

Indian Botanic Garden Library
BOTANICAL SURVEY OF INDIA

CLASS NO. **025.343**

BOOK No. **REPD i**

ACC. NO. **B-19697**

9A
6.4

SONIC GAR
B19697-
UTTA



Sixty-Second
Annual Report of the
Government Cinchona Plantations
and Factory in Bengal

For the Year

1923-24

CALCUTTA:
Bengal Secretariat Book Depot.
1924.

Price, 7 annas.



Sixty-Second
Annual Report of the
Government Cinchona Plantations
and Factory in Bengal

For the Year
1923-24

CALCUTTA:
Bengal Secretariat Book Depot,
1924.

B-19697

B-~~19695~~

11-12 -67

SIXTY-SECOND ANNUAL REPORT
OF THE
GOVERNMENT CINCHONA PLANTATIONS AND FACTORY
IN BENGAL FOR THE YEAR
1923-24.

1. General.—The year under review has been a normal one so far as plantation and factory work are concerned. No outstanding developments are for record but the Department pursues a steady course of expansion which will require to be intensified as and when the recommendations of the Quinine Conference, held at Delhi in December 1923, are carried into effect.

Weather conditions during* the year were not altogether favourable. Mungpoo with 112.18 and Munsong with 87.9 inches rainfall are 10 and 8.5 inches respectively below the averages of past years. There have now been two successive years of drought on Mungpoo through which cinchona has had to struggle but the adverse conditions have been successfully countered by improved methods of cultivation and taking all the blocks together cinchona is looking as well on this plantation as the writer has ever seen it.

More difficult to counter than adverse weather conditions are the attacks of *Helopeltis*. On both plantations this pest is on the increase and indeed the attacks have reached and maintained a severity that renders hand-picking ineffectual. The incidence is worst at lower elevations where certain blocks have their growth completely suspended for several months of the year. Coppicing as a preventative is beneficial in so far as the affected portions are removed entire but the disease quickly reasserts itself when the fresh shoots break. There seems, unfortunately, to be no entirely satisfactory method of dealing with the pest. A season unfavourable to the development of the insect will probably accomplish more than all the counter measures that practice could adopt.

On both plantations methods of planting not hitherto adopted on any large scale are under experiment. All extensions on Mungpoo have gone out on narrow contour terraces along with the Soy bean and a species of *Tefifosia* as green manures and light shade, a departure in method which makes possible the cultivation of cinchona on slopes that would otherwise remain unutilised on account of dangers of excessive wash.

A somewhat different method but with the same underlying idea has been followed on Ivlunsong. Here retaining walls on the contour system have been constructed at intervals of 25 to 50 yards according to the slope and at longer intervals parallel strips of secondary jungle consisting mainly of stout, deep-rooted grasses have been left uncleared. Shallow drains leading at every gradient to the main jhoras complete the arrangement. For both methods the extra expense in the preparation of the land for planting is negligible while the results so far as these can at this stage be predicted are markedly superior to those on control areas. Much of the Munsong extension is on land that has already borne one cinchona crop. The secondary jungle was cut down early in the season when, instead of burning as has hitherto been the practice, it was allowed to rot and afterwards dug in. This practice is, of course, merely a repetition of what is done yearly during cultivation but is new so far as the preparation of land for taking cinchona is concerned and has been rendered possible by the nature of the jungle coming up after the first crop.

Areas not carrying a full complement¹ of trees at coppicing time are being filled up. For this purpose two-year old plants are being tried as seedlings fail to compete with the rapid coppice growth.

Plantation bark sufficient to meet current provincial requirements of quinine only has been put through the factory, the balance required to keep the factory working being from imperial stocks of Java origin. As the bark agreement does not terminate till 1928 and as considerable quantities of foreign bark are due for delivery only the minimum of local barks is being cropped. The present limitation to the use of plantation barks is the capacity of the factory which some ten years ago could turn out 55,000 lbs. annually but which now requires overtime working for 50,000 lbs. and this only if sufficient power is available. The present year has been particularly deficient in water supplies for the turbines in spite of the fact that additional water was available from the partially constructed nullah referred to in last year's report. The factory ran for 250 days throughout the year, a limit set by the power supply as well as by the budget allotment which was insufficient for longer working. As power is mostly consumed in the grinding house arrangements have been made to lay in a stock of ground bark during the rains when running can be continuous to be used during the dry season when power fails for processes other than extraction. By this means and by the additional power expected from the nullah when completed factory work throughout the year should again become possible.

Although the quinine agreement has terminated bringing outside supplies apart from those in bark form, to an end, stocks of the drug continue to mount up. The condition of affairs leading to this result was the subject of a protracted examination by the Government of

India during December 1923 when the whole quinine position was reviewed and discussed. The Committee appointed to advise Government reached certain conclusions lately to have a far-reaching effect on the future of the Department as well as on the health of the peoples for whom the Department exists. Its findings embodied the view that while stocks were increasing they had not yet reached proportions that would allow of an intensive anti-malarial campaign being initiated and continued. The quinine used in India under present economic conditions is but a fraction of what could be usefully and remuneratively employed and public health officers hold the view that it would be unfair to promote the creation of a demand that even the very large stocks now in hand and supplies in sight could not continue to satisfy.

The general quinine position remains much as it was at this time last year. Reports of a world shortage of the drug appearing in the Press from time to time fail to distinguish between an actual shortage of the commodity and a shortage in purchasing power. While world stocks are, possibly, not ample for a demand that might exist under more stable and favourable world conditions of trade generally they are and have been throughout the year more than sufficient to meet all the demand the world could afford to put forward for them.

The view shared by the writer is that quinine is at a price when buyers limit their requirements to the minimum and when many people simply do without it. Prices are still largely under the control of the quinine ring. Agreement succeeds agreement to regulate supply and restrict production. The hoped-for fall in price has not materialised nor can any substantial fall be looked for in the absence of outside factors capable of affecting control.

2. **Extensions, Acreages and Crops.**—(a) *Mungpoo.*—The rainfall for the year was again below the average, being 112.18 inches only. The deficiency was most pronounced from October to March when 2.68 inches only were recorded. A series of somewhat violent windstorms in March uprooted many trees on exposed hill sides and was responsible for destruction to coolie houses but damage from such causes is of small consequence compared with the loss that goes on yearly through insect and fungus pests. Extensions comprised 50 acres *Cinchona Ledgeriana* on Labdah, 65 acres *C. succirubra* on Mungpoo and 35 acres *G. Ledger x succirubra* on Sittong divisions. Harvests were obtained by cutting out 93.5 acres of *C. Ledgeriana*, 9.8 acres of *C. succirubra* and 9.8 acres of *C. Hybrid* barks, the total of 113.1 acres giving 180,151 lbs. *C. Ledgeriana*, 10,140 lbs. *C. succirubra* and 9,075 lbs. *C. Hybrid*, or 215,366 lbs. in all. The average ages of the Ledger, succirubra and hybrid barks were 7.04, 11.2 and 8.3 years and the average annual bark increments per acre of the acreages 273, 237.2 and 111.6 lbs. respectively. The average age of all the acreages cut out is 7.5 years

and the average annual bark increment per acre calculated on these acreages is 253.3 lbs. The yield per acre over the period is therefore 1,900 lbs. This yield is not a true index of what the plantation reaches. The figure is vitiated by the fact that in past years one large block now finally uprooted was not written down fast enough with the result that the area appearing on the books was much above the area actually in existence.

Apart from sections of the Silake block where a southern exposure, poor soil and the ravages of *Helopeltis* combine to produce an effect fortunately rare on the plantation all blocks look well. Cinchona is seen at its best on Iiungbee where an area recently put out is likely to prove of very special interest. The young plants here, the progeny of a single high trade tree, appear to be all of a type, a result very unusual even when great care is taken in the selection and crossing of the parent plants. If as there is some cause for hoping, these plants prove uniformly high in quinine content the result may be one of far-reaching importance to the plantations. The reputed high grade seed bought from Java some years ago is not proving up to its guaranteed standard. Indeed plants grown from this seed are no better than a type of plant common here now. At the end of the year there were 936.6 acres with a full complement of cinchona on Mungpoo Plantation. Details are available in Appendix A(1).

(b) *Munsong*.—Rainfall was 87.9 inches being 8.5 inches below the average of the past 23 years. From November to March 1.20 inch only was recorded. No excessive fall occurred, the highest being 3.57 inches, but with the rainfall in such pronounced defect the plantation had to suffer.

Another hailstorm, the severest ever experienced on the plantation, occurred towards the end of the year. Fortunately the damage was confined to a single strip running from the bottom of Munsong Division to above Kashyem bungalow. The violence of the storm is indicated by holes in the leaves of a large Agave plant near Munsong, measurement showing that the stones had gone through a $\frac{1}{2}$ inch of tough plant tissue. In the narrow track of the storm cinchona suffered badly. All divisions are looking as well as they have done in past years. Extensions have been resumed and these in particular are looking fresh and promising. As far as can be managed slopes with a northern exposure are being selected, the deleterious effect on cinchona of a southern exposure being pronounced on this plantation. The blocks were given as much cultivation* as was possible with the labour available. The scattered nature of much of the cinchona on Munsong makes it difficult to get in the requisite number of sijkings during the rains, for the plants spaced as they are give little assistance in keeping down weeds. Contract labour was short resulting in a saving in the budget allotment.

