it <*ocs in an approach that combines sound technology with social strategies. Such an nppnudi requires a high degree of creativity and determination on the pan of both agencies of change and the political leadership of the underdeveloped nations, "

W, Ross Cockrill

No Easy HanesU Th* PiUmma of Agriculliirr m Underdrvrh'prd Countrirt **by M*x F-Millikan and David H»ptS*xhJ.**
Little, Brown *nd Company, Boston [178 *pX* SJ,7J.

The Rockefeller [Foundation Approach

CAMPAIGNS AGAINST HUNGER

by Skikman. Brsd&eld
und Mangelsdorf

(he **"campa^is**[1] of **the** tit It of this book axe the agricultural development programs carried out by the Rockefeller Foundation. The first of these, which began in Mexico in 1943, helped to raise the country's production of maize, wheat and beans — the three staples — by **3004** in 20 years. In the same period. Mexican population increased by 70%, but despite this Mexico changed from a ^rain-deficient country to one with a slight surplus for export. This astonishing achievement encouraged the Foundation to turn its attention to other countries, where it is siill hard ai work.

I la philosophy behind the Rockefeller Foundation's agricultural programs is to bring about increases in per-acre yields b> carrying out research, and by then exploiting the results of the research through education ami extension. Their research is, at all times, practical and has some outstanding achievements to its credit, particularly in terms of plant breeding. The development of high-yielding. dLscase-rcsistant crop varieties was the key to Mexican success and Mexican dwarf wheais. developed with the help of the Foundation, arc now also giving excellent **ttaultl** in many other countries.

Rockefeller Foundation scientists have produced. ;ind still are producing, Spectacular results. For L-vim pie. there are new rice varieties {developed at ihc join! Rockcfellcr/Ford Foundation I menial ion-*xl Rice* Rest-arch *itMiHtic in the Philip-*piiRsi which can yield 8-10 tons per hectare, instead uf ihe Asian average of J-2 tons, and milk'ts ;md sorghums that yield **70-100%** more than the local Indian varieties from which they were bred.

These unassailable achievement* compel admiration, but obviously the results of research alone, without complementary education and extension, can do nothing to overcome a nation's food shortages. And one gets the impression (hat ihcM.[1] complementary aspects of the roundation's programs arc not yet gaiheiiog momentum within other countries U they did in Mexico, despite the fact that, for example, wheat yields in Colombia have been doubled since 1950.

The authors are optimistic about extending the Mexican pattern to other parts nf the world, but perhaps they underesiimate the difficulties that **tie**-ahead, for they give insufficient credit to the very special circumstances that favored the Mexican program, tt must have been considerably helped, for example, by ihe simple factor of the country's geographies) proximity with the United States: to have such a technologically advanced next-door neighbor is bound to stimulate a country's interest in progress. Mexico was also unique in having completed its land reform and thrown wit ihc yokes of *lalifundia* and punitive share cropping — some of the greatest obstructions in the p-..!. JI "igi:->iltural progress.

Private institutions, such as the Rockefeller Foundation, do have a trump card in their hands: they can involve themselves in aid programs purely on a basis of where they think they can accomplish something, and they are less bound by peripheral interests to continue the program if it is not going well.

The Rockefeller Foundation's successes to date are ubly described by the authors, the Three Ancients* of the Foundation's agricultural development programs (their long association goes hack to 1441 when they went to Mexico to assess how the Foundation should apply its efforts lo agricultural development there). The story they tell might have benefited by a greater lightness of touch, and the writing is often self-conscious: une occasionally get* the impression that the scientist authors were striving f$_{or}$ literary **bap**act, and they have, as a result, developed Mime stylistic mannerism!, thai W o m e irritating. These are small points, howfftcr. *and, <n<TdU. the* o w l is immensely informative — a musi for anyone seriously interested in agricultural development.

Colin Fraser

***Campaitnx* ^jpiion *Huitxff,* by Slakrnan, Bridfirki anil Minjclsdorf.**
Rclknap Prc^ uf Harvard University. I » 7 (12K jvj, $7.50.

NEXT: FRESHWATER FISH

Two reference bimks ti\ S.L>. CcffcMf Jnd U.K. R kker

With our oceans reaching near-capacity for fis»h production, the mrn to Ircshwaier fish is inevitable, and there seem to be good prospects for iocreaiing the catch.

The International Biological program (IBPJ Sectional Committee on Productivity of Freshwater Communities (PF) is attempting 10 provide the stimulus and ac! as a focal poipr iiA-n.'Vvig the needed research. The challenge to meet huniiin needs for food is a strung one and must be mei immediately.

Two recent complementary volumes on freshwater iisii production, published as a result of IBP initiative, should prove exceedingly valuable to fishery officers, especially in developing countries.

They arc the result of a technical meeting sponsored by the JBP Committee and held at Reading University, kngiawi, in 1%6- The meeting was divided into two parts: a symposium nhkh produced the volume *Hutloiiitai Bam of* ***Prtsh*** *Water* ***Pith*** *Produittun,* and u vnvking party which compiled IBP Handbook **Ho.** 3, *Methods for Assessment of Fish Production in* ***Fatah*** *Water.*

The symposium, consul ing of 21 papers by imited contributors, was divided into five categories: (1) vital statistics of populations. (2) relations of fish population.", k) the food supply, (3) competition and behavior, <4| prcduljon and exploitation by man. and (5) the contribution of freshwater iish production to human nutrition and well-being.

The first category deals with various subjects which enter directly into the calculation of production, such ai recruitment, growth. **MTviwal** and population abundance. The next three categories are **MOOBdary** in the **MOM** th.it they represent a variety of factors tending to Li nil one i>r more of these basic **RIM** su.emeuis. I he last category is a look at the contribution which ficshwaicr frih pro lucliun is making to human nutrition „d well-being and at what the prospects **are for future improvement.**

The papers present an excellent review of uV current status of knowledge in the **U«ai covered** and suggest profitable lints Mf future l'IBWITrJ they also provide a kk.kground of information for the meth**odoJofS** given in the handhtiok.

The hantlbuok contains 13 chapter dealing *uh: **captws;** sumnlingandtxam**btatfao** of fishes; identificatinn; marking ^nd tagging; age and growth; estimation of population number and mortalitj rates; eggs and earl) lile history; prixJuc* lion; food analysis and **WtM ol** digestion; JS[imaiion of food cctnsumption; causcst of mortality: appraisal or a fishery: and the **upGdVKBUJ** approach. A useful appendix gives a list of symbols and scientific fish names used in the text. Tables of equivalent value* and exponentials from e--[1] to *eP* are also included.

It is to be emphasized that the methods described aTc *recommended* for the purposes of IBP work, but arc not universally ***agntd****

Methods, of course, change and must Change with further investigation and accumulation of daia and experience and are thus not to be considered sacrosanct. Nonetheless those presented can be recommended • a starting point.

Both books should become a standard addition to ail fisheries **Hbl'Wha,** and most ludmduaJ worker, will **tin** wish to ha\e their own copy.

As • part of HAO'S contribution to the I HP it is undertaking the translation (if the handbook into French and Spanish. It is not known *ai* this lime when the translations will be completed and published. Meantime, perhaps. libraries in the French- und Spanish-speaking countries might consider acquisition of the English version lo insist their workers pending tramktion.

W.C. Beckman

The Biolitficai Bath t>l FrnHwatrr Fhh l'n>-durliitn. **edited by Shclbv I) dcrkinj:** ***»t,d Mfihji.Jf for Auesiment i'f Fhh Production in Frr\h Waim,*** **JBP HindhwjL No, J, e*lj(ol hy W.E. Ricker. Blackwell** Stwniirk **Pubtkition*** *<fw* the **Inter** national ijln«K»! Pn^ramt. OiforJ and Edinburgh, 1967 (W p.), 105s., and 1968 (313 p.). 41*.. re%pcttively.

International Agricultural Institutions

A h;indbuok
In .Inn and A most Taulier

The two authors set **ttansetvts** a task that has only rarely been tackled. Their **book,** translated from Czech into German, is the only up-to-date handbook giving an overall view of international agricultural institutions. The last work **OOaeetad** :ilong !he same Jincs was pubiisticd in F-rcnch in 1^51. The fact that this handbook has been published in German will certainty limit the number of readers, but attention should be drawrt lo it because of its unique nature.

The handbook combines information and analysis. The authors evaluate the major guidelines of international collaboration in chapters on: the origin **tod** development of the first international agricultural intergovernmental summit organi/aliurts; and, international institutions dealing with general agricultural p ruble ms,

[heir unaKsis. **COVHI** the work of FAO, the International H-tler-nion of Agricultural Producers and the European Confederation of Agriculture, as well ,is the part played in agricultural mailers by international organizations such as the United Nations, otcn and Comccon. It' also **loot)** at solutions to agricultural problems offered by the European Economic Community.

Following ihis group of *21* general institutions, the book reviews 159 spe-ei;ili/ed international intergovernmental and nongovernmental instilutk>os. They .ire grouped according to JWkis of ac-*HMty.* Their program of work is outlined* and other aspects arc mentioned, such M their **offlcU** purpose, their competence, compoitikm ot membership and coopefiliou (or **eonwlMlM** status) with other international institutions.

O\hcT tacts tmcitd imclmlc mcmr«T-

ship tees, period kill publications, dale of foundation or reorganization and similar information which helps the reader to place each institution in perspective.

An effectivcJy compiled index enables each institution to be quickly located by means of four different enws refcrcnuts.

While granting ihat works of [his kind are rare, I should like lo complete the documentation listed at the end of the volume by adding the three tyaoptic works offering an overall analysts of international agricultural institutions which, to my knowledge, appeared prior to this handbook: *L'orgenbtttiaH internatiortalv (Ift'aitricttbur?,* by F. Houillicr (Paris, 1935-K *Vade-mecunyjics principals organisations intrnnitidpatvs* by Andre" L. Gcisendorf (Vol. 5 of the publkiitiun of the European Confedcration uf Agriculture, llrugg, 1951) and *L?.i institutions de la cooperation imtrmnkmaic dam la domains de Vagricuiiure,* by (he author of I his review, published in German (Win-Icrthur, I960-

The first mill third of these studies do not claim to be complete and are largely economic analyses of the activities of various institutions. The second work deals with about 100 internaliortal institutions and is in ihe category of handbooks.

The main difficulty in compiling Midi a work, as the authors point out in their foreword, is in gathering together the vast amount of data and keeping it up to date. It would be dt!sir;ible. precisely for this reason, for a limited circle of researchers to cooperate in a subsequent edition under the sponsorship of un international organLcation or foundation.

Marcel 6. L'Hpiatttniet

k. *iiiiiulbiuh fat iitternaiumeleu landwirtschaftlit hfn hiuiluiitmrn,* **by ArnoM and Jan Tjiubct. Imtito)** fur **tondwirttcluiftHdM tafonntioa nod** Dokumentatio**ri, Berlin 12-48** *p.).*

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Index - 1963-1966,

ceres

Ceres was adopted as the name of *this.* review because of its close association with agriculture, particularly the growing of food crops. *Ceres,* the Roman version of I he Greek goddess De meter, has its equivalent irt most languages just as *Ceres* herself, symbol of agriculture and representing mother earth, has her cqui- • iilcnt in most culture.

A terracotta of the goddess and her daughter whtc/i was made in Corinth about 620 BC

fly the beginning of the Roman Republic, Sicily was known as the center Of [he worship of both *Ceres* and her daughter Persephone. *Cere*J herself was ihcn considered as the most ancicni and venerable of all the gods and goddesses. During the famine which ihc Romans suffered after the expulsion of the Tarqum monarch*., the dictator Tulio Postumio consulted the Sibylline books which advised that the worship of *Ceres* should be established in Rome. A temple to *Ceres* was therefore buill in 493 B.C. on ihc Aventine hill (near (he present site of FAO). *Ceres* was then regarded as the goddess of food grains and patroness of the corn trade,

Ceres also adopted Triptolemus. the son of Ccleus, and initiated him in the arts of **(nicdkaic.** He became identified as the deity of agricultural **cnJtl,** :<iul in some legends is nanted as the inventor of the plow.

The attributes of ***Cere**** are chicRj connected with her position as goddess i>(agriculture and vegetation; ears of corn, the poppy, the mystic basket fkalalhos) filled with flowers, corn and ***tnkl*** of all kinds, Ihc pomegranate being especially common. As the earth goddess sk- is often associated with ihc snake, mynle. asphodel and narcissus.

Letter to the Reader

The debate on the present development decade and on the future world plan, hunched in our previous issue, is now in full swing. With this number, Processor Singer enters the fray: is the growth percentage of the ***gross*** *national product the proper criterion for evaluating a country's progress?* ***Which*** *is the more suitable level for planning economic growth — at the nation-state or at the global level? These questions dealt with by Dr. Singer vise whenever development, the basic theme of our half-century, is discussed.*

*The most serious danger lying in wait for us is to abandon ourselves solely to a sense of justice. It has become commonplace by now to ftale that the gup "<:«.<;! ruh and poor countries is widening, that the ruing birth-rate keeps down the standard of living and that then u an evident disproportion between effort expended **n development* ***and*** *ttz<'ffeatveness. We despair, without letup, at* ***ike*** **ir/JbAnrtr** *of* ***men*** *and of nations, we bemoan ietoei an* ***cooperation and onton*** *motivated by narrow poltltiJ, nin\tdr-rtitum* Hi *itish out al the international manager* of 'Operation Development' because of their lack of boldness, their flight-salaried .\iaff and their petty jealousy over selfish prerogatives. All this disturbs our sense of justice and forces us to admit that, even if results are achieved here and here, they art minuscule compared with the enormous imbalances that continue to plague us.*

But while we are paying our tithe to a tense of justice, we are ignoring that of reality,

This leads us to one of the main points in our dialogue OH *at'thai development planning: the fact, the reality of nation states, in preparing a world plan, one has to reckon with facts, such as these: Mauritius — the* ***yemmmmt*** *ituh pendent state, and the latest to join the United Nations family, with some 800.000 inhabitants living over an area of t .600 square kilometers; the Soviet Union, one of the founders of she U.N. wth 2.W million people spread over 22 milli'tn square kilometer* i; *annual per input income* in *38 dollars in Malawi and 2.W3 dollars in the United States,*

These facts, however ***weM known,*** *are not only* ***fagf/np*** *phic, demographic and economic: historically, they are also jot-tors of national sovereignty. Sovereignty* it ***not*** *quantifiable; it* ***h*** *the most propitious framework for thnamicgrowth and development.*

Yet it would he proof of short-sightedness if we mopped here. Development, today, cannot he envisaged within the framework of a single country The process i.i *m,Ul,hh- marked with the need for national interdependence; and thn involves voluntary limitation of sovereignty for all nation Mates, both large and smalt. Those countries which luivt* **CQMM** *of age. and have Hied and enjoyed their sovereign!y to the* ***full,*** *are obviously more inclined u> grasp* **Cttti** ***nud*** *than the new countries which tire jealous of their recent* ***mwfy-fommd*** *identity. Thus, we face the need to work out a global plan which marries principle of* ***tovetviptty that*** *iun* ***dombtaud*** *tlu /«Lif two centuries with ihc need tor u>tt>t,ianh hrnttin* ihut ^vereigmy. Each of thent two* ***pobOs-of-rir*****,** *euth ol th,* ***two*** *facets* **earrfej** *a* ***pattih*****.** *d^namu charge To fmd the pomt of ,uncture, to expUm the adwntagri* ***ofmi*** *b\ each of them —* ***this,*** *m our opinion, ment, a htgh place amongst our prtortnes in working out a flan for* ***tomorrow*** **A. R.m**

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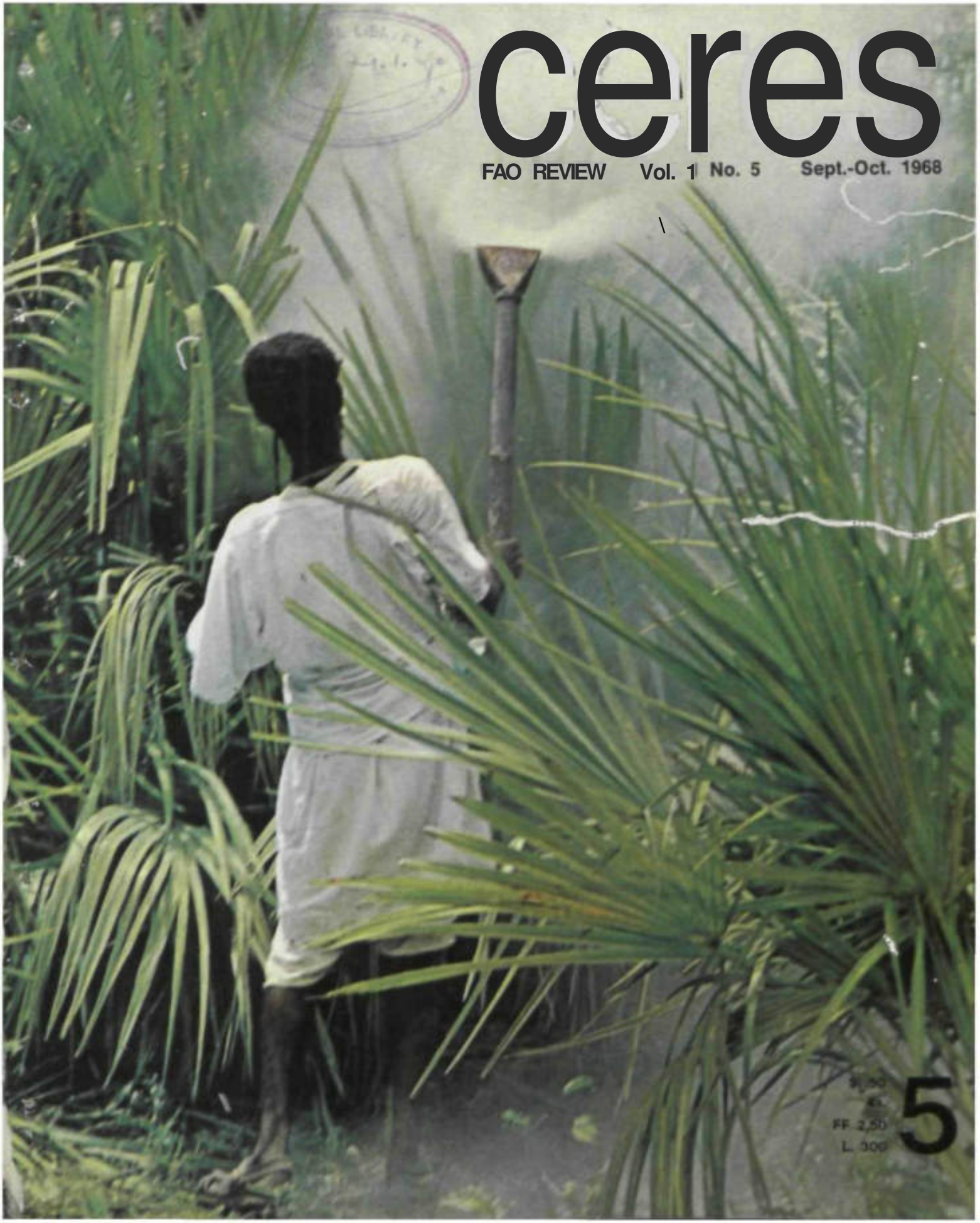

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The desert locust deviated Moroccan orchards in 1957. But the locust has no regard for rational boundaries and it created equa/. *or greater, havoc in every ccjntry from the Atlantic to the Indian* Ocean- *Finally it disappeared, but ",", 1968 it reappeared once more, likB the phoenix, Nearly 40 countties^pre involved in* a *Hfe-and-dQBth struggle to track down and control this new plague. See the article by* Stanley Baron *on page 32 and the photographic essay by* Tsd Pa sea *and* Gianni Tortoli on *page* 38*

N. W. Pirie

Having one's fset on *the ground is a touchstone ol west&tn civilization and ol those countries who wish tc present a similar image to the world. More soecificaliy, in the field ot research,* Dr. N.W. Pirie, a *biochemist, talks to planners, economists and other specialists (page 26} telling them that the need of the developing countries is for simple, practical solutions which are immediately usable*

Ester Boserup

It is not always the most spectacular eflorts which are *the most useful. In improving transport and communication facilities, the roads themselves can signify* new *beginnings tor communities which have been isolated for centuries.* Peyton Johnson *went up into the Peruvian Andes {page 22) and talked to villagers who were moved* lo fears *by the new roads.*

Amlan Datta

Development is still a vast, chaotic movement about which one can *only hope that it moves two steps forward tor* one *step back. In many countries one cannot even predict whether the next [1]*rvest will be too much or too little; or if one is going to be faced with propie'rhs i*'. *tnr'"•-piles or of malnutrition. Again, the situation can change with startling rapidity. It now looks as though some countries which have been dependent on foreign aid will soon be able, through the use of improved techniques, to product surplus crops.* E«t*r Bowrup. *a-Danish economist (page 19}. poses ttte Question at surpluses to both* me *developed countries, who already sutler from this problem tnd to the developing countries who nave to* And *new markets tor ttrnr product*

John Stirling

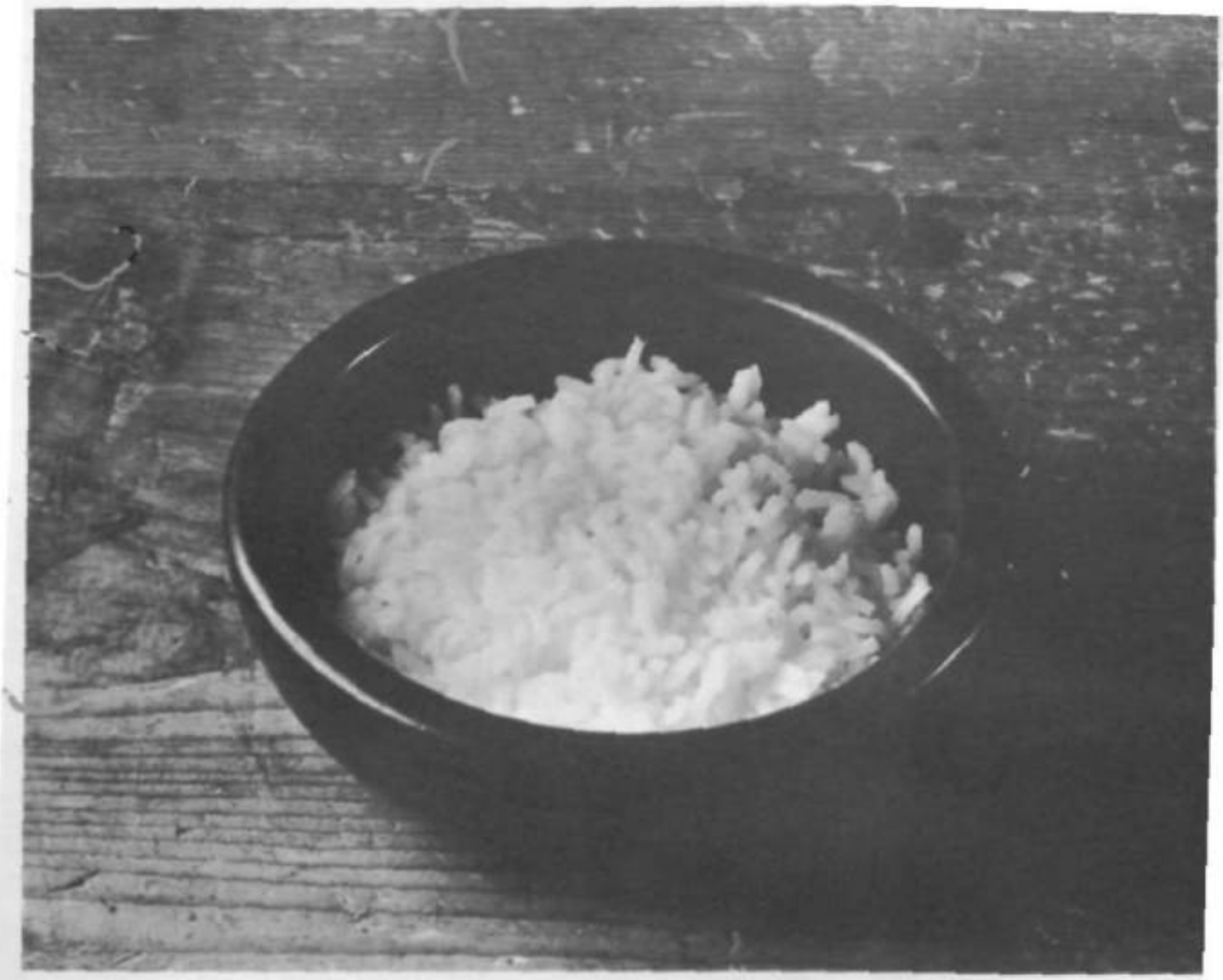
Solutions to such problems can onty com from organization on a World-Wide scale. A place has to be found to* both raw materials and manufactured products front the newtytndtpendent countrtes.* Am lan Oatta, an *Indian economist /page 41). thinks that this problem* must *be solved otherwise both halves ot the world wilt* suffer *m the long run.*

*One way ot avoiding the possible pile-up ot surpluses is to diversity- Thailand, which has !r»dition*lty depended upon nce-growing tor much ol its internal and external needs. »s now widening its agricultural base in case the growing self-sufficiency ot its present customers endangers the trade balance.* John Stirling *(page 431 reports on successful attempts ta change Thailand* agncutture*

P A Forthomme

Finally, if immense stocks ol agricultural raw materials become available without any immediate market why not have the auCiciiy to treat them for what they are: chemical building blocks. II one can *produce protein from* a *petroleum base why cannot new materials, new* energy sources *be* made *available Uom* fte/d craps, asks PA.Forthomme *(page 50).*

The claims ot agriculture are quite as strong, if not stronger, than industry when it comes to financial investment lor development. During the three years of its existence the joint FAO-Worid Bank programme has raised $320 million for 27 agricultural development projects. Alain Hvrvt *(page 29} describes the way in which this cooperative programme works in bridging a gap between two worlds: international finance and agriculture.*



There are many ways to get more food from earth. The simplest is to provide the crops with the right nutrients without useless waste.

Feeding tbe crop* i» *a*y: there arc kfti of good fenilurr brand* to chootc from. To avoid * a>te **is iMOCba ;••! : "f boois. Only a** comptct jran- **i fertilizer** tan **pUMJU** iJi^ In a *Scti,i)*ert, for instance, (he plain **nutrients finked** m a defi* rriic **cbemlct]** .sffutfurt' h> a modern *synthesis* give the Lpops i hi.' riphi **imod&l** of ftxxl at ihc right moment. T(IL' granular shape ***at*** **Setfdfcrtl** allows easy and even broadcasting and, at Ihc same time, avoids their hoiiiy MU'in away by wind or washed away by rain. Being more concentrated, they arc less bulky; this means IcsMn **transport,** storing and broadcasting **expen**ses. Even the package can be special: you may find Seifafen granules packed in waterproof plastic bags sn that, should it be necessary, *they* can be safely sinrcd ouidoors.

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A plague of desert locusts is upon us and some 40 countries are preparing to do battle (see pages 32-42). Here, an Ethiopian field worker, garbed like some Medieval warrior for the lists, sprays locust hoppers with insecticide (photo: Gianni Tortoli)

The Daily Bowl of Rice

Every second iwo babies are born.
One of them in a rice-eating country.
More mouths to feed rnean hunger.
It's **not** enough |ust to plant more acres.
Bigger and betler yields also claim for efficient pest control.
Between planting and harvest.

Ceigy's contribution to ratse the yields:
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LATIN AMERICA

• *Drought* in Chile. Ecuadur and Ponu*

The worst drought fn a century recently hit Chile according to President Frei By early August the drought had affected 6.5 million oeople (75% of the population) and losses to crops and livestock were estimated at 387 million.

Reserves of snow were down at least 10% and it is expected that lack of water .'.ill seriously affect industrial and agricultural users during the coming spring and summer. Rising unemployment is already reported from rural areas.

President Frei has announced that the national budget will be revised to cope with the new public needs The government opposition is now pressing for reduction of funds assigned to the land relorm programme to help meet these needs

The drought was reported by FAOs new MMy warning system a* soon u it came into operation m April of tN» yea' Tht naming sv**am. based upon monthly country reports, ha* *** n organize? to r»»p *pa«d up action when food inoftiflM occur — 44 countmi *v** ocwtrwi by tna sy*t**n and th« is ***P*M6* to ria» » 87 oountna* inertly

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Chile's President Frei

ing canals, drilling wells and performing similar work. The Chilean government has indicated that the United States AID programme will also provide food aid In a similar amount.

Severe drought has also affected southern Ecuador and northern Peru, according to *Foreign Agriculture* In Ecuador. President Gome^ has issued a declaration of emergency It is expected thai the country's rice, cotton and oilseeds crops will be reduced by 35%, 50% and 2S$/n respectively this year as a result of the drought In Peru, production of rice, coiton and sugarcane will also be down this year, by as much as 44%, 34% and 22% respectively, states the report.

• *Mammivo U.S. mid tor Cmntral Am&rica*

Th* Cemtal American Common Market was givan * substantial financial boost from the United Stata*. foltowtng Prevoeni Johnton't f«-c*nt vim to th* tiva itwmbtr countries Coat* Rica Moodura*. Nicaragua. Guatemala and El Salvador

During his talks with the *fnm* presidents, President Johnson said that: " There i* no mythical benefactor who wiH appear out of the mists to spread plenty Nor •s there any all-powerful deeper of the peace who can soive family quarrels or offset the problems Of prolonging them. " Despite this, he announced a $30 million loan to the Central American Fund for Economic Integration and a total of $35 million worth Of further loans 'd be distributed among the five countries.

• *Proposal to develop thm Rio da ta Plata*

Development of the vast and fertile basin of the Rio de la Plata and its subsidiaries, which was agreed to dt a meeting in May of the five countries concerned — Argentina. Bolivia Brazil. Paraguay and Uruguay — Is likely to be a slow affair, beset by political difficulties.

The meeting, in Santa Cruz, Bolivia, as reported in the *New York Times,* agreed to an econ om ic d ?"»I opm en \ plan embracing an area which will be populated by 200 million people by the end of this century H is reported that the plan calls for dams. Hood control and power projects on the Pitcomayo and Bermejo rivers: clearing and dredging of the Paraguay river to give Bolivia an outlet 10 the sea *a* hydroelectric project on the Satta Grande river in Uruguay: moderniza-

tion of port facilities in Buenos Aiies and Montevideo: and agricultural development of the Plata Basin. The multi-

UREA STRIPPING a new SNAM PROGETTI PROCESS

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million dollar plan is expiected to take at leasl three decades to complete.

The timetable agreed to at Santa Cruz called lor a lormal treaty to be signed by the five foreign ministers within 120 days and. two months later, the establishment of a regional organization to Carry out the programme Differences of opinion on the ways in which the project would be financed and carried out are likely to delay this schedule.

• *Literacy training during military mmrvloe*

A law has now been passed which makes it obligatory for all young male Brazilians to obtain a certificate ol literacy before being dismissed from military service. L iteracy schools are "being set up in the armed forces and any young person who is not (iterate at the end of the normal period of military service win have it prolonged for literacy training.

AFRICA

MClmCtriO **pdirfr,** *road; tohoolm and tna*

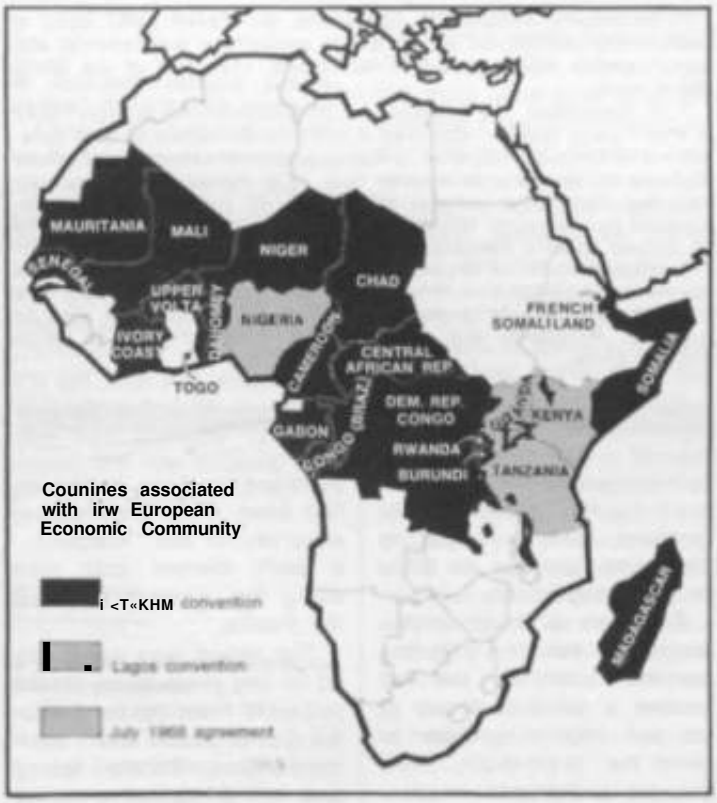
Four African countries — Ghana, Ivory Coast. Kenya and Sudan — are to benefit from a series of loans from the World Bank group totalling more than $37 million The loans are lor the devefopmeni of agriculture education, roads and eieclncai power.

A loan of $10 miiiron has been extended to Ghana by the International Development Association (IDA) to improve and expand tn« electrical power grid stemming from tf* Upper Voita complei

In the Sudan an **IDA** loan of $8.5 million has been offered to cover 50rV» of the costs of an improved schools system.

Some 26 000 small farmers should benefit from a ."? million IDA credil 1o help Kenya diversify its agricultural output and, in particular to develop tea-growing Some 37.500 acres have been set aside for tea production which should, eventually, produce some S11 million a year for Kenya. A further credil of nearly $11 million has also been granted io Kenya by IDA to part-finance Ihe construction of 300 miles of roads, ten new bridges and the planning of a further 300 miles of secondary roads.

A World Bank loan of *$5.8* million has been granted to the Ivory Coast to pay for the construction of a road link between the northeasi and Abidjan.



• *Agreomnnt on Aruaha Convention*

Ftepreaenutivw of Kenya. Tanzania and **Uganda** and of **iiwirfin eountnw** of me **European Common Mart*** — Belgium. Franc*. Italy. Luxembourg, NetP*rtandS and **Wnt** *Gmttnmny* — m*t together at Ihe end of July to sign the Arusha Convention This new extension of EEC'Atrican relations establishes preferential tarlfls among the various countries

The linal agreement comes after three years ol iniarmiltent negotiator'-. It forms a logical develop "nent from similar agreements now in force: the Yaounde Convention with 16 French-speaking African countries; and Ihe Lagos Convention with Nigeria.

These agreements provide for free entry of African products'into the European member countries in exchange for larifl concessions on a limited number of products from ihe EEC countries.

Mr. Ivan Majugo. the minister responsible for **EEC** relations and economic affairs of the East African Commun:ty. expressed his satisfaction m these terms: " I Ininfc that the signing of this important agreement will prov« to be a major step in th* development of the community.

Mr Kibaki, Kenya's Minister of Trade and Industry, sad ' I hope that the agreement will give us the opportunity to reverse thB direction in which trade has (lowed since 1963. Since then, the value of imports from the six EEC countries has doubled from S52 million to $110 million while the value of exports to the Common Market countries has decreased from $67 million to $52 million. "

• *The kilo contmm to Kenya*

Kenya. Uganda and Tanzania have decided to adopt the metric system. The decision was announced in July by Mr William Kaiema. Uganda's Minister of Trade and industry, and president of an *ad hoc* commission representing the three governments, in Uganda, next season's cotton crop will be weighed in kilograms and quintals

• *African bank* moot at Accra*

Twenty-live governors of African banks met together recently at Accra, Ghana, under the theme of economic cooperation. Participating were banks from west Africa including Ghana, Central Africa, Algeria, Libya, Madagascar. Mali. Morocco, Sudan and Tunisia

During the opening session General Ankrah, president of the Ghana National Liberation Council, said : T^p necess ty for close economic cooperation has never before been so evident m the history of the African continent. "

• *U.S. road and Chinmmm railway for Tanzania*

A first group of 150 technicians has arrived in Tanzania from Mainland China to start planning and construction of the Tan-Zam railway. The railway's main purpose will be to transport the output of Zambian copper mines io Tanzania and ihe coast The 1.000-mila iron link between Lusaka and the sea is being financed by Peking to Ihe tune of S?S million

At the same time, ihe Tanzaman government is negotiating with the United Stales for a loan of $13.6 million to construct an auioroute along the same strejeh.

The proposed communlca* tion links, lying parallel to

one another, are symbolical of the political viewpoint of Tanzaman president Julius Nyerere. who said m 1965: • We wish to be friends with everyone but will never permit our friends to choose our enemies for us."

ASIA

m $ 14 million loan for land mmttlvmmnt

Malaysia's first large-scale land settlement and development scheme is to be assisted by the World Bank to the tune Of $14 million

TheJengka Triangle covers some 300.000 acres of land **fefog** 120 miles northeast of Kuala Lumpur. Half of the land remains undeveloped and the programme f$ aimed at bringing this area into production while, at the same time, diversifying Malaysia's crop economy, increasing the country's foreign exchange earnings and using the pool of unemployed labour to carry oui the projecr

The World Bank loan will help to finance the first stage, to cost $23 million and to last four years The entire programme, to cost S116 million, is aimed at resettling 9,000 farm families on 93.000 acras ol oil palms ann Tubber, A forest products industry is also to be established, based upon 47.000 acres of permanent forest.

• *Scimntimtm nrnmdw* tor Amimn dmvmlopmttnt*

in 1965 there were 867,000 scientists and engineers m IB Asian countries serving some 1.000 million people: yet there were over 1 200.000 in the U.S. scientific manpower pool alone that year In Belgium there are three times 3$ many scientists and engineers as in Pakistan, which has ten times more people

These figures were reported to Unescos conference on the application of science and technology to the development of Asia, which was held in New Demi <n August This was ihe third regional conference of its Kind Africa and Latin America were covered by two previous conferences held in Lagos in 1964 and Santiago de Chile in 1965. respectively

Emphasis at these conferences has been on planning so that scientists are not trained at great cost only to go Out into a vacuum or down the ' brain-drain.' The present conference examined an Asian plan which calls for a six-fold increase in Asia's scientists and engineers by 1980. This would bring the region, in terms of the proportion of scientists and engineers in the total labour force, to the level achieved by western Europe and the Soviet Union in 1950.

Indonesia's Minister ot Agriculture. Mr Toyeb HelU looks at work being earned out **a I** *the Bogor agricultural otpenmentat station, together with Mr* **Robert** *McNamara pwaent of* **('s** *World Bank tnghh*

In SegtwntM It** infrntttonat* **0*»topm«nJ** *AtaooStrtn (IDA) a Worn} Bank* **| M M . Bffpwtf «** *etm&t ot* **J5 mrffrpo IB **p r*ft«- JVMf» IndDMMi tfnpaMVt *|MMM,** *at part Ot HHanaMomaJ* **effort!** *to* **&fuig** *tttm mconomy to an* **man** *kaat Ttm* **Har»W Tribwn*** *tmcantty reoottta tttmi m thm tan fmmt* **panod** *1X7-67* **indooMtM pnc*i** *increased or * ttntaattc* **T« ,MO* . I** *and that prices are still accelerating at around 40-50% annually.*

Indonesia's three largest and most important irrigation systems on Java will be the first to be rehabilitated while a completely new irrigation system now under construction on Sumatra will also be assisted: altogether, the total irrigated area amounts to some 500,000 acres.

OCEANIA

• *ftmvr ocmmm vttrrmmt tmmmat fm Pmoffto*

A subtropical counWrcurrent in lhe western Pacific that may be of economic importance to tuna fishermen has bean discovered during a survey of the " Kuroshio.' a Swift current that runs along the western edge of the Pacific.

The region was investigated for two years by seventeen ships (10 from Japan 6 from the Soviet Union and i from the United Stales) taking part in a co-operative survey sponsored by Unesco, Their observations showed ft curreni 100 miles wide. 300 metres deep and heading east at a speed of 1,3 to 2 knots, roughly along the Tropic of Cancer, running counter to the North Equatorial Current.

The couniercurrent could transport tuna juveniles, larvae and eggs into the central and easiem Pacific, and could be an added lactor to support the argument that tuna caught m various fishing grounds m the Pacific are related. If this were so tuna catches on one side of the Pacific would affect those on the other side

• *Private* **burning** ** *to* **spur** *devttloptnont*

A new organization — the Pacilic Basin Economic Cooparation Committee (PBECC} — has been formed, in the words of its covenant: " To help private enterprise cooperate with governments and internationa) institutions in overall economic development of the Pacific Basin. "

The organization, representing businessmen from Australia. Canada. Japan, New Zealand and the United States, has met three times in 1966 and plans its fourth meeting for next year. Shigeo Nagano, president of Fuji Iron and Steel Company Ltd., of Japan is tmj current prest-

Tht committee is looking fof opportunities of expandmg (rod*, ("vestment, tourism and cultural and scientific exchange among the membar countries and between them and the developing countries of the Pacific Basin. During the last meeting members discussed the repercussions of sterling devaluation and dollar defence measures, investment possibilities and the organizational aspects of a proposed joint private investment company

NEAR EAST

■ *Fertilizer plant for Sauti Armbi**

A $50 million 350.000 tons per year urea fertilizer plant *is* to be built at Dammam by SAFCO. the Saudi Arabian Fertilizer Company, The United States Expon-Import Bank has authorized a $12 million credit to help finance tha project.

SAFCO is pintiy owned by the Saudi Government's General Petroleum and Mineral Organization and by onvate Saudi investors Technical and marketing assistance will be available after stari-up from Occidental Petroleum's Subsidiary, the International Or« and Fertilizer Corporation

NORTH AMERICA

p *More* ***thmn $ 2,000 million rained***

The UN Development Programme has heJped to stimulate more than $2,000 million of public and private investment in the developing countries, according to the UNDP annual report. More than *AXflo* ot this was raised in the same low-in come countries where the money is now at work 10 promote progress in key sectors of the development drive.

By the end of 1967 the programme was helping 137 countries and territories to carry out 600 major pre-investment projects, as well as supporting 2,556 small-scale technical assistance operations The UNDP received Si&3 million in voluntary contrtbulions from 117 countries »n 1968 but the UN Secretary General. U Thant. has urged that the figure be increased to $350 million by 1970

• ***Grand mmmiim on mid gut* underway***

Lester Pearson, former Canadian Prime Minister, has been appointed to head an international commission which will look at the past

Canada's Ltsier Pearson

experience and future problems of economic development.

The appointment was recently announced by Robert McNamara new head of the World Bank, which is financing the project. The idea of a grand assize on past and **future** aid to the third world was first suggested by George Woods, Mr. McNamara's predecessor. Mr Pearson's small but select commision is lo report its findings sometime in 1969

In his reply to Mr. McNamara. Mr. Pearson said " I do not think it is possible to exaggerate the importance of this problem; or the danger to peace and stability of the world becoming increasingly divided into rich and Door developed and underdeveloped nations. "

• ***Indumtriatiiad*** **court-***tritrm'* **low** *birth rate*

During the last decade tn« birth rate in the United State* hat declined 28%, rod m Canada 30%. *Stmttv* declines •r* recorded in mm industrialized countries In t»7, the United State* txrth rat* was 25 p*r 1.000 while in the USSR **I was** 25 4 in **1967** the US rate had dropped to 17.9 while m 1966 the USSR rate had sunk to 18 2 In Japan, the rate dropped from 30 2 between 1945'49 to 13 7 in 1966

EUROPE

• ***Letter front Rontm*** **On *birth control***

The encyclical latter ol Pope Paul VI on the regulation ot birth was made public from the Vatican at the end of July.

The Roman Catholic Church* position on birth control ?« obviously ot great importance m relation to the demographic problems of *at* vaiopment within the third world.

Reproduced **below are two** key **paragraphs of the** ong»-nal te*i dealing with the point of view which is opposed to birth control and il the Church's position on birth control itself (in the • Opinion ' section of this issue we are also publishing a selection ol pro and *con* **viewpoints ot' the Pope's statement):**

" Fear is shown by many that world population is growing more rapidly than the available resources, with growing distress to many families and develdpmg countries, so that the temptation for authorities to counter this danger with radical measures is great. Moreover, working and lodging conditions, as well as increased exigencies both in the economic field and m that of education, often make the proper education of in elevated number ot children difficult today

" In conformity with mm landmarks in the human and Onstsan viston Ot marriage, We must once again declare that the direct interruption of the generative procata already begun, and. above all. *a.'ecVy* vriJJed end procured •twriion. even tf for therapeutic reasons are to be absolutely e> eluded as licit means ot regulating txnh

Equally to be excluded, as the TeacNng authority of the C lurch ha* frequently declared is direct sterilization, whether perpetual or temporary whether of the man or of the woman Similarly • «-eluded is every action which, either tn anticipation of the coniugai act. or tn its accomplishment or in the development of its natural consequences, proposes, whether as an end or as a means, to render procreation impossible. ,, "

• ***Norway incram*** mid to third world***

Norway is the second country to announce an >n-crease in its contribution to **the replenishment of the International Development Association (I DAI resources Norway * COrtlr*0uliOn now totals the equrvaienT ot 512 million bringing that country's** share of the proposed $' .200 million fund from O.89% to 1%. Sweden was the tirsl country to announce an increase in its original contribulion to IDA.

11 was recently announced in *Far East Trade and* DereJ-*opment* **that Norway is planning to considerably increase its flow of aid to the developing countries. The present budget appropriation of around £23 million might be increased three times by 1973, and a special Ministry for international Development Aid might be set up lo administer this amount.**

• ***Now taws to modor>nim Polish farm****

Three new laws were passed by the Polish Sejm (parliament! in 1968 which, when put into eflect. should increase output from Poland's private and stale farms

The first law provides for pensions and other compensations tor farmers 60 years ot ape or oWer who voluntarily transfer their (arms to quafrhetf private *farmers, or* to the stale

The second law states that farms which am neglectso". or where production is unaccepted low. can be put up for compulsory sale

The third law provides for ttw consolidation of small. scattered privately - owned farm plots into more rational farm units, and for the exchange of land between state and collective farmers and private owners

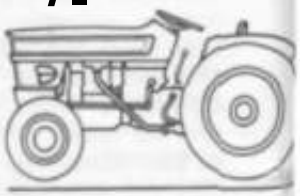
• ***Pmtrolaum-protmtn mtmttt for Scotland***

The second commercial factory to produce protein from petroleum has been announced by British Petroleum. The plant will be built at Grangamouth. Scotland, and wtll be on stream by 1970 It will differ from the plant now gmj*r construction *i Manigues-Lavera France. by using paraffin as the base rather than petroleum oil

The idea of oroducsng proiem from petro^^n was first mooied in 1959 and became actuality m 1963 with the startup of several pilot plants For the moment, commercial production is limited to producing protein lor •animal, rather than human, consumption

Fiat´s new farm

Out of 31 models you´ll find the one you want «/.



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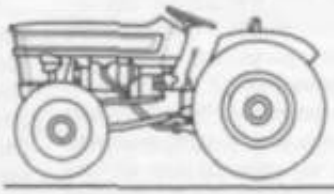

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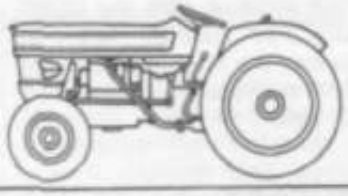

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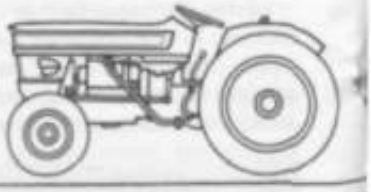

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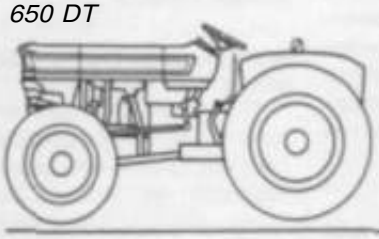

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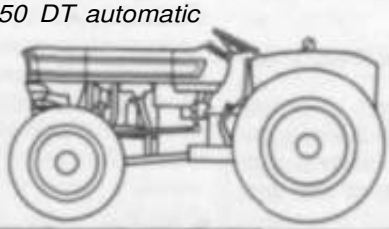

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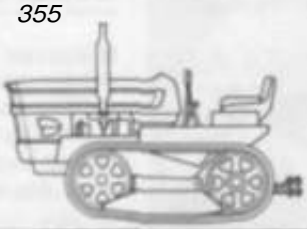

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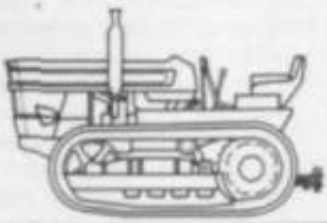

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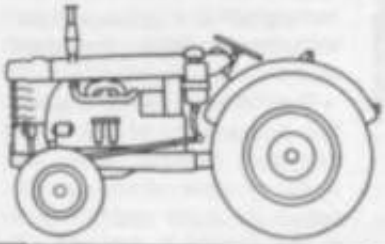

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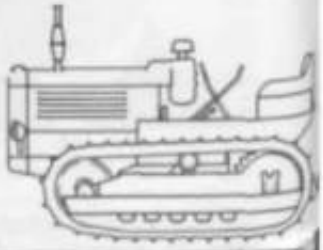

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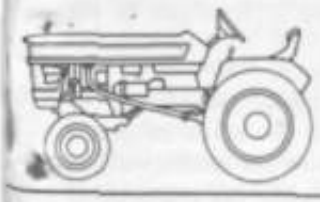

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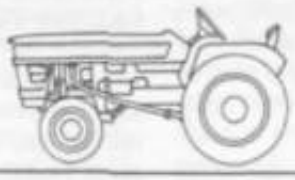

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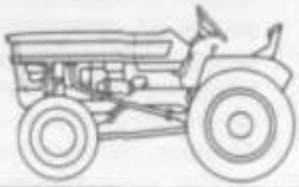

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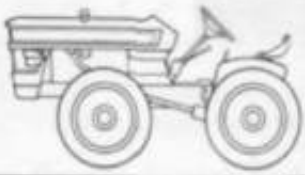

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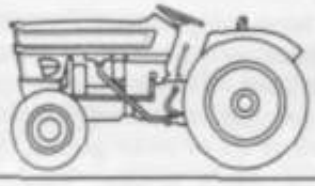

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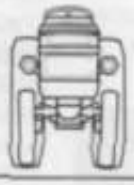

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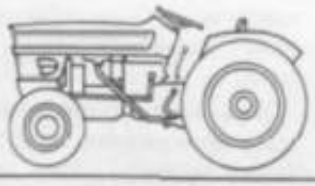

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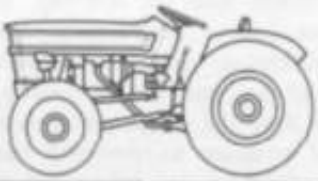

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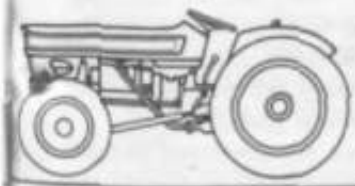

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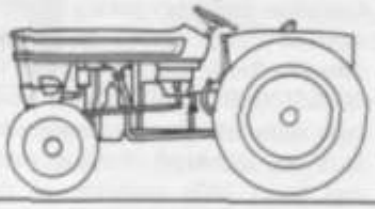

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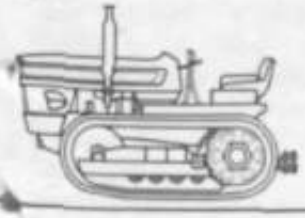

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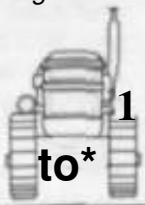

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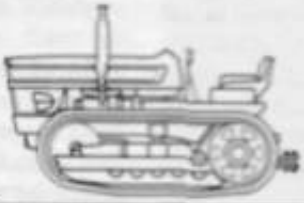

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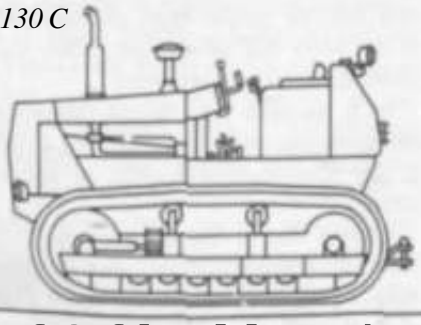

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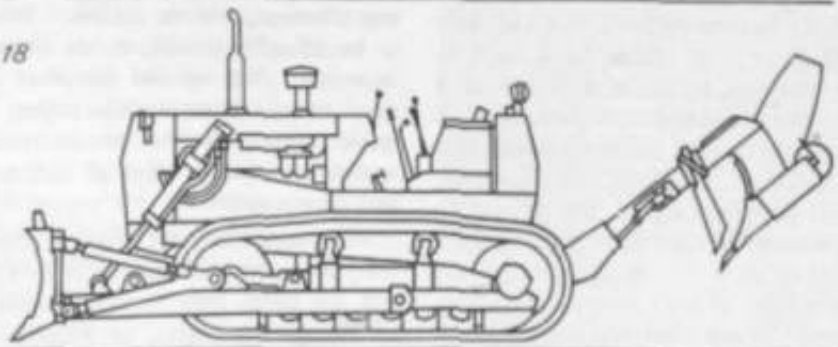


f3finV7 *the largest wheeled*
+ l?-and crawler tractor
xratton manufacturer in continental Europe.

opinion

tied aid or not?

From an address by Pierre Trudeau, /'rime Minister vf Canada.

. . .Never before in history has the disparity between the rich and the poor, the to m fort a hie and the starving, been so extreme; never before have mass communicalions so vividly informed the sufferers of the extent of their misery, never before have the privileged societies possessed weapons so powerful that (heir cm ploy men i in the defence nf privilege would destroy the haves and the h.iw-nots indiscriminately- We are faced with an overwhelming challenge. In meeting it. the world must *be* our constituency .

Any discussion of development assistance tends to lead eventually to a complex of issues which can convenient!} he grouped under the word 'strings'. The very mention of this word prompts cries of foul from those whose interest in aid programmes is essentially philanthropic **•tat** it suggests Machiavellian political motivation on the part of the donor, I IK-**litlMttau.** as with any problem which has defied final solution over (he years, is very complicated...

We all fee) instinctively that our help should go to those in the direst need, to those who will make the best use ol it and *to* those making an honest effort to promote democratic institutions and personal liberties. Beyond this, however, difficult questions arise. Should aid be given unconditionally or should it be dependent on some concept of performance? For example, if land reform or tax revision are, in our view, necessary for economic or social development in (he recipient country, should this firing be attached to our aid.' More difficult, perhaps, in domestic terms a(least, is the problem of Canadian conlcnt. It is widely held that tied aid diminishes the real value of development assistance by increasing LIWLS. Yet an element of tving, with the immediate benefit it implies for Canadian production, may be an important factor 'in assuring wide domestic >uppo« for the .iid programme...

The long-range benefits cannot be overemphasized. As **CMWAMM we mot** realize that international cooperation, particularly in the field of economic assistance, in order lo remain effective must take on a new form. From the present pattern of commodity and food assistance, of gift of manufactured goods and km of money, we must, in response to the economic needs of the developing countries, turn more and more *to* preferential trade arrangements. The two United Nations conferences on trade and development have made clear that economic aid, in order to be effective, must increasingly lake the form of trade...

This kind of aid, these preferential trade arrangements, have no glamour attached to them. They cannot be illus-**trmd** by stirring photographs of rugged Canadian engineers posing before massive dam& in remote places This kind of aid doesn't offer a ready market to Canadian manufacturers, nor does it reduce our **IWo** metal or other commodity surpluses. In short, this kind of aid is competition, ;md bears little evidence of the **NMI** philanthropy which we have sometimes employed in the past to coat the cost of our aid ' pi)| *, Unless Canadians Arc aware of the vital goal our aid is seeking to achieve, they may not be sympathetic to a change of this sort. It is my opinion ih.ii **rmritillli** will understand, and will accept the challenge. Economic aid. unless effective, wilt be useless. In order to be effective it will, in all likelihood, be costly. Ycl we and the other developed nations have no alternative. The world cannot continue to accommodate mutually exclusive **trioci** of rich nations arid poor nations.

We must recognize that, in the long run. ihe overwhelming threat to Canada will not come from foreign investments. or foreign ideologies, or even — with good fortune — foreign nuclear weapon*. It will come instead from ihe Iwo thirds of the peopJc* of the world who arc Mcadily falling fan her and farther behind in their search for a decent standard of living. This is the meaning of the revolution of rising expectations. I repeat, this problem is not new. But its very size, involving some two and a half billion people, makes it qualitatively different from what it has been in the past...

aid or take-over?

From on article by L K> Cydsi in the Ghanaian Times.

.. .In the first place, considering the abject poverty and the needs of developing countries, we do not receive enough aid to enable us to make any encouraging dent in the ihick wall of poverty that surrounds us...

Secondly, considering our poverty once again, the period of repayment of loans is often too short. Worse, short-term loans cany too high an interest, sometimes as much as six or seven percent. ..

Thirdly, the donor nations, whether east or west, give loans generally on **tVO** iii.iii] conditions: \Lr.. that the receiving country use the loan to import goods needed from the donur nation only, or use the loan to carry out projects agreed on before the loan is given. . .

Naturally, when the developed nations give loans or invest in a developing country they look for political stability nd even more important, a " friendly " policy. A " friendly " policy is, of course, • policy that suits the donor country. It is in the interest of the donor country to sec JO it that the receiving **count!}** remains friendly. If the receiving country tries to be hostile it may be abandoned as m>t worth saving, or it may be brought into line by gentle hints of displeasure. If the hints fail to regisicr, other harder methods may be employed.

In a nutshell, this virtual take-over of the government of ihe receiving country, is the phenomenon known at nco-colonialism...

Unles* the developed nations tear off ihe veil of hypocrisy Mid give us genuine help we must te perm in cd some cxpres-lion of cynicism and indifference towards protestations o(friendship The rich and poor belong *w* loo different a plane \o be true friends.

computers and credit cards

From an interview with Chow Kwanynn. nttmtn>iiti! director of the Thai Oil Rrfinay, in the Bangkok Post.

, . .To transform Thai agriculture, education and credit must be brought to 42,000 villages across the country. A **pCOgnuDBV** reaching this many pewple in *a* short time **mquim** PBWdotkH«IJ approaches to Ixnh education and credit. . .

haeh J W, thousands of draftees compluli: their two years of military service. O\er K()<r of them return to their home \illaj!L-s to **begjc** f.irmini! again. Yet they **DSed** not rL-\t:rl to traditional farming techniques. Soldier could learn better farming incihods in an intensive agricultuml training programme Selected trainees could rtcelu' prsetkal instruction in agronomy and farm management at training centres particularl) suited ro ihe farming cimdiiions of iheir local areas

Such a programme **OMId** irain as many as I(),(K)t) soldiers each year, (n less than a decade, udl-trained farmers could seed widespread agricultural chiinge in every village in Thailand. . .

I o stimulate agricultural change, a cred-]i ***tytttm*** must be linked to agricultural education, Farmers who learn ;ibou< new techniques are most apt to adopt them if they have cheap credit nuiilahle. . .

A military credit card programme would meet all of ihcsc needs. Credit cards for the purchase of agricultural farm inputs could he issued to soldiers receiving intensive agricultural training. These cards would put cheap buyer's credit in the hands of trainees, encouraging (hem to use new know-huw on their farms...

Computers must ploy a vital role in the proposed **cmtt** system. **To** provide abundant, low-cusl credit, one musl overcome LIJ in mist niiivc difficulties of directing farmers" credit and devising ways of reducing the risks for lenders, Computers ciui liL-lp jo overcome hoih types of I difficulty; without them the cosis o(M-! tending credit to farmers on I widespread basis would he prohibitiu-

pro and con the encyclical

• **From** Vision.

It is not thought likely that Paul VI's recent encyclical *Humanae Vitae* will affect the birth control p[r]ogrammcs which, officially and unofficially, are being carried out in various Latin American cnuntrics. This belief is founded, among other things, <m the attitude taken by the advisory com mil tee **on** population and development of :hc Organization of American Stales, which brings together outstanding demographic experts of Ihe hemisphere.

The committee, meeting in Washington •*&i* the time when the Pope published his encyclical, rejected it completely and declared that the application of its premises and vetoes on birth control: " would result in greater affliction, misery, sickness and despair for millions of Latin Americans."

• *From a statement by Nicamor Costa Mendez, Argentine Minister of* ***Foreign*** *Affairs, in* Croissance ties Jeunes Nations.

Argentina has always expressed at intcrnational gatherings a point of view on birth control which is similar to that of the Church, now confirmed in the papal encyclical.

I believe, speaking personally, that our position is based on ihe fact that juridical or moral standards cannot alter the forces of nature, and that the demographic explosion is not one of the gravest dangers facing the world today. This is certainly true for our continent, particularly for Argentina.

• ***From*** Jeune Afrique.

I he scarcity of population in the countries of black Africa is being quoted by the Vatican to juslify the condemnation of birth control by Pope Paul VI in his encyclical *Hmimmtr Viiac* In spite of the opinion of sociologists and demographic experts that the use of contraceptive methods is necessary for the greater part of the third world countries, orthodox (aiholic specialists have objected on more **TOW** one occasion ih.n the general use «of birth control can only harm the musily underpopulated countries of black Africa 11 is **to** be hoped that ihc marked attention given on this occasion to Africa by Roman prelates will soon be extended 10 other fields.

• *From an interview with Philippe de Seynes, United Nations assistant* ***aecrttm*** *\ general for economic and social problems..*

" The United Nations js now engaged in a limited number of assistance projects undertaken at the request of certain governments anxious for more precise knowledge of their demographic problems with a view to undertaking birth control programmes. These activities have received considerable encour;igi!mL'n[**tad** some uoI t;tboralion from member countries. . . It is extremely difficult **for** me to calculate the effect which the new papal encyclical will have on the attitude of governments. It may be that the reconciliation of extreme positions which we thought we could discern will be slowed vip by it... I do not think, however, that our practical action programme can be reduced. . . "

poverty is the enemy

From **M** *article by Artttro Frondi:i, former President of Argentina, in* The Student.

. . .Those of us who Jive in the southern hemisphere, inhabited by two thirds of the world's population whose social level oscillates between absolute poverty and a degree of want that is just bearable, look on with astonishment at the youth of Europe and North America for whom welfare, the fruits of civilization, the feats of science and technology, constitute a threat to liberty of the spirit. For our young people of the so-called third world do not accept material well-being as being the enemy of the spirit. Their experience tells them, on the contrary, that it is poverty which is the enemy... They **refect** the notion that industrial and technological civilization will finish up by destroying man.

But those of us who arc living in the underdeveloped parts of the world are not indifferent to the unresl of the young people who arc criticizing (and sometimes using violence in doing so) the dehumanizing features of modern society... The young people of great nations have our sympathy when they struggle for racial equality, the raising of the workers' living standards, and peace among nations of all ideologies and all kind* pf political systems. They arc beginning to grasp the fact. too. that the greatest contradiction, the most notorious injustice plaguing the world today js the abysmal difference between the developed nations of the northern hemisphere and the underdeveloped countries south of the equator.

1967: a good year

World production of food rose by 3% in 1967 after two years of poor harvests In the developing regions hardhii by the reverses of 1965 and 1966. the overall increase was about 6°/».

FAO's annual report for 1968, *The State o! Food and Agriculture,* published in September, says the preliminary food production estimates compare with an average world population increase of 2.2%; individual national rates of population growth in developing couniries ranged as high as 3.6% More than half the losses suffered in food production per person In the developing countries m the two preceding years were recouped m 1967; it was **the** largest rise in these regions for many years.