Extensions were 100 acres *C. Ledgeriana* on Kashyem and 40 acres, also *Ledger*, on Sangser. Harvests were obtained by cutting¹ out 125.7 acres of *C. Ledgeriana*, 1 acre *C. succirubra*, 10.1 acres *C. officinalis*, 9.9 acres *C. Hybrid II* and .9 acre *C. Hybrid III*, the total of 147.6 acres giving 378,089 lbs. *C. Ledgeriana*, 3,742 lbs. *C. succirubra*, 19,610 lbs. *C. officinalis*, 33,316 lbs. *C. Hybrid II* and 1,329 lbs. *C. Hybrid III*, or 436,086 lbs. in all. The average ages of the barks in the above order were 7.5, 9.8, 9.74, 8.28 and 5.22 years' and the average annual bark increments per acre of the acreages 400, 381.8, 200, 406.3 and 282.7 lbs. respectively. The average age of the total acreage cut out is 7.72 years and the average annual bark increment calculated on these acreages is 382.4 lbs. At the end of the year there were 2,118.4 acres with a full complement of cinchona on Munsong Plantation. Details are available in Appendix A(1).

(c) *Plantations as a whole*.—The total area under cinchona is 3,055 acres. Details of the species, the acreages going to be made up this total and their ages are available in Appendix A(2). In all cases the acreages are calculated as carrying their full complement of cinchona trees.

3. **Factory work**.—Besides 430,604 lbs. of Java bark for the Government of India 154,297 lbs. of Mungpoo bark (143,022 *Ledger*, 2,843 *succirubra* and 8,432 hybrid) and 807,002 lbs. Munsong bark (271,498 *Ledger*, 5,331 *succirubra* 15,814 *officinalis* and 14,359 hybrid) were worked up to produce about 19,207½ lbs. quinine sulphate, 530J lbs. other*quinine salts 4£ lbs. quinidine salts, 181 lbs. quinoidine, and 7,859½ lbs. cinchona febrifuge—a total of 27,782 lbs. provincial alkaloids. Exact amounts are available in Appendix C(1). The Java bark produced 24,056£ lbs. quinine sulphate and 4,983 lbs. cinchona febrifuge. The total production of quinine sulphate, both provincial and imperial, was 43,264 lbs., and the total products from all sources 56,822J lbs. The amount of quinine sulphate proved by analysis to be present in the bark was 47,535 lbs.

4. **Cost and value of plantation bark**.—The average cost per lb. of all Mungpoo barks taken over a series of year is 3.6 annas and of Munsong barks 2.7 annas. The cost of the 215,366 lbs. Mungpoo bark harvest is, therefore, Es. 54,707 and of the Munsong 436,086 lbs. harvest Us. 73,589. The unit rate for bark being 1.5 annas the average Mungpoo bark quinine percentage of 4.4, gives the harvest from this plantation a value of Rs. 88,839 or Es. 34,132 more than it cost. On a basis of an average quinine percentage of 4.39 and the same unit rate the Munsong harvest valuation is Es. 1,78,863 or Es. 1,05,274 more than it cost. The year's expenditure for both plantations including their share of general charges is Es. 2,09,697 while harvests costing Es. 1,28,296 and valued at Es. 2,67,702 are the year's return for past expenditure.

5. **Cost and value of quinine produced.**—(a) *Cost in the bark.*—The 19,207 lbs. of quinine extracted were contained in 461,299 lbs. of mixed Mungpoo and Munsong barks, which cost (154,297 lbs. at 3-6 annas and 307,002 lbs. at 2-7 annas per lb.) Rs. 86,513. The cost per lb. of quinine in the bark was, therefore, Rs. 4-5.

(h) *Cost of extraction, packing and delivery to railway.*—This is calculated on the total extraction of quinine both provincial and imperial. The total direct expenditure on the factory was Rs. 1,21,973-9, general charges debitable to factory account Rs. 3,984-2, factory depreciation charges Rs. 5,183, stores (oil, chemicals, etc.) depreciation charges Rs. 5,855-5-6, the gross factory expenditure being, therefore, Rs. 1,36,996-0-6. From this has to be deducted expenditure on products both imperial and provincial other than quinine sulphate Rs. 27,647-7-5 leaving Rs. 1,09,348-9-1 net expended on the production of 43,264 lbs. provincial and imperial quinine sulphate. The cost of extraction, packing, etc. is, therefore, Rs. 2-527 per lb., a figure slightly below that of last year.

(c) *Total cost per lb. and value.*—This is made up of the cost in the bark—Rs. 4*5 and the cost of extraction, etc., Rs. 2*527, a total of Rs. 7-027. The present wholesale rate being Rs. 26 per lb., the 19,207½ lbs. provincial quinine manufactured are worth Rs. 4,99,395 but cost only Rs. 1,34,971.

6. **Sales and selling rates.**—A statement of the sales of factory products for 1923-24 is available in Appendix G. Sales of quinine sulphate have increased some 4,690 lbs. As an examination of distribution showed that the areas of supply allotted to the Governments of Bengal, Madras and India were not being strictly adhered to orders were issued to all Departments to regulate distribution in such a way as to prevent any district getting its supplies from other than the proper source. The amount of cinchona febrifuge sold was 12,478 lbs. of which 2,000 lbs., the cost of which was not borne by the Bengal Cinchona Department, were received from the Madras Cinchona Department and 2,62½ lbs. belonged to the Government of India. Credit in these accounts is, therefore, taken for the proceeds from the sale of 7,856½ lbs. provincial febrifuge only. The excess credit lying with Bengal will be adjusted hereafter in transfer account.

Selling rates were as follows: Quinine sulphate Rs. 27 to Rs. 29. Other quinine salts Rs. 35 to Rs. 40. Cinchonine and Cinchonidine salts Rs. 12 to Rs. 13. Quinoidine R% 6 to Rs. 8 and Cinchona febrifuge Rs. 8 to Rs. 10. All these rates are based on and are liable to fluctuate with market rates.

Rupees 4,36,945-14-3 were obtained from the sale of 13,348 lbs. Quinine sulphate converted to tablets in the Juvenile Jail but of this sum half only is taken as credited to the Cinchona Department. Details of the monthly receipts from this source are available in Appendix H.

7. Expenditure and receipts.—The total expenditure on the department detailed in Appendix D was Es. 3,35,655-4-3. The total receipts including Rs. 550-15 received direct were Rs. 7,92,480-9-3, of which Rs. 1,39,684-7 were credit and Rs. 6,52,724-2-3 cash. These receipts include the Jail share amounting to Rs. 2,18,472-15 of proceeds from the sale of quinine tablets, but do not include proceeds from the sale of Cinchona febrifuge belonging to the Government of India. The net receipts properly creditable to the Cinchona Department are therefore Rs. 5,73,935-10-3, but sums of Rs. 60,790-12 and Rs. 9,966 are still due from the Government of India to cover the cost of extracting 24,056½ lbs. Quinine sulphate at Rs. 2-527 per lb. and 4,983 lbs. Cinchona febrifuge at Rs. 2 per lb. Reference to the profit and loss valuation account will show that a further sum of Rs. 45,220-6, all good debt, was outstanding at the end of the year.

8. Quinine reserve and stock account.—Full details of stocks in hand are available from Appendices C(1) and C(2). The provincial reserve of quinine is some 3,886 lbs. lower at the end of the year due to an increase in the consumption as compared with last year, and now stands at 27,799 lbs. 10½ oz. Stocks of other products are, however, slightly up on the years working. The 7,859½ lbs. provincial Cinchona febrifuge manufactured have been sold leaving all stocks of this product in hand at the end of the year both at the factory and jail the property of the Government of India.

The stock of plantation bark at the end of the year was 355,081 lbs. against 168,928 lbs. carried over from last year. This is a very large increase due to the amount of Java bark arriving and requiring to be worked up. Harvests from the plantations are being restricted by the removal of thinnings and casualty trees only and with half the Java bark now going to Madras, bark on balance at the end of the year should gradually become less. While the oil account shows a slight increase in the new carry over chemicals and stores are some Rs. 7,307 down on the year's working. The total value of stock carried over is Rs. 6,97,584-3-9 against an opening balance of Rs. 7,19,373-12-6.

As regards valuation rates the figures employed last year have again been utilised, Quinine sulphate, the main item, is carried at Rs. 20 per lb. a figure considerably below its present market value. It would conform more closely with commercial methods to value stocks at cost or market rate whichever is less but pending decision on the question of commercialising the accounts the old system of valuation has been retained.

9. Block account.—Excluding the value of extensions which for purposes of the block account are taken at cost price, the increase in value of Cinchona trees at the end of the year is Rs. 3,75,837.

Each block of Cinchona has been valued separately on the basis of the analytical figure for its Lark sample and a unit rate of 1-5 annas. The method of valuation is not as reliable as could be wished but it is difficult to devise a system that gives approximation to the results known only when the blocks are finally uprooted. The annual bark increment figures hitherto taken for Munsong will probably have to be reduced. In the writer's opinion the system leads to overvaluation of this plantation. Cinchona trees are valued at Es. 2,325,233; fuel and timber trees at Rs. 2,81,063. See Appendix F for further information.

10. **Profit and loss valuation.**—The valuation profit balance of Rs. 7,30,386-15-3 may be considered a very satisfactory result of the year's working. It should be noted that outstanding in this account include a sum of Rs. 70,756-12* due from the Government of India for work done. The exchange account between the two Governments results in a net debit of Rs. 49,465-12* only against the Central Government but this account credits the local Government with proceeds from the sale of Cinchona febrifuge belong to India which the sales shown in Appendix E do not include.

11. **Land rent.**—From Mungpoo the sum of Rs. 5,266-8-9 was collected during the year and paid into the Darjeeling treasury. From Munsong Rs. 1,322-4-6, representing fees collected from cattle grazing within the cinchona boundary, were paid into the Kalimpong sub-treasury for credit to the Forest Department. No credit is taken for these sums in the accounts of the Cinchona Department.

12. **Staff.**—Lieut.-Colonel A. T. Gage, C.I.E., I.M.S., was on leave throughout the year during which time the writer officiated as Superintendent. Mr. G. E. Shaw, was Government Quinologist and Mr. S. C. Sen Assistant Quinologist throughout the year. Mr. H. Thomas was Manager, Messrs. Fothergill and Richards, Assistant Managers, Cinchona Plantation Munsong, throughout the year. Mr. Fothergill was on leave for one month from 14th January 1924, when Mr. J. Hulbert, Overseer, officiated in his place.

Mr. P. V. Osborne was Manager, Mr. P. W. Cresswell, Assistant Manager and Messrs. Holl and Harkaman Lama were Overseers, Cinchona Plantation, Mungpoo, throughout the year. The Head Clerk, Babu S. K. Mitra, was on leave from 2nd January 1924 till the end of the year during which time Babu A. T. Banerjee, 7th Clerk, officiated in his place. All officers of the plantations and factory and the clerical establishment have performed their duties satisfactorily.

13. **Medicinal plants other than cinchona**—About 47,500 *Ijiecuanlia* plants were raised from seed for planting in a new nursery

* Exclusive of pensionary charges.

500 feet or so higher than the old beds. During the cold season temperatures in the valley, where the old beds*were situated, are believed to go lower than they do higher up. The change in site is an attempt to avoid the evil effects on *Ipecacuanha* of excessive daily fluctuations of temperature. Stocks of the plant are looking well. Already about 3 lbs. of Emetine hydrochloride have been extracted.

The cultivation of *Digitalis* is being continued but the limited demand makes it questionable whether it is worth while to go on with this crop.

C. C. CALDER,

Ojfo Superintendent,*

Royal Botanic Garden, Calcutta,

and of Cinchona Cultivation in Bengal.

APPENDIX A(2).

Abstract of acreage with full complement of cinchona in the Government Cinchona Plantations, Darjeeling district, on the 31st March 1924.

Species.	Number of acres bearing trees of—				Total acreage.
	0—5 years old.	6—10 years old.	11—15 years old.	16 years old and over.	
1	2	3	4	5	6
Cinchona Ledgeriana ..	1,465.4	814.6	76.7	..	2,356.7
„ officinalis ..	..	78.8	29.6	..	108.4
„ succirubra ..	80	20.2	1.5	39.8	141.5
„ (ledger x officinalis)	107.9	..	..	..	107.9
„ (ledger x succirubra)	186.7	130.9	20.4	2.5	340.5
Total ..	1,840	1,044.5	128.2	42.3	3,055

APPENDIX B.

Receipts For 1923-24.

Transactions of the year.	Sales to Government Offices and institutions.		Sales to the public for cash payment.		Total.
	Cash sales.	Book credit.	In tablets.	In tins in powder form to Native States, Municipal and Local Funds, Dispensaries, Missionary bodies and others.	
1	2	3	4	5	6
	Rs. A.	Rs. A.	Rs. A.	Rs. A.	Rs. A.
Quinine sulphate	1,07,615 12	1,24,122 4	2,18,472 15*	35,844 0	4,86,054 15
Other quinine salts	225 9	14,960 0	..	115 10	15,301 3
Cinchona febrifuge	..	..	..	..	69,1 #7 4
Cinchonidine salts	51 0	17 0	..	..	68 0
Cinchonino salts	7 9	13 0	..	44 12	65 5
Quinidine salts ..	..	91 0	* ..	..	91 0
Quinoidine ..	U9 0	80 0	..	378 0	607 0
Bark	25 0	..	..	1,975 0	2,000 0
Miscellaneous ^.	149 12	401 3	..	..	550 15
Total ..	1,08,223 10	139,684 7	2,18,472 15	38,357 6	5,73,935 10

* This sum is half of Rs. 4,36,945-14-3 being value of 13,348 lbs. of quinine sulphate sold in form of treatments. The remaining sum of Rs. 2,18,472-15-0 is credited to the Prison Department.

APPENDIX 0(1).

Stock Account, 1923-24.

	Quiiine sulphate.			Other quinine salts.		
	Quantity.	Rate per lb.	Value.	Quantity.	Rate per lb.	Value.
1	2	3	4	5	6	7
	lbs. oz.	Rs.	Rs. A.	lbs. oz.	Rs.	Rs. A.
Balance on 1st April 1923	31,635 9	20	6,33,711 4	102 i	25	2,550 12
Purchased .. ..	..	..	..	..	..	..
Harvested .. ..	..	..	..	..	..	..
Used in factory ..	..	..	..	..	..	..
Manufactured ..	19,207 6*	7.027	1,34,970 7	530 7J	10	5,304 11
Issued or sold ..	23,093 5	..	4,86,054 35	394 8	..	15,301 3
Balance on 31st March	27,799 10J	..	5,55,993 2*	238	..	5,950 0

	Quinidine* sulphate.			Cinchonine salts.		
	Quantity.	Rate per lb.	Value.	Quantity.	Rate per lb.	Value
1	2	3	4	5	6	7
	lbs. oz.	Rs.	Rs. A.	lbs. oz.	Rs.	Rs. A.
Balance on 1st April 1923.	G 11½	20	134 6	20 15J	10	209 11
Purch£3ed .. ..	..	..	..	..	..	..
Harvested .. ..	..	..	..	..	..	..
Used in factory ..	..	..	..	..	..	..
Manufactured ..	4 8J	10	45 5	..	..	..
Issued or sold ..	2 0	..	91 0	4 13	..	65 5
Balance on 31st March	9 4	20	185 0	16 2£	10	161 0

	Cinchonidine salts.			Quinoidine.		
	Quantity.	Rate per lb.	Value.	Quantity.	Rate per lb.	Value.
1	2	3	4	5	6	7
	lbs. oz.	Rs.	Rs. A.	lbs. oz.	Rs.	Rs. A.
Balance on 1st April 1923	4 0	15	60 0	74 0	2	148 0
Purchased	..	..	..	..	..	..
Harvested	..	..	..	..	..	..
Used in factory	..	..	..	..	..	..
Manufactured	..	..	..	181 0	3 *	543 0
Issued or sold	4	..	68 0	89 0	..	607 0
Balance on 31st March 1924	nil	..	..	166 0	2	332 0

	Cinchona Fobrifuge.			Cinchona Bark.		
	Quantity.	Rate per lb.	Value.	Quantity.	Rate per lb.	Value.
1	2	3	4	5	6	7
	lbs. oz.	Rs.	Rs. A.	lbs.	Annas.	Rs. A.
Balance on 1st April 1923	..	..	..	168,928	5	52,790 3
Purchased	..	..	..	..	..	..
Harvested	..	..	..	651,452	..	1,80,661 0
Used in factory	..	..	..	461,299	..	86,522 0
Manufactured	7,859 8	2	15,719 0	..	..	..
Issued or sold	7,859 8	..	67,197 4	4,000	8	2,000 0
Balance on 31st March 1924	..	..	..	355,081	5	1,10,962 0

	Oil.			Chemicals and stores.	Grand Total.
	Quantity.	Rate per gallon.	Value.	Value.	Value.
1	2	3	4	5	6
	Gallons	Rs.	Rs. A. p.	Rs. A. r.	Rs. A. p.
Balance on 1st April 1923.	10,364	Various	9,804 5 6	19,965 3 0	7,19,373 12 6
Purchased ..	21,695	..	18,239 10 3	49,372 7 0	67,612 1 3
Harvested .. ..	..	..	....	....	1,80,661 0 0
Used in factory ..	13,572	..	16,701 7 9	56,765 15 0	1,59,989 6 9
Manufactured ..	..	..	....	•*••	1,34,970 7 0
Issued or sold ..	..	..	....	....	5,71,384 11 3
Balance on 31st March 1924.	13,487	••	11,342 8 0	12,658 0 9	6,97,584 3 9

APPENDIX G(2).

Detailed Stock Account of barks for 1923-24.

	Cinchona Ledgeriana.			Cinchona officinalis.		
	Quantity.	Rate per lb.	Value.	Quantity.	Rate per lb.	Value.
1	2	3	4	5	6	7
	lbs.	Annas	Rs. A.	lbs.	Annas.	Rs. A.
Balance on 1st April 1923 ..	156,914	5	49,035 13	3,165	5	989 1
Harvested ..	558,240	•Vari-ous	1,04,335 0	19,610	2-7	3,309 0
Used in factory ..	414,520	..	77,995 0	15,814	2-7	2,668 0
Sold .. ..	..	..	..	..	..	..
Balance on 31st March 1924 ..	3,006	5	93,948 0	6,961	5	2,175 0

» 30 annas for Muagpou bark and 27 annas for Mungsong bark.