The excellent production results in the developing regions in 1967 were to a large extent due to much belter weather than in the two previous years But other lactora also contributed. A number of development olans now place more emphasis on agriculture than in the past, while in some cases long-term investments in agricultural intr«tfuC!uf» UftdW «Vher plans *#• now beginning to fltve cortcf#t results.

The **Kvcffy onca* o< 1866** and **loOD mCfVBWv unnfrs** incentives »O produc* mon» In some countnw, ***wapmoatty*** in Asia f«Wtt«r UH h«i increased rapidly and high-yrelding varieties of cereals are beginning to be introduced on a large scale

LATIN AMERICA

Food production rose by about *&"ia* and total agricultural production by about 4<Vo in Latin America in 1967

Cereal production increased substantially, large increases in the production of wheat (especially in Argentina) and ot rice more than outweighing a define In maize production For most other major crops the preliminary data indicate only small changes in 1967.

FAR EAST

in the Far East, excluding China (Mainland), agricultural production increased by 6% In 1967, after making no progress in the two previous years. Much better weather was a main factor, but The high-yielding varieties of cereals, introduced on about 9*/o of the total cereals area in India and Pakistan and about 10% of the rice area in the Philippines, also contributed substantially. India's food-grain output In the 1967.68 crop season was expected io exceed 95 million tons, in comparison with 76 million tons in 1966/67 and 72 million long in 1965V66. Pakistan expects a food-grain output of about 24.0 million tons (21.7 million Ions in 1966/67)

Rice production increased by about 12% (in spile of declines in Indonesia. Malaysia. Thailand and the Republie of Viet-Nam), but was only about 3% more than the previous record ta 1964

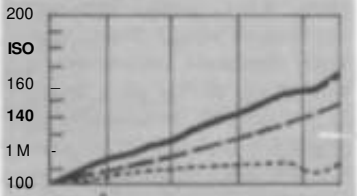
NEAR EAST

in contrast io n HrW developing regions, agricultural production * **tftt** Near East has continued **to** increase **thirty stBKfily** in rsc&nt years, and irt 1007 Ihtr# wu « fur-

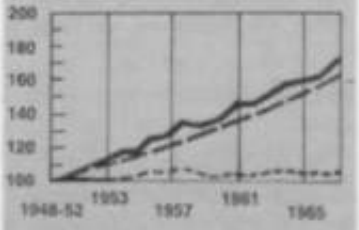
FOOd production and population ir the developing regions

^ ^ m ***food*** **Production**
^ — ^ ***Population***
— • • ***Pat caput*** Food Production

ALL DEVELOPING REGIONS



LATIN AMERICA



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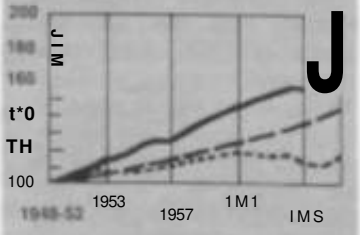

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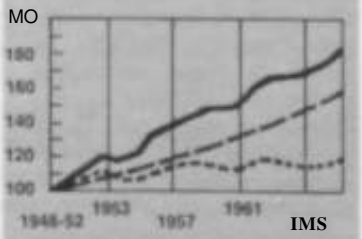
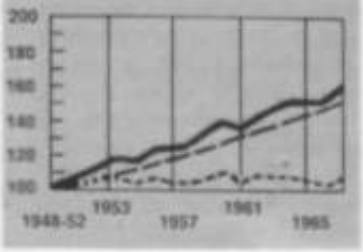


AFRICA



iher rtso Ol 4fl/o. The increase was entirely in food products, however, and (mainly because of the stagnation of cotton production) the output of nonfood products remained below the high Jevel of 1965.

Grain production increased sharply as a result of favourable weather almost throughout the region There were large crops of wheat and barley in Iran. Jordan Syrian Arab Republic and Turkey: in Turkey some 200,000 hectares (2°/t of the total wheat *area)* were under *Mexican* varieties of wheat. The United Arab Republic harvested a large crop of rice as a result of the greater availability of "irrigation water Rice production also increased considerably in Iraq, with some shift of area from barley as a result of higher rice prices, TJie region's cotton crop was about the same as in 1966,

AFRICA

The increase of 6% in agricultural production *in* Africa in 1967 was the first substantial expansion for two years.

Grain production recovered sharply from Ihe very low levels of 1966 The wheat crop was a record in South Africa, there was a good recovery in Algeria and Morocco, and good crops in Ethiopia and Kenya. South Africa harvested 9 9 million tons of maize in 1967 as compared with 5.1 million tons in 1966. and its sorghum crop nearly trebled The 30*A> increase in sugar production in 1966 was followed by only a moderate rise in 1967, largely because the Rhodesian crop was halved Groundnut production rose by 12°/i to a new record; m Senegal production was 50% above the drought-affected 1966 crop. and in South Africa Ihe crop was doubled, but in Nigeria there was a alight decline There were considerable reductions in the production of palm oil and palm kernels, mainly because of developments in Nigeria.

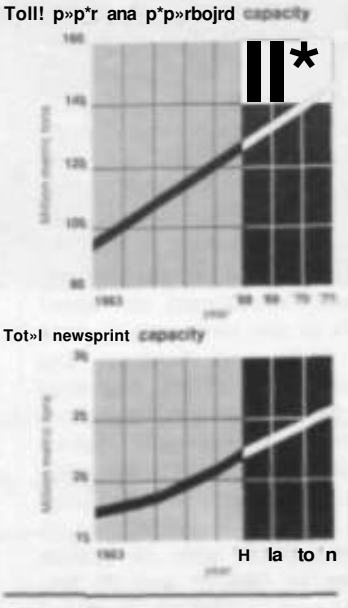
PULP AND PAPER

World capacity to manufacture pulp and paper now stands at 127.6 million metric tons of paper and paperboard and <096 million metric tons of pulp. This includes 22.2 million matrrc tons of newsprint.

These figures come from FAO s survey of world pulp and paper capacities for 1968-71. which is broken down into countries and categories *of manufacture.*

The estimates show that world capacity to manufacture

Growth of the world's paper manufacturing capacity



paper and paperboard has expanded by some 5.8% per year since 1963 and that it will grow at a slightly lower rate untjl it reaches 145.5 million tons in 1971. Total pulp-making capacity has expanded by 5,9% per year since 1963 and is expected to reach 122 1 million metric tons — also a slightly smaller growth rate — by 1971

Plant capacity to make newsprint was capable of producing 17.5 million tons •n 1963 and this is expected lo reach 25.1 million tons in 1971.

The FAO advuory committee on puJp and paper was recently told Ihai 3 surplus of capacity to make some major grades of pulp has had a depressing effect on investment in the less-advanced countries, and Ihat pulp manufacturers might extend their interests in making paper in these countries — as they have increasingly clone in Europe and North America — so that they become & market for their own pulp.

POLYPWOPYUNE

Hard fr&res *and* jute, important sources of export earnings for developing countries, are being threatened by a new cheap synthetic material, polypropylene, which may replace them on the world mar Kef

Two studies on the impact of polypropylene on these natural fibre* have fust been completed by FAO * Commodities and Trad* Diviston The twin reports, prepared *i the request of the FAO study groups dealing respectively witfi jut* and h«r<] fibre*, will be docuurt by these two bodies In lata 1968 and miaul to the public after revitton m tarty 19SQ

The studies show that m many developed countries synthetic* are already D"ce-competitive with jute m two of its main markets heavy-duty sacks and woven pnman cat pet-back ing. Synthetics are also well established m ihe markets for ropes and packing twine, major outlets for hard fibres — sisal, henequen and abaca. In addition to their price advantages, tapes made of polypropylene, and to a lesser extent high density polyethylene, are lighter but stronger than jute and hard fibres. In one particular market that of harvest twines, polypropylene does not appear to be competitive because of the tow prices of sisal and henequen twine

Prices of synthetics are expected to decline further in ihe future, because of cheaper raw mitertnl costs and improved manufacturing techniques. Unless corresponding reductions aie made in the prices of natural fibres, mere is likely to be further substitution of synthetics for natural products

ThB reports estimate that if natural fibres cannot compete with synthetics in the majority of developed countries the loss in potential sales may total about 650.000 metric tons of jute and £50,000 tons of hard fibres in 1975. At that date, demand from developed countries could be for only 150.000 tons of jute and 50 000 tons of hard fibres, compared with today's market ol over 600,000 tons of jute and about 400.000 tons of hard fibre*.

According to the studies there are indications that the trend toward synthetics is also taking place m some developing countries particularly in the case of heavy-duty sacks for commodity shipments

Synthetic competition with (ute and hard fibres is likely to haw* Mrtom effects on the iwHonei income and balance of payments of the mam fibre producing countries Paki*t*<v India and Thailand for jut*. Tanzania, Brazil Mexico the Philippi r*es. Kenya *nd Angola for hard fibres

BUTTER

World stocks ol butter reached 450,000 tons by the end of 1967. an increase of about 200,000 tons over the previous year This total is considered to be about 100,000 ions above the stock level regarded as "sufficient". The 1967 rise in stocks was mainly due to increases in the United States and France Some 230,000 tons are now located in European Economic Community countries. In September, the EEC Commission authorized member countries to sell some of this surplus at a loss

Tho fulure outlook is for increased butter production in 19BB and a persisting surplus

Surpluses in the third world # — who wants them ?

The developing countries have surplus disposal problems too — which will grow as new techniques are adopted. Outlets must be found, either in the developed countries or within the third world itself

by ESTER BQStRUP

Propaganda addressed to a broad audience is most etfee- live if it can avoid complicated issues and can stick to a small numt>cr of very simple ideas. One such simple idea is to explain rural poverty, malnutrition and famine in developing countries as the result of rural overpopulation.

This idea has been widely propagated as a means of obtaining popular support for birth control programmes and for programmes of food aid. But a public which has been taught to accept this explanation of rural misery is ill equipped to understand the needs of those developing countries which arc saddled with problems of surplus agricultural production for which they arc unable to find remunerative outlets. It is necessary to abandon such oversimplified ideas in public discussion of agricultural problems and in trying to explain why it is necessary not only to help the developing countries to produce more food, but also lo help them find outlets for food surpluses.

The first step towards a more complete view of the agricultural problems of developing countries than the simplistic identification of rural misery with rural overpopulation is lo distinguish two possible causes of rural poverty: one is low labour productivity which reflects the use of unsuitable farming iyuenw., primitive techniques,, and tack, of capital; the other, »n excessive number of people engaged in the cultivation of a given land area.

It is irue (hat the ruru! population in some developing counifies with a high population density suffers from chronic malnutrition, and that famines may occur in years of bad h*rv«t.

But these phenomena arc by no means restricted to the densely populated countries; they arc found in many developing countries which must be charattcri/ed ** underpopulated. In fact, droughts seem to he the most frequent cause of famine, and droughts <*k*> far more « r m u d t t U f e to harvests in underpopulated cwattne*. where only ranted bind is used for cultivation, t h n is countries where heavy population pressure has brought most of the *Wfhakiutl* lanJ under artificial irrigation. Thuy in ewes where popuUtvw pressure on land promotes the applKaUon *ot* artificial irri^tion « may serve to forestall famines rather than lo foster them.

This is not *to* deny that, in somt.[1] cases, population pressure can be identified as the chief cause of ihe lowncss of rural incomes in developing countries. Bui ii is important to remember that population pressure is a highly elusive concept. Its existence and degree cannot be gauged simply by A consideration of the raiiu (if rural population (o existing land resources, without regard to the pre\ailing agricultural system.

In a very sparsely populated country, the increase of populaiion may depress rural standards of living if the rural population is unwilling to give up the traditional system of shifting cultivation. But in other cases, when the increase of population density leads tu more extensive provision -ind use of irrigation faciliiies. the result of the demographic expansion may well be to raise per capita rural income. Anci since multi-cropping of irrigated land requires several times more labour than extensive dry farming of the same amount of land, even with an increase in populatkm there may still be a shortage of labour.

Thus, land improve menu, such as irrigation or ihc draining ot swamps, may chinjs a region i«Viich was hcSd to be ovcrpopulnied into a region of scarcity of labour. Indeed, in regions where major schemes for land improvement are under-

• **V vier ttotcnip Aoi *uniirrmirn many rc»m>mit analysts* in.iijlt«/rtir»tli *jor '*<• Vmifd Nation) and in affviei and was FAO ftatti-i"^rt of iht mini f-4t> tnup $_{mj_{ssum}}$ if, Spain in /WJ(M. Sht tt ike author o\ The CondriKjm of Agricultural Growth.**

[a lcon, decades may pass before the population has grown sufficiently, by natural increase and immigration, **to** ensure the proper use of all the improved land.

The basic cause of rural poverty in developing countries is low invcsiment in agriculture and **little** use of industrial and other purchased inputs per worker. This is tFue of densely as well as sparsely populated **countries,** ,ind it is (he main feature whkh distinguishes agriculture irt developing countries fmm that in industrialized countries. The gap in agricultural labour productivity and rural incomes as between developing and industrialized countries has become wider still in recent decades because the industrialized countries have increased the use of capital and of modern procedures at a rate which the developing countries have been unable **to** emulate

[11] ***Wtiete population pressure on land promotes*** **W»** ***application Ot artificial litigation it*** **may serve Jo** ***forestall taming '***

Many indust**ruined co—trki** — imotf them the United Slates, France and **the** NethertaiKb — **which** face the problem of disposing **of btmkfiaome rarphfi of** food, have reached their high level **el aarkwtmral** production by means of large public **inv«tmcflt* at land impiuvtaicni in** ihe past. Owing to the long **tine lag from the JtLhimi to** cwift major worts of this ktnd to the ttmc they come **into full** use. the fruits of these imeumcnii have often ripened **t* a time when •t was impossible la J&poae **of the nnVHrimil output 21** remunerative prices Man> developing **coyntrie* BOW** have large-scale schemes for **land tmpnwcacni in the oAof and** it is possible that some of **then** *miB* **ran iate ahaato** dMaculties in disposing of the increased output **in (hear hone — tali** Their access to export market* wi|] then **be rrwial)** important

Generally **speaking, the aim of agricyfcwai** policy in developing countries should not be seen as that *vi* **Datdfeg** increasing number-* "t subsistence prudu^ers. hut r.iiher ,i\ I hat of improving rural incomes by higher per capita output in agriculture I his implies that investment in land irnpnvement so as to create emplov mcni .md subsistence for increasing numbers of producers musi be supplemented b) investment in improved equipment, seeds, livestock, fertilizer. elc; i.e. by the type of investment which raises output not only per unit of land, but .tlso per worker.

If **a** developing country succeeds in such an investment policy, by i,s own financial efforts or by loans and grants from abroad, its farmers will produce an increasing surplus of agricultural products over and above their own needs, and outlets for this surplus must be fouid cither by sales to the urh;in sector or by exports.

Export outimt mpgmmily needed*

In many developing countries at a relatively advanced economic stage and with a fairly large urban sector, the disposal of a steadily growing marketable surplus of agricultural produce may create few problems and be a great help in improving urban living standards, or providing the food basis for an expansion of non-agricultural employment, and /or reducing food imports.

But in developing countries at the early stages of economic development, where the urhan sector is liny compared TO the large numbers of rural subsistence producers, U is impossible to find sufficient consumers in the country itself for a surplus large enough to permit a significant increase in rural incomes In such countries, average output and incomes of farmers cannot be improved significantly unless a large share of the additional agricultural output in exported.

Even those least developed countries which can provide ihc necessary foreign exchange for expansion of the urban sector by exports of minerals, forest products or services, need to sell increasing agricultural surpluses in export markets if the average output and income of the agricultural sector is to be improved, since the absorptive capacity for food in the urban sector is very limited, and since a rapid large-scale transfer of agriculturists to non-agricultural employment cannot be envisaged.

Thus, in the least developed countries, the hope of itnproving average rural incomes, and thus of reducing the incidence of rural malnutrition and famine, depends upon the development of exports of food and other agricultural products to other developing countries, or to industrialized countries.

*High-yielding vmrtmtfttm m*y m***mo* *****luses*

It is frequent l v staled in books on **economic** development that developing countries may be well advised 10 limit their efforts to expand agricultural exports and, instead, to speed up industrialization with a view to exporting manufacttires, This may be sound advice in the case of some economically adv iinccd developing countries where further expansion of agriculture would require heavy investment, but it is wholly irrelevant as a recommendation to developing countries at the early stage Of economic development, where a great majority of the population will (or a long time continue to be engaged in agricultural pursuits In the latter countries neither birth control nor food aid will **provide** the solution lo rural poverty- The on|v efficient assistance to the rural population in such countries is 10 help them produce larger marketable surpluses and to help them dispose of those surpluses .it a fair price.

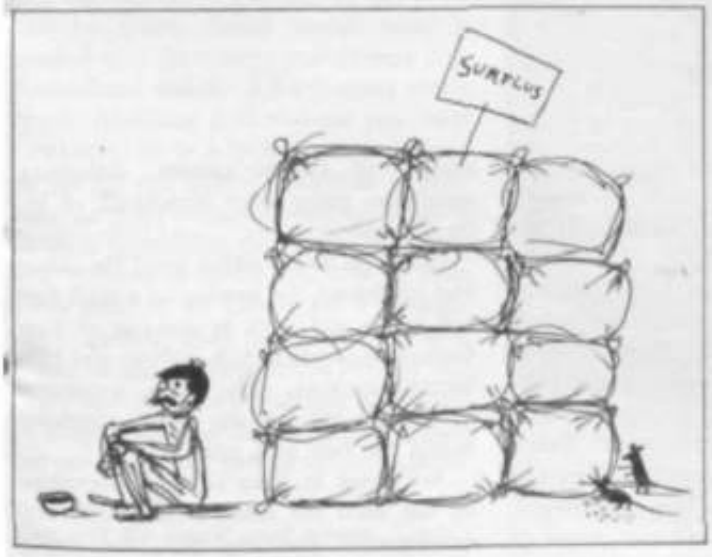
Recently, some important scjenhfii **improvement*!** no-labk lhe development of high-yield ing varieties, **of** whent a"0 • rice, have become available foi producers in developing CO"* (rict. In has thereby become possible with quite m^lt'n'"'

increases of inputs to achieve spectacular increases in output both per hectare and per worker. One probable result of ihis is thai in the near future many more of the poorest countries will develop surpluses which must be exported in competition with the surplus disposal-of industria1in;d countries.

Here, then, seems to be a problem that should be tackled fonhwiih at an international lewd with a view to finding politically acceptable solutions of an expansive kind. Otbetwfce, it is only too likely that solutions of a restrictive kind will be imposed when the problem becomes acute. It is Abo urgent that the public be informed about the true nature of agricultural problems of countries at different stages of development and with different degrees of population pressure. In other words, we must get rid of the oversimplified picture of the ovcrpopulaied poor world depending on the food surpluses of the rich countries.

We have now made a distinction between one group of countries, which must misc production in order to get food enough for domestic consumption, and another group of countries, where the income df 'he rural population mu^i bo raised by the production of food and niiur B$iOU&t&>] ^oods for export. Bui this, is onry tile fint *icp lowwd* a better understanding of the africahml pmbtew *vt* developing eauntrics. A further important dirt iart ion mu« be nude hcTween countries which hwt temporary mn***n *at* food in yean of good harvest, but arc dependent upon food onporu in other years, and thtnc countries »hkh n<HTnaUy produce surpluses. This distinction i* important hctatrtc the two tvpes of surpluses call lor different kinds of posi

Just now. in 1968. the problems of a temporary surplus arc highlighted by events in India. From one year to .mother that country moved from near-famine conditions in certain



*** *It* « neewjary *not only to ttolp the oavelofimg country to produce* more fOM, *but alto to tiwip* lh«m ro *tint outlet* tor food tut pluses.***

areas to being a surplus producer. I his is «* solely the result *ot* dimwit condition*, hut also of the rapid spread Of the use 'of improved seeds and *vi* bmiUmH **J other economic - initiative* j$_n$ responv; to the increase, long overdue, in agricultural prices which came about during the years of scarcity. The present situation is in some ways similar l(» Ihc temporary surplus production in Indian agriculture which occurred after a very good harvest ytar at the beginning of the nineteen fi flies. At that time, the temporary surplus caused a collapse of agricultural prices which seems to have had a deterrent effect upon the agriculturists who hud contributed to the increase of production investment in the preceding years. It is much to be hopc/J that, this lime, the programn>e of government purchases of cereals For stocking will prevent similar unfortunate elf eels of the atnmdan! harvest ll is generally agreed that lor half a decade or more India must continue to be j deficit country in vcars of average harvest, so that any Indian surplus can be disposed of by slocking and by an appropriatc reduction of imporls. Therefore, barring the particular problems of certain crops, the need 10 find export markets docs not arise

Sohrttom needed hmtorm m*to** collapse*

In iiew of the rapid iocrettc of output now made possibte by high-yielding varieties, we may expect, in years of - good cBmatk conditions, to sec other developing countries in the unaccustomed role of surplus prtnlviccr. It is important to foster awareness of this posMbiluv among technical advisers tad national civil servants in such countries, n ihat aitministrative and pttlitical preparations can be nude fur meeting Ihis prohlcm when and where it trim. Otherwise, a collapse of orkei tnnndiirH an an unexpected surplus m*j dtocwm ge the igncuitturists Erotn their cfloris to moderni/t and expand" food production.

in addition, sonic developinj; countries already produce a surplus in all normal harvest wars, and with (he new agricultural techniques more countries may be expected to join that group in *a* near future. In such countries, programmes of stocking of course prmkle BO Miutiofl to tin surplus problem and room must be made in the world market for rcguhirly forthcoming exports from thes*; countries.

The Indicative World Plan of FAO may make an important contribution to the solution of this problem because it will throw light on ihc prospective pattern of deficits and surpluses of f«xxl in both developing and industrialized countries.

To be sure, in a world market already burdened by agri- cultttml surpluses il will be no easy task to provide such regular outlets for exports from developing conatrioff. The crucial preconditions are: (J) that food-import ing industrialized countries show wiMiftfncu to buy from other than their traditional suppliers, wiihin H oouidc Unr own regional groups, and; (2) that dc\clopiof «nd Milwtrieliiid *eamlits*\ with favourable possS»iBtic* far cxpuwon in other Sckh than agriculture show wilhnjM.M to fclrain frvwn punutng policies of tf-Mifficknc y in food, w that ihc> may iratcad purchase food from, and sell nianufjrctura to. tkoK developing countries which must bate Their dcvclopmeM poticy upon the m i n i from exports of agricultural surpluses.

f-or such policies to be acceptable, however, world opinion must he enlightened by realistic analysis instead of being misled by a pn*pajtanda th;ii ikvinbcs ull developing countries M " hungry " countries which need fo<id imports. anU oniy industrialized countries as needing to gel rid of food sui pluses.

"Another Peruvian, half in laughter,
told how the night they had finished
the stretch of road that
ran below his house he had gotten drunk
and slept in the newly-turned
dirt of the exact middle,
the better to hold it to him...
He said:

Road, I have awaited thee all my life

by ***PEYTON JOHHSOM***

All Peru is divided into three pans and people from any two of them seldom meet. Why' Because the mountains, the mighty Andes, thai split this South American republic into cost a, the narrow coastal plain, sierra, ihc harsh chilly highlands, and selva. the sprawling irnpkra) jungle, arc too rugged and too high **Htd** the roads through the mountains are too poor and too few.

Peru is a big country: twice the size of Texas and larger than France, ftajy. the Low Countries, the Unired Kingdom **tod** u>,^i **QMMMJ HMMMA** Vet ii hi* but 2,121 miki of paved roads, less than Denmark, or Delaware. And so broken and divided b the terrain that for many Peruvians it is easier to spend a few days in Paris or New York than (o visit their cousin in the ne*t province, around the mountain or across the valley. 50 mites away.

Roads and more roads, high roads and low roads, dry roads and all-weather roads, national roads and local roads, arc (he crying need of Peru

If you go to Peru, as I did recently, you arc convinced of this need before your feet touch ground. Flying in over the Andes, greal white peaks come thrusting up on every side. Geography here iv written in vertical symphony. Down below, as far as you can sec, a rocky and warfitc mass of earth heaves skyward. Burnt browns and parched reds, (ones of the middle altitudes, leap to the eye, disturbed occasionally hy the noshing green of one of the brief scattered valleys, The patchwork blurs in a bank of cloud until the mountain light hrcaks free again over the cold blues and purples of the upper reaches. The single note of a river, ribbon of wet fire in the Andean tun. slices east in search of the Amazon. The shadow of a lone condor, disturbing somehow, glides over snowlields of incredible purity.

Here anil ihcrc, pitiful amid the chaos and splendour, the hairline of a road dips **lid** twists and turns in and out of view through the endless hills, valleys and high barren meadows. The roads, occasional in the extreme, arc the merest scratches across the face of a giant.

No group in Peru is more convinced of the need for more roads, and rural development generally, than the young men of Cooperation Popular, the agency set up four years ago by Ptru'i young architcct-preiideni, Fernando Bclaunde Terry, Coopencion Popular'* philotophy, a deliberate reconstruction of the old Inca concept, of " brotherhood through work," is summed up in the phrase "seW-help," The agency's red and while sign* *ii pueblo lo* [illegible] or •' the people huili

In a village of Huancavclica they were building a district medical post for a *Doo-custeni di>ctor. It did not matter. With the building dune, now they had a road, a doctor would surely arrive. *At Acostambo. on the edge of the dismal Puna, jubilant villagers work-Ld in ihe rain, to the beat of a drum and the hypnotic note of an Inca flute, to pu: finishing touches un their whitewash-ed vchool of nine adobe classroom*. Raul gave them their *ei fniebto lo hizo* sign and we watched as they scaled it into the wall beside the entrance.

" Nine classrooms ! " an old man croaked. " We will be ilic envy of these hills and that is why we arc inviting (he Sum if Presidents to the inauguration,"

The old man led us. to a ravaged desk in the school's office and, with trembling hands, brought forth an oversized, ornau' and handmade invitation, it one in archaic script and with a grace that no niachini: could hope to match, bearing greetings from the *ivcinos* of Acostambo *o] moy vstitnado excelent'tssimo srnor arquitttro ttott* Fernando Bclaunde Terry.

Iverywherc we saw the red-and-whiic signs and everywhere medical posts, bridges, drainage canals, schools, community centres, and, above all roads, were •btrifcttog,

lotting bltunt flow

The aim of alt this. Raul explained, is not just to improve communications and services, but lo start ix-oiinmic blood flowing through the long-stiffened limbs of ibe isolated sierra. The World Food Programme's role is to help Cooperation PiipulLir sustain the villagers" determination to keep at it. Some 4,000 men, with thirir families about 20,00(1 people, get incentives in WPP rations for work on ?! roads totalling 870 miles through 37 sierra provinces. The food — wheat, and wheat flour, dried skim milk and vegetable oil from the United States; dried fish and eggs From Canada; canned meat from Denmark — is the best they've ever had and most will work hard lo earn il over the maximum term of two years, nine months.

The food is distributed fortnightly and. as Cooperacion Popuiar's transport and wherewithal arc more limited than its energy and will, in some provinces villagers must walk many miles to jrcT it. We saw two distributions of WFP rations.

" Look at those, " Raul said nodding toward the first of 100 families in line. "They come from a village 14 miles and nine hills away, but they are always here hours early."

We watched them, children and mother and father wait wit hum expression until the first name was called. Then the man quickly went forward to make his mark and die woman bundled the food up into

Ttiil W-ytMf Old ft Timoiao Ramos Cabriol H hti been werrkfftff m'tfi A/J tatfywf and grtn&Bihet an a S-mite tMip If cm it*ir vil-IMQ* ol Tathuls lo Ihm nBighbouriny village ot Ftaquina*

(he big many-coloured, once-bright shawl every Queehua woman wears round her shoulders.

" The flour and the oil and the wheat arc pri/cil -.tuples. " Raul said. " But the codfish and live tinned meal are great delicacies. We remove the labels so there will be no temptation to sell such costly luxuries. "

The East day we drove on a new road with a median altitude of 12,500 feet thai connected, for the first time, the villages of Sincos, Aramaehiiy and San Juan de Mir allures with each other and the valley of Jauja, There were drainage works and a sturdy bridge too, but the J5-miJc road was the pride and glory. In celebration we took refreshments with the town council of Miraflores. The mayor passed round fat botties of good Peruvian beer, ice cold wkhout benefit of refrigeration, and thinner ones of fiery *Pisco,* clear lo the eye and harsh to the taste, lo go down in small pleasing explosions.

A young-old notable's voice broke as he recalled how hard it was, in the old' days before the road, for a man to carry to market on his batk enough llama and iilpaoa wool to buy hLs family a decent Christmas. Now buyers would come in truckl .ind there uould tvw be a bus. .ill ihi: wa> from Juuju.

Another man, half in laughter, told how tfae night tho> hj<J finished the Wretch ol mud ihut ran below his house he had gotten dnunk and slept in the newly-turned dirt of the cuct middle, the better to hold il lo him. • Road. I said." he [old tn, " I have availed the* all my life. Thou CMIKSI late, but 1 uill love thce."

Then we wen all misty-eyed and the oauBdL man by man, inuricd un embracing the food link *ftft* Raul and the skilled CL> MejmdBB and myself, visitnig (hem on behalf of the mysterious World 1 IHKJ Programme, who hud made their road possibJe,

Such rOKk .ire hudjj more than rough t.^iiipjlh[1]. to I BIOpORO and North Anicrk-an eyes, Tbej arc spectacular only in the pnindtur and incredible difficulty of the tirrruin they must conquer. They figure linle in the august parlance of foreign aid agreements, but without such roads people like the villagers or JTaDmfe and San Juan de Miraflores can never enter the mainstream of their nation's economy and culture. Such roads are their highways, however narrow, not only to market, school, and health dink, but to hope itself. Building such roads is ihe ullpgcrs" firsi step in linking themselves and their children with their kinsmen, •ad ihe alien world, beyond tht high uncaring mountains.

it," about 2,000 so far. arc going up throughout Peru.

C'otipcradon Popular gets help — $1.5 million in food and services — from the World Food Programmer a deve-lopment-Ihrough-food venture of ihe[1] U.N. and FAO. On walking into Cooperacion's headquarters in Lima, you are struck by the youth of its officers. Most arc in their twenties or early thirties. Raul Gonzalcs Vigil, a 29-year old civil engineer, heads all the agency's projects using WFP aid.

1 asked him what he thought of this aid: •; The * food is as good as money, " he said. " Maybe better. With this high quality food, we compensate villagers for badly needed work of importance to their own community, and also improve local nutrition. "

J asked what he considered Peru's biggest problem: "To unite-the country, We haven't had unity, in trulh, since Inca days, The Inca, please note, had an CA-LL- lient road system. Without better communications, particularly in the sierra, unity will remain a dream in PCTU. "

Raul Gonzalez Vigil is a smallish young man of raven hair and quick, questioning eyes. Though good natured, he is **tone** and serious and tends to reserve his smiles for the end of a long day's work. His features owe something to the hawk and his slight, almost boyish build is packed with the energy and stamina of a professional athlete. Like so many young South American professionals you meet nowadays, he is a technocrat, consumed by his job and largely indifferent to politics. In supervising a couple of hundred projects throughout the sierra, he spends half his time in travel and. though from Lima himself, he knows the wild highlands north to south as do few Peruvians. • When he joined Cooperacion Popular two years out of Lima's National University of Engineering, he had a fear of horses, but now rides well and. of necessity, often,

Cut off by rock mntf ***now***

" You will understand our difficulties better after a few days in the sierra, We leave fur Huancayo tomorrow," he said

That evening I pored over Raul's voluminous reports and charts. His preoccupation with the sierra ,seerTn;d well •taken for though ii occupies bui 26% of Peru's 496.000 square miles, the sierra holds 60 % of the country's 12 million inhabitants. At an average elevation -of 13,000 feet, the sierra is the very heartland of the Andes, a mountain chain seven times the length of the Alps and three times longer than the Himalayas. Along ihe Andes' 4.500 mile stretch *4<)* silver summits lift to above 20,000 feet,, ten of them in Peru.