				Cinchona succirubra.		
				Quantity.	Rate per lb.	Value.
1				2	3	4
				lbs.	Annas.	Rs. A.
Balance on 1st April 1923	..	..	..	8,849	5	2,765 5
Harvested	..	..	..	29,882	Various*	65,129 0
Used in factory	..	..	..	8,174	..	1,539 0
Sold	..	..	..	4,000	8	2,000 0
Balance on 31st March '1924	..	..	..	26,557	5	8,299 0

	Cinchona (Ledger x succirubra).			Cinchona (Ledger x officinal is).		
	Quantity	Rate per lb.	Value.	Quantity.	Rate per lb.	Value.
1	2	3	4	5	6	7
	lbs.	Annas	Rs.	lbs.	Annas	Rs.
Balance on 1st April 1923.	nil	..	..	nil	..	..
Harvested	42,391	* Various	7,664	1,329	2-7	224
Used in factory	21,462		4,096	1,329	2-7	224
Sold	..	..	..	..	..	..
Balance on 31st March 1924.	20,929	5	6,540	..	..	..

* 3⁶/₁₆ annas per lb. for Mungpoo and 2⁷/₁₆ annas for Munsong bark.

APPENDIX D.

Expenditure for 1923-24.

I.—PLANTATIONS ACCOUNT.

A.—MUNGPOO PLANTATION.

Salaries.

					Rs.	A.	P.
1. Manager and Assistant Manager	..	..	..	..	8,848	0	3
2. Overseers	..	..	..	..	2,570	0	0
3. Duty allowance	..	..	..	?	1,200	0	0
4. Exchange compensation allowance	..	..	..	..	....

Establishment,

5. Sub-Overseer.	..	..	..	..	1,420	0	0
6. Sub-Assistant Surgeon	..	..	..	..	1,856	1	0
7. Artificers	..	..	..	..	360	0	0
8. Sirdars and coolies	..	..	..	..	54,273	8	6

Allowances,

9. Travelling allowance	..	..	..	..	46	7	0
10. Pony allowances	..	..	..	..	1,038	0	0
11. Compensation for dearness of provisions	..	..	..	..	....

Contingencies.

12. Purchase and koop of ponios and bullocks	..	..	..	..	2,160	0	0
13. Purchase of manure	..	..	..	..	....
14. Purchase of seeds	..	..	..	..	....
15. Carriage charges	..	..	..	..	8	1	3
16. European stores	..	..	..	..	755	8	0
17. Freight	..	..	..	..	62	2	0
18. Buildings	..	..	..	..	911	10	0
19. Machinery and plant	..	..	..	..	—
20. Miscellaneous	..	..	..	..	4,086	0	3
21. Servants' clothing	..	..	..	..	....
22. Labour of malis	..	..	..	..	2,280	0	0
Total Mungpoo charges	..	..	..	..	81,948	8	0

B.—MUNSONG PLANTATION.

Salaries.

					Rs.	A.	P.
1. Manager and Assistant Managers	..	..	..	..	16,612	11	0
2. Overseers	..	..	..	..	2,122	5	0
3. Duty allowance	..	..	..	..	1,600	0	0
4. Exchange compensation allowance	..	..	..	..	....

Establishment.

						Rs.	A.	P.
5.	Clerks	..	..	..	• • •	....
6.	Sub-Assistant Surgeon	..	..	..	•	2,660	3	6
7.	Artificers	..	•	..	• •	....	
8.	Sirdars and coolies	..	..	..	•	82,276	15	3

Allowances.

9.	Travelling allowance	..	..	• •	• •	74	2	0
10.	Pony allowances	..	..	..	• •	1,440	0	0
11.	Compensati^ for dearness of provisions			• •	• •	....	

Contingencies.

12.	Purchase and keep of ponie3 and bullocks			• •	..	2,160	0	0
13.	Purchase of manure	..	..	6 ..	..	....
14.	Purchase of seed	..	..	..	..	....
15.	Carriage charges	..	..	..	..	5,608	11	6
16.	European stores	..	..	..	..	1,688	2	0
17.	Freight	..	..	..	..	101	2	0
18.	Buildings	..	..	..	..	1,999	14	0
19.	Machine^ and plant	..	..	..	..	—
20.	Miscellaneous	..	..	..	..	2,771	15	0
21.	Afforestation charges	..	..	..	..	....
22.	Servants' clothing	..	..	..	..	—
	Total Munsong charges	..			..	1,21,116	1	3
	Total for both plantations	..			..	2,03,064	9	3

II. --FACTORY ACCOUNT.

Salaries.

						Rs.	A.	p.
1.	Quinologist	..	..	..	..	21,496	7	0
2.	Assistant Quinologist	..	..	»	..	6,354	11	3
3.	Manufacturing Chemist	..	..	..	*	....

Establishment.

4.	Clerks	..	..	..	..	815	^0	0
5.	Servants	..	..	..	..	....
6.	Artificers	..	..	• •	• •	....
7.	Sirdars and coolies	..	..	..	..	8,745	3	0

Allowances.

8.	Travelling allowance	..	..	..	..	30	0	0
9.	Compensation for dearness of provisions	..	..	..	..	....

Contingencies.

					Rs.	A.	p.
10. Purchase of machinery	..	..	..	..	....
11. Buildings	..	..	..	..	3,497	15	0
12. European stores	..	..	..*	..	27,966	4	0
13. Freight	..	..	..	..	4,220	13	0
14. Chemicals	..	..	..	..	26,944	3	0
15. Fuel (carriage and cutting up only)	..	..	..	..	10,063	12	0
16. Purchase of bark (carriage only)	..	..	..	..	3,813	9	3
17. Purchase of cinchona febrifugo	..	..	..	..	.....
18. Packing materials	..	..	..	..	2,527	15	0
19. Distribution charges	..	..	..	..	337	5	0
20. Miscellaneous	..	..	..	..	5,160	1	6
21. Servants' clothing	..	..	..	..	....
Total Factory charges	..			..	<u>1,21,973</u>	<u>9</u>	<u>0</u>

III.—GENERAL.

Salaries.

					Rs.	A.	P.
1. Superintendent	..	..	..	..	2,400	0	0

Establishment.

2. Clerks	..	..	..	..	5,776	7	0
3. Servants	..	..	..	..	236	11	0

Allowances.

4. Travelling allowances	..	..	..	..	.....
5. Compensation for dearness of provisions	..	..	..	..	....

Contingencies.

6. Miscellaneous	..	..	..	..	....
7. Postage and telegrams	..	..	..	..	*90	0	0
8. Advertising charges	..	..	..	..	....
9. Subscriptions to newspapers and periodicals	..	..	..	..	....
10. Purchase and repair of furniture	..	..	..	..	....
11. Road and Public Works Cess	..	..	..	..	1 ¹ / ₂ SU	0	0
Total General charges	..			..	<u>10,617</u>	<u>2</u>	<u>0</u>

IV.—ABSTRACT.

					Rs.	A.	p.
Total Mungpoo charges	..	..	..	..	81,948	8	0
„ Munsong	..	..	..	..	121,116	1	3
„ Factory	..	..	..	..	1,21,973	9	0
„ General	..	..	..	..	10,617	2	0
GRAND TOTAL EXPENDITURE	..			..	<u>3,35,655</u>	<u>4</u>	<u>3</u>

APPENDIX E.

Profit and Loss Valuation, 1923-24.

---	Amount.			---	Amount.		
1	2			3	4		
To -	Rs.	A.	p.	By -	Rs.	A.	p.
Stock on 1st April 1923	7,19,373	12	6	Arrears recovered ..	4,171	3	0
Outstanding or ^F 1st April 1923 ..	4,171	3	0	Sales during the year	5,73,935	10	3
Expenditure (less Rs. 29,000 capital expenditure) ..	3,06,655	4	3	Outstandings on 31st *March 1924 ..	1,15,977	2	0
Depreciation on buildings ..	3,199	0	0	Stock on 31st March 1924 ..	6,97,584	3	9
Depreciation on machinery ..	3,719	0	0	Gain in revaluation of Cinchona: trees ..	3,75,837	0	0
Balance (profit) ..	7,30,386	15	3	Timber trees ..	*		
Total ..	17,67,505	3	0	Total ..	17,67,505	3	0

* This includes outstandings of Its. 70,756-12 against the Government of India.

APPENDIX F.

Block Account, 1923-24.

I.—MUNGPOO PLANTATION.

---	Amount.			---	Amount.		
1	2			3	4		
To -	Rs.	A.	P.	By -	Rs.	A.	P.
Value of buildings on 1st April 1923 ..	27,272	0	0	Depreciation on buildings at 2J per cent.	737	0	0
Machinery (Sirocco driers) ..	921	0	0	Value of buildings on 31st March 1924 ..	26,535	0	0
Value of plantation on 1st April 1923—				Depreciation on machinery at 5 per cent.	54	0	0
Cinchona trees ..	3,70,123	0	0	Value of machinery on 31st March 1924 ..	867	0	0
Timber trees ..	2,72,033	0	0	Value of plantation on 31st March 1924—			
Value of extensions at cost made in 1923-24—				Cinchona trees ..	3,92,616	0	0
Cinchona trees ..	15,000	0	0	Timber trees ..	2,72,733	0	0
Timber trees ..	700	0	0				
Gain on revaluation of plantations at end of 1923-24 (extensions for the year excluded) —							
Cinchona trees ..	7,493	0	0				
Timber trees ..	.....					
Total ..	6,93,542	0	0	Total ..	6,93,542	0	0

II.—MUNSONG PLANTATION.

—	Amount.	—	Amount.
1	2	3	4
	Rs. A. p.		Rs. A. p.
To—		By -	
Value of buildings on 1st April 1923 ..	34,942 0 0	Depreciation on buildings at 2½ per cent.	944 0 0
Value of plantation on 1st April 1923—		Value of buildings on 31st March 1924 ..	33,998 0 0
Cinchona trees ..	15,50,973 0 0	Value of plantation on 31st March 1924—	
Timber trees ..	8,330 0 0	Cinchona ..	19,32,017 0 0
Value of extension at cost made in 1923-24—		Timber trees ..	8,330 0 0
Cinchona trees ..	13,300 0 0		
Timber tree* ..	.....	
Gain on revaluation of plantations at end of 1923-24 (extensions for the year excluded)—			
Cinchona trees ..	3,58,344 0 0		
Total ..	1,975,889 0 0	Total ..	1,975,889 0 0

III.—FACTORY.

—	Amount.	—	Amount.
	2	3	4
	Rs. A. p.		Rs. A. p.
To—		By -	
Value of buildings on 1st April 1923 ..	56,199 0 0	Depreciation on buildings at 2½ per cent.	1,518 0 0
Value of machinery on 1st April 1923 ..	02,321 0 0	Value of buildings on 31st March 1924 ..	54,681 0 0
		Depreciation on machinery at 5 per cent.	3,665 0 0
		Value of machinery on 31st March 1924 * ..	58,656 0 0
Total ..	1,18,520 0 0	Total ..	1,18,520 0 0

* Value of cinchona trees Rs. 23,25,233, timber trees Rs. 2,81,063, of buildings Rs. 1,15,214, of machinery Rs. 59,523, total value Rs. 27,81,033, -

APPENDIX G.

Statement of sales of factory products during the official year 1023-24.

Particulars.	Quinine salts.	Cinchonine and cinchonidine salts.	Cinchona febrifuge.	Quinine salts and quinoi-dine.	Cin-chona bark.	Total.
	lbs. oz.	lbs. oz.	lbs. oz.	lbs.	lbs.	lbs. oz.
<i>Assam.</i>						
Jails ..						
Dispensarios ..						
District Boards ..						
Missionary bodies ..						
Others ..						
<i>Bengal.</i>						
Jails ..						
Medical Store Depot ..						
Dispensarios ..						
District Boards ..						
Missionary bodies ..						
Others ..						
<i>Bihar and Orissa</i>						
Jails ..						
Dispensaries ..						
District Boards ..						
Missionary bodies ..						
Others ..						
<i>Punjab.</i>						
Jails ..						
Dispensaries ..						
District Boards ..						
Missionary bodies ..						
Others ..						
<i>Other Provinces and States.</i>						
Jails ..						
Dispensaries ..						
District Boards ..						
Missionary bodies ..						
Others ..						
Total ..						

"APPENDIX H.

Sale of sulphate of quinine in « treatment » tablets during 1923-24.

Consecutive No.	Months.	Total proccoda from sale of tablets.	Credited to Cinchona Department at holt rate*
I	2	3	4
	1923	Re. A. p.	Rs. A. p.
1	April		
2	May	18,312 0 0	9,156 0 0
3	June	30,907 13 0	15,453 14 6
4	July	34,651 8 3	17,325 12 1
5	August	46,529 13 0	23,264 14 6
6	September	37,901 10 3	18,950 13 1
7	October	52,360 14 0	26,180 7 0
8	November	38,958 8 3	19,479 4 1
9	December	50,336 8 9	25,168 4 4
		38,030 5 6	19,015 2 9
	1924		
10	January		
11	February	51,376 2 3	25,687 9 1
12	March	21,649 11 0	10,824 13 6
		15,932 0 0	7,966 0 0
	Total	4,36,945 14 3	2,18,472 14 11

* Supplied by the Accountant-General, Bengal.

GOVERNMENT OF BENGAL.

REVENUE DEPARTMENT.

Cinchona.

CALCUTTA, THE 21ST NOVEMBER 1924.

RESOLUTION-No. 9275Cin.

READ—

The Sixty-Second Annual Report of the Government Cinchona Plantations and Factory in Bengal for the year 1923-24.

READ ALSO—

The Report of the previous year.

The Sixty-Second Annual Report of the Government Cinchona Plantations and Factory in Bengal, written by the officiating Superintendent Mr. Calder, is an interesting and satisfactory record of the work done during the year 1923-24.

The policy of the Government of Bengal is to maintain and, if possible, extend the Cinchona Plantations and at the same time to improve and develop the factory, in order to meet the requirements of the province. The extension of the plantations is limited by the fact that cinchona is a plant that requires a certain combination of soil, rainfall and elevation, and will not grow unless these three conditions are suitable. It is therefore a matter of satisfaction that in spite of a deficient rainfall in both the Mungpoo and Munsong plantations and difficulty in obtaining labour, the Superintendent is able to record an increase in the area under cinchona from 3,026 acres in 1922-23 to 3,055 acres in 1923-24. The Governor in Council hopes that it will be possible during the present year to make a further extension of the area.

The factory deals not only with the bark produced on the Bengal plantations, but also with Java bark purchased by the Government of India, which pays this Government, for the cost of extraction. It depends on the supply of water for its power, and was affected in the year under report by the deficient rainfall. The Superintendent hopes to obtain a better supply of water from a new channel. The total products from both the local and Java bark were 56,822 lbs., of which 43,264 lbs. were quinine sulphate, being nearly the same as the quantities produced last year. The fact that analysis showed that the amount of quinine sulphate present in the bark was 47,535 lbs., whilst 43,204 lbs. were actually extracted, shows that the methods followed in the factory are efficient.

The price at which quinine sulphate was sold during the year was Rs. 21 to Rs. 29. The selling rate is based on and fluctuates with the market rate ; it may be noted for comparison that before the War, the price was Rs. 11-8 and rose to Rs. 48 in 1922. The financial results to the province have naturally varied with the market rates, which are beyond the control of Government, but it is satisfactory to find that whilst the total expenditure on the department was Rs. 3,35,655, the total receipts were Rs. 7,^2,480. These receipts include a sum of Rs. 2,18,473 credited to the Juvenile Jail, Alipore, in accordance with the arrangement by which that Jail manufactures quinine tablets and distributes quinine products. The profit and loss valuation shows a profit balance of Rs. 7,30,387. His Excellency in Council agrees with the Superintendent that this may be considered a very satisfactory result of the year's working.

The Governor in Council takes this opportunity of placing on record his appreciation of the valuable work done by Lieutenant-Colonel A. T.

the I^AS; S^A&^A
 Sⁱ to MVT^{CLT} for the efficient working of ^A factory,
 Eⁱⁿⁿⁱⁿg of 19⁰⁰, for ^{affiliated} Superintendent since the
 tration of the plantations. s successful adminis-

By order of the Governor in Council,

W. S. HOPKYNs,

Secretary to the Government of Bengal (offg.).

Published at the Bengal Secretariat Book Depot,
Writers' Buildings, Calcutta.

AGENTS IN INDIA.

Bengal.

MESSRS. A. H. WHEELER & Co., Calcutta.
MESSRS. B. BANERJEE A Co., 26, Comwallis Street, Calcutta.
MESSRS. BUTTEWORTH A CO. (INDIA), Li., Calcutta.
MR. G. N. HALDER, Calcutta.
THE INDIAN SCHOOL SUPPLY DEPOT, 30, Bowbazar, Calcutta.
THE PROPRIETOR, INTERNATIONAL BUDDHIST BOOK DEPOT, 4, Olmuduey Chowk, 1st Lane, Calcutta.
MESSRS. LALL OHAND A SONS, 7G, Lower Circular Road, Calcutta.
HAI M. C. SARKAR BAHADUR A SONS, 90-2A, Harrison Road, Calcutta.
MESSRS. NEWMAN A Co., Calcutta.
MESSRS. R. OAMBRAV A Co., Calcutta.
MESSRS. S. K. LAHIKI A CO., Printers and Booksellers, College Street, Calcutta.
THE STANDARD LITERATURE COMPANY, LD., 13-1, Old Court House Street, Calcutta.
MESSRS. THACKER, SPINK A CO., Calcutta.
THE WETDON LIBRARY, 18-5, Ohowriighee Hoad, Calcutta.
THE YOUNG MEN'S CHRISTIAN ASSOCIATION PRESS, Calcutta.
BABU JADUNATH HALDAR, Muktar and Revenue Agent, Gorabazar, Munhidnba<!.
BABU S. O. TALUKDAR, Piopriector, Students A Co., Oooh Behar.
BABU B. O. BASAK, Proprietor, The Albert Library, Nawabpur, Dacca,

Bombay.