The clusters of population-arc so scaled inward and shut off from one another by soaring walls of rock and snow, that the horse, burro or human fool is often the surest — and sometimes the only — way of getting from one place to the next.

Up is the right word to describe the drive from Lima to Huancayo. We left at dawn and the driver, Alejandro Sala-**zftr,** put the four-wheel drive pick-up jn low gear just outside the city limits and we started climbing. By noon we had

A young Peruvian who has been working on the roads lot Cooper scion Popular signs (or the tood which fie is receiving trom the World Food Programme.

passed a herd of llamas and the heat and humidity of sea-level Lima gave way to cold; and up above ihe first snows spread grey-white over sharp slopes the colour of rusted metal.

" What do you think of (his road ? " K;uil asked.

" Good, But no superhighway, "

" It is the best we have into the central highlands. "

World'm Mgh0mt railway

At Ticlio we crossed the world's highest railway passage, at 15,688 feet. The Andes, frozen and gloomy, loomed up all about us now. The railway from Lima to Huancayo, Raul explained, is the most important one in the country, It is also the world's most spectacular The ruling grade is almost 5% and along its length the line traverses 66 tunnels, 59 bridges and 22 flying zigzags whepe the train seems to run suspended on nothing more solid than blue Andean air. Tourist, who seldom take this train twice, often faint a couple of times before getting off to embrace the sweet earth on hands and knees at Huancayo.

We strained up through another high pass and came down into Huancayo, a provincial capital of 90.000 inhabitants, as the last blue light flooded with rose and the mountains turned a deeper purple. We were at the relatively modest elevation of 10,700 feet now and breathing was easier. There was an edge of snow in the wind that blew down from the darkening sierra, Alejandro, wooden-faced all day, now said his right leg •H cramped

" Because of the brakes, " he said. " They have been slacking off these last three hours."

Raul and I looked at him Alejandro **gave I** slow grin: "No use to mention it. There w[ti]s nothing we could have done and it would have slowed us down." We had covered IV2 miles over the best road into the sierra: the irip had taken 11 hours with slops.

Peru's 24 departments arc divided ink) 140 provinces, and the provinces into 1..12l districts. Junin is one of the most mountainous departments and Huancayo one of Junin's most mountainous province*. The district of Pucara is in the middle of Huancayo and the village of Talhuis, atop a 12.000-foot mountain, is IN remote and poor a place as there is in the district. We spent a day. half of it getung there, visiting Talhuis.

" From up here," Raul panted, tracing with his ringer a crazy red thread thai wound drunkenly up from the Tumplcd

green valley 3,000 feet below, "you can **see** most of the road, ll will run five miles and they have finished more than **four.** Here road-build ing is hard work.""

" I betteve it"

We sat in the sun, sweating and breathing hard from the climb, and 100 yards on up. if we could ever make it. all the 40 families of Talhuis, some 200 people, worked on ihe road that was to link them with the neighbouring village of Raquina and both villages with a wider road that ran to the market centre at Huancayo.

" These people never had a mad, " Raul said. "Only a path barely wide enough for a burro. For lack of a road, they had no market for their wool and sheep and the potatoes and qurnoa."

We OOold see men hard at work with shovels and picks. Others, their bodies rising and falling in rhythm, sliced away earth with the long polc-and-blade *chaquiiadta,* I he Inca h;md-pli)Ugh that is the universal implement throughout the sierra. Farther up an improbable Cooper.icion Popular bulldozer broadened a **ledge** that looked no wider than its own treads.

"" How did They get that *maquiim* up here[1].' "

" They ran cables from the top of the mountain, and the machine, thus steadied, employed its own power. The operator is a man of great skill. "

We staggered on up the mountain and **bWECd** children, unheeding of the sheer drop lo the valley, scampered effortlessly before us. their dark eyes dashing in young fire as they giggled, whispered lo mie another in QlirrtllHI The sun wa?> strong but if you stopped in the shade **tfal** sweal went eold on your h;itk in *A* second. Raul, a man of mercy, took my ton-heavy 35 mm cameras. The villagers came down (he road to meet us and there was much bowing and lifting of hats unti shaking of hands and everything was very fiirm.il in Spanish and Quechua. Ihe **adults,** though many were barefoot and their clothes so patched you tried not to stare, were of a dignity to daunt Oueen Victoria, They palled Raul on the shoulders, and adduced him as **fpMM** *patron* and *jtft'iitu.* The road-work foreman **CHM** up. a young man elected for his fluency in Spanish: " If it pleases you, " he said. " we have prepared a *putha-***nMML"** Pachiunanai is a kind uf *icrra meal; it comes from the Quechua words: *Pacha,* earth, and *mania,* jar. The women dig a hole and build a fire in it, then cover the fire with stones. Over these they place the food — various types of potato, beans, peppers, meat, whatever — covering it all with stones, then earth. • We were many that day and this was a big and formal *puchamanca.* We ate with our fingers, decorously, and without the rudeness and distraction of speech.

it were possible to have two such signs, one for the valley beginning and the other For where the rn;id ended in the village. Raiil took a notebook from his pocket and scribbled. " It is a possibility, " he said.

The rest of that week we got up each morning with the mountain light and piled into the truck to visit similar small, vital projects throughout Junin and ncigh-

fiosds and *more roads, national roads and local rends, are \t>* crying newt of Peru.*

When we had eaten our fill, the **foreman** cleared his Ihroal and inquired politely about ihe tillage's promised red-and-white sign for the finishing of the road. W *pueblo lo hizo.* " Yes, man," Raul \;iid. "It is ready in Huaneayo,"

The young foreman looked away, spoke to un elder in Oueehua. then, smiling shyly and with great sweetness, asked if

bouring Huancavclica. Often we crossed the bleak tredess Puna, thai I:IM /on* of water-logged and freezing plains, grazed by wandering llama anJ alpaca and barren of all else, before the snowline, tf 14,000 to IG.OOO feel, where the only sound is the unnatural ness of your own **woke** and the brooding of the Andean wind.

Down-to-earth research

A sometime-critic of FAO and its conventional viewpoint talks of the need for a new, practical kind of research which would include non-traditional food sources

by M. W. PiRIE

Every organization inevitably develops a characteristic style. This is imposed partly by history, and the factors leading to its initial establishment, and partly by the attitudes of mind of those who are influential at the beginning.

During the 1939-45 war, the Atlantic Charter defined one of the four freedoms as freedom from want and, in pursuance of this, there was a food conference at Hot Springs. The delegates agreed that a new organization was wanted, but disagreed over whether it should be a fact-finding body, or a body with actual control over food supplies. This disagreement persisted during the 1945 Quebec Conference which established FAO. In the end, the fact-finding faction won.

Lord Boyd Orr, FAO'S first director-general, commented sadly: "The hungry people of the world want bread, and they are to be given statistics." If he had had his way there would have been a world food plan which would have ensured that need, not the ability to pay, would guide the distribution of available food supplies. In his autobiography, Orr emphasizes the discreditable machinations by which food was preserved as a domain for uniestricted commercial scrambling.

Various research projects were discussed at Quebec. Many of these had been conceived, or concocted, by people with little understanding of the nature of real research. They consisted largely of proposals to survey issues that needed no surveying. A tidy mind is naturally attracted to the idea that an essential prelude to action is a precise survey to find out what particular action will be most advantageous. It would, for instance, be useful to know which region is in the state of greatest need and what it is most in need of. But any observant traveller can recognize, in a few days, the existence of urgent needs about which something can be done while the survey is getting under way.

Survey are often conducted to postpone decisions on action rather than because the information is actually needed.

A tmtmo policy?

In 1SJ46 (here was considerable justification for a policy of neglect of, or even hostility towards, research. Stockpiles of food existed and it was reasonable to assume that, with the labour and materials released for productive use at the end of the war, supplies would be abundant in some countries.

Unfortunately, a policy was established then that still persists, even though stockpiles are shrinking and annual food production hovers uneasily parallel to, or below, population increase.

Established policy depends on the assumption that food production can outstrip population growth if conventional agricultural methods arc applied more intensively and over a greater area. It may be that this assumption will prove to be correct; but it is prudent to recognize that it is just an assumption and that it may be erroneous.

An international agency concerned with improving the standards of nutrition in the world is called on to do many things: to advise on, and if possible control, trade and the distribution of commodities; to compile statistics; to spread information about improved methods of agriculture, organize training courses in them and encourage their more general adoption; and to cope with emergencies and crises such as drought, earthquake and flood.

The last is the activity that the public thinks of first, though it absorbs only 5% of FAO'S present budget, according to the 1965 report on the World Food Programme, and it is not expected to absorb more in future.

In the present political state of the world, no organization that lacks executive authority can be expected to control trade and distribution to a much greater extent than is outlined in FAO'S program of work; and in the report of the World Food Programme, which has SI20 million worth of services and surplus food to help labour-intensive projects for rural improvement, or for use as emergency relief.

Few would criticize the comprehensiveness or quality of the statistics that are collected by FAO, though their accessibility is sometimes commented on (see *World Crops,* 19, No. 6, 1967).

All these activities presuppose the continuance of styles of agriculture that are essentially the same as those adopted now. As a result of training courses and the spread of information, the character of agriculture in many developing countries is being radically altered. But it is being altered by the adoption of methods that have been developed elsewhere, and that seem to a visiting expert to be adaptable. The alterations are often enormously valuable, but this method of improvement is far from ideal.

Every symposium dealing with the problems of world feeding contains comments on the inexpertness of some 'experts,' and jokes abound at their expense; the most charitable being that an expert is any scientist away from home. **This** may be unavoidable with the present system of short-term visits, but a more serious objection is that techniques developed in Wisconsin, or Worcestershire, may **not** be ideally suited **to** (he **wet** tropics; **and**

N.W. Pirie's *research on plant viruses led to his present work a! the Rothamsted Experimental Station. U.K., **tehert** he is head of the BitKhemistry Department. He is a pioneer on the use t>l* few/ *protein us human foot! and h the author <>/ mtiny icienlific papers.*

these are the regions now in most need of food.

In the past, there were periodic famines in temperate regions that arc now very well supplied with food. Their present favourable position is the result of more lhan a century of intensive research on all aspects of agriculture and food technology.

li is excessively unlikely that the ideal crop and techniques lor one; region will be discovered as a result of research done in another, The necessary research on agriculture and food technology will. .therefore, have to be done in the regions *where* rJ)c raKareb b to be- used ii *will* have \o be exicnsive; ai least as extensive as the work thai has been done on cash crops in these same regions, though probably not as extensive as the sum of all the research on which agriculture in the temperate /one depends *fat* much of this is universally applicable.

Hmod for mop r*m*omrch*

The need for research and novel forms of development is now gaining recognition. The U.N. committee responsible for the booklet *International action to tivtrt the impending protein crisis* (1968) recommends the setting up of five new training institutes, and many multi-disd- plinary research institutes. Unfortunately, it docs not specifically state thai some of these should be in the wet tTopics; ii is hoped thai ihis was assumed to be obvious.

The committee is imprecise about where the money for these institutes is to come from. Ai first sight, (he U.N. Development Programme would seem a likeJy source, but this hope U dampened by a glance al the list of projects approv- I cd up to 1964. The closest these come to research is the category " diversification of crops," with \% of the total; only " land reform " got less. The 1968 lists of projects approved by the United Nations Development Pmyamuw <ind by the World Food Programme (CERES 3) include nothing that could properly be called research,

This form of comment may be unfair, for FAO, apart from the Frccdom-from-rfaftjaf Campaign, can only deal with governments and must Md| for a request for help. But this restriction is, in ilsclf. symptomalic. By t he t i me a j»i ve rnn>cn(. even in a technically advanced country. knows it needs some research, the point has been obvious for years to scientists working on related subjects,

The position is not likely to be belter in developing countries. A recent study (Paddock; *Animal Review nf f'tiytopaiij-<>togy. 5,* 375, 1967) Acnrad sh.it oorji one of thirteen ndnhten *tA* JiTKulture in Latin American anintriev'ahoui which there was information, had taken an undergraduate course in animal hustundry. tw» hud medical TiiiniB|. and the others came from law and the army These are not bstckgroooda that will tend to make a minister think that research i\ notdi :

Furthermore, ifm thought is nut likely to be put into his head by a \Kiting adviser; the -vanie study showed that only three uf the sixty-eight lop men in the U.S. Agency for International Dctclopment (AID) have had scientific training Luckily pressure is being put on the United Nations Development Programme not to be " a passive instrument for meeting requests by governments of developing countries for assistance in dealing with itiL-ir protein shortages. Rather, n should **slimuljle these g<niTiimcnts. . , "**

Research is not an activity that produces a return which eta Iv realistically MBttWd in financial terms. It is not, therefore, reasonable to expect such organisations as the World Bank to tinancc it. Similarly, it cannot be left entirely to commercial concerns; their contribution — notably in the development of fertilisers, hL-rbicides and I"*—»frfr*t — has been immensely valuable, but, nut unexpectedly, tend to be restricted to projccis that will call for ilk- continued use of a commercial product, t-urthermore, big business, like the heart: "a •M raUons qu£ la raison ne airmail point."

We look next to the Foundations (Ford. Nurncld. [Till tuft I n. WoHiOB, etc). Our indebtedness to them for such vi'iitribulkins as the International Rice Rescurch Institute in the Philippines* and research on wheat in Mexico, is enormous and is likely to be increased. But they cannot carry the whole burden. noT ilioutd they. Among the many merits of a foundation is the ability to act quickly: this enables it to initiate project* arxl this ability would be lessened if a targe proportion of its funds were devoted to the continued maintenance of institutes.

Ideally. *HO* should assume rcspotisi-

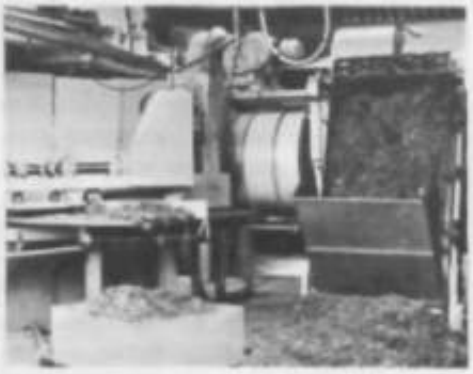
Protein from leaves

Leaf protein — by which is meant protein extracted from leafy matter — is on.y one ol the novel protein sources on .v".| mucn mere wasrch is needed, and which would M into the kind ol <jowrMo-**rtn n*s*«fch tuggested by Dr. Pine In many pans al ttie wet tropics it <• probably th* protein that is best •dipMd to tocal production far local use.

A projtct to itabliah two or more production and imaich tutrons tor leaf protein concentrates m *wet* tropical zones has been launched *by Find-Your-*Feet Ltd. *m* UK r*ii#t organisation Thaw siaiiort? would use the extraction pro caw dvwiopad at AotMmsted Expenmantal Station under the direction of Or Pine

Tht P«r« ptani. wh-ch can use a wide variety ot lush leaves, has a capacity ol one ton hour, with a yield of some 20 kg of pure protein per ton of leaves

T"e process, essentially, consists of: 11 a pulper which can be adjosted lor different crops and which can handle J to 2 lons [wet weight) per hour' 2) a press capable of pressing out 90% of the juice contained in the pulped mass; 3} a coagulator which uses steam injection for conlinoous ronninq to form a curd; 3nd *A)* a curd separator which litters out the alkaloids and produces a final product with the keeping qualities ol sauerkraut or cheese



The system can be more clearly seen m this photograph of the 1961 model than in the later integrated units Pea cannery waste is being fed into the pulper afld trom there to the press, Juice containing leaf protein runs off into a tray.

Trials using Pine designed equipment to produce dietary additives from leafy crops have been going an tor some time in India and New Guinea.

bility for financing and managing the necessary institutes. It already advises the U.N. Special Fund and, on this advice, institutes — such as one dealing with food technology in Ghana — have been set up. The process could go very much further, but more direct involvement seems to be impossible under the constitution that FAO has been given. Constitutions are not unalterable, and their interpretation is flexible, so this may happen; but it will not happen quickly.

In many developing countries where research on food production is needed, targe, sometimes lavish, laboratories already exist of which much more practical use could be made.

There is an extensive literature of caustic comment by visiting scientists from industrialized countries on the impractical, 'prestige' research activities of such laboratories.

For example, McMeekan *(Finance and Development,* 2, 1965) comments that scientists from developing countries see those in industrialized countries: "Exploring the mysteries of metabolism of plants and animals with elaborate and expensive radio-isotope techniques... What they do not see, and are not told, is that this kind of research — research for the distant future — has been made possible only by successful accomplishments in a much less exotic area of activity — the solution of immediate problems hindering development." Balogh and Payne commented in similar vein in the second and third issues of CERES.

The rules are simple: Projects that need expensive pieces of imported prestige equipment should be embarked on only when the research is useful and cannot be carried out in an industrialized country. There are few such projects, so the rule can be further simplified: "If the work can equally well be done elsewhere, it should be". If that rule is adhered to it will ensure that most of the woik will be novel, to a considerable extent, and will therefore produce some quite unexpected results.

This suggests a second rule: By concentrating on phenomena that cannot be studied elsewhere, and by allowing some latitude for fundamental research, such work should be ahead, both in concepts and results, of the rest of the world. This rule calls for the exercise of as much intellectual skill as can be mustered and should make it easier to discourage emigration. If vigorously applied it will lend further force to Sir William Hardy's classic comment: "You know, this applied science is just as interesting as pure science, and what's more, it's a damned sight more difficult."

There is immense scope for fundamental work on agriculture, plant physiology, plant breeding, pest control and biochemical engineering, none of which demands, of necessity, the use of electron microscopes, ultracentrifuges, etc. These instruments could, of course, be used but, for many years to come, any specimens that it would be useful to study by sophisticated techniques could be posted to laboratories elsewhere. Competent scientists seldom find any difficulty in getting cooperation from their more favourably placed colleagues.

***Dietary** changer inovitablo*

Investigations that are both novel and useful are being organized under the aegis of the International Biological Programme. Research on pest control and on plant breeding is already under way; the latter has concentrated so far on cereals and legumes. It is hoped that the potentialities of other seed crops will be explored, so that buck-wheat and quinoa lose their lonely position, and that a search will be made for tubers more nutritious than existing potatoes and yams. Research is beginning on methods of handling and processing oil-seed residues, leaves and other materials so as to make human food.

All this is, at present, being done in and by industrialized countries. If extended quickly enough to suitable developing countries it would not only be of immediate practical use but would also act as a valuable stimulus to their scientific advancement.

FAO could encourage developments along these lines in two ways, without becoming responsible for the actual research: It could arrange conferences in institutes where useful, practical research was being carried out; and it could invite **members of** the staffs of similar" institutes to them, so as to make the existence of this type of research more widely known.

An even more useful service would be performed merely by refraining from so tediously pointing out all the possible hazards and difficulties inherent in any proposal that a novel form of food should b: used. Those concerned with food production know the difficulties; they also know that some dietary change is inevitable if everyone is to be properly fed.

What is needed now is research on the most effective ways of promoting change, rather than flat-footed assertions that people are very conservative in their food habits. It is encouraging to find this need recognized in paragraphs 125 and 126 of the 1965 report of the World Food Programme.

From most points of view, rural depopulation and the drift towards shantytowns on the outskirts of cities and in the neighbourhood of factories are pernicious. This is recognized in the provisional outline of the Indicative World Plan ***(World** Hunger,* 1, No. 3, 1968), which stresses the need for more rural employment and the local processing of foods. It is also recognized in the development of the concept of intermediate technology, which aims at bridging the gap between peasant methods of farming and production, and large-scale industrial techniques.

It must also be recognized that people living in unfamiliar surroundings, and eating in municipal or factory canteens, are no longer able to eat in their traditional manner. This may well be unfortunate but at least it facilitates change. Employment may be the main factor causing the drift to town but another factor is that nutrition is often better there, partly because imported food is more likely to reach towns than villages, and partly because politicians are more aware of conditions in and around towns.

Particular attention should, therefore, be given to methods for producing food, and especially protein, in villages. By this criterion, the management of fish ponds, the fermentative up-grading of cassava or coconuts, the preparation of leaf protein and the development of improved strains of vegetables are more valuable than the production of fish protein concentrate or inicrobial protein; for these processes are, and are likely to remain, technologically difficult.

Down-to-earth research is concerned with the welfare of that large group of humanity which lives at the end of a long and inadequate rural road, for urban populations seem, at the moment, to be getting more attention. •

Multilateral investment in agriculture

In the three years of its existence the joint FAO-World Bank programme has generated $320 million to finance 27 agricultural development projects, and has shifted the emphasis of development finance toward agriculture

Constructing the Rosettes dam across the Blue Nile with the help ot Maria Bank financing

***by AIAtM** Hiftvi*

Tokyo — 11 a.m. on Monday, 9 September 1964. President George Woods is making his **(broe-poiflfl HafMIWI** — review of the past year, forecasts, changing conditions in which the hank is working — tn ihe authorities **of** the World Bank assembled for their annual meeting

He presents statistics, practical considerations. judgements, the results of long, collective labour. His style is **tanewfad** laconic but it Joes not hide the strength **of his conviction***

He reviews the bank's policy concerning two major problems of the ihird world____agriculture and education — and reports on discussions held with two other bodies: the Food and Agriculture Organization (FAOU and the United Nations Educational, Scientific and Cultural Organization (Uncsco). And. finally, he announces a programme fjf cooperative agricultural and educational development.

I lie idea of cooperation between IBRD (International Bank for Reconstruction jiij Development, otherwise known as the World Bank) and FAO had been in the wind for some time. The bank **ratted i" expend** its **tctivitfci** while FAO was looking for new financial resources for its adion programme. The heads of the two organizations exchanged ideas whenever iheir paths crossed.

If one could attribute a symbolic character to these great international agencies the World Bank would be the power uf money: its widen rule is profitability; its principle, prudence. no would be know-how in the held: its manim b development; its principle, promotion.

High officials conceived a programme til joint action. The idea gathered >irength ;ind led to summit talks between the heads of the two agencies. An agreement was signed on 2 April 1964.

The bank had hud its own agricultural department (or MM time and was financing a few projects^ road construction in undeveloped areas; canals and irrigation systems: support of farm credit.

The bank was dealing with high-value products in relatively rich countries where **money OOvJd** quickly be rclundcd; Malaysia, for **example.** But it was also operating on a large scale in countries with **extranet) diSadl** repayment **coafi-**lionv such M India,

I lie bank's interest in agriculture remained rather limited until Mr. Woods announced ihe new **poNcj of NHMg** support for agricultural development. The bank felt that it could develop the agricultural sector — of prime importance to many of its member states — with I-AO'S help.

Why did the bank turn to KAO? 1 lie official answer is that ii wished to avail iiself i>f the organization's experts and their work, eipccially that resulting **fron** Special Fund pre-investnieni projects; to compare experience in the field of investment; and to widen the bank's role

toward new operations such as the development ot forestry and forest industries, fisheries, crop planting using improved seeds, and agricultural training.

Svrvimg am m trail-blazer

(n his Tokyo speech, Mr, Woods had this to say aboul the philosophy of joint enterprise: "I have no doubt that in putting increased emphasis on agriculture *nn<i education, we* are *following the right* course. Lagging production of food, the lack of diversification within the agricultural sector itself and the shortage of skilled people at ill levels, in both government administration and productive enterprise, arc holding hack economic growth in far too many countries.

" But let me add that, in view of the magnitude of the financial requirements for adequate educational and agricultural development, the bank can do little more than serve as a irailblaicr. We can point the way for others by supporting a few siniitgk projects and by helping to identify, and to move toward solution, a few of the key problems.

" But these efforts will be useful onl> if governments follow through by focusing more of their attention on the critical needs of agriculture and education and by according them appropriate priority in the allocation of available resources, both domestic and foreign,"

In **1964** th- first joint projects, serving as prototypes, were launched. The hank and *VAO* started to define more clearly the concepts of short and long-term profitability and (o develop methods for project appraisal (see reviews of books by Hirschman and King on page 59 of this issue). I hi programme started to help governments identify and prepare agricultural investment projects.

The bank ha* the right of final approval, for it is the bank loans which make projects possible. The bank bases its appraisals on a multitude of factors: the country's economic and financial performance; its balance of payments: and ***at* trade;** and the country's capacity to administer and carry out projects. The bank also goes into fiscal policy in deciding on what terms it can expect reimburse ment

If it b a loan, it will be granted at 6.25% per annum **owff** 20 vcars, if nof. the bank will **after** ;i credit from IIJA (In- (cp n at ion a] Development Association) funds at 0.75% interesi repayable over 40 years, with 10 years' grace. tDA is a bank subsidiary wbkh grants 'soft' loans to developing countries, credits nn much more lenient terms of reimbursement than is normal financial practice.

A group of high-ranking specially from FAO'S technical divisions was formed to implement the cooperative pro-Lira njme It includes agronomists, irrigation engineers, economists and other specialists in fisheries, forestrv, farm credit

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SOURCE: International Bank for Reconstruction and Development and International Development Association

and agricultural cducatkm. In fact, iht-group is capable of dealing with problems in all the liclJs in which the programme wpcratcv Missions sent out to survey a potential project arc relatively small in number but the team specialists arc able **to** sis: up problems tfiat go beyond (ficir own fields of spccinli/aiion: they practice what t-AO has been advocating for a long time — the integrated approach.

Their main task is in nelp countries identify projects which can be financed by the bank. If *a* country wants to receive *i* loan, it must be able to submit an application backed up by solid arguments, *I)* must pnivc that the project can be profitable, that it is technically rcuibk and that it can be efficiently managed. The country must also furnish financial details on how it clans to repay the loan.

Under lhe IBRD-FAO agreement, a project ha> to pass through five stages.

Identification b the first stage after a government has submitted its application. This can be *a* (airly easy task it it b a fertilizer plant, for instance, but a complicated[proposal like a dam is more difficult, as can be seen in the interview with Mr, Fjalkovsky (CERES No. 4). A dam means construction, machinery installation and power distribution. It means land redevelopment, the building of canals and training in irrigated agriculture A whole country, sometimes a crimp of countries, will feel the effect*. The team must lind out exactly how far the project must go to control all these repercussions.

One icam recently identified three possible projects in Chad, for instance; animal husbandry, farm credit and irrigation It quickly decided that the livestock project had the greatest chance of success and the government was asked whether it **agreed**

If the government does agree, the project will pass on to the second stage — preparation *FAO* experts in *(fc 8dd* secure, select and analyse the technical, economic and financial data on which the project is based; then they return to Rome and draw up a report. They send their report to the bank; " This is what we recommend. If you agree, we are ready to send a mission to prepare (he project." At this stage, the government *concerned may* rake *the place of the* expens and the report thus becomes a direct request, that is, an application to the bank for a loan.

Ef the hunk agrees, the third stage begins — appraisal. The bank sends its own team to the country: KAO may join in but without direct responsibility. The **teaa** has to evaluate the data gathered *during* the itagrs *ol UicniiScation* and preparation, work out the financial arrangements iind define the stages of execution, This is the crucial phase in obtaining a loan.

A tOO **mfflrt** *fn thm* pipeline

The bank also considers the country's capacity K> manage its own project. Projects sometimes come to nothing because there is no responsible admini&tmmc authority to man^c them.

Negotiation is the fourth stage. This is carried out directly between the bank and the country concerned.

Imptemcnip'iot] *of* the project starts after financing has **been** approved — iM* *a* the fifth stage. The bank pays out the loan or credit in stagtcrcd instalments.

It is then up *to* the bank to check on working progress, though it may enlist a team from the cooperative programme as a supervisory mission. Under the lo;in agreement, the bank can finance pcrsonnel for certain kinds of technical assistance to help I he **government** launch its project during this fifth stage; FAO may supply the necessary **stiff.**

After four years of the FAO/IBRE) tf> operative programme. 27 projects, totalling about $380 million have been completed or are in progress in 17 countries In addition, a very considerable number (more than 100) are in the 'pipeline'. lhaL is they arc being, prepared by FAO. or being evaluated or negotiated by the bank. The five stages may take eight months to one year, or even more. EVLTS - thing depends on the countries' capacit> to prepare projects and to decide on policies that will ensure their success.

Ooml of % too million m ym-

FAO contributes 25*& and the bank 75% of the programme's funds. The amount of future work depends on res to ration of IDA'S financial resources, hard hit by the world economic crisis.

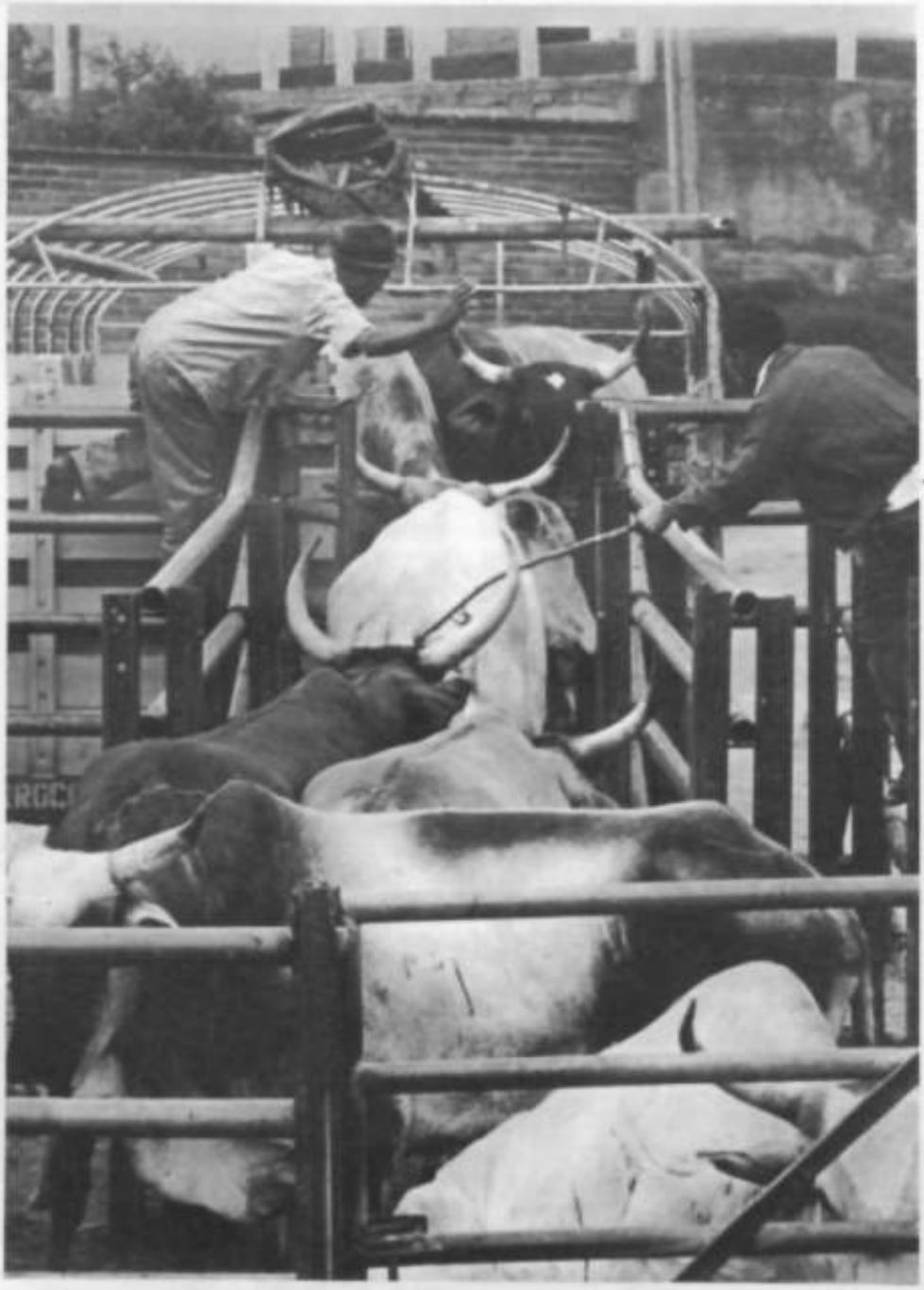
Gtorgc Woods, Mr, McNamara's pTC- decessor, would have liked the bank's funds to be raised to St,(XK) million a year but he **WM Mtjl lfck togtt** approval in principle that aid should be increased to $400 million a year, to be raised to a higher figure after further negotiations with donor countries. The immedi^iL' goal is to reach $700 to $800 million a year compared with IDA'S ceiling of about S300 million over the past three vcars.

It is probable thai there will be a considerable increase in lending for agricultural projects financed by the bank. At present such loans amount (t> 5200 million (1967); this should increase in the years to come.

The cooperative programme has passed its trial period now and has proved its usefulness; its future lies in expansion. Its most immediate benefit tor FAO is that it has enabled the organization as a whole (o become aware of financing problems which, previously, it approached in terms of pre-in vestment work.

The programme is now preparing the ground for ;in investment centre which would group the activities'of FAO with the World Bank and the regional development banks.

t 16 ***MILLION FOR ANIMAL*** *HUSBANDRY* ***IN COLOMBIA***



This project is lhe practical appltcattc-n of a theoretical ideal At the outsat. the Colombian Government, the World Sank and FAO agreed on the terms-of the project- il is lo fit into a larger plan which places the Bmphasis on improvement of meat cattle, milch cows and shBep. The project includes all kinds of work___ land clearing, enclosures water supply, livesltrck installations, grazing improvement and a oreedino. programme

The S16.7 million loan is being used to help linance the firs! three-year stage of the ten-year plan. The bank loan covers 60°/* ot the total costs of about S28 million, The Caja de Credit Agrario. Industrial y Minero. an autonomous credit agency which organizes and manages the operation, is contributing 22% while lhe rest comBS from farmers and cooperatives involved in lhe project About 900 ranches, 250 dairy farms and 35 sheep stations are taking part.

the desert locust

A plague that could last a decade affecting millions of people is rapidly spreading over the vast area from Casablanca to Bombay. Many countries are working together to control this ancient menace

Not a country within the whole range of the invasion area escaped. Individual catastrophes, when swarms settled on subsistence farmers[1] land, were too many to count.

Scistocerca gregciria, the desert locust, is one of ten main species, subspecies and varieties of locust, and is one whose outbreak areas have not yet been tracked down. Part of the reason is indicated by its common name. It is a creature of the desert, or to be more accurate of the desert wadis whose sparse vegetation makes occasional scribbles of green in some of the loneliest country in the world.

Having no specific breeding grounds, it can break out in any one of a thousand or more places strewn through 5 million square miles from the western Sahara to the western desert of India,

Since the first requisite of a good breeding habitat is rain to moisten the sands for egglayingand to produce enough vegetation for food and shelter, and because rain in the deserts is highly sporadic and may fall at intervals separated not by months but by years, many, probably the majority, of these local population flare-ups come to nothing. The insects then revert to their solitary, harmless phase, scattered in insignificant numbers, which may again build up if rain comes, only to die down once more if they are not renewed.

These are the recessional periods. During the 58 years from 1910 to 1967 there were five such recessions. The longest lasted only seven years, the shortest only two. Altogether they have totalled only 19 years compared with 39 plague years. The brevity of their duration compares strikingly with that of the plagues, none of which has been shorter than seven years — the longest, mentioned above, being fourteen. Equally striking is the immense contrast between the numbers of locusts in plague and non-plague years. Probably the biggest swarm ever recorded was one which appeared in East Africa in 1958. So dense that aeroplanes at an airport where it settled were unable to take off, it was estimated to measure 400 square miles and contained about 40,000 million locusts of a tonnage equal to the liner Queen Mary, Yet in the recession which followed there was scarcely a locust to be seen.

Nevertheless, it is the evidence gained during recessions and transitions that is most likely to provide the answers necessary if man is ever to gain the upper hand against this most enduring and intractable of his insect enemies.

How did it happen?

Since 1952 FAO has been coordinating international and regional efforts to survey and control the desert locust. The anti-locust programme, inaugurated in 1960 with the aid of the United Nations Development Programme (Special Fund), has been carried out mostly during a period of recession and transition. It has included widespread ground and aerial surveys and, perhaps most important in the long run, an ecological survey directed specifically toward gaining more knowledge of the desert locust's life cycle and habitat preferences. The latter was a seven-year undertaking during which the length and breadth of the outbreak areas were traversed in journeys totalling 68,000 miles.

In addition, coordinated research programmes have been encouraged and expanded and 19 new national research stations built and equipped. National reporting and forecasting services have been given financial help and the Desert Locust Information Service (operated by the British Anti-Locust Research Centre on FAO'S behalf) has been strengthened. Vehicles, locust survey equipment and radio for field communications have been issued. Some 400 locust officers have received some form of training, either at seminars or in specially arranged courses.

Existing international locust-fighting organizations, such as the Desert Locust Control Organization of East Africa,, have been supported and regional defensive groupings encouraged.

Why, then, has another plague occurred?

One answer is inescapable: there was a lack of information at a critical time from physically and politically inaccessible areas.

Another, interlocked with the first, is that the desert locust is a supreme opportunist. Requiring rain for the creation of its habitat, it needs only three sustained downpours in three suitable breeding areas to enable it to begin the successful migrations and multiplication which can lead to an incipient plague.

The second of these conditions was satisfied when, in November 1966, a cyclone moved from the Arabian Sea into the coastal hinterlands of southern and southeast Arabia, bringing with it such torrential deluges that in one district alone nearly four inches — more than the normal average for a year — was recorded. This was followed by rainfall well distributed through 1967's rainy season.

Its effect was to transform the desert from a scene of total aridity into a swiftly flowering wilderness in which the' locust population quickly bred and thrived. Partly no doubt because of the wild nature of the country, their existence went unreportcd.

In this and other respects the outbreak bore a remarkable resemblance to that of October 1948 when a cyclone, similarly occurring in the same region and at much the same time of the year, was believed to have set off the last great

Stanley Baron, *formerly* ***a*** *feature writer for the* News Chronicle, ***h*** u *freelance writer, author of* Road **lo Rome** ***and other books.***

No frontier in the fight against

by ***STANLEY*** *BARON*

At the end of last year the governments of more than 40 countries were warned that the desert locust, which had so often afflicted them in the past, was again on the increase.

The upsurge in numbers was known to be particularly heavy in Arabia and, u fresh news came in, it was ciear that there **wen** also dangerous infestations in African countries on the other side of the southern end of the Red Sea and the (iulf of Aden. If successful spring breeding occurred, they were warned, a plague **coald** follow.

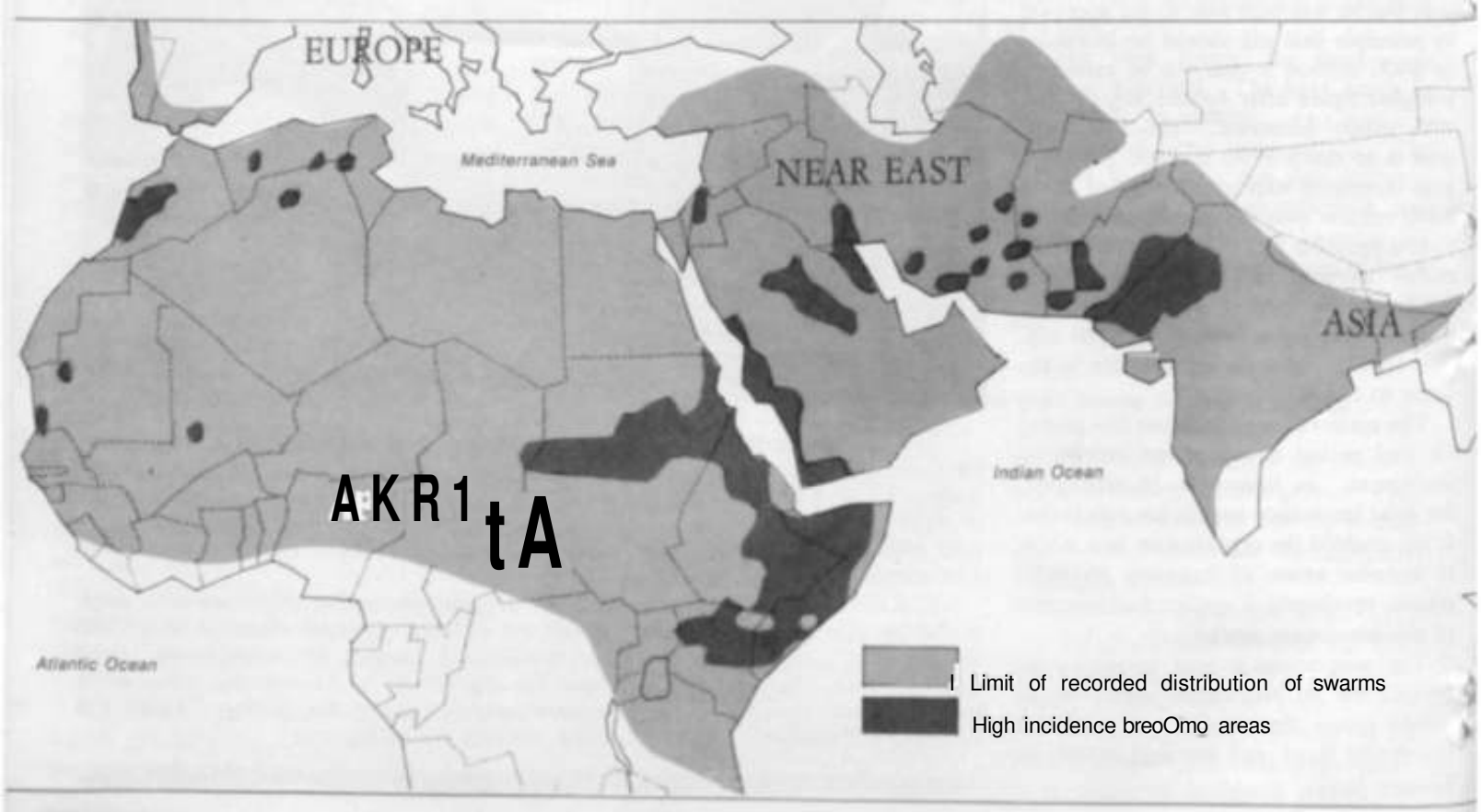
Spring breeding did occur, on a large jnd grave scale. Nor. unfortunately, was it confined to Arabia and cast Africa for, 3,000 miles away in west African countries bordering the Sahara, **these** were also serious outbreaks. In Iran and Pakistan. loo, weather conditions favoured the locust. By early August, in spite of the most vigorous efforts of locust control teams, swarms had been reported from every major summer breeding area between we si Africa and India, Breeding had begun in most of them.

Il now seems certain, therefore, that 1968 must be added to the list of years that have already ushered in four major plagues during little more than half a century.

The possible consequences need no underlining to peoples of the countries who have suffered in the past. Even to others far from the affected areas the very name of the locust is synonymous with destruction, hunger and famine. From biblical times and earlier the recurrence of these plagues has brought JM **Iff Iff** both to nations and individuals.

But one need only go back to the li*>t plague to realize the magnitude of the Ihrc:it which now hangs over the crops of more than 40 countries. Ending only five years ago. it ran for 14 years and. in that time, invaded more than one fifth of the world's land surface and affected one tenth of the world's people. Areas where the swarms struck stretched from northern India to west and north Africa; from the Near and Middle East to Kenya and Tanzania; and the whole of Arabia.

Ethiopia, in 1958. lost 167,000 tons of grain, much of it in the single province of Eritrea. This would have been enough to feed more than a million people. Four years earlier Sudan had lost 55,000 tons. In 1957. when the locusts invaded Senegal, they consumed 16,000 tons of millet and 2,000 tons of other craps. The orange orchards of Morocco and Guinea were devastated, as were the Libyan vineyards,



plague. Then, too, great stretches of desert extending into central Saudi Arabia exchanged their normal desiccation for mantles of unaccustomed green. On both occasions the swarms and their progeny must have moved through, at least a couple of thousand miles of wilderness before emerging to sew the Red Sea coast with their cggfields.

There is another unfortunate parallel. In 1950, when the swarms had penetrated Iran. Pakistan and India, FAQ prepared a plan of campaign which might hftvc curtailed the plague: but no funds were then available and the chance was lost.

During the present outbreak the defences have again been overwhelmed, allowing the desert locusts' unique power* of long-distance nomadism again to come into play. The swarms have the ability to cross deserts, mountains and seas, covering distances of many hundreds of miles.

In laboratory wind-tunnel tests locusts have been known to keep flying, continuously flapping their wings, for 17 to 18 hours, a record for any insect. Over land a normal migration between one suitable breeding area and another may advance them from 8 to 200 miles a day. depending on the winds.

The logistic difficulties of a locust control organi/iitiun trying to keep up with such a rapidly moving target are all too obvious. To be fully effective in such a case total destruction is necessary, hut in practice there are bound to be escapes and, given the fantastic fecundity of the insect, swarms can rapidly build up again.

During the present plague it is obvious that there have also been many escapes of hoppers — yuung locusts before they have taken wing, Marching bands up to three miles in length — sign of a very heavy infestation — were seen early this year in the south Tihama, the tong stretch of desert between the Red Sea and the towering mountains of Saudi Arabia 20 to 30 miks inland. In spite of energetic control operations with good results against the younger and smaller hoppers, it was all too clear that many of the older ones had failed to take the bait, or were jnsufikicmly harmed by sprays applied to vegetation.

The result, unfortunately, must hive been that many achieved adulthood and were able to fly off inland to breed again before migrating back lo the Red Sea countries or eastward across lhe Persian Gulf to Iran and Pakistan, where an outbreak flared in July,

hi the Sudan the invasion began with the arrival, in June and July, of six or seven swarms which came from Arabia after crossing some 200 miles of sea, or from Ethiopia. There must al«>. certainly have been some scattered locusts in Sudan's own coastal IRIS only wailing for the rains which would rocket their numbers. These duly occurred and, by the end of July, five province* were indued.

In the large Wadi BafaJil. near Shcndi on the Nile about 100 miles north of Khartoum, these took every form fn>m eggfWlds measuring several square miks — many of them already beginning to shimmer with the leaping bodies of countless baby hoppers — to marching hopper bands and bright yellow copulating swarms.

A veteran locust officer, taking a spade marked out a square foot of eggficld and dug up 41 eggpods capable of producing, at a conservative estimate, 3,200 nymphs. If only 10% survived to adulthood the increase, unless it could be effectively controlled, would be certain to mean a new population of many thousjfnK of milliom in this Wiidi alone Probably 200 square miles in this province were equally badly infested, as well a*

Collecting Uv* locusts in Ethtapit — body measurtmtnti art clues to breeding density and. with oihmr litld obitrvtiions, may indtcatt their place at ongin.

other districts and regions where hatchlings are now emerging.

The danger is always, in such cases, that there may be enough escapes to set off new waves of swarnjs which will in due course either return to the Red Sea coast or shift westward on the first stages of the long trek south of the Sahara into west Africa.

To " lose " a swarm in these great areas is all too easy. The locusts' need of rain does, nevertheless, give a broad indication of certain zones where breeding is likely to occur and control, if applied in time, can be most effective.

*Rain **and** wind*

One such zone, the spring breeding belt, runs through northwestern and northern Africa and the Near East to Pakistan. A southward bulge in the middle includes • parts of cast Africa. Breeding follows the occurrence of cyclonic rains associated with westerly disturbances and is confined to the first half of the year. It has not yet occurred during the present plague.

The second main zone of breeding is a summer and autumn one and is confined to an equally vast belt of the country lying along the southern part of the Sahara from Senegal and southern Mauritania through the mainly desert lands of Mali, Niger, Chad and Sudan to Ethiopia; thence on through southern Arabia to West Pakistan and northwest India, There has been breeding nearly all the way along this belt, and this is where most of the battle has, up to now, been fought. Its rains, normally sporadic but this year exceptionally heavy in many places, are the outcome of a meteorological phenomenon known as the Inter-Tropical Convergence Zone (ITCZ), where the southwest monsoon winds meet the northeast trades.

Finally, there is a very large and important winter breeding area which includes the Somali Peninsula, eastern Kenya and northeastern Tanzania, with a northward extension along ihc coastal hinterland of the Gulf of Aden and the southern Red Sea. This, too, is closely affected by the ITCZ. Often the opposing winds approach so close together Ihal • pilots flying through the zone of convergence in east Africa find themselves exchanging a south-wester for a north-caster within a couple of' minutes. The movements of swarms being invariably downwind, they can naturally be found most often where the winds converge,

The rain-bearing winds, in other words, provide the locusts with a convenient means of transport and also create their needed living and breeding conditions. On the other hand, if the rains fail, the* locusts' quest for new breeding sites is likely to fail also. Deprived of food, shelter and moist soil for their egg-laying, they are then at their most vulnerable to human counter-attack. It was probably a combination of drought and a well-limed attack by Pakistani spraying planes that finished off the last plague in 1963.

In the present one the role of FAO has again been focussed on the coordination of national and regional control efforts and the provision of material assistance up to the limits of the funds available.

Last May the United Nations Development Programme allocated $285,000 for emergency action under the UNDP Desert Locust Project, which has been running since I960; and has since made a further $70,000 available. At the same time U.S. AID was asked to provide any help possible and has already contributed $200,000 to the Desert Locust Control Organization of East Africa. Individual government gifts have included 50 tons of pesticide and five spraying vehicles supplied by U.S.S.R. to Ethiopia. Pakistan gave 1,000 gallons of liquid insecticide and 34 cwts of BHT dust to Saudi Arabia.

***Countria** must* cooj><«i>a(o

Among the endangered nations there has been a welcome acknowledgement that in fighting such an inveterate internationalist as the desert locust, to whom frontiers are no impediment, a high degree of mutual help is needed. This has enabled FAO to arrange for the loan of spray planes from one country to another and for the transfer of experienced locust control officers to areas where the need is greatest.

Given continued cooperation and new techniques of control such as the ultra-low-volume spraying now being practised successfully in east Africa, there is hope that the plague can, at least, be curtailed and its catastrophic consequences minimized.

What of the future?

It would be blind to ignore the fact that the desert locust seems to thrive best where there is human distrust and unrest. In this respect it is both a symbol and a challenge.

Scientific observations of an outbreak in west Africa have shown that detection and effective control in the early stages are possible, but require the prompt location of habitats by air observation working closely in cooperation with ground observers. Both air and ground surveys need- to be done by trained personnel with knowledge and'experience of locust ecology and behaviour. From an aeroplane it is easy to quickly see where rain has produced new vegetation encouraging infestations of locusts which might otherwise be overlooked. If they can be attacked then, without regard for frontiers, incipient plagues may be• stopped.

*Emargency **fund** nesderf*

This means that the cooperation of the plague periods must be extended into the recessions. The object of all reconnaissance is to extend the recessions as long as possible. It must therefore be as efficient as possible. Within the limits of political realism it must also be as international as possible.

Another vital lesson of the present plague is that aid, to be effective, must be prompt. Once an outbreak has occurred the locusts' rate of multiplication is so fast that, within the three generations, the swarm population can increase by between a hundredfold to a thousandfold, even where there is control.

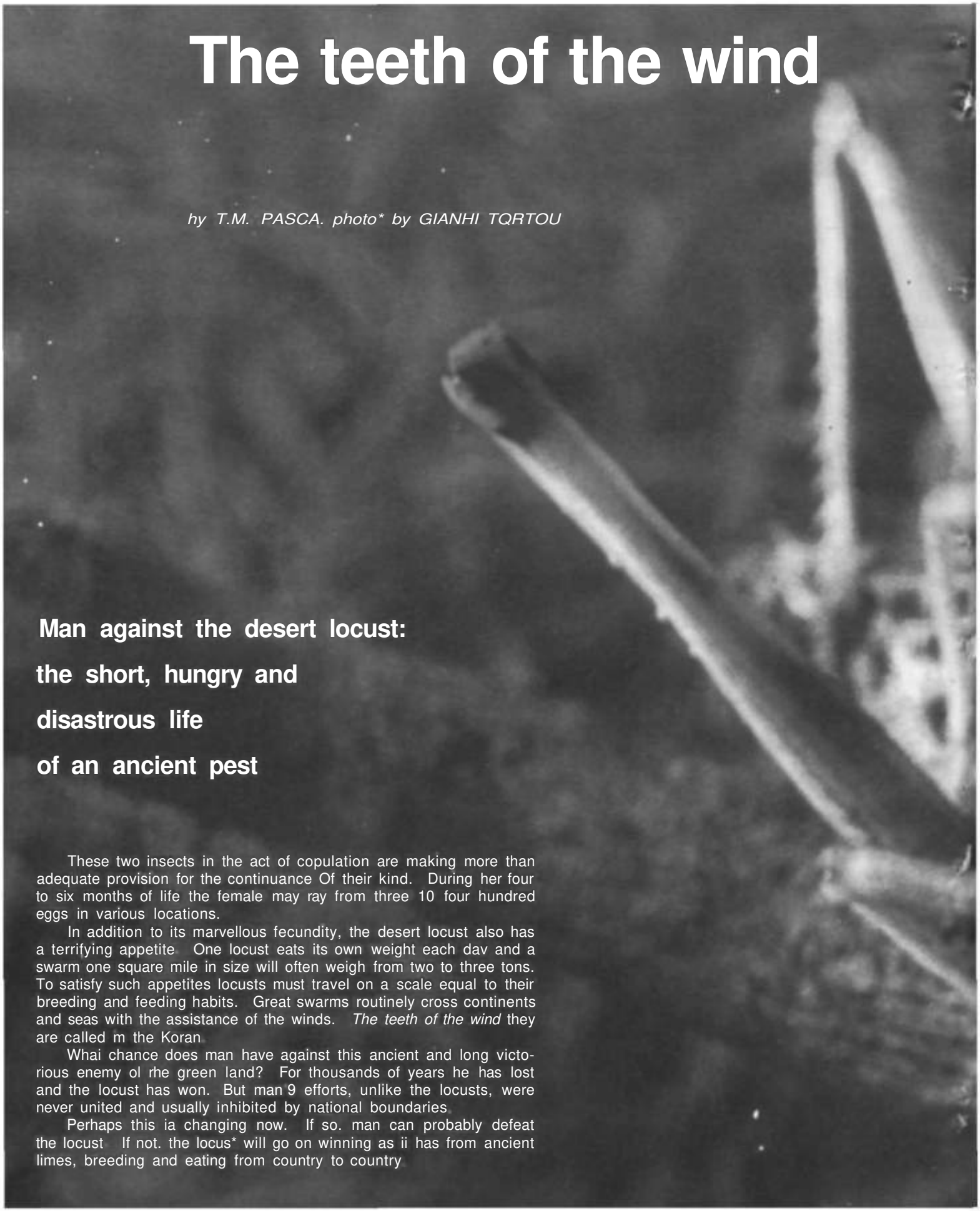
At present, before international action gets into its stride, there may be a delay of several months, equal to at least two generations. Pesticides have to be ordered and delivered and arrangements made for men and machines to be moved. All this takes time, while the locust, regardless of protocol, waxes fat at the farmer's expense.

What is urgently required is a.i international emergency fund permitting rapid "fire brigade" action immediately on news of future outbreaks. The sum of $500,000 has been suggested. Applied, as needed, it would be a small insurance premium to pay for the protection of threatened crops whose value has been estimated at $20,000 million annually, A small price, too, for averting so much misery.

B

The teeth of the wind

hy T.M. PASCA. photo by GIANHI TQRTOU*



Man against the desert locust: the short, hungry and disastrous life of an ancient pest

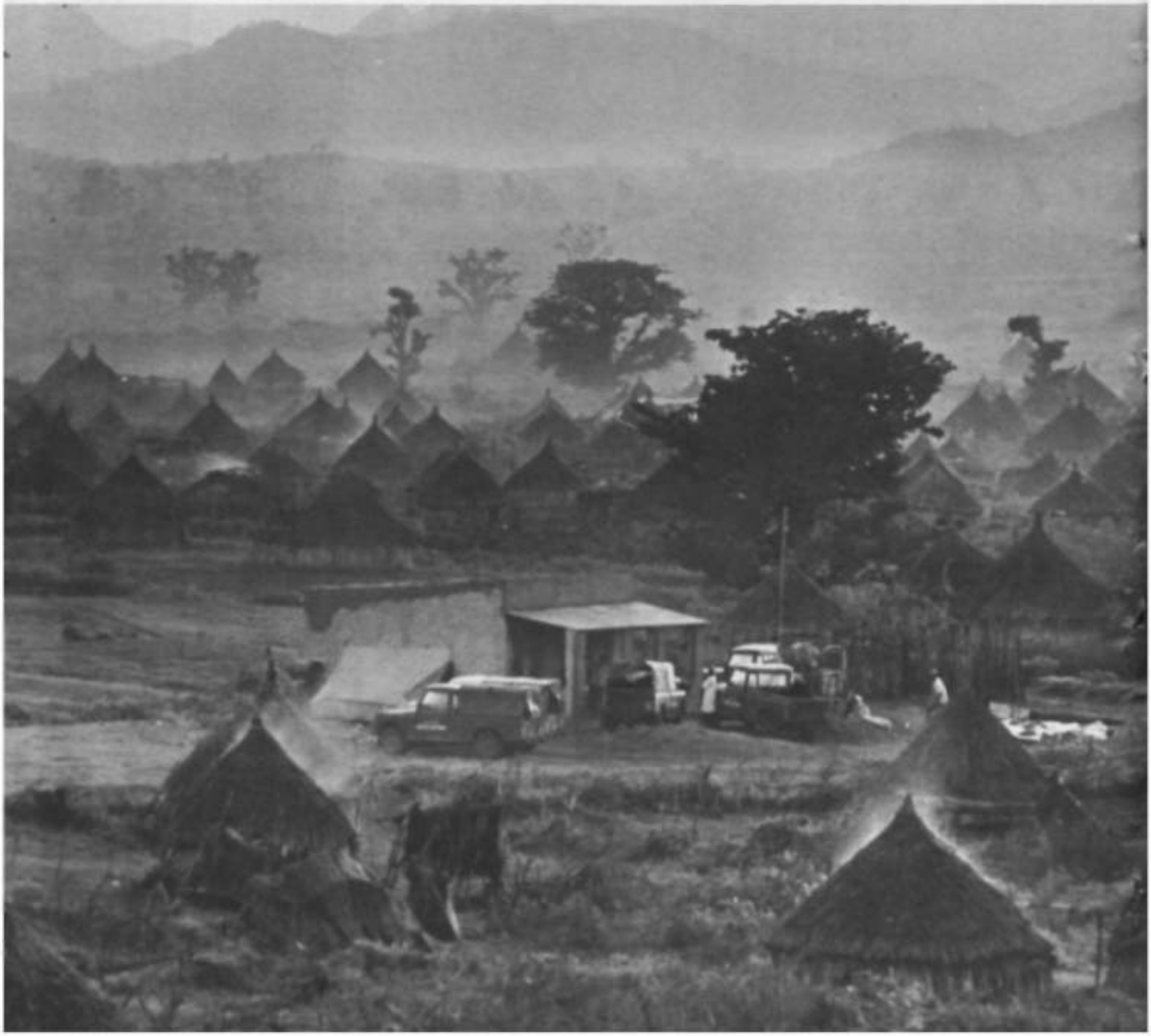
These two insects in the act of copulation are making more than adequate provision for the continuance Of their kind. During her four to six months of life the female may ray from three 10 four hundred eggs in various locations.

In addition to its marvellous fecundity, the desert locust also has a terrifying appetite One locust eats its own weight each dav and a swarm one square mile in size will often weigh from two to three tons. To satisfy such appetites locusts must travel on a scale equal to their breeding and feeding habits. Great swarms routinely cross continents and seas with the assistance of the winds. *The teeth of the wind* they are called m the Koran

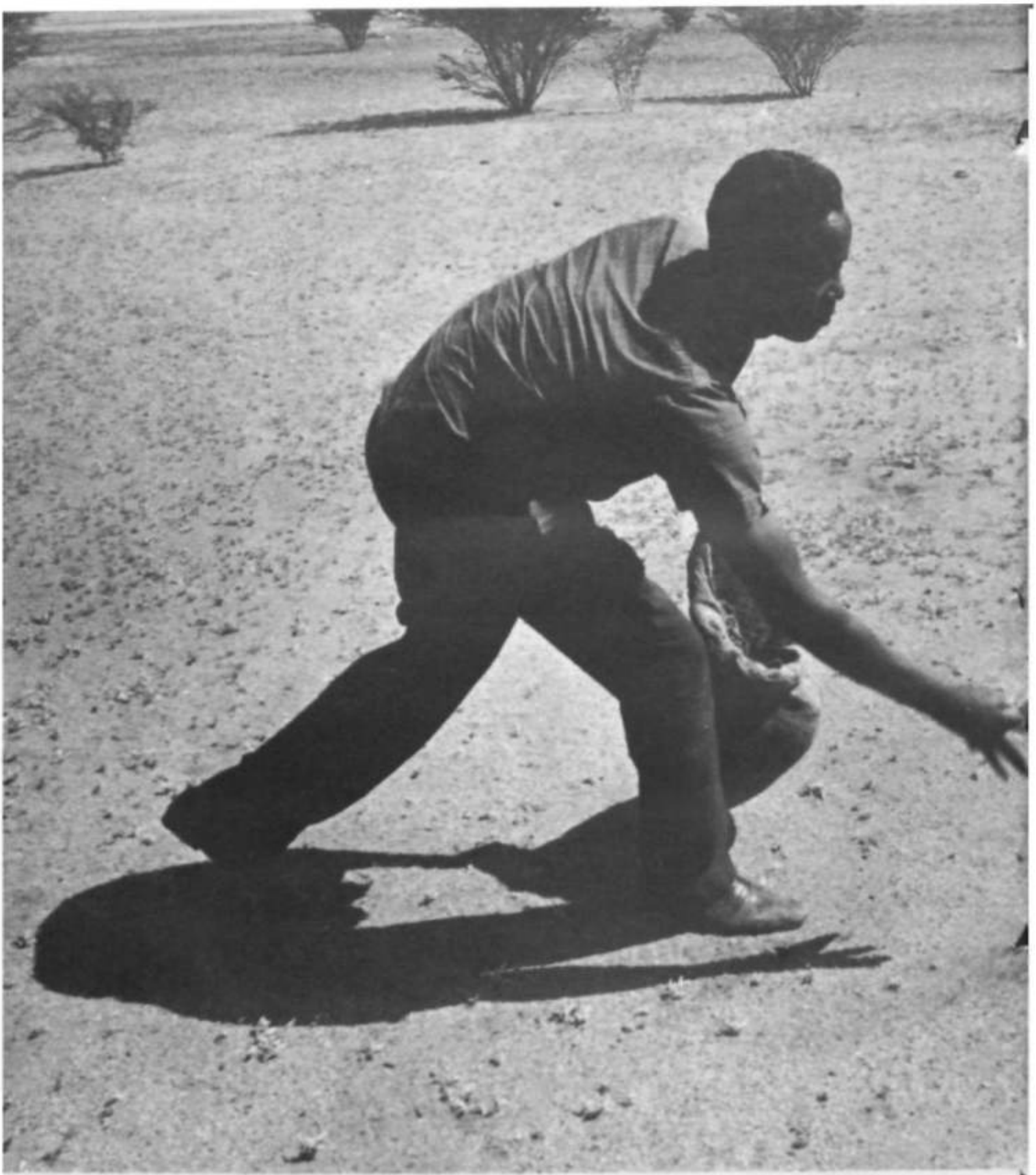
Whai chance does man have against this ancient and long victorious enemy ol rhe green land? For thousands of years he has lost and the locust has won. But man 9 efforts, unlike the locusts, were never united and usually inhibited by national boundaries

Perhaps this ia changing now. If so. man can probably defeat the locust If not. the locus* will go on winning as ii has from ancient limes, breeding and eating from country to country

In Asmara, John Sayer {right], chief locust control scientist in east Africa, decides where to send spray planes alter talking to far distant camps in Ihe lield, such as this one [below) at Gogni. Ethiopia



An immature desert locust climbs out of its shell for the litih and last time. From now on it will become increasingly destructive. Its appetite is at its most voracious. It feels impelled to join a large swarm — tts new wings will keep it Ny.ng over great distances



It is easier and rhMpir to destroy locust hoppers on the ground **than to kilt them after th*y hgv*** taken **to Ih* «ir SorMding bait made from crushed groundnut** husks **m>i«d** with poison m Khartoum **Province, Sudan**

After a rainfall the Sudanese desert is spotted with vegetation. Young locusts gather among the new green plants. Portable powered dusters are effective weapons against the hoppers and hatchlings.