MESSRS. A. H. WHEELER A Co., Bombay.
MESSRS. A. J. OOMBRIDGE A CO., Bombay.
MESSRS. D. B. TARAPOREVALLA & SONS, Booksellers, 190, Hornby Road, Fort, Bombay.
MESSRS. QOPAL NARAYAN A CO., Bombay.
MRS. RADHABAI ATMARAM SAGOON, Bombay.
MESSRS. RAMCIANDRA GOVIND A SON, Booksellers and Publishers, Kulbnd<vi, Bombay.
MR. RAMNATH SUNDER, Bombay.
MESSRS. THACKER A CO., LD., Bombay.
THE STANDARD BOOKSTALL, Karachi.
THE PROPRIETOR, New Kitabkfcana, Poona.
MESSRS. KARSANDASNARANDAS A SONS, Snrat.
MR. MANOAT.DAS HARKI8ANDA8, Surat.

AGENTS IN GREAT BRITAIN.

MESSRS. A. CONSTABLE A Co., 10, Orange Street, Licester Square, London* W. 0.
MESSRS. GRINDLAT A CO., 64, Parliament Street, London, S. W.
MESSRS. KEGAN, PAUL, TRENCH, TROBNER A CO., 68-74, Carter Lane, London, E.G.; Oriental Department, 39, New Oxford Street, London, W.C.
MR. B. QUARITCH, II, Grafton Strei*, New Bond Street, London, W.
MESSRS. W. THACKER A CO., 2, Croid Lane, Ludgato Hill, Lpndon, E.C.
MESSRS. P. S. KING A SON, 2 A 4, Greit Smith Street, Westminster, London, S.W.
MESSRS. EAST AND WKST, LD., 3, Victoria Street, London, S. VV 1.

AGENTS ON THE CONTINENT.

MR. ERNEST LEROUX, Rue Bonaparte, Paris, Franco.
MR. OTTO HARIUSSOWITZ, Leipzig.

Madras.

ME3SR8. G. A. NATESAN A Co., Madras.
MESSRS. HIOQINBOTHAM & Co., Madrns.
MESSRS. S. MURTHY A CO., Madras.
MESSRS. TEMPLE A Co., Madras.
MESSRS. THOMPSON A Co., Madras.
MESSRS. V. KALYANARAMA IYER A Co., Booksellers, etc., Madras.
M. H. KY. E. M. GOPALAXRISIIXA KONE Madura.
MESSRS. VAS A CO., Madura.

Central Provinces.

TnE MANAGER, "HITAVADA," Nngpur.

United Provinces.

MESSRS. A. H. WHEELER A CO., Allahabad.
THE PROPRIETOR OF THE NEWAL KISHORE PRESS, Luck now.
MUNSHI SEETA RAM, Managing Proprietor, Indian Army Book Depdt, Juhi, Onwupore.
MANAGER, IMPERIAL BOOK DEPOT, Delhi.
OXFORD HOOK AND STATIONERY CO., Delhi.

Punjab.

RAI SAHIB M. GULAB SINGH A SONS, Proprietors of the Mufld-i-am Press, Lahore, Punjab.
MESSRS. RAMA KRISHNA A SONS, Anarkalf Street, Lahore.
MESSRS. THACKER, SPINK A Co., Simla.

Burma.

THE SUPERINTENDENT, AMERICAN BAPTIST MISSION PRESS, Rangoon.

Ceylon.

MESSRS. A. M. AND J. FERGUSON, Ceylon.

MR. B. H. BLACKWELL, 50-51, Broad Street, Oxford.
MESSRS. DEIONTON BELL A CO., LD., Trinity Street, Cambridge.
MESSRS. LUZAC A CO., 46, Groat Kussoll Street, London, W.O.
MESSRS. OLIVER AND BO YD, Twieddale Court, Edinburgh.
MESSRS. E. PONSONBY, LD., 116, Graftou Street, Dublin.
MR. T. FISHER UNWIN, LD., 1, Adelphi Terrace, London, W.O.
MESSRS. J. WHBLDON AND WESLEY, LD., 2, 3 and 4, Arthur Street, New Oxford Street, London, W.C. 2.

MB. MAHTINUS NIJHOF, The Hague, Holland.
MESSRS. B. FUIEDLANDER A SOXIN, Berlin.



Sixty-Second
Annual Report of the
Government Cinchona Plantations
and Factory in Bengal

For the Year
1923-24

CALCUTTA:
Bengal Secretariat Book Depot.
1924.

Pr/oe. 7 annas.



Sixty-Second
Annual Report of the
Government Cinchona Plantations
and Factory in Bengal

For the Year
1923-24

CALCUTTA:
Bengal Secretariat Book Depot,
1924.

SIXTY-SECOND ANNUAL REPORT
OF THE
GOVERNMENT CINCHONA PLANTATIONS AND FACTORY
IN BENGAL FOR THE YEAR
1923-24.

1. General.—The year under review has been a normal one so far as plantation and factory work are concerned. No outstanding developments are for record but the Department pursues a steady course of expansion which will require to be intensified as and when the recommendations of the Quinine Conference, held at Delhi in December 1923, are carried into effect.

Weather conditions during the year were not altogether favourable. Mungpoo with 112.18 and Munsong with 87.9 inches rainfall are 10 and 8.5 inches respectively below the averages of past years. There have now been two successive years of drought on Mungpoo through which cinchona has had to struggle but the adverse conditions have been successfully countered by improved methods of cultivation and taking all the blocks together cinchona is looking as well on this plantation as the writer has ever seen it.

More difficult to counter than adverse weather conditions are the attacks of *Helopeltis*. On both plantations this pest is on the increase and indeed the attacks have reached and maintained a severity that renders hand-picking ineffectual. The incidence is worst at lower elevations where certain blocks have their growth completely suspended for several months of the year. Coppicing as a preventative is beneficial in so far as the affected portions are removed entire but the disease quickly reasserts itself when the fresh shoots break. There seems, unfortunately, to be no entirely satisfactory method of dealing with the pest. A season unfavourable to the development of the insect will probably accomplish more than all the counter measures that practice could adopt.

On both plantations methods of planting not hitherto adopted on any large scale are under experiment. All extensions on Mungpoo have gone out on narrow contour terraces along with the Soy bean and a species of *Tepkrbsia* as green manures and light shade, a departure in method which makes possible the cultivation of cinchona on slopes that would otherwise remain unutilised on account of dangers of excessive wash.

A somewhat different method but with the same underlying idea has been followed on Munsong. Here retaining walls on the contour system have been constructed at intervals of 25 to 50 yards according to the slope and at longer intervals parallel strips of secondary jungle consisting mainly of stout, deep-rooted grasses have been left uncleared, shallow drains leading at every gradients to the main jhoras complete the arrangement. For both methods the extra expense in the preparation of the land for planting is negligible while the results so far as these can at this stage be predicted are markedly superior to those on control areas. Much of the Munsong extension is on land that has already borne one cinchona crop. The secondary jungle was cut down early in the season when, instead of burning as has hitherto been the practice, it was allowed to rot and afterwards dug in. This practice is, of course, merely a repetition of what is done yearly during cultivation but is new so far as the preparation of land for taking cinchona is, concerned and has been rendered possible by the nature of the jungle coming up after the first crop.

Areas not carrying a full complement' of trees at coppicing time are being filled up. For this purpose two-year old plants are being tried as seedlings fail to compete with the rapid coppice growth.

Plantation bark sufficient to meet current provincial requirements of quinine only has been put through the factory, the balance required to keep the factory working being from imperial stocks of Java origin. As the bark agreement does not terminate till 1928 and as considerable quantities of foreign bark are due for delivery only the minimum of local barks is being cropped. The present limitation to the use of plantation barks is the capacity of the factory which some ten years ago could turn out 55,000 lbs. annually but which now requires overtime working for 50,000 lbs. and this only if sufficient power is available. The present year has been particularly deficient in water supplies for the turbines in spite of the fact that additional water was available from the partially constructed nullah referred to in last year's report. The factory ran for 250 days throughout the year, a limit set by the power supply as well as by the budget allotment which was insufficient for longer working. As power is mostly consumed in the grinding house arrangement* have been made to lay in a stock of ground bark during the rains when running can be continuous to be used during the dry season when power fails for processes other than extraction. By this means and by the additional power expected from the nullah when completed factory work throughout the year should again become possible.

Although the quinine agreement has terminated bringing outside supplies apart from those in bark form, to an end, stocks of the drug continue to mount up. The condition of affairs leading to this result was the subject of a protracted examination by the Government of

India during December 1923 when the whole quinine position was reviewed and discussed. The Committee appointed to advise Government reached certain conclusions lately to have a far-reaching effect on the future of the Department as well as on the health of the peoples for whom the Department exists. Its findings embodied the view that while stocks were increasing they had not yet reached proportions that would allow of an intensive anti-malarial campaign being initiated and continued. The quinine used in India under present economic conditions is but a fraction of what could be usefully and remuneratively employed and public health officers hold the view that "it would be unfair to promote the creation of a demand that even the very large stocks now in hand and supplies in sight could not continue to satisfy.

The general quinine position remains much as it was at this time last year. Reports of a world shortage of the drug appearing in the Press from time to time fail to distinguish between an actual shortage of the commodity and a shortage in purchasing power. While world stocks are, possibly, not ample for a demand that might exist under more stable and favourable world conditions of trade generally they are and have been throughout the year more than sufficient to meet all the demand the world could afford to put forward for them.

The view shared by the writer is that quinine is at a price when buyers limit their requirements to the minimum and when many people simply do without it. Prices are still largely under the control of the quinine ring. Agreement succeeds agreement to regulate supply and restrict production. The hoped-for fall in price has not materialised nor can any substantial fall be looked for in the absence of outside factors capable of affecting control.