At a locust control camp near Agorda. Ethiopia camels are loaded wiih sacks of insecticide for a day-long trip to a wadi where hundreds of thousands of hoppers have been discovered.

The locust control programme, like the locusts, needs wings
A spray plane loads with insecticide at an Asmara air strip

Thailand breaks the monocrop barrier

A dangerous dependence upon rice for export earnings is being balanced by the dramatic rise of non-rice crops

tty **JOHN STIRLING**

In the *\Mh* century *A.D.,* King Ram Khamhaeng defined the wealth of his realm in these words: " In ihe waters are tisti. in the fields rice. . . coconut, jackfruit, mango and tamarind abound in this land. Whoever plants them, unto him they shall belong. . . "

Seven centuries later, the same fecundity i>f soil and water underlies the prosperity of what i* now Thailand. The country is the largest **exporter** <if rice in southeast Asia, exporting rice **gwu** 10 former granaries of the region. In the MiKidtd **rkfffIgtff.** ttiL[1] ***Tilapia*** **Btn contrib-** utc protein to the diet of the village dwellers. Other kinds *of fish* iire netted in vast quantities from the canals **kOd** rivers, and from the seas around Thailand

Nature has been generous to this country. Yet the same bounty has been conferred on adjacent states such as Burma and Viet-Nam which, today, are in economic distress. Natural factor[1]., **clearly,** arc not the only ones **to** rwe shaped the Thai economy.

Since world war II. a high and **eva** quickening rate of **economic** growth has been maintained b> state planning Despite four ***coupi*** *il'tiai* since 14.12, the mi-pk-!iu-ri(Lttinii **of** economic plans h;is **nol** been hampered by political instability

E\en in the da)* of royal despotism, the country was fortunate to have had a succession of forward-looking kings. King Mongkut. who ruled from IK? I **to 1868. opened** up the country to foreign trade, **built** roads and canals, and issued the first modern currency. His successor. King Chulalongkorn i)XhS-I'>Mh abolished slavery, reorganized the ministries and ordered the building of the first railway line. King Vajiravudh {1910-]923) made education compulsory and established the first secular university.

I **be** ***gyvtmoua*** has traditionally taken an **important** role in rcgutating the **economy,** particularly in iJLitrniining the export price of rice Some industries — such a-i the distillation *i>f* nlcohol, the manufacture of agareucs and tobacco and pork production — **have** been state miv nopolius for years. Bui economic **planning** in the modern **MOK** began in 1961 with ihe hist sin-year development plan.

I his plan **took** mtn account the special **characteristics of die** thai economy in which **R29** Lif the **total** working force is employed in the agricultural sector and [1(]J' *i* of the grnss domestic puxluct is **dBttnd** from .sericulture

t **he empb&sis** in this first phase of de-**velopmeQl** was on Ji\crsiliL-j.tion. Large rtiulti purpvist **pcojecta** were undertaken lor ihe **benefit ol** bnih tilt- industrial and **ngriodtml ncton** The most **hnportart** was ihe **Bhumiphol** d.im on the Ping **river,** the **westenuiutf** iributar) of the (li:io ph>.i **rtwBT.** Completed in 1964, the ilani rises SIX) feet ahou- the bed of the Ping *ti*\ .nid **cmttei** a reservoir with ;t Lupacin ol ir.tMin milliuii cubic meters ot loiter. It provides h\d roe lee trie p*jwer **Bdd** water control, **rcdOON** the Yisk of Hoods and perm its the storage of mon- **lOO0** water. The two 70,(MX) kilowatt generators instiled at Bhumiphol. and the reserve capacity of six more units, ha%e been an important factor in meeting the increased demand for power from the expanding industrial sector.

The figures published by Thailand's National **EoOBOOaic** Developrrfcni Board on the results of the six-year plan reveal

Jahn F. Sitrljjif. ***former*** *utf!* **writer** *fur* The **I .o iH>miM /i** *iftr* **ObiieTver'h** *<i>trr\pf»tdrnt in THiiittintt and* rrfirur *of thr* Bangkok World.

that ihc annual **growth** rate of manufacturing was 14% per year, electricity and water supply I9<£ and trade 10%. The growth rate of ihc gross national product was 7.2'fr per year, surpassing the annual target rate of 6% envisaged in the plan.

Tim. rvbb+r and mmizm

The first plan gave increused-conrkk-ntv to the planners and taught them many valuable lessons. The second development plan (1967^71), launched last October, has more ambUk>us objectives and requires a greater mobilization of national resources. It aims at an annual growth rate of 8.5^ with a **516** increase in per capita income. The total invest-.ment required is S2JD0 million compared with 51.600 million for the first plan. Three quarters of this amount will come from domestic financial resources.

These figures arc an assurance ihat. unless war or natural disasters intervene, I ha Hand's economy should continue to expand rapidly — welcome news for the fowl deficit countries of Asia. There will be greater emphasis on agriculture in thinew plan: 20^ of the total investment will be devoted to farming. This, in turn, will mean a larger surplus of food erops fur export.

Rice is the **moM** important of Thailand's exports, and will remain so in thiforeweablc future. Last year, rice earned some $223,330,000 in foreign exchange This was almost ihc same amount earned collectively by the three nent most valuable exports — tin. rubber and maize. Domestically and in external trade, the economy is almost dangerously dependent nn one crop.

1967 was a bleak year for all crops because of severe drought Thai farmers produced an estimated 11 million tons of rice, compared with nearly 12 million tuns ibc previous year.

Cultivation still depends largely upon rain as'the main source of water for the crops. Since only 2K^f of the **total** area under rice is irrigated, drought* and floods can destroy .substantial amounts ol the crop. As in **the** rest of Asia, rtcc cultivation in Thailand remains largely a gamble on the rain.

However, ihc kmg-term trend fe for production, **area** and **jfWd** to **foflOW** a rising curve ProdIR-Iion increased rapidly after **world** war II, mainly **through aiwextentkM** of the rice area. Increases in production since the early 1950s have been due largely to higher yields. The hurvested area has increased by 13% in ihc last eighteen years, and the yield per acre has risen by 19%,

The most rapid increase in production lias been in northern Thailand where *<ui-put has risen *by* more than 60%. In the waterless northeast, the average yield is the lowest in the country and production has increased only sluggishly. Even so, dramatic increases were reported in the northeast on irrigated land; unfortunately, irrigated land is such a small proportion of ihc total area — 4% in the

northeast, compared with 6U<7 in the central plain — that this increase h;ut .t relatively small impact on the average yield for Ihc whole region

However, the irrigation picture is con* stantly changing. The Hhumiphol dam *is* the most spectacular of a congeries **ol** projects. In the northeast, two important multi-purpose dams, on the Nam Pong and Nam Fung rivers, are being suppk-mcnteu[1] by purely irrigation projects **at** Lam Pao. Praplerng and Lam Tukong. Together, tht> will bring another **200,000** acres under irrigation. The need for controlled water **qntHM** in the northeast j* underlined by the fact that the per capita income is the lowest in Thailand.

In the north, (he effort is directed towards the improvement of Ihc existing network of canals, many of them more than a century tild. Stone weirs arc being built to store water from the Ping river (north of the Bhumiphol dam) and to distribute it through the canals. Extensive drilling of artesian wells is being carried out to supplement the weirs and canals. Officials in this region point out that the problem is not to expand the acreage for agriculture, in a region which is already overcrowded, but to raise the yield per acre by improved irrigation.

In the centre, watered abundantly by the Chao Phya river and by innumerable canals, the need for development is less obvious than in other parts of the country. However, the central plain accounts for nearly 80% of the country's total cul**tivaled** land and it has received at least U much attention as other regions. One of the first loans made in Southeast Asia by the World Bank was to finance the **comtration** of the Chainat diversion dam on the southern Chao Phya river and the installation of a system of main canals. **The** current phase of the international programme to harness the Chao Phya began in 1962 with the construction of • series of dikes, canals, drains and roads, I his **phau** will be completed by 1970 and i. will bring almost two million acres under intensive **cultivation.**

National measures to increase the irri-iMfL-d urva art- fundamental CO the economy and trade expansion.

A **Thai** cconomiit recently noted that in the last six years non-rice crops h-jve shown spectacular increases. He pointed out: " Ihjs increase and diversification is the result of ihc ability of the Thai farmer to adapt to changing world demand*. . . but it wouJd no< have happened if the government had nut **provided** the infrastructure, especially irrigation projects, to the value of about $200 million. "

Tmm **Ataft******** *m* **queeze**

However, (he announcement that Dunland this year will export not more than a million tons of rkc (compared with 1.3 million tons in 19*7) strikes an ominous **note,** It reveals Ihat some fundamental problems ha^ not been resolved. Thailand's planners *m* well aware of what these are. The National Economic Deiciopmcnl Board summarized the pmbleim as follovs; "The rapid rate of population growlh, (he danger of uncm-

from the few birth control centres and from shops selling contraceptives reveal thai some 300.000 wonwn are practising family planning. Experts point out that this is only 10% of married women jn the reproductive years. But (here is strong evidence :hat a much higher proportion would practise birth control if the techniques were nwre widely known and available.

Mobile birth control clinks have met wiih overwhelming response. Those in charge of a pilot projccl in Potharam district carried out a survey of married women between 20 and 45 years of age which revealed that though kss than one in a hundred had even the vaguest idea of **COOtiactptioa,** 70% wished either to practise birth control or to learn all about)i.

In this country there arc no religious or social barriers to birth control Family planning is limited only by the scarcity of clinics and contraceptives. In the climate of Thai opinion, the 1.4% annual growth rate of population can be held constant or even reduced if the government **rnmmhl** iiwrlf wholeheartedly to a nation-wide policy of population control.

Diversification of agriculture in Thailand has already upset the hoary theory that the Asian peasant is incurably conservative. In Ihc last decade, new cash crops were developed ut an astonishing rale. Since 19M, exports or ma Lee have trebled, while jute and kenaf exports doubled. Last year, make was rhc fourth most valuable export (having dropped from third place due to drought), earning about 564,320,(100.

Individually the new crops do nut challenge the pre-eminent role of rice but, **coflcctivejy,** they earn more on the worltl market. Rubber, formerly the second most valuable export, has now yielded that place **to** (in. Earnings from robber have fallen sharpty over th< last two years with the decline in world prices.

However, planting and production continue to rise. Last year's yield of 228.000 metric ions was an increase of 8.000 metric ions over 1966. Output would have been higher but for low world prices. Smallholders, who reaci sharply to

*Rice is tt>9 tB&c toed ot more than **lf* **W» mWUtt** people and * **ttifl tfW** major ***rport earner tor Thailand.** Here, **replanting r-c»** nmv Bangkok

market condilinm. nuke up »t*>ut 90% **of the rubber industry In** Tl»i!.ind A replanting schema has been in operation Mnce 19ftI. and has replaced old trees **with** high-yjcld clones on about 6% **of** the planted area. The admittcdlv sluggish programme has been intcn-iihed ihis year, but the results have not yet been published by the Ministry of Agriculture. The benefits **of** replanting will not. in any case, be apparent until most of the new clones **cone** im*> production five to seven years after germination

Diversification and modernization are among the most trKuuraging a*pcciv of thai agriculture Paradoxically, ihc impetus (o switch to other crops may be given by ihc very prosperity of ihc rice sector. Dr. T.H. Silcock. of the Australian National University, has produced cogent arguments that the rice export tax has indirectly subsidized other farming and economic activities. The tax — which is about 35% of the f.o.b, value of rict shipments, and which provides over 10% of the government's total revenues — weighs most heavily on the farmers who grow rice exclusively. In effeel, the rice premium transfers about 5% iif rice-growers* income to other rural producers, mainly in the form of development projects,

Laommty structured mOOlmty

Another, more obvious, influence has been the price incentives in foreign markets The enormous increase in the output of kenaf in 19ft] was the result of crop failures in Pakistan, and consequent high world prices. Maize expansion is partly due to the rapid growth of the Japanese market. Rubber responded. after some delay, to the high prices prevailing during ihe Korean war, Other fitclors which have benefited both the new and the old crops art increased irrigation, more and better roads, improved plant varieties and increased use of fertilizer.

These are the secular influences on **Thai** agriculture. Behind all of them lies the attnude of mind of the Thai farmer; **a factor** loo rarely considered by economist* A sociologist with a profound knu* ledge of Thai vUllage society describe-« ii as "loosely structured. " Individuals move frech from tillage to village. 10 the towns and back again. Land is regarded as a commodity, not a> a status symbol 1 he \a>l **BMJOfif)** of the farmers .ire **Theravada** Buddhism. They arc totwniiii and **pttgnutk Village** communilies are not rigid I \ si ratified, nor arc they shackled by **C&tte.**

Movement from occupation to occupation, up and down the hierarchy was not and is not hindered hy birth and oiher factors. Mobilily is sanctioned in <hc Buddhist system of values, by which status derives from religious merit, acquired in previous lives. Social mobilin is thought to be quite natural.

The Thai (armcr feels that he lives in a stable, comparatively prosperous society, and that he is free to experiment, to travel and to take risks. It is this which Iks ;ii the heart of 7 huiland's economic strength. ▪

ployment, low agricultural and industrial productivity, high cost of capital, and the growing need for **conserving** ihc natural resources. . , (he uncertainty of foreign markets for major exports, the **imperfeo-**lions of the marketing and transportation systems, the low level of savings, the lack of skilled manpower and an anachronistic civil service system."

{population growth) rate of over 3% per ; inuirn continues, the present population of 30 million will have reached a figure of about 50 million by 1982. . . This rapid increase in population would naturally aggravate the existing basic problem i. making it a more exacting tasfc# Lo raise the standard of living in the years ahead."

birth rate and the trend towards diversification of food crops.

There arc several reasons to dispute the M:il[husi;in attitude. The irrigation programme is only one part of the development plan for agriculture. In the first stage of the plan, being implemented this year, (he distribution of improved seeds is being expanded by contracts with se-

Waier for new areas *of Irrigation i/t Thailand. Here, a large upsuetm conduit undei construction some years* ***ago*** *as part of the Marty Kiactiar* dam complex on tn$ Petcnbun River tinancett by a* ***S3.4*** *million loan from the World* ***Bank.***

In short, Thailand has the same general economic profile as other developing nations. At the hc;irt of the interlocking problems is the " MullhuMun squeeze. " Again quoting the National Economic Development Board: "If the current

A western economist predicts that the local consumption of rice will rise to meet the production curve and will intersect it between 1973 and 1980. Admittedly, this forecast is hascd on **variable!** such as the growth rate of production, the

lectcd farmers, the agricultural credit system is being revised and improved and agricultural pricing and marketing policies are being reorganized to offer stronger incentives to farmers,

On the suhject of the birth rate, figures

We must export

says a leading economist from the third world: It Is in the long-term interest of the developed countries that we export not just raw materials but, increasingly, manufactured goods

by MMLAM DATTA

Internationa] cooperation for economic development comprises three different but Lntcrrcluted **activities.** It involves aid in (he form of capital from the developed in the underdeveloped countries; a changed pattern uf international trade; and transfer of knowledge, which is a somewhat wider term than technical assistance.

It is now recognized by most economists that there is nu question as to whether agriculture or industry should comt first in (he process of economic development. What is necessary is in maintain a certain proportion between these two sectors, a proportion which iisdf changes in the course of development.

If we want tn put our idea in somewhat more precise form, it can only be done under **WttrtfHw** assumptions. If a country does not depend upon imported foodstuffs to iin> significant degree, the rate of growth of the marketable surplus of food within that country will determine the permissible rale of growth of its industrial sector. Whichever sector develops at less than this warranted rate of growth will be a candidate far **priority** attention. Strictly speaking, it is not so much a question of priority as of correct proportion.

In developing countries with a high dingily of population, there is a special reason for ex pec Ling agriculture lo lag behind and thus become an obstacle to I he overall growth of the economy, Economic development involves, among other ihings. a process of transformation of the technological basis of society. But new knowledge and new **tcdariqwi** of production da not penetrate all sectors of the economy with equal ease. Experven-CC in the developing countries shows that I he introduction of advanced techniques is easier in the organized sectors of industry and transport than it is in agriculture and allied household activities. Where this is so. the comparatively slow rate of growth of agriculture, particularly of ftHnl production, acts as a serious constraint on the Attainable rate of growth for the economy as *a* whole.

The experience of India illustrates ilupoint. In all such cases, agriculture calls fur special attention if growth is to be achieved without crisis.

Tbc argument so far is independent of whether the developing coumrjes can depend on primary products for increasing

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Amlin Dana *h head t\i iht Drpanmtnt •>/ fUtwomics at the Vnivmity of Calcutta and thr Olithot *>i many arm in tin A Man rtantimir drveioptntnt.*

iheir exports sufficiently rapidly. It is well known that the growth of demand in the developed countries for primary products (exclusive uf **petrolewa)** is slowing down. This is due to certain characteristics of the income elasticity of demand for food at existing levels of per capita income in these countries, new possibilities of achieving economy in the use of raw materials and more extended use of synthetics.

But before going further into the question of trade with developed countries, we must consider the question of trade ;,iiu>rti> the developing countries themselves.

Ooubltt dopundmmca am thtt USA

In the trade between the developing countries as a whole and the United States of America, the firs! among developed countries in the world today, there is one special feature thai needs to be noted: the underdeveloped world is dependent mi the U.S.A. for food a* well u industrial goods. This is in sharp contrast with ihc situation before world war | when Britain, the most developed country of that earlier period, supplied ***mmwtw*** tured articles to the developing regions hut depended on them for fotxl and raw materials.

The double dependence of ihc developing countries today on the United States of America for food and manufactured goods creates a special problem for their balance of payments and, ultimately, for their overall rate of growth.

The problem may be relieved, to so nit-extent, by more trade among the developing regions themselves. Some developing countries have a surplus of food and raw materials needed for i*r\<i*usirealization. The case of Thailand has already rvon mentioned, and it would be easy to multiply instances. Side by side, there are other developing countries which are in a position to export an increasing range uf manufactured goods. India is a L\IM. in point.

Among the developing regions. :hcn. it should be possible to arrange an extended exchange of surpluses of food, raw materials and manufactured articles. Regional economic cooperation and bilateral agreements across regions may help achieve this. It is a task awaiting fullilment. which must receive a great deal mure attention in ihe coming decade.

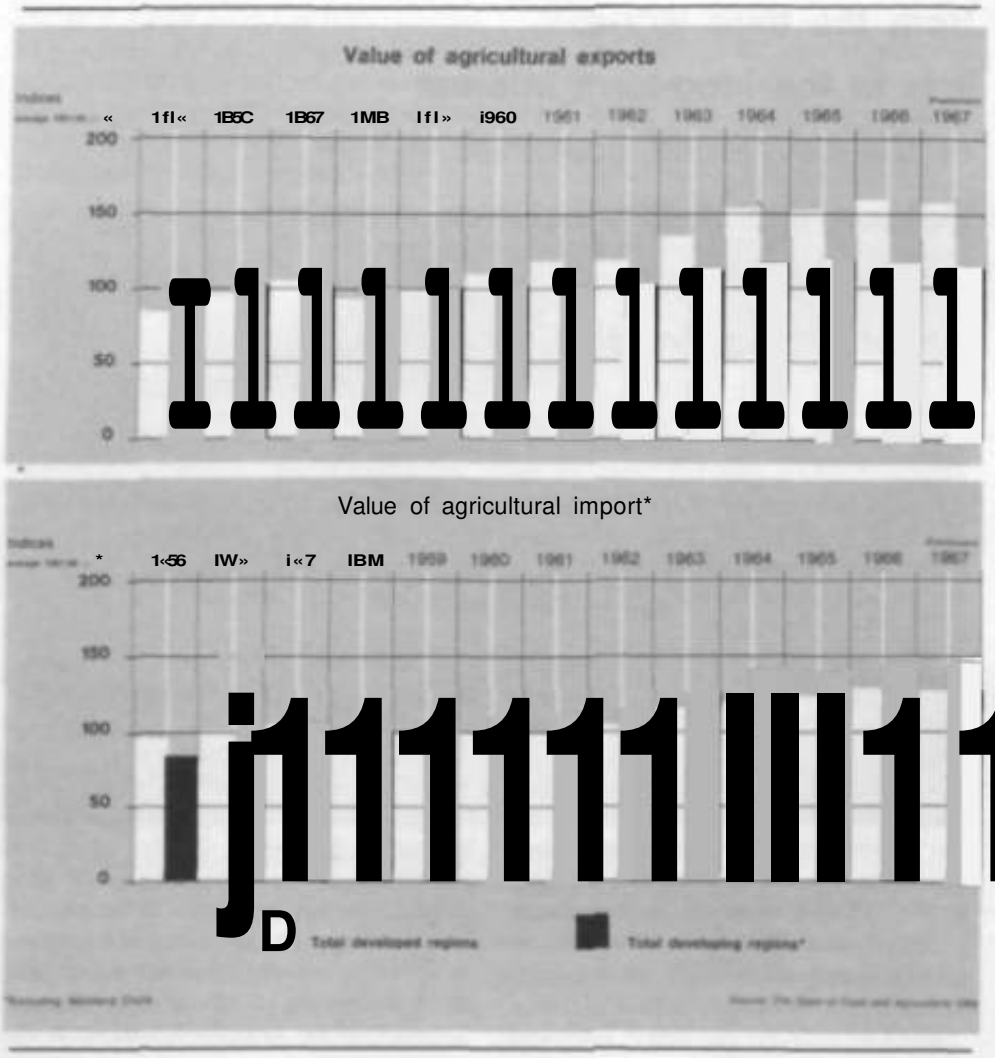
Returning to the question of trade bciwcen the developing anti the developed countries, there is a general feeling in many developed countries that the third wocld should specialize in primary production and very little sympathy for the idea that they should try to develop their industry too.

This attitude «s perhaps not quite so prevalent as it was; but it persists, even if in a less emphatic form, ft manifests itself in the t.iriff policy of the developed countries when they let raw materials Tram Africa. Asia and Latin America **COOM** in freely, but impose impon duties jnd **Other rtrtaJOUI** on manufactured itnd •w.-nii-manufaclurud articles from these same regions.

It is wcl known that when such discrimiii.ilinn **h** practised the effective rale of !*ny import duty is considerably higher than the nominal rate. For instance, if the value added at the manufacturing stage is 25*'i* of the value *tk* itvc final product, and if the nominal rate of import duty is 12'zi^, ihe effective protect inn enjoyed hy manufacturers in the importing country is more like 50%.

Long>rerm interests of hath

That the developed countries can practise such prof;ctkmism againsi the developing countries — a rever%al of the original idea — arttf that they can do this



Individual developing countries still rely on primary products and are increasing their exports fairly rapidly, as in the case of Thailand, not to mention those countries which mate a fortune out of petroleum. But if the developing regions, as *a* whole, are to increase their export earnings from the developed countries to **pay** for their necessary imports of capital goods and other essential conimodities, they will have to depend increasingly on Ihc export of a variety of manufactured and semi-manufactured goods.

apparently with a good conscience, is only explicable in terms of an economic philosophy which is not very sympathetic to the whole process of industrialization of the underdeveloped countries.

Uui this is a wrong philosophy, It would be in the long-term interest of both halves of the world if the developing countries could expand their exports of manufactured goods.

*Mark**a needed to* pay *oft mid*

Capital and technical assistance front the developed countries should flow inti> rhe export industries of ihc developing *countries so as* lo secure *higher* labour productivity and necessary market connections.

This may seem like demanding loo much of the developed countries. If the developing countries succeed in increasing their sales of manufactured articles (like lex I tics, MI car and products of light engineering industries} in the markets of the developed countries, this may create temporary unemployment in (he importing countries and call for a structural reorganisation of the labour force, which is never a painless process

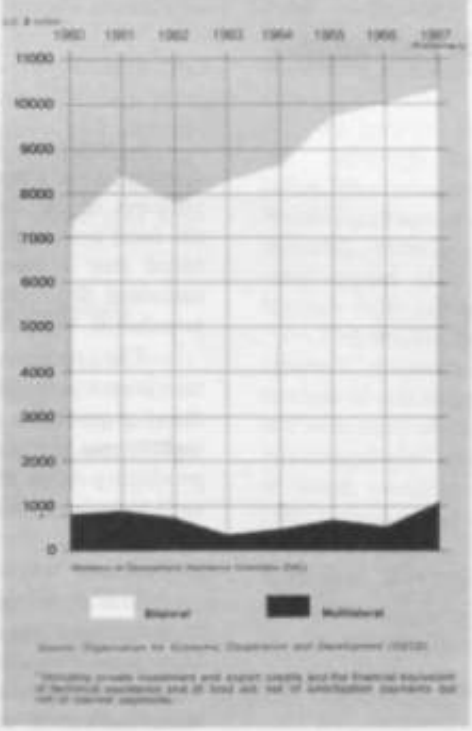
It may be 100 much to expect the developed **countrkl** to assist in this process. Yet, in the long run, all countries stand to gain. Structural transformation is taking place all the lime within any dynamic economy. If this is true of national economics, 11 must also be true for the world economy.

Within the national economy, new techniques and flew commodities render old industries obsolete. The con sequent readjustment is accepted as it is seen to be necessary for growth. In the world economy, development in one part calls for readjustment in another. If the developed countries show reluctance to accept this, the underdeveloped countries will still develop but the process will be more painful. The developing countries will, in thai **cut,** incline **men** in the direction of autarchy and dictatorship *ami the* pattern of world economic exchange will be distorted. In the Jong run. all countries will lose.

Those who pretend to be positively interested in world economic dcvclopmem should also be ready to pay the price of development. The developed countries show themselves ready, some more than others, to pay this price in the form of aid and loans to the developing countries. But it is not logical to agree to aid and yet remain hostile to the repan ern ing of world trade that development requires.

Unless the developing countries can strengthen their export industries and steadily increase their exports to the dc-\eloped countries, aid can never be repaid. I hi- impulse to aid itself is bound to weaken, and **oCbei** complications arc bound to arise, unless aid is combined with a process of change in the structure of the world economy, making it pns-

Foreign auiatanca' to developing countrws



sibk for aid to be repaid and. eventually, (o cease.

There is ulsu a basic **mfccooccfXiofl** of the process **of** international transfer of knowledge which has to be laid baTC before cooperation in this field CU show maximum **molfe** Some **people Men lu** ihjnk thai the knowledge and ihe knou.- **exkl** in iht developed countries and nil rliiit b mctlimrj is to appl> this knowledge to the problems of the poorer countries But this is a wrong idea. Knowledge is universal in a certain sense; but there is a true and a false conception of the universality of knowledge as an instrument of practical change. In agriculture, seeds, fertilizers and other inputs ha\e to be adjusted to the nature of the soil and the climate.

In a wider sense, this is true of economic life as a whole, The knowledge that exists in the developed countries has grown in respond to, and in adjustment with, the material endowments, social requirements and the cultural climate of those countries.

In the **developing** countries, where social requirements and the Cultural climate ;ire different, the knowledge needed for development is also different.

The pressure of population and the extent of underemployment in snmc of the developing countries are significantly £rcuter today thati the) were in the western countries on the **m** of the industrial **re volution.**

There are also fewer outlets for surplus population. This changed situation cannot he nut adequately on the basis of existing technology, It is mil enough simply to transfer knowledge to the poorer regions of the world as though knowledge were like minted coins.

Scientific tttit-rttiimncm

The developing countries can, of ***BCNBM,*** learn from the more advanced countries. Yei what is basically required is that people in the less ,id^ miccd countries develop habits of scientific self-reliance, o(facing their own peculiar problems with the confidence that science can hcip. and of competence in applying ihe methods of science.

Probably nothing else is more important (or sustained economic development than ihiv I ht **RKCeta of** international technical **HWhtMICC** ;ind of other educational program *mm* should be judged by this standard.

In other words, they should be judged and assessed not so much in terms of how they have solved some specific problem in a backward country ,or-helped to implement some particular project, as hj the fxti-nj to ^bicb *ihcy* ha>f *crcawd* .1 **tctenttflc** nuiliHik in a tradition-bound people.

If transformation of the technological basis of society is a primary physical requirement in the less developed countries, then the creation of its psychological counterpart in the minds of men is equally essential.

point of view

Today's sophisticated technology is using petroleum as a base for protein. Can the tables be turned to produce new industrial products from agricultural raw materials?

Can rice replace petroleum?

hy P. *A. FQRTHOMML*

Agriculture, long treated as the scullery maid, has. been restored ti> a place at the banquet table by the leaders and planners of the developing countries, at least in the case of the food producing sector. Indeed, it is now generally recognized thai a country cannot expect to achieve rapid and sustained development unless it is largely able lo feed its own population from its own crop production.

This renewal of interest in farm produce is reflected in current activities of the international organizations and those of governments and private associations. Unfortunately, it does not yd extend to that pan of the agricultural sector producing crops other lhan food. This activity is still considered inferior to the industrial OT goods and services sectors. We still think ihat it is a misfortune fur a country to have an economy based on crop cultivation arid animal husbandry.

This is a regrettable stale of affairs, especially when it occurs in the less advanced countries. Although such counirics mav. one ddv, be abic to reach the level of (he more **developed** nations, at present they cannot hope to achieve **industrialization** on (he scale required to allow them lo live on I he production and trade of manufactured goods.

While the possibilities of establishing various industries in such areas should not be neglected, we should also consider the prospects open to agricultural products if suitable policies were applied.

A rapid growth in food needs is expected in I he develop ing countries, due both to population increases and to the demand for quantitative and qualitative improvements in nutrition. This has Led to a searching examination of the various ways of increasing food production.

One form of diversification suggested for countries with a single cash crop is its partial replacement by various food crops. For other plant produce, and even for some food commodities such as sugar and coffer, the future must be viewed in terms uF production surpluses, income-earning capacity, fluctuating **ami** unprofitable prices, competition from the developed countries **nud** the IIK u'.iMtig trend inward substitute produtis. particularly synthetics.

P.A. PonhomtlK. *formrriy odttuntitralivt 4iretitv-gtntral for rttrrnol Irtuir, it ttttfium't ptrmunrttf rrprntntatixe HI inttlruiltvntil cwtftrrncr*.*

The paradoxical situation is that, basically, there is no over-production in the world, only underconsumption. All ^uch problems result from the inadequacy of present markets because the overwhelming majority of mankind has not yet reached an acceptable standard of living. Therefore it can he assumed that economic development will lead to increased consumption, a reduction of surpluses and, eventually, to a balanced supply-and-demand.

In fact, as various development plans are put into effect, measures should be taken to ensure that newly-established processing facilities do not lack raw materials. Production statistics show that — apart from food, for which there are already almost no remaining surpluses — a 10 to 25% increase in consumption for most other basic products would create problems of shortages.

If the two billion inhabitants of the developing countries were to attain a standard of living only half as high as that of the 800 million " developed " peoples, the world's consumption of goods would be at least doubled.

The plans and policies of both the industrial and the developing countries should take into account the fact that the demand for food and other raw materials will rapidly increase cs recent development efforts begin to produce results. And, despite the possible short-term advantages offered by competing mineral-based products, it is agriculture that will be increasingly called upon to fill this need.

Increasing world dnmand for raw materials

Agricultural production can act as an accelerator of overall development as it increases, provided appropriate policies are applied. Such policies should be aimed at increasing both the producing and purchasing power of the farm masses so ; that they create sizable **markets** for local industries.

Some of the methods for achieving these goals are of a national character, others lie in the sphere of international relations. National measures, varying from one country to another, may involve: land reform; financing of farm enterprises; agricultural credit; farmers'cooperatives; organization of transport; marketing and distribution to consumers; vo- r calional and oceupational training; agricultural production requisites; and experimental research. The development of agro-allied industries will also be needed and can provide a reasonable way for many countries to begin industrialization.