2. Extensions, Acreages and Crops.—(a) *Mungpoo.*—The rainfall for the year was again below the average, being 112.18 inches only. The deficiency was most pronounced from October to March when 2.68 inches only were recorded. A series of somewhat violent windstorms in March uprooted many trees on exposed hill sides and was responsible for destruction to coolie houses but damage from such causes is of small consequence compared with the loss that goes on yearly through insect and fungus pests. Extensions comprised 50 acres *Cinchona Ledgeriana* on Labdah, 65 acres *C. succirubra* on Mungpoo and 35 acres *Ledger x succirubra* on Sittong divisions. Harvests were obtained by cutting out 93.5 acres of *C. Ledgeriana*, 9.8 acres of *C. succirubra* and 9.8 acres of *C. Hybrid* barks, the total of 113.1 acres giving 180,151 lbs. *C. Ledgeriana*, 26,140 lbs. *C. succirubra* and 9,075 lbs. *C. Hybrid*, or 215,366 lbs. in all. The average ages of the Ledger, succirubra and hybrid barks were 7.04, 11.2 and 8.3 years and the average annual bark increments per acre of the acreages 273, 237.2 and 111.6 lbs. respectively. The average age of all the acreages cut out is 7.5 years

and the average annual bark increment per acre calculated on these acreages is 253.3 lbs. The yield per acre over the period is therefore 1,900 lbs. This yield is, not a true index of what the plantation reaches. The figure is vitiated by the fact that in past years one large block now finally uprooted was not written down fast enough with the result that the area appearing on the books was much above the area actually in existence.

Apart from sections of the Silake block where a southern exposure, poor soil and the ravages of *Helopeltis* combine to produce an effect fortunately rare on the plantation all blocks look well. Cinchona is seen at its best on Eungbee where an area recently put out is likely to prove of very special interest. The young plants here, the progeny of a single high trade tree, appear to be all of a type, a result very unusual even when great care is taken in the selection and crossing of the parent plants. If as there is some cause for hoping, these plants prove uniformly high in quinine content the result may be one of far-reaching importance to the plantations. The reputed high grade seed bought from Java some years ago is not proving up to its guaranteed standard. Indeed plants grown from this seed are no better than a type of plant common here now. At the end of the year there were 936.6 acres with a full complement of cinchona on Mungpoo Plantation. Details are available in Appendix A(1).

(b) *Munsong*.—Rainfall was 87.9 inches being 8.5 inches below the average of the past 23 years. From November to March 1.20 inch only was recorded. No excessive fall occurred, the highest being 3.57 inches, but with the rainfall in such pronounced defect the plantation had to suffer.

Another hailstorm, the severest ever experienced on the plantation, occurred towards the end of the year. Fortunately the damage was confined to a single strip running from the bottom of Munsong Division to above Kashyem bungalow. The violence of the storm is indicated by holes in the leaves of a large Agave plant near Munsong, measurement showing that the stones had gone through a 1/2 inch of tough plant tissue. In the narrow track of the storm cinchona suffered badly. All divisions are looking as well as they have done in past years. Extensions have been resumed and these in particular are looking fresh and promising. As far as can be managed slopes with a northern exposure are being selected, the deleterious effect on cinchona of a southern exposure being pronounced on this plantation. The blocks were given as much cultivation as was possible with the labour available. The scattered nature of much of the cinchona on Munsong makes it difficult to get in the requisite number of sicklings during the rains, for the plants spaced as they are give little assistance in keeping down weeds. Contract labour was short resulting in a saving in the budget allotment.

Extensions were 100 acres *C. Ledgeriana* oji Kashyem and 40 acres, also *Ledger*, on Sangser. Harvests were obtained by cutting out 125.7 acres of *C. Ledgeriana*, 1 acre *C. succirubra*, 10.1 acres *C. officinalis*, 9.9 acres *C. Hybrid II* and .9 acre *C. Hybrid III*, the total of 147.6 acres giving 378,089 lbs. *C. Ledgeriana*, 3,742 lbs. *C. succirubra*, 19,614 lbs. *C. officinalis*, 33,316 lbs. *C. Hybrid II* and 1,329 lbs. *C. Hybrid III*, or 436,086 lbs. in all. The average ages of the barks in the above order were 7.5, 9.8, 9.74, 8.28 and 5.22 years^f and the average annual bark increments per acre of the acreages 400, 381.8, 200, 406.3 and 282.7 lbs. respectively. The average age of the total acreage cut out is 7.72 years and the average annual bark increment calculated on these acreages is 382.4 lbs. At the end of the year there were 2,118.4 acres with a full complement of cinchona on Munsong Plantation. Details are available in Appendix A(1).

(c) *Plantations as a whole*.—The total area under cinchona is 3,055 acres. Details of the species, the acreages going to be made up this total and their ages are available in Appendix A(2). In all cases the acreages are calculated as carrying their full complement of cinchona trees.

3. **Factory WWk.**—Besides 430,604 lbs. of Java bark for the Government of India 154,297 lbs. of Mungpoo bark (143,022 *Ledger*, 2,843 *succirubra* and 8,432 hybrid) and 307,002 lbs. Munsong bark (271,498 *Ledger*, 5,331 *succirubra* 15,814 *officinalis* and 14,359 hybrid) were worked up to produce about 19,207[^] lbs. quinine sulphate, 530^J lbs. other quinine salts 4[|] lbs. quinidine salts, 181 lbs. quinoidine, and 7,859[^] lbs. cinchona febrifuge—a total of 27,782 lbs. provincial alkaloids. Exact amounts are available in Appendix C(1). The Java bark produced 24,056^j lbs. quinine sulphate and 4,983 lbs. cinchona febrifuge. The total production of quinine sulphate, both provincial and imperial, was 43,264 lbs., and the total products from all sources 56,822[|] lbs. The amount of quinine sulphate proved by analysis to be present in the bark, was 47,535 lbs.

4. **Cost and value of plantation bark.**—The average cost per lb. of all Mungpoo barks taken over a series of year is 3.6 annas and of Munsong barks 2.7 annas. The cost of the 215,366 lbs. Mungpoo bark harvest is, therefore, Rs. 54,707 and of the Munsong 436,086 lbs. harvest Rs. 73,589. The unit rate for bark being 1.5 annas The average Mungpoo bark quinine percentage of 4.4, gives the harvest from this plantation a value of Rs. 88,839 or Rs. 34,132 more than it cost. On a basis of an average quinine percentage of 4.39 and the same unit rate the Munsong harvest valuation is Rs. 1,78,863 or Rs. 1,05,274 more than it cost. The year's expenditure for both plantations including their share of general charges is Rs. 2,09,697 while harvests costing Rs. 1,28,296 and valued at Rs. 2,67,702 are the year's return for past expenditure.

5. Cost and value of quinine produced.—(a) *Cost in the bark.*—The 19,207 lbs. of quinine extracted were contained in 461,299 lbs. of mixed Mungpoo and Munsong barks, which cost (154,297 lbs. at 3-6 annas and 307,002 lbs. at 2-7 annas per lb.) Its. 86,513. The cost per lb. of quinine in the bark was, therefore, Its. 4*5.

(b) *Cost of extraction, packing and delivery to railway.*—This is calculated on the total extraction of quinine both provincial and imperial. The total direct expenditure on the factory was Its. 1,21,973-9, general charges debitable to factory account Its. 3,984-2, factory depreciation charges Its. 5,183, stores (oil, chemicals, etc.) depreciation charges Its. 5,855-5-6, the gross factory expenditure being, therefore, Es. 1,36,996-0-6. From this has to be deducted expenditure on products both imperial and provincial other than quinine sulphate Its. 27,647-7-5 leaving Its. 1,09,348-9-1 net expended on the production of 43,264 lbs. provincial and imperial quinine sulphate. The cost of extraction, packing, etc, is, therefore, Its. 2-527 per lb., a figure slightly below that of last year.

(c) *Total cost per lb. and value.*—This is made up of the cost in the bark—Its. 4*5 and the cost of extraction, etc., Its. 2*527, a total of Es. 7-027. The present wholesale rate being Es. 26 per lb., the 19,207 lbs. provincial quinine manufactured are worth Es. 4,99,395 but cost only Es. 1,34,971.

6. Sales and selling rates.—A statement of the sales of factory products for 1923-24 is available in Appendix G. Sales of quinine sulphate have increased some 4,690 lbs. As an examination of distribution showed that the areas of supply allotted to the Governments of Bengal, Madras and India were not being strictly adhered to orders were issued to all Departments to regulate distribution in such a way as to prevent any district getting its supplies from other than the proper source. The amount of cinchona febrifuge sold was 12,478 lbs. of which 2,000 lbs., the cost of which was not borne by the Bengal Cinchona Department, were received from the Madras Cinchona Department and 2,621 lbs. belonged to the Government of India. Credit in these accounts is, therefore, taken for the proceeds from the sale of 7,856 lbs. provincial febrifuge only. The excess credit lying with Bengal will be adjusted hereafter in transfer account.

Selling rates were as follows: Quinine sulphate Es. 27 to Es. 29. Other quinine salts Es. 35 to Es. 40. Cinchonine and Cinchonidine salts Es. 12 to Es., 13. Quinoidine Es. 6 to Es. 8 and Cinchona febrifuge Es. 8 to Es. 10. All these rates are based on and are liable to fluctuate with market rates.