Two types of action will be needed at the level of international relations. Firstly, the third world must be offered support and assistance by the developed countries, consisting of easier access to their markets, financial aid, and technical and material assistance. Secondly, a new form of international trade must be created among the developing countries themselves.

It is often said that these developing nations are not mutually complementary in their various natural products but are, rather, natural rivals. This statement is too general, and is becoming less valid as such countries emerge from a primitive living standard. There arc wide disparities between the ^.legrees of progress reached by the various developing counirics today, over and abovo differences due to climate and natural resources. It is precisely these differences that must be used to their best advantage.

It is up to the more advanced of the developing countries to take the lead. This means improving their industrial production and prices so that they can offer capital goods, implements and commodities to their neighbors under advantageous conditions.

Steps must be taken to lower frequently excessive tariff and customs barriers between developing countries. Such countries should also inaugurate policies aimed at creating reciprocal purchasing power through regular surveys of export/ import possibilities between the developing countries.

Such policies would enable the semi-industrialized countries to become important clients and suppliers, buying more primary products and supplying more finished goods of alt types every year. It would also speed up agricultural expansion and development as a whole, possibly beyond all growth predictions.

If we look further ahead to a more distant future we must assign even greater importance to the expansion and improvement of agricultural production. We can expect an increasing world demand for raw materials, especially chemicals.

At present, synthetic products are mainly derived from oil. Although the known and estimated reserves are enormous, this resource is nevertheless not renewable and will become exhausted at an increasing rate as overall production demands increase. Coal could replace it, but the same argument applies while costs are high. Conditions arc favourable, for raw materials of plant origin to come into their own.

The decline of such materials before the onslaught of synthetic products in recent years is due to the enormous amount of scientific and technical research that has been carried out to ensure the fullest utilization of petroleum by-products. No comparable effort has been made for plant products, most of which continue to be used without undergoing any significant **metamorphosis.** The few exceptions, such as cellulose, or soya casein in the manufacture of plastics, have had only a modest development compared with competing synthetic products.

National and international plant rasaarch

International organizations, national governments and private enterprise should agree to launch a research effort comparable to the one which has so favoured the development of petrochemicals.

Such international endeavour would aim at the introduction of new processing methods for the utilization of plant materials, either without basic changes in their physiological structure, or with profound modifications which could turn them into basic stock for new synthetic products.

This type of research would create vast new outlets for traditional production and would break the ground for the introduction of new raw materials to supply leading chemical industries.

The benefits of such a venture would not be confined to farmers alone. It would assure a continuity of development and the probability of new raw materials, natural or synthetic when those now employed become exhausted. It is by no means too soon to begin organizing this common effort in the interests of all.

in the field

JORDAN

• Nsw *irrigation pommibilHiom uncovered*

The search for underground water in Jordan, being carried out as a UN Development Programme project by a joint FAOAJordanian ,team. has resulted in major finds of waier for industrial and agricultural uses, as well as drinking water for both animals and humans

The project, which began m late 1967, has been extended twice at government request. The second amendment asks the team to help in developing pilot irrigated agriculture using these new groundwater resources over a 2.500 acre area To date, 78 wells have been completed under trie project and six more are now being drilled

The Satest findings of underground water have aroused the interest of several bilateral aid organizations and have led to West German aid ana UK. financial assistance in locating areas of soils suitable for trngation development in the Karak-Maan area, loward the fabled city of Petra,

FRANCE

• **Man's** *inhumanity to* ***mmn*** *mxmntinmd*

Scientists from over 50 countries mei at Unesco headquarters in Paris in September to search for ways of protecting the earth's fast-disappearing natural environment

The intergovernmental conference ol experts met to suggest a scientific basis for raiional use and conservation of the resources of the biosphere (the sphere of living organisms inhabiting the earth, the aqueous vapour which envelops the earth, and the atmosphere itself). Discussion focused on broad problems including the threat to the planet's resources posed by population growth.

Food production in the poorer countries can grow faster than their populations if the necessary efforts are made, said A.H. Boerma FAO's director-genera) in his Conference address. But growing numbers of people would mean more unemployed drifting from the farms to the cities Progress in some other economic sectors might well have to be given a iower priority than the need to produce food

Current demographic trends seem destined to iead to the memorable growth of.., marginal populations " he said. " I believe that this is the gravest problem facing the world of today and tomorrow, "

Among the suggestions offered at the conference was the need to preserve natural areas as a ' gene pool ' or 'gene fund'. It is these areas that provide the raw materials for breeding domesticated species: it is here that the search is carried on for medicinal drugs or chemicals to control weeds and pests. When a new disease attacks wheat or rice or cattle, the scientist tries to breed a new resistant strain. To do this, he must go back to the wild representatives of the species.

A strong case is made in another paper for game-farming and game-ranching in Africa and Australia to supplement and even substitute for the age-old tendency to desiroy wildlife and replace It with domestic livestock Experience has shown that, under certain conditions, wild animals make much better use of available plant resources and can yield more meal per acre than ' traditional ' species introduced into gamelands

A paper on pollution prepared by WHO stales "Human infestations with worms, transmitted mainly by polluted soil, are so massive that over half the food produced and consumed is metabolized by the parasitic worm population infesting man HaJf the work of the sick peasantry goes in the cultivation of food for the worms that make them sick. "

The conference's underlying purpose was to bring both scientists and governments closer to the biosphere by creating a climate of ' ecological thinking ' For the scientists, this implies a breakdown ol barriers between disciplines, for governments, it means moral and 1 nancial backing lor conservation programmes and BCOloglcal research to put the environment lo more etftrient use.

Another* sec lion *at pipe* go#s *if own* in *(ht wrch lot ontjat ground water in Jantwn % southern desert

GUYANA

■ **Greenheart exports** *being pushed*

Guyana is the only source of greenfteart — a very durable hardwood used particularly for marine piling and port decking — in the world Guyanas exports of greenheafi have slumped recently due to strong competition from other woods and this has. in turn, led to price-cutting among the exporters

FAO forest products rnarKeting officers, wortong witn a UNDP forest industries 6*v«4opment survey team have helped lo set up an exporting consortium to stop this pnce decline and to boosi exports Agreemeni has been reached on pnces and production quotas and an attempt is being made ic standardize *lumber grading.*

Members of the team have also helped to interest a North American plywood and manufacturing company in s proposed joini venture with a Guyanese logging and sawmilling company; and in boosting chip exports to Japan.

THAILAND

Wreshwater fish *production tte expanded*

The Thai Department of Fisheries is undertaking three projects to promote the freshwater fishing industry *n the northeastern pert ol ttw country. Eight new inland t*neries stations wiii be opened to promote and expand spawning. In addition the fishing industry in the Ubol Ratana Dam area is to be developed The present catch al this reservoir amounts to about 1.000 tons annually but ii i$ hoped to increase the catch fourfold.

• Mate* ***crap* mndmr mt~ tmak »y Bvmbmy ioommt***

Two locust specialists are being sent to Thailand tinder lhe auspices ol the UN Development Programme lo fitudy the effectiveness of various insecticides and to improve survey and control measures as well as to investigate the behaviour and ecology of the Bombay locust, now widely spread in Southeast Asia. The locust has caused yearly mfestations in Thailand since 1962.

Because lne locust M M -•d V * U are rather remote and difficult ol acceu. and because trw mtaution* develop during in* ***tttonmoofi*** trie control measure undertaken so fif tint not prowl adequate to tuppwa tn* owlbreaks <$•* ***tht vtief*** on *desert* toewttt *m tfus issu*)

The **Upamu OeparaiMrt** of *Mftt&iitvi** n« *b—n* mwwig **n* **c y w w *MI»M *I* itactonp** *ttm* liriw, *lit** •mj **me CAIMWI** *fum* ***emti*** *to pt*r* **r''•'' *rotm m amntopmg* country'!**

5m tifi m I9W *tn* Young F»mmn* **Of *Mqwtm* P n y i w n n t** njJunls/r eoucsfjona' w n C i *tot* young term *B*opim* 6oh*«*ft SofVJco or tfiff Oepsfimem o/ ^gfrtLr/ruJ-e and [no paivjupaig a^o tetf fty *unpaid. i/Qivntery local leaders* and *elected officers.*

Ona of rn» main aims >s *to interes) the childr&n ct (arm families in agriculture and to intiu&nca them lo lake up a farming carear Young farm pttaple must havo ttmit patents' permission lo participate in tns programme. SMC* J964* rn»mb#rs/rip hsj *risen to 13,000. with* 530 *societies and 1.0BQ voluntary tetders.*

UNITED KINGDOM

• ***Royaitioa introduced tor H*mr*** *plant variolimm*

Following tna's r.j< l, •• • National insKTufe of Agrlcut tural Bolany, farmers in Great Britain are using Joss *Cambier,* a new winter wheat originally developed in France, which gives a 10% higher yield and greater disease resistance than ***Capoelte,*** ihe farmers favourite for the past decade.

Last year, payment of royalties lo UK plant breeders was introduced; with an exceplionally popular variety a breeder can now look forward to substantial sums of money lor hn efforts

One of the private breeders m the UK e»timat*4 that the future lies with dwarf Mftieatft ***WJ*** oetifys. *ith ultra-ShOft Stiff Mraw able to stand up to heavy fertilizer applications and with far better resistance to me plagues ol blotches rusts and mildews wfticn ai present rob larmen of something ltke a quarter ot ttwr poiantial yield

• *Big aavinff with pAi-***ticidea

Several specific instances where plant protection has brought about substantial uvinrta were Quoted at the 1st Internationa! Plant Pathology Congress, held m London in July.

Banana growers in Mexico are saving $100,000 a year through improved spraying methods recommended by an FAO expert *in* Guinea, a replanting programme has saved the coffee-growing induslry which was being depleted by quick-spreading fungus. By 1970, Guinea is expecied to be producing 50.000 ions of coffee worth *$\8* million annually. The banana export trade in Taiwan is expected to achieve Savings of up to $9 million a year because of experimenta' work conducted by another FAO expert on Ihe use of a new fungicide to control post-harvest decay

MALAWI

• Cras/i *ppoyrammti to incrmate mugmr Output*

Although 4,500 acres of bush have been cleared, irrigated and put under sugar, cane, Malawi's sugar consumption is still outpacing production The Sugar Corporation of Malawi has therefore decided on a crash programme to bring a lurthet 2.000 acres under cultivation in Lime for the 1969 harvest. This will increase the estimated annual yield from 24.000 lons in 1968 to 35.000 m 1969

ITALY

• ***World*** fAiusn *bunk for cattle oropottid*

A practical plan by Hereford cattle breeders in 18 countries to help bridge the pfOtein gap to the devefopino countries by creating, a beef economy was completed in August at FAO * Home headquarters

The 17 member ccunines *at* ihe World Hereford Council h*v* agreed to donate doses of semen so ttial large numbers of indigenous cattle In parts of Africa. Asia and Latin America can be artificially inseminated FAO has agreed to distribute semen to countries reqoesHng it,

and to help in training personnel from developing nations.

More Ihan 100,000 doses have already been promised. but Ihe countries with the largest herds — UK USA and the USSR (an associate member) — have yet to decide the size of their donations.

AUSTRALIA

• *Firmt look at new wortd moil man*

The first draft & a new world soil map snowing the distribution and qua major soils m more than 50 countries was presented to the 9th International Congress ot Soil Science h*td in Adelaide during Auquit

The new map a product of the jotnt FAO Unesco world soil map prof el has taken eight years to produce The map uses «n internationally-agreed language a* soil nomenclature and soil definitions which grew out of international collaboration over the map By consulting the map and lext ii will be possible to gauge the total areas oi associated so its in any one country or region and thus begin appraising their potentialities for development,

COINS FOR DEVELOPMEMT

Aden arm* two c&m *bmmg* lUvtftf under M O I com *plan* To *ttm* toff, *mm lint imo-rupmm* pwc* *{worth about* 34 in *CmyKtn it* Man *mm reproduction tt~ * to &• *'ng Paratrama Bahv* MM HMM JDifBon (|*>m *ot mma $00 ymara ago. Thm* > nic *"Pt.*on rftdi * Qrow «W* ftOO ' •* SMWMB. TanMT end *Cngtnh* To rn* rifrir, « art* 5r'i*n *pound coin Iworlii about 24 cmntti Il ifiows a pair ot* fMAO* *Holding ears* of *wheat, with an inscription mine* rmad* '*10M *Sytun Arab Republic 1386 — Campaign Against Hungmr — C*W pOUtKf*

So *tar* uvn X *countries have staled that they will take part in fAOt com plan by bringing out cams which will increase public m world food and agricultural development.*

Thfougn It agms* coins /rave shown SCGrtes 0/ *sowing, ptougnhv*m*tmg attc tuning. but this is the first time that nations md* ID *cooperate in using Ir>e:r carnage as an educational*

U.S.A.

• *Man mgainmt nature*

The Ford Foundation recently made grants of about $4 million to e>g.ht umversit«s to firiane* programmes in ecology Ecological research has been given impetus by an ever-growing volume Of documentation on the way in which man threatens the balance of nature. " Our one-problem, one-solution approach. ' said Gordon Harrison of the Ford Foundation recently, " inevitably courts disaster because the environment is so complex."

Biologist Paul Ehrhch and

What's new in science and technology

CZECHOSLOVAKIA: Scientists at the Prague Institute af Entomology have established that male insects doped with a chemical which resembles juvenile hormone transfer enough of the substance daring mating to sterilize the insects which hatch from eggs laid by the female. The synthetic substance also causes permanent sterility in the female when applied to the body surface in quantities of less than a millionth of a gramme. They also found that up to 5% of the chemical applied to the male is transferred to the female during mating which can be sufficient to render her permanently sterile.

BRAZIL: A new bread, made of a mixture of wheat flour and local maize starch, supplemented with milk powder and local soybean flour, has been successfully produced by the Tropical Center for Food Research and Technology.

UNITED KINGDOM: Plaice, sole, oysters, clams and prawns are being artificially reared at the Lowestoft fishery research laboratory; the problem is the high cost of feed for the fish. Herbivorous fish — such as the grey mullet which feeds mainly on algal slimes — has been suggested as a way of avoiding high costs.

CUBA; Sugar is being used to an increasing extent as a major source of food energy in cattle production. Cuban researchers are using final molasses for 73% of the dry matter in Zebu-cattle diet with daily gains averaging 0.78 kg. and carcass yields at 57% of live weighl.

INDIA: Synthetic lysine, one of the protein-building amino-aeids, has been shipped from a 300-tons per year factory in the Netherlands to India in the form of lysine-enriched wheat flour.

ISRAEL: A pilot plant to extract protein from cotton seed for Human use is to be built at the Technion Institute. Haifa. Already, cotion seed is being used to feed cattle; but cattle are not afiecied by gossypol — a toxic anti-metabolic factor oi the resultant protein — which will have to be eliminated for human consumption.

NEW ZEALAND: Laboratory experiments have shown that rats can survive more than a month on a diet constituted of chemically-treated wool as the only source of protein. Wool contains 60% protein and the 11 essential amino-acids but the problem. SO far. has been to process the wool into an edible form.

HONG KONG: New beverages using cheap protein sources provide one avenue to better diets. Monsanto Company is planning to manufacture and sell throughout Asia a highly popular Hong Kong soybean drink with a satisfactory amino-acid balance. Meanwhile. Coca Cola has launched a high-protein beverage in Brazil which is chocolate-flavoured and soybean-based, containing both vitamins and protein. In El Salvador. Pillsbury Company has just completed consumer testing of a new high-protein soft drink made from corn meal, cottonseed and nut meal.

UNITED STATES: Bacteria contains a high proportion of protein (dried cells contain 78%). Two U.S. researchers have been leeding bacteria to rats and have found that it is an adequate source of protein for extended periods when at low concentrations in the diet.

LEBANON: A six-year trial of a new protein-rich powdered food — made of chick peas and wheat, with supplementary skim milk and bone ash — developed at the American University of Beirut, has just been successfully completed and has entered the distribution stage.

JAPAN: 4.000 tons o) seaweed is grown and eaten as human food in Japan each year. Considerable research on the more refined processing of algae is being carried out in Japan and Czechoslovakia to see whether this relatively unexploiled source of food can be put into greater use.

NETHERLANDS: An insulated plastic, developed by the Delft plastics laboratory of Royal Dutch Shell, which is brilliantly white in daytime and completely black in terms of night-time wavelengths, is performing as a iery efficient dew-collector for smalt-scale irrigation purposes f

HAWAII: An infra-red radiometer is being used by the Geological Survey Section of the US Department of the Interior to locate underground reserves of water in the Hawaiian Islands.

CANADA: Scientists at the Halifax fisheries research laboratory have found 'that lobster can be treated with irradiation to keep it fresh on ice for almost twice as long as normal.

• The often-repeated tale that music can help plants to grow has been proved right by a University of Ottawa experiment. It was found that wheat seedlings exposed to 5.000 cycle sound tripled in weight and developed four times as many shoots as normal.

SOUTH AFRICA: Open storage water reservoirs in arid areas can lose 94% ot their water by evaporation over a three-year period. The National Mechanical Engineering Institute is investigating a technique of packing the reservoirs with coarse sand to slow down the rate of evaporation.

U.S.S.R.; Various zoo-geographic studies have been carried out recently aimed at transplanting fish species into a particular environment. Having transferred hump-backed salmon from the Pacific to the Atlantic, and flounders from the Baltic to the Caspian, it is now suggested that herring should be introduced into the Antarctic Ocean and that the milk fish. Chenos **chenos,** should be brought from the west to the east coast of Mexico.

AUSTRALIA: The effective protein intake of sheep is sharply reduced by the degradation of protein by rumen microbes. It was found some years ago that injection of protein directly into the sheep's stomach resulted in a 200% increase in wool growth compared with a 15% increase when the same amount of protein was eaten by the sheep in the normal way. Experiments are* under way to protect the protein against the microbes and some success has been reached using casein and other protein-rich foodstuffs treated with formalin.

• Pale green loaves of bread enriched with protein from crushed grass — developed by the Australian governments research centre at Bubia — are being used to raise the nutritional standards of the inhabitants of Papua and New Guinea.

• A quick method of making hay has been perfected in which the grass is sprayed with paraQuat, a bipyridyl chemical, which rapidly desiccates the green plant tissue and immobilizes the nutrients. High-quality grass can thus be stored as standing hay.

ARGENTINA: A killer-weed. **Solarium** malocoxyion, has been identified by the Instituto Nacional de Technology Agro-Pecuario as the cause of a disease which has been killing cattle along the Argentine coast for many years.

VIRGIN ISLANDS: Scientists from the Lamont Geological Observatory have suggested a method of condensing moisture from the winds. They have designed an installation for the island of St. Croix in trie Virgin islands in which cold ocean water is pumped through a condenser 600 feet long and 30 feet high. It interrupts the onshore winds and turns the moisture into drinking water.

ITALY: Research has shown that the foot-and-mouth virus in tissues of experimentally-infected animals can be inactivated by a sterilizing dose of radiation: products successfully treated include meat, bones, glands, hair and hides. This technique has also been successfully employed in Austria to eliminate anthrax from baled goats hides.

AUSTRIA: Tomatoes are being grown in a wholly-controlled self-regulating environment that automatically provides the plants with optimum growing conditions. Information stored in computers is used to guide the plants in their successive stages through a series of tower glasshouses.

WEST GERMANY' A new process for dehydrating solutions, emulsions and pastes has been developed at the University of Bonn. It is known as diffusion drying and operates by blowing tiny bubbles of dry gas through a wet mixture, drawing out the water vapour and leaving a dry porous mass

psychology Jonathan Freedman (both of Stanford University. California) have been *granted $470,000 tc study* the effects of overcrowding in caties, "We're really very good at sustaining human life;" Freedman says, " and so the population continues to grow. The question ts[1] How much farther can we go?

• *Flmh protmtm aoma*n-trmtm* coming *Into ttmm*

Fish protein concentrate is being mass-produced by s new plant in the fishing port of Nfcw Bedford. Mass, and oeing shipped overseas, chiet-lv to South America, for animal consumption. The plant will also produce a concentrate approved for human consumption overseas

James S- Tolin, the firms president, has said: • Dog i food, which already *is* being used as human food in poverty areas in the United States, has **90°'«** water content and is not a good buy. But by mixing one part fish con-CBntcate wrth 16 parts of rice, you have the protein equivalent ot a pound of beef steak The mixture is Odourless and colourless and *can t>e* mized with wheat, corn, tortillas, soybean flours. soups, sauces and so on.

The US. Food and Drug Administration, conceding that its reluctance to give full approval to fishmeal for human consumption is based on aesthetic objections, ruled earlier this year that the concentrate might be marketed m packages no larger than one pound and marked 'for household use only,'

• *Contmranaa on dry-f-mmit fmpmimg*

A worldwide conference On techniques for wresting more food from the vast areas of the world where rainfall is so scarce *or* erratic that soils are classified as ' dryland ' ***will*** be nefd m Minors and Montana. United States from 17-23 August 1969

The international conference on mechanized dryland farming is to be sponsored by Deere and Co., and will be held under the auspices of FAO's Freedom from Hunger Campaign. Montana was chosen for the field demonstrations because its climatic conditions closely approximate those found in dryland areas and because in various parts ot that state in August it is possible to see tillage. ; seeding and harvesting being carried Out.

CAMEROON

• *Sttoomumfml* MM *ot raw material**

One of the examples of senseless trade patterns which Rene Dumont cites in his *t'Afrique* esf ma l *partis,* is that of the west African country which exports high-quality hardwood in unfinished form and imports prefabricated houses made from the same wood.

In Cameroon, two young carpenters have started their own personal crusade against this sort of waste. Several years ago, fresh from technical training, they pooled their resources and s«t up the Modern Furniture Company under a tree with only a few crude tools at their disposal They buiJt *up a* steady business and. with the heip of a $7,000 loan from the West Cameroon Development Agency, moved into rented premises

This year. Fonds national pour la cooperation au developpement (Belgium) has given them $5,200 to buy tools and woodworking machines and to help pay new workers being trained in the workshops. There are now 34 workers on the labour force and the company has moved into a new building.

SENEGAL

• *Mora* feet/ *and vratmr for cat if o*

Senegal is, above ad. a pastoral and agricultural country. Two thirds of the livestock population are found in northern Senegal where harsh ecological conditions and traditional systems of cattle husbandry have pre-

vented the local population from rising above subsistences level.

The government has established a network of deep boreholes. Simply providing mom water for the cattle, however, did not markedly improve the situation: the dry season lasts nine months and the scarce vegetation around the water holes is quickly consumed- There is also a marked deficiency of minerals in the grasses during the dry season

An FAO pasture and forage expert has been working in this region since the early 1960s conducting forage trials and encouraging the pastoralists to grow a hay crop for teed during the dry season.

The original FFHC forage improvement project was adopted by Entraide et Fra*tern'tts* ($5,200) *and an* attended project has recently been adopted by Misereor ($21,500). Two pitot cenires will be established so that local personnel can be trained in haymaking and cattle feeding and in the use of mineral supplements. A workshop will be established at each centre to instruct pastoralists in the ma'ntenance and reoair of animal draft equipment

LESOTHO

• ***ViUaQB water*** *mupphtt* built **by mmlt'hvln**

Some 5,000 inhabitants of twelve villages situaied in the heart of Ihe mountainous area of Lesotho now have a modern water-supply **system** which they installed themselves. This system ha* provided the villages with **frMh** water throughout **the y«ir** even during **recent drougnts-** It has relieved the **woman**folk from the burden ot drawing water from far-off springs for household purposes as well as helping agriculture.

Eight additional villages are completing similar watei* systems and eight furihe/ villages will soon begin work. When the entire project is completed, twenty-eight vil^ tages will have new water systems supplying over 10.000 people, The cost is being met on a pound lor pound basis by the Catholic Relief Services.

CANADA

• *Food* ***and p&mce*** dec* ***Imrmtlan***

The Agricultural Institute of Canada now affiliated with the Canadian Hunger Fourv d at ion. recently adopted &

Dr. Howard L. Truaman

policy declaration on * Food and Peace' which calls on the Canadian government to strengthen its aid programme, particularly Ihrough multilateral sources.

The declaration lists some basic prerequisites for development emphasizing, in particular, the importance of dearly-defined goals It recommends more effective use ol known pest control and preservation techniques and greater use of fruit and **»aqat»bt»** production tor hom* **and local consumption**

The declaration is. in **large** part. **du«** to the efforts or Dr Howard L Trueroan who recent ty **rail red after seven** years as executive director ot the Canadian Hunger Foundation In December 1967 Dr Trueman was awarded the Canada Centennial Medal for ' distinguished service to the nation.'

Desert + Nuclear Power + Sea

Nuclear power, empty desert land and desalted water exiracted fmm the sea may combine to become one of the great agricultural techniques that will help feed the world Of torrtorr*w.

As an indication of the importance of this fuiuristic process, the director of the Oak Ridge National Laboratory. Dr. Alvin M. Weinberg. when he appeared before the U.S. Senate Foreign Affairs Committee last year, said that One nuclear powered, agro-industrial complex producing 610 million gallons of desalinated water a day and linked to a farming area of 180.000 acres, could feed three million people.

These figures were reached following a special Oak Ridge study on the technical and economic feasibility of these complexes lo provide power and food. The team had particularly studied the possible use of nuclear reaclors in the empty, dry coastal areas of Baia California, Gurajat, Peru. Australia and the Smai-Neoev region, all of which have at their disposal lots of desert and sea-water and little else

Dr. Weinberg revealed some other interesting figures in his testimony to the Senate. For every million gallons of water pumped out through the complex, the plants would turn out 2.0 megawatts of electricity as a by-product of the water. While the desalinated water was used to irrigate the land, the electricity could in its turn be harnessed to set off an immense variety of industrial processes.

For instance, through the electrolysis of water to produce hydrogen, the large-scale manufacturing of primary metals and fertilizers could be launched. A large nuclear complex could manufacture enough ammonia fertilizer to help feed 20 million people. Another use for the hydrogen would be to replace coke in the manufacture of Iron from iron ore.

A more direct use of the electricity would be to convert phosphate rock, which is very abundant in some parts of the Near East, into the more transportable phosphorous Or where bauxite is available electricity could be used to convert it into aluminium

However m ihi» **year 1968 th»** cow t* still the major obstacle to the **ute of desalinated tea water** in agriculture, a though >t **has com* down from fi per** thousand gallons three years **ago to an estimated 30 cant*** today it is hoped to reduce it sMl further vnthm **the neti** 10 years to TS cents in the r«non*iiz«d ***yst*m ol food** growing |tnl described 200 g*Horo **would b* rmdtd** to produce **one man's daily ration ol 2.400 caJoriM. Tha cost** 3 cents **per day**

Although tha strata on ttw peaceful use of the atom **hat largely baan on sea dasaimuation,** another American **rat—eh Mam headed by** the University ot California? **protauor Perry Stout, hat described how a** nuclear comp*e* could tap the underground water resources of the **Ganges** Plain in **India lor** agriculture **and** industry Since m this case the water is already fresh there would be no call for desalting it Here the power of the alom would be harnessed lo supply the electricity to operate thousands of well-tube pumps to bring up 1hB water from underground and bring prosperity to an unprivileged land

AID Off A PERSON At BASIS

The joint Unesco/FFHC gift coupon project has. in its five years existence, distributed $200,000 to some 78 projects designed to assist rural development and food production in 39 countries.

The programme allows private individuals and groups, especially schools in the developed courHries. the chance to contribute directly to small self-help projects such as unproved water supplies, nutrition education, rural literacy, improved seeds and equipment for school gardens and so on

*This **East** Pakistan farmer is using a Japanese semi-turning plough purchased with UNESCO gift coupons ufidef an FFHC-financed* programme *to introduce improved tarm implements **These** are imported tram abroad **and** then **used as** prototypes tor local manufacture.*

This year, the gift coupon programme contributed iools 10 I he villagers of Dassa-Zoume, in Dahomey, to help them construct a concrete dam which will provide water to the village during ihe dry season. The dam. built with both bilateral and multilateral money, means that the villagers will be able lo develop vegetable gardens and raise livestock

In Western Samoa, badly-needed text books are to be provided by the gift coupon programme to the Regional College ol Tropical Agriculture The college, built with Ihe help of funds from the New Zealand FFHC Committee, provides a three year course in general sciences, animal and crop husbandry, agricultural economics and marketing and extension methods

In Gabon, the programme provides vegetable and Iruit seeds to schools and farmers m twelve regions. Local diets are being improved and choice ol lood crops expanded More than 2,000 women and girls in the Kin gouss< region ol the Upper Voita have been taughi how to sew by the government workers In the Service <f«nh mation *urale feminine, thanks to a gift coupon donation which enabled Ihem to buy clo h

Indian Agriculture

Studies in Indian agriculture: the art of the possible

h\ <;iHurl 1 I it in

V i% **now being iacreaungh realized hy uit<rn*tioaaJ experts ttu!** the **fannen** of the ooc loping **countries** arc **as eager, i!** not mt>rt **in, as government officials** and the c>.pcrti iheitw..^- to increase productivity. *Studti"* in Indian* ***Agricui-Hire*** is. perhaps, the first book whuh tries tu allocate the responsibility for the lack of adequate progress between the experts, OIL- state, the administration, the social organization, the land tenure system and the farmer himself,

Mr. Elicnne proceeds systematically, yn the basis of firsi-hand field observations, to explode several myths, ahout the farmers of the developing countries. Realwing the futility of studying rural **area** through living visits, he studied in depili a few villages from **different regioas** ot India. He exam tried tKe varied aspects of the farmers' universe from the viewpoint of technicians, ml ministry tors, eeon**omilti** and planners. The result is this authentic book, full of acute obscrvalions, Some of them merit spec if ie mention for their purpose of dispelling prejudices about the farmers;

...On extension — " Often, the farmers know mure about agriculture than the instructors."

...On fertilisers — " Chemical fertilizers arc the most effective, provided there is adequate irrigation. The farmers /•mortize the problem, and it is not generally because of ignorance that they refrain from u*iri£ chemicals on plots ivttcrc ihcy arc not sure of **obtamktg** waler."

...On water — " Influential person's and **weB-to-do** farmers can usually fcl by uithout paying, but the poorer pcus.mK are obliged to suffer under'the system... Instead of using it all lajjiienti for the canals, he (irrigation contractor) w ithhokK **pan** of it to **sell** on the hlack market; as i **result,** many tield channels are defective **because too mud)** sand was mixed in with the cement. "

...On agricultural administration — " 1 he **main handicap** is thai **tin** team nil **administrators)...** is all but swamped by the daily hurden of paper Wurk... **The'** problem is *not* (emphasis oursi that of propagating new methods (extension), of **demonstrating** ihe **advantages of** green manure and superphu-ipluiles, and encuur-.iging the **peasaats** v.iih tine words Rather, **the** puhlit services ihal deal wilh •suuh **practical** matters as irrigation, **credit, cement** and **fertilizers** should he made **to operate** with greater speed and efficiency "

Ihe author **Snail; concludes** th;n **the** farmer^' **protests agains]** inefficiency **are** fruitless, **and states** " I he **fanners** are well aujre that their protests will seldom come to **anything** 'No one listens **to** us" ihey sj\ when we jsk them why they tolerate sueh a situation. I his should he **adequate** pnxtf. if it is indeed required, of the **fat'!** that increases in **productivity** can onl) be achieved through multidimensional efforts by government, teehiiKuiis and farmers."

While he has been successful in understanding the problems of the farmers of khandoi — a village in one of the northern stales, where he evidently spent a considerable part of his total period of US) in India — he appears to have been less successful in this task in other regions, perhaps **because** he could not spare adequate time for these villages. It he had, he would have been able io make as penetrating a study of cooperatives and land reforms in the southern villages as he has done of the administrative structure of the northern villages.

But the most noteworthy feature, in spite ul this minor limitation, is ihat he h&S employed a mciltod of enquiry for the sifting and winnowing of data which has to precede aft ion at the field level.

His observations and assessment of the **relative** importance of technical know-how, extension methods, supply of inputs, rural **institutional framework,and** administrative orpni/atkm in the **agricultural** planning process arc also worthy *of* note haih by the pt^sirimiv who arc obsessed with nco-Mahhusian **theories,** and by the visionaries who **envittge** fotid sclf-surliciency in the **near** future.

At the close, he correctly assesses the problem in these words "A close **look** at the facts leads us **to** less pessimistic, and also less **definite,** conclusions, bringing **to** mind the old alchemists' **Formula** 'Solve ct **eoagula*."** Is this not refreshing in these days of a plethora of publications and reports giving ready-made and uniform solutions for other peoples' pruh**lemi** '

S.G. Maditmm

***Stadia in liidinn Aerieuitutt: Tht Art of the Ptatibi** by Gilbert Ktrenne.**
I'ntvciNily *at* California Prov Berkeley, tali-i. . . .,:. I<J6K \M\ [i.), ST.flS dranilaleJ (nun ihe orijtinjl hrcnth edition).

Projects and Their Appraisal

Two studies of the World Bank

by V.O. Ilir^hman and J..V Kiny Jr.

\ experience in the prcpar.i'i *nd **implementation** irf **development project* fo^ae* ahead, lac** nljicd lino of **activk)** am "u ds foi :hi-uj:ti! **are emerging** u-hicti :. •_•." "i !'I«NC concerned **with development planning.**

One is the ' project appraisal' technique furthered especially by the development financing instil utions as a tool to select those development initiatives which h:ne the highest qualified kins for, and priority claims to. capital assistance.

The other is the penetration around, beyond and within the project in order to determine its relationship with the country's general economic development processes; to discover **its** own **unknown** territories: amJ **to observe** iis behaviour during and after the implementation period.

The wo lines of **activity are. of course, part** of one larger evaluation process, some aspects of which ha\e **progressed** further than others 1 he 1*0 bonks provide some insight into the present **state** ill the art arid **Blake** it clear that **my** much work will still have to he done before the world can be sure thai **tefceted** developmcni projects represent ihc. best use of resources.

King's **book** is dedicated exclusively to case studies of World Bank projects in electric **power** generation, transport **and** industry.

The work can be classified its a useful, but limited, source of background information for **development activities** in which the Bank bus b«n particularly active.

Quite a different, and **a** more exciting, approach is followed by Professor Hirishman. This author **likewise** u«s selected World Bank projects as his **bate** material, hut he crosses project limits and takes **a** stance away from particular details in order to analyze **project** fcwhavnmi in a more general way.

While King writes about known **aspects ol development** projects, Hirschman **makes** it **dear** Lhat, in fact, v#ry Mule i> **kaown** .ml much remains uncer- M In jn original and highly rea- JJMC manner. **HindMMM outlines** a number of important common -.irengihs and *ejkncsacv **uncertainties** and /ones of ignorance of **ha ickcieti projects.**

If one did not **know,** n would seem ditfttull to helic\e ihJl the two books •ire **based on one and** the **same** bodv of **baak** experience of the Bank As it is. Hirwhmjn <t t/ofhJu^ions strinusU qualify ihe *tc». implicilh supporu-d hy King. that' **ippriinl** sijndjrJ-. ha\e already :..K'K>i nigh **kveh.** Read in **conjunction** HJL two • I is identify, **as** it were, a gap between conventional and new frontier development thinking.

With Kings book **providing specific details about individual projects** and Hirschman **ootlining the uncertainties** and the unknowns, burning questions **arise** in regard to present development and appraisal techniques, such as; What is a **project's** role in the perspective of **a** country's long-term economic develop me tit **effort?** Is the rate of return truly indicative of a project's contribution? Why is 11 that project develop so differently. and often more slowly, ihan foreseen by the best informed people,[1] Can it be expected that the mere multiplication of projects as we know them today will **result** in **generalized** economic growth in die **countries concerned*** nr will **new** approaches be required' What is the **exact** meaning and scope of such terms as project appraisal, project evaluation, feasibility stud), and. in fact, project ilself','

[I seems .1 vi kit Lin develop men I lhat such issues begin to get the audition they deserve.

From the point of view of an FAD observer, it is. of course, regrettable that none or so little attention is paid to the problems posed by agricultural development projects. As King points mil in his preface, " More than two thirds of ihc **money** tent hy the Bunk has been for projects In the fields of electric power and transport " and " The lunik dttes not . . **pftwnt** any cases in ihe field i>f agriculture, education, or water supply and sanitation, sectors in which the Bank is **afao** currently active, partly because the Bank has accumulated tcss experience in these **(Wds. "**

Hirschnian, on his part, does cite agricultural experiences, but in his case four of the *five* agricultural **projects** selected involve irrigation developments, tt can only be hoped that, in the not too distant future, somebody will venture into the :w far virtually unexplored territory of agricultural project evaluation. Let us hope that the author will **cover** all the more relevant phases and aspecis of agrieuliur- **al development,** including the experience **obtained** by institutions other than the **World** Bank.

The rapidly-increasing interest of the Bank in agriculture is a relatively new deveiopnu'in .srii! [tusidiites ihe riiaiL-ii.il **covered** by these books. For this reason, the **Inadequate** coverage **of agriculture** constitutes no criticism *of* lhe authors, King's **omission QJ** an **analysis of** agricultural aspects **trf** electric power or **transport** pm|ecls does, however, seem questionable. As un example, although hi\ review of the (inn. a Valley f Colombia) power dam **development** makes a passing **reference to, supposedly project-loiked,** activities of flood control, land reclamation .mi! irrij;:niiin, this theme is **ool developed.** Thus, the tender is left uninformed about the agricultural implications of the project. *U is* at least possible thai the anaKsis would have come out differently if agricultural possibilities had been more fully considered antl perhaps included in ihe **project.**

Similar problems arise jn connection with **several** Of the tr;inv|i<iil pruiecls ul ed. vi/ ihe **Ecuador** highways. Mexico lollroads and **Ethiopia's** Iliiiul highway programme **One** would have expected to find adequate reference somewhere to the **difficulties** of appraising the (often largely agricultural) **benefits derived** from road construction projects. The omission of such analyses additionnlh limits the usefulness of King's hook.

The merit of Hirschman's approach is **that be spotlights** aspects i>f **development project** planning and implementation which still need **Improvement** In discussing [he state of appraisal techniques, he rightfully points oul that " a very large portion of the decision-making **process** " in the development projects surveyed was, in fact, based uti " feel, instinct, "seal-of-thc-pants" tudjsemcnl and the like. '* **Hinchman** fet'ts that his bmik should be regarded " as an **attempt** to reclaim *'

least part of **this** \asi domain of intuitive discretion for the usuat processes of the *rat'soti* ***raisormant.***"

While few people will deny the value *,of ihe development project appraisal ex-Lpcricna: already obtained by the World *tfank, Hirschman competently argue* ihj< **flu.'** siory docs not end with ih.ii L\;« ' rience. Although he doe* noi vinale **out** for particular **criticim the** rate of return calculation, commemh nude by ihe **B.mi,** it is quite clear from (he analyst* that Ihfe " heroic **compression** of financial dat.i into a single figure." as he **Cfilla** ii, can i ;>nly be one approximate measure of a project's merits. The rate tan. in fad, be influenced in many different ways in the process of its calculation, only to result yci quite differently in the implement atk>n period. At the present **stale** of knowledge and experience, one might therefore be nble lo distinguish projects yielding rates of return in the **order** of 30% from those producing 5%. but it would he very difficult to differentiate between projects, say, in the zone of 10 to 20% return, which is where many of them fall.

Many of the reasons for the obviously large margin of error or deviation from the expected rate of return figure, arc explained refreshingly and in straightforward language by Hirschman.

The latitude for aclion in the **developing** countries is very large, as this author stresses, and depends upon numerous factors, few of which are as yet quantifiable. Development projects art- in fact " voyages of technological and administrative discovery " — thnt is. after all ***t*** appraisal work in the current sense uf the term **been completed,** and after the financial resources have been committed.

In conclusion, both works should be read by development **students,** but Professor Hirschman's book is much tu be preferred lo Mr. King's, Indeed, some care should be taken lest the reading, in isolation, tif King's book give the reader a false sense of security regarding the **cUte** *of* present project selection and apraisal **techniques.**

Onno van Trutem

Development ***Prafrctt*** *Obsrrvrd.* by Albert O. Hirxbman.
Ihc HnxiJtintv Imhlution, WashingliHi. DC . ^OetPTJCf I%7, 119? pi.

F.et>»4tmic Driflopntfttt Pinjnti and Their Aff fftiim), by Jtrtm A. Kin*. Jr •
kihrri Hoptimi *Wrtvi.* B»l1imori , .Mjicyland, fnf **ihe** BcuntHnit Deveiopn^ni InMilutc of ihc **IBM), IWi7.** *lHO p.),*

Economic Development in Latin America

li> I iii|»t HcrrtTU

The issues of economic development :ind integration arc interdependent for Latin America and constitute the major themes of this collection of puhlk statements.

The speeches, lectures and reports, in whole or in part, by the author Kelipe Herrera, the dynamic president **of** the Inter - American Development Bank, cover the seven years fryni *IVH)* to l°66. Herrera presents u chronicle of the eco**nomk** developnieni of Latin America and of its tiniincing during this period, taken from his annual Tcports to IDB'S governing assembly.

Il is a book aimed at selling the bank uf which he is president. It stresses the need for accelerating economic and sociaj development in Latin America iliri'ugh adequate schemes of regional integration and international financing if that region i^ **to** attain its full **potential** in the future.

He succeeds in gUinj; *a* forceful and comprehensive picture of the situation, the problems encountered, the possibilities and **achievements** attained during the 1960's when the area first realh .moke lo the **realizatkn of** the need for its own integration and development.

If he had been able to include his I9A7 report to the i Lib's ninth governing assembly. delivered in Bogota in April 1968. this book wnuld be a great deat morc complete This was **undoubted^** In* IH.NI presentation of a proposed **global** strategy to solve Latin American development problems and of inn **activities** which, during l"hl-!y67. lent OVL r **MM** third of the $7,000 millkin made availiible ID the area fur economic and social development by all external financing **agencfes.** *

He carefully examines ihc negative conditions which threaten future ir\'Lrr!.«iiiinnl Hnancirif for development, ontrinating in balance-of-payments dif-**Rcultka in the Industrialized** countries as -well j-i a **new trend** towards trilateral rathe; ihan multilateral aid. He analyzes ihe weaknesses of international trade which te;*d lo a dcbilitatiun of the developing countries.

Felipe Herrcra's book provides a worth•iwhik service for Spanish-speak ing Uudcntv n(economic development by bringing together widely scattered, but liiluahic. documents on a subject of primary importance. This topic is daily gaining more and more popular interest in Latin America, where some 21X) mil. lion people are becoming familiar with sufh terms its economic integration, **Latin-American** free trade association, • inter-American common market, region il development and. above all. social change.

Antonio /. Posada

F.I DaanvHo *tfr* ***Amirica*** *Latino y >» h,,iu,, i iamicnlv,* p:ir Felipe Herrera.
^guav, ButDM Airei. l%7. l.7CM Argentine peso*, ino tnglish cJilton « yet.)

Agricultural Development and Economic Growth

i-diltd ti
Si>uth»orlh and Johnston

\i first glance this hook appears to he .1 coileclion ol i-ssays ;ind criticism which ' iidifc up to something imd nothing I *he* editors have collected together an impressive range of eighteen authors io contribuie chapters on vinous aspects of agricultural development. and then invited an equally distinguished army of twenty-five critics tn shoot down the arguments thai have been advanced.

Presumably every reader will find something to his liking, but (o use this argument would be unfair and would seriously devalue ihv volume. Paradox-kaBy, the strength of this massive collection lies in just the approach that the editors have taU'n I on often. single author k'tK un development economics serve us a vehicle fur the not-atmys conventional ideas ol the authors. They are. of course, none the worse for thai but the danger is thai they lend to be accepted by eager itudentl and embryo experts the world over as if they had been offered jp with the infallibility of papal dogma in a way in which the author hiiiiM-lf would iioi lave wished. For >tudents of agricultural development, and indeed practitioners. I here is considerable value in having a variely of texts ;md criticisms bound together in the same volume.

The introduction, contributed by ihe editor*, sets out the thmtinj; behind the volume and !J>S particular emphasis on the fac! that industrial and agricultural development are not vniid alternatives. fur effective **(fevdopmetd** plans must embrace both goaK. • Thai such interdependence is necessary, * say (he editors. " ts a premise of (hh hook. Its subject is agricultural development, but viewed in the context ol overall economic growth. "

Il [his may MHIIKJ \/ commonplace then it [1] one only recently fully understmxl in i ...l<ipLd countries, if economists from eloping countries (rained at Chicago • I i \ i.ii.I Litfect to understand ii. I he rnmenii <nJ politicians i)f developing ii ions frequently do not and still too hen asptre l< iltuix[1] and in- **worlds** on their i<un

The point » nude frequent K in the nfumc *JBL, tot* example uhen Earl *O.* Hcjdv commenting on the chapter on the •mic* of farm UK writes ' I th [1].rni tcvhnologji **Hid** structure on '•'. *specU* • we consider a modrl ul Ihe total econoim. *ith approprolc specilh /i ' production functions, factor ^uppl> cmditiDU and commodn> demand from «Jl **•ecu** (1urk'\ F g£ points il out more *lrungK in J on jgncuHural dcvekipinenl in the tropics when he writer " Uthoogh the authors chose mod cr their examptes from the farming sector of agriculture, comparable ones cotiJd have been cht>scn from the industrial and service lectors. Now in the United Stales two thirds of the full-tune labour in agriculture produces machines, chemicals, electric power, oil and other production goods for farmers, . "

It is difticuh, if noi unpotsibte, to do adequate justice in a short review io a book of this si?c ranging over MI many subjects but attention should be drawn to four further points which continually shine out from ihc pages.

The first is the comptenity erf Ihc problems of agricultural devekipnicnt which the book illustrates eloquently by the varied approaches to the ran p.- i*f topics. The cootribtitOTS, between them h:ivc experience in many different countries and titostioot, in (kvetoped and development work and yd working relationship-, .in.- rarely close enough.

Secondly, gjven the normal problems of implementing aiiriculluraf development programmes, there is the added one to be faced in >o many developing couiltrief thai effiectivc progresi is ilmoai bnpi blc without Ninhk and progress-oriented govern menii.

I hirdlv. and the book itself is *u* standing advcrtbcnK-nt for this, progre^ i also **impoaibte** without **doter coUabon-**lion bel»trcn cconomiils, stientjsis .irnl siKH>logisi>, all are involved in development **wort and yel** workirtg'relid an* rurely **dOM** enougl.

Fourthly, and it is encouru^r how many writers prL-ssfi.1 this puir one . of the greatest obstacles to jv i the lack of adequate and i. : education programmes, We m whether tradition or ignorance !> the n in impediment to progress, but proper edu-*i* cation still holds the key to .•>' < : experts may know tlk sol .'inns lo nun> I prnhlems hut solutions ure \.. tfcej cannot be explained to the man ; the plough

I! is not possible I" mention hy n.ink-•tU the contributor* and their I her? b a posthumotti *asay* on Tradituiful Social Strutturcv av Barriers l Chance' h> John VI Brewttcr, to wbosc memory the book » dcdk.jlnl FAO Half memherx ctwtnbulcd throe *of* Ihc main chapters on farm *int.* **mai«.** *r.-^j* ,md programming and • number of others BBtodued w:'h i WJ, now or in the past. are among the critics \ simple of other L-onlributon, includes Ruj Krishna of the University of Rajastban, Philip M. Baup of the Universit) oJ Minnesota. R.I[1] I><MI of the London School "I Economics, Kenneth H. Parson of thu University of Wisconsin and Theodore W. Schult/ of the University of Chicago. Any apparent weightmg of academics docs not mean that the hook is purely theoretical, for many of the contributors have spent much of their time in irw held in various parts or the world. The result suit blend of theory with practice helps to give the work a down-io-canh flavour,

Il is *a* hook to which all concerned with agricultural development shouki have access For it is both useful and siim-**uiatinff,** it will not. however, provkM answer*; as Solon I. Barraclougb writes in liis comment: " To discuss thv advantages of big and link- farms in lbs tract H like talkini! in general about *vne** preference (or hlondcs or brunctics. ' all depends — upon the gW, the tirn* and the place. "

The comprehensive references to each chapter will prove • Ivxin to many O thanks itn; due to the edttori for haviti given tu the whole *u* cohesion which '* might well have lacked.

*John Hi**'

OrrWbfrtKW *ami Gmwth.* cJuci[1] h> **Hciniiii M and Bnitt h** | ibn-" **Cornell** InneiMi> Press. Ithaca, New York. 196? IM>K **p I**

EAST ASIA

Economic development in East Asia

bv I. Si mm kirln

\ dondse book like this one. dealing D wiih the problems involved in economic j deielopmcni of East \->i-i including 5 fifteen • ntries, from P.ikisf,m to Japan (_ along ihu \sian contineni - tnusi. of necessity, be limited in its .scope It tmcrs as wide a Mope as can possibU be expected[1], hom.'.i.'r. irt *a book dealing* with the general aspects of economic de- uloiiriRni in the countries under study, though the method of analysis is almost completely limited to ihr itatistkal de- scription of p^i performances for the period l<m to 1%?.

Anton? who *K,* interested in statistio coverinj: economic development of ihe countries nf the region during thh period *A* win find in [his book an c.isv reference . tn the relative position of each country's performance in comparison with that of the «orld at large, and of a few selected developed countries, such as USA. UK and CSSR \ good sub-title for the book J, would be 'statistical handbook of ihc TC-

fhe authoi has done a credit ahk job in collecting tiHKini.' available Matistjes cr such *a* wide field ol economic dcvcl- iipment. ranging ihinugh population, food, forctpn trade raw- material, industrials- tion. transpofi and communications, na- tional budgets, BSOMOink' planning und international iiid Rek'\>int Mliiil i jrt[1] p r n i o d for tiich countrv. and the TC- gion .»s .1 whole, .ind compajpd with world totals, sometimes wiih the devtloped countries, for the period of postwar re- construction (1945-53) and tbe Follow- iii^t decade (1953-63)- Trie sclection (if siaiUtks is not always consistent, ap- reiiity due to unavailabililj' of data.

History, however, even Economic his- urUlory evolved suprxxcdly on ; rational basis, cannot *be* described by si atistics alone One cannot, for example, find in this book any rcsison why Ihe per acre >ield of main cereals has not increased with the pace of population in the re- pon? (Juestions like these cannot be answered bv the content] ol this book

In order tu proM.lt. some kind of* tnswer to suih qucMKnu OIK must de- velop ihe inlerpictation ,rf econofnic h»- torj in either or two dirtcttoot. to incJade •he msiiimional tharji.icristK.s .>((he **BCD*** .inn. which are not ahnjn quantifiable m statistics; or to process the raw oa- lisiics into some fonn which pmfcsoa answers to the ^untiott. Many attempts have slreadj been made akng the nru line nf approach but tew JUOOE the ScOOOd line, w hich wens to me a logical sequence to the appmach sdupKd in th» book

1 be aufhoi seeaaa tciuctant to go into the held ol quantilativt inttrpretjlion of bistory, i>r so-called econu teiric mtcr- pntadoa, became the rtatistics are not *adequate* tn<wp!i *for* more re-frrieJ ;ina(- >st-s, iiK iniiy I\- **the** cise fur developed countries. Vet. a verj ibnpk statistical analysis wnuld tell us. for example, that ihe change in .i&trc^atc cereal production over the period 1^52-fifj m Asia and the Kir Eiasi region, has been sustained on an average b> area increases and yield incrcaies, each amlrihuiint about 36% and 46'J respecti\el> to the total pro- duction increase. The t>pc of technol- og\ prevailing in the a-pii.>n is quite div- tinci from thai pre\ailing in the devel- oped regions, where jield increases and land saving technology have dominated production. Then, one can search for reasons why a particular production tech- nology has been adopted in the rei;ion.

Needless to say. such type of statistical analysis does not provide the complete answer. But it does provide the question to be asked in order to find the answer. Ihis book hardly poses questions, explic- itly al least, aiminji its ;ihundanL display of statistics; ii dins nol ask why the coun- tries in the region remain as poor as their statistical figures indicate Probably it is left 10 the readers tu pose mid an- swer %uch questions b> rhemseKes

Regardless of what is asked for Ihc boot is outstanding value as a concise general survey of economic development in the region, encompassing indu»trtali- /aiion but with substantial emphasis on ••Siimitur;ti development Those who are specialislsfshould get much tnit of the book in ihe way of general perspective, those who arc generalisls should benefit by the w~a\ ii quantifies the rnagnjti ude of the probtema involved,

A four-volume series, *Industrial Devel- n]>ii)tnl • Asia anil* f/u[1] ***Fur*** *Ea\i* wan rc- cently p**oNiihed b> i u n fltB \olu-** minous **report with 500 pages per vol- ume, include* more on industrial *1. velop- meat and on country fltMtjct. The Kir- r>\ bonk, howim. Martd* is a food com- plementary volume to the vohuninous (4 %n rcpun, particuUrl*< became *at* the** occasional references comparing Mainland **Cniaa »iih other countries ot the region.**

One last remark, *m* nmi c^icj the book include* Jjpjn in the repunul to- tals If the rapnn had been kwkBQr *iiown* nto fmipi of dewdopinf coijn- tries ctdudtng Japan *»h«.i*c economic dMracterutin are quite dislincl (rom the rest of the rcpon i like the KAPI report. the overall picture of the developing countries in the region would have been much ctearcr and more imprwsine.

Shohei Kawakatsu

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FOOD AND AGRICULTURE OR'SANIZATIO N OF THE UNITED NATIONS

LETTERS

The dialogue on different aspects ol development in the third world, started in Ceres, could tt greatly helped by the active participation ot our readers. ~he editors invite letter from ill those who wish to express their opinions, comments and sujgestions.*

What ***can the individual do?***

Dear fcdilor.

There is a massive and growing degree of concern by individuals in developed western countries about our responsibilities in this generation and our frequent failure to meet them. At the same lime there arises a feeling of helplessness — tan we, as person., do anything genuinely effective? *Cere.*\ is helping to stimulate this concern — can it also turn it to useful ends?

Would it be possible for *Ceres* to deal with ways in whir', individuals can make a contribution? ^tiis might include details of specialist'skills which are in short supply, a discussion of career possibilities and perhaps an appointments column.

Opportuniiies for qualified personnel, for short-term secondment to specific projects, might also be featured, us well as details of the means that are now available within the developed world for contributing to the many voluntary bodies that are committed to the third worlds problems,

Graham Ovens
Talybont. Cardiganshire, U.K.

Kanym *caffoo crop*

Dear Editor.

I was most concerned to read in your May' ' June issue of *Ceres* an erroneous report on the Kenya coffee crop lpage 19). I would be most grateful if you would publish the true facts which are presented below:

The Kenya coffee crop was estimated for the quota year ending .Wlh September 196K at 39,141 tons and the final deliveries received for this pool which closed on 7th September 196* amounted to .18.605 tons. The export value of which is estimated at £ l?,511.750. These figures compare with that of the same period of the 1966/67 crop of 4K.JB.1 tons valued at £ *i* 5.469,314. The potential crop from the bearing acreage is around 60,000 tons, the export value of which is estimated ai *a* 2i.000,00<>

Although coffee berry disease accounted for a large periS\'..i'je of the toss of crop for the past ye;n and is regarded as being very serious, it must be pointed out that adverse weather conditions also contributed K> the short-fall. Scientists, responsible for investigations into the control of coffee berry disease, arc now satisfied that a great measure of control can be obtained by spraying the trees with 'Difolatan'. If the scientists' recommendations are efficiently carried out, and this involves many sprayings throughout the year, there is no reason why individual producers should not adequately protect the crop and any loss should only be very small. Therefore, whilst it is obvious that a very large measure of control can be obtained, the cosi is very high and further research which includes the necessity to reduce costs is now being undertaken.

In some high altitude districts where coffee is planted, the altitude makes the incidence of coffee berry disease greater due to the relatively damp cold conditions which generally prevail and which are more suitable to lea production. It is therefore true to Mute that *a* very limited acreage of planted coffee has been replaced with tea. but most of the land and the necessary altitude for toffee growing is unsuitable for the growing of tea.

Bruce McKenzie.
Minister of Agriculture, Kenyti.

Word as important as *dosds*

Dear Editor.

In answer to your appeal in the ' Letter to the Reader' of *Ceres No. 2* I would tike to comment on some aspects of development in the third world.

I am afraid that I must disagree with the opinion of Mr. S.O. Adebo, director of the U.N. Institute for Training and Research, who was quoted in *Certs No. 2* as saying, in effect, that there has been too much talk and not enough action on aid.

If one considers the reality of our independence — the economic sacrifices, the scourge of illiteracy which devastates the third world — one can understand the imperative need to plan our economy and our acceptance of the sacrifices and the inconveniences which are necessary to bring about economic development. All this must be explained to our populations through words.,.

We must improve our ways of doing things and to bring this about we need trained people. Our students, once their European studies have finished, often do not want to return home. Their studies have been paid for by taxes imposed on poor peasants but they think that the salaries they will earn in their own countries will not be enough to bring them the luxuries they tasted in Europe...

Words — we have not had enough of them. Words arc the medium of expression of the rural extension leaders who are helping our farmers to gradually abandon their traditional habits and to improve their productivity.,,

In this letter I am simply saying that ' too many words, not enough action' does not always apply to the developing countries who have so much need of helpful advice, both from their own people and from visiting experts.

I am a student in tropical agriculture in my third year at the Agricultural Faculty in Prague, a Togolese citizen and a subscriber to Ores.

Claude A, Tovor.
Prague

Education for ***an*** *nilto*

Dear Editor,

Mr. Balogh's article on education in developing countries iCcrc.t *No. 2)* raises a universal issue. Of course the problems of agriculture and food production are paramount, but the development of these countries is hampered also by the current conceptions and practices in other fields.

Being an architect and town planner. I can voice my support *ot* Mr. BuU>ith's views and extend his criticism of the present practice and education to the realm of my pro(»r •*>...•- .

There are. nevertheless, many attempts to break with the obsolete and ticli.ious ways of thinking and acting. There'is a new way o! considering housing and squatters' settlement? as expressed by John Turner and supported *b*\ an excellent group in M.f.T. There is th(remarkable work done by some teams of Mexi can architects who produced easy, do-it-yourself methods for building village schools ant hospitals. There is the humble but enthuvislii work of a group of architects in Recife (B wil) and in Uruguay who designed very cheap' ing construction methods, using local mai, .i.-[1] and the unskilled labour of the people settled.. .

To conclude I want to stress the ne.d t<j change the technical and the general edut^'ior not only in the developing countries, in', it is an immediate and vital issue, but a the rich countries. . .

The widespread students' revolts in cos of different regimes, indicate, as S;irtre pt i out, a revolt against the dehumanized mo r civilization, in which the individual is viewec mainiy as prodi.^er and a statistical figure. W< have much to learn from traditional socittie: about the relations of the individual and tht group and the possible composition of I rgi societies without the destruction of intermedt iate groups which give the individual a f r; m^ of life, a sense of belonging, and a jiuidanc in moral feeling and behavior.

Michael Kuhn
Tel Aviv, tsrai

Manchata and *Pilkhi again*

Dear Editor.

In your No. *4,* July-August I96ti issue, yol were kind enough to publish my article o[Indian agriculture. 1 am afraid that some *9* your comments introducing my article may bt misinterpreted: It is only in certain cases and areas that socio-cultural obstacles to new *m&* thods arc really retarding progress. As W social and agrarian structures, they arc rrf, doubt far from perfect, hut they are not major obstacle to agricultural development.

Gilbert Eiien
Geneva

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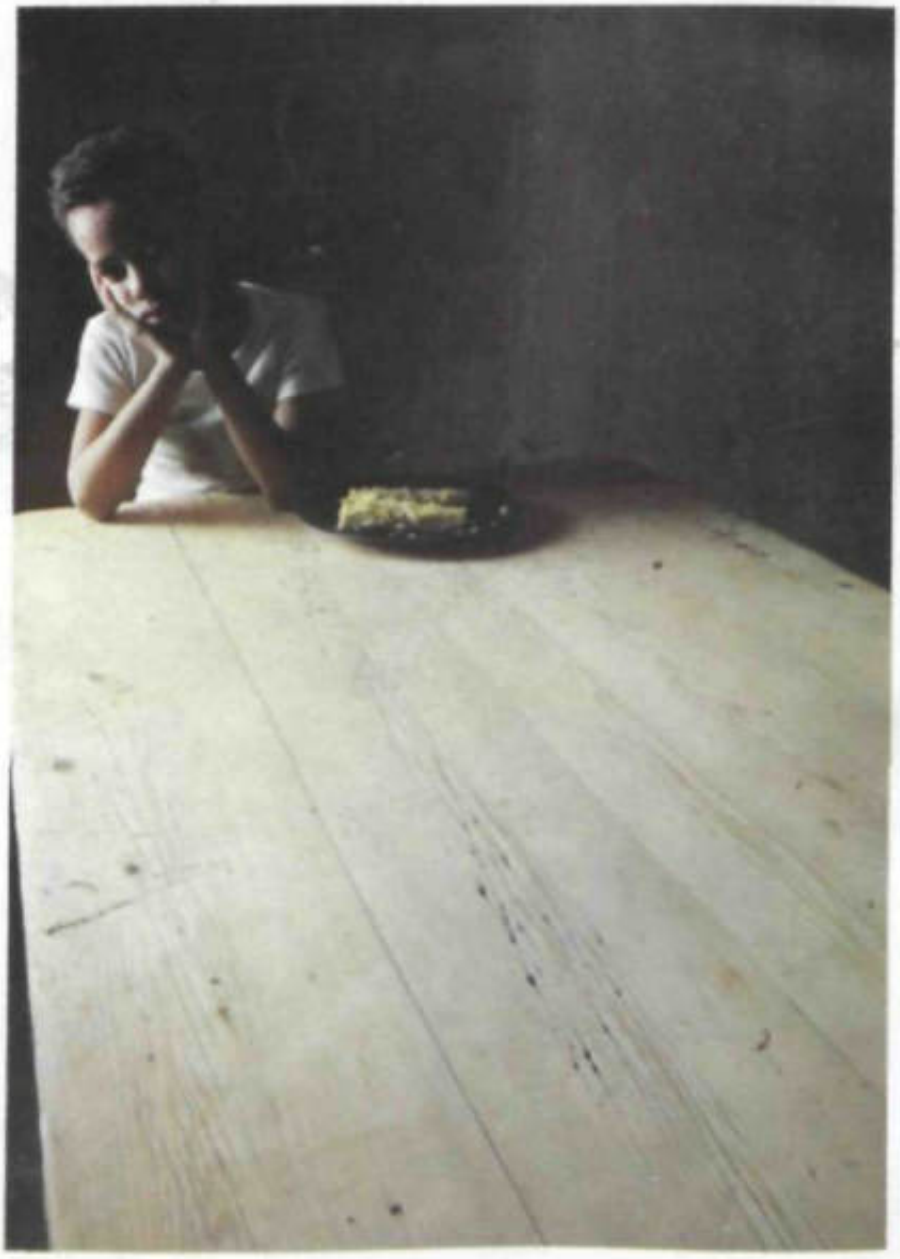
The Shell agricultural chemicals range includes product* like PhosJrin, a remarkable insecticide that cleans any insect from any crop within minutes and then breaks down into harmless compounds. It includes herbicides and nematicides. It includes, in fact, a complete range of agricultural chemicals that *reduces* crop pests and *increases* the amount of food per acne.

Shell specialists are working constantly, both in the laboratory and in the field, to research new chemicals. New-chemicals to protect future needs by guarding future crops. All to ensure he eats tomorrow.

If you would like more information about the world-wide range of Shell agricultural chemicals, contact your local Shell company or Shell chemicals distributor.

Shell Chemicals I SHELL



But what will he eat tomorrow?

Harvests impoverished by pests and msects mean far fewer cobs from a corn-stalk or bread loaves from a wheat field. That's where Shell comes in.

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