Eupees 4,36,945-14-3 were obtained from the sale of 13,348 lbs. Quinine sulphate converted to tablets in the Juvenile Jail but of this sum half only is taken as credited to the; Cinchona Department. Details of the monthly receipts from this source are available in Appendix H.

7. Expenditure and receipts.—The total expenditure on the department detailed in Appendix D was Us. 3,35,655-4-3. The total receipts including Rs. 550-15 received direct were Rs. 7,92,480-9-3, of which Rs. 1,39,684-7 were credit and Rs. 6,52,724-2-3 cash. These receipts include the Jail share amounting to Rs. 2,18,472-15 of proceeds from the sale of quinine tablets, but do not include proceeds from the sale of Cinchona febrifuge belonging to the Government of India. The net receipts properly creditable to the Cinchona Department are therefore Rs. 5,73,935-10-3, but sums of Rs. 60,790-12 and Rs. 9,966 are still due from the Government of India to cover the cost of extracting 24,056½ lbs. Quinine sulphate at Rs. 2-527 per lb. and 4,983 lbs. Cinchona febrifuge at Rs. 2 per lb. Reference to the profit and loss valuation account will show that a further sum of Rs. 45,220-6, all good debt, was outstanding at the end of the year.

8. Quinine reserve and stock account.—Full details of* stocks in hand are available from Appendices C(1) and C(2). The provincial reserve of quinine is some 3,886 lbs. lower at the end of the year due to an increase in the consumption as compared with last year, and now stands at 27,799 lbs. 10½ oz. Stocks of other products are, however, slightly up on the years working-. The 7,859½ lbs. provincial Cinchona febrifuge manufactured have been sold leaving all stocks of this product in hand at the end of the year both at the factory and jail the property of the Government of India.

The stock of plantation bark at the end of the year was 355,081 lbs. against 168,928 lbs. carried over from last year. This is a very large increase due to the amount of Java bark arriving and requiring to be worked up. Harvests from the plantations are being restricted by the removal of thinnings and casualty trees only and with half the Java bark now going to Madras, bark on balance at the end of the year should gradually become less. While the oil account shows a slight increase in the new carry over chemicals and stores are some Rs. 7,307 down on the year's working. The total value of stock carried over is Rs. 6,97,584-3-9 against an opening balance of Rs. 7,19,373-12-6.

As regards valuation rates the figures employed last year have again been utilised, Quinine sulphate, the main item, is carried at Rs. 20 per lb. a figure considerably below its present market value. It would conform more closely with commercial methods to value stocks at cost or market rate whichever is less but pending decision on the question of commercialising the accounts the old system of valuation has been retained.

9. Block account.—Excluding the value of extensions which for purposes of the block account are taken at cost price, the increase in value of Cinchona trees at the end of the year is Rs. 3,75,837,

Each block of Cinchona has been valued separately on the basis of the analytical figure for its bark sample and a unit rate of 1-5 annas. The method of valuation is not as reliable as could be wished but it is difficult to devise a system that gives approximation to the results known only when the blocks are finally uprooted. The annual bark increment figures hitherto taken for Munsong will probably have to be reduced. In the writer's opinion the system leads to overvaluation of this plantation. Cinchona trees are valued at Rs. 2,325,233; fuel and timber trees at Rs. 2,81,063. See Appendix F for further information.

10. **Profit and loss valuation.**—The valuation profit balance of Rs. 7,30,386-15-3 may be considered a very satisfactory result of the year's working. It should be noted that outstandings in this account include a sum of Rs. 70,756-12* due from the Government of India for work done. The exchange account between the two Governments results in a net debit of Rs. 49,465-12* only against the Central Government but this account credits the local Government with proceeds from the sale of Cinchona febrifuge belong to India which the sales shown in Appendix E do not include.

11. **Land rent.**—From Mungpoo the sum of Rs. 5,266-8-9 was collected during the year and paid into the Darjeeling treasury. From Munsong Rs. 1,322-4-6, representing fees collected from cattle grazing within the cinchona boundary, were paid into the Kalimpong sub-treasury for credit to the Forest Department. No credit is taken for these sums in the accounts of the Cinchona Department.

12. **Staff.**—Lieut.-Colonel A. T. Gage, C.I.E., I.M.S., was on leave throughout the year during which time the writer officiated as Superintendent. Mr. G. E. Shaw, was Government Quinologist and Mr. S. C. Sen Assistant Quinologist throughout the year. Mr. H. Thomas was Manager, Messrs. Fothergill and Richards, Assistant Managers, Cinchona Plantation Munsong, throughout the year. Mr. Fothergill was on leave for one month from 14th January 1924, when Mr. J. Hulbert, Overseer, officiated in his place.

Mr. P. V. Osborne was Manager, Mr. P. W. Cresswell, Assistant Manager and Messrs. Holl and Harkaman Lama were Overseers, Cinchona Plantation, Mungpoo, throughout the year. The Head Clerk, Babu S. K. Mitra, was on leave from 2nd January 1924 till the end of the year during which time Babu A. T. Banerjee, 7th Clerk, officiated in his place. All officers of the plantations and factory and the clerical establishment have performed their duties satisfactorily.

13. **Medicinal plants other than cinchona.**—About 47,500 *Ipecacuanha* plants were raised from seed for planting in a new nursery

* Exclusive of pensionary charges.

500 feet or so higher than the old beds. During the cold season temperatures in the valley, where the old beds were situated, are believed to go lower than they do higher up. The change in site is an attempt to avoid the evil effects on *Ipecacuanha* of excessive daily fluctuations of temperature. Stocks of the plant are looking well. Already about 3 lbs. of Emetine hydrochloride have been extracted.

The cultivation of *Digitalis* is being continued but the limited demand makes it questionable whether it is worth while to go on with this crop.

C. C. CALDER,

Offg. Superintendent,

Royal Botanic Garden, Calcutta,

and of Cinchona Cultivation in Bengal.

APPENDIX A(2).

Abstract of acreage with full complement of cinchona in the Government Cinchona Plantations, DarjKling district, on the 31st March 1924.

Species.	Number of acres bearing trees of—				Total acreage.
	0—5 years old.	6—10 years old.	11—15 years old.	16 years old and over.	
1	2	3	4	5	6
Cinchona Ledgoriana ..	1,465.4	814.6	76.7	..	2,356.7
„ officinalis ..	..	78.8	29.6	..	108.4
„ succirubra ..	80	20.2	1.5	39.8	141.5
„ (ledger x officinalis)	107.9	..	..	..	107.9
„ (ledger x succirubra)	156.7	130.9	20.4	2.5	340.5
Total ..	1,840	1,044.5	128.2	42.3	3,055

APPENDIX B.

Receipts for 1923-24.

Transactions of the year.	Sales to Government Offices and institutions.		Sales to the public for cash payment.		Total.
	Cash sales.	Book credit.	In tablets.	In tins in powder form to Native, Statts. Municipal and Local Funds, Dispensaries, Missionary bodies and others.	
1	2	3	4	5	6
	Rs. A.	Rs. A.	Rs. A.	Rs. A.	Rs. A.
Quinine sulphate	1,07,615 12	1,24,122 4	2,18,472 15*	35,844 0	4,86,054 15
Other quinine salts	225 9	14,960 0	..	115 10	15,301 3
Cinchona febrifuge	..	..	..	..	69,197 4
Cinchonidine salts	*51 0	17 p	..	..	68 0
Cinchonine salts	7 9	13/0	..	44 12	65 5
Quinidine salts ..	..	Stf 0	..	..	91 0
Quinoidine ..	149 0	80 0	..	378 0	607 0
Bark ..	25 0	..	..	1,975 0	2,000 0
Miscellaneous ..	149 12	401 3	..	..	550 15
Total ..	1,08,223 10	139,684 7	2,18,472 15	38,357 6	5,73,935 10

* This sum is half of Rs. 4,36,945-14-3 being value of 13,348 11* of quinine sulphate sold in form of treatments. The remaining sum of Rs. 2,18,472-15-0 is credited to the Prison Department.

APPENDIX C(1).

Stock Account, 1923-24.

	Quinine sulphate.			Other quinine salts.		
	Quantity.	Rate per lb.	Value.	Quantity.	Rate per lb.	Value
1	2	3	4	5	6	7
	lbs. oz.	Rs.	Rs. A.	lbs. oz.	Rs.	Rs. A.
Balance on 1st April 1923	31,685 9	20	0,33,711 4	102 i	25	2,550 12
Purchased .. ..	..	..	..	..	..	..
Harvested .. ..	..	..	..	..	..	..
Used in factor}-	..	..	..	..	..	..
Manufactured ..	19,207 6J	7.027	1,34,070 7	530 I\	10	5,304 11
Issued or sold ..	23,093 5	..	4,86,054 15	394 8	..	15,301 3
Balance on 31st March	27,799 10i	..	5,55,993 2	238	..	5,950 0

	Quinidino sulphate.			Cinchonine salts.		
	Quantity.	Rate per lb.	Value.	Quantity.	Rate per lb.	Value
1	2	3	4	5	6	7
	lbs. oz.	Rs.	Rs. A.	lbs. oz.	Rs.	Rs. A.
Balance on 1st April 1923.	6 111	20	134 6	20 15 J	10	209 11
Purchased .. ..	..	..	..	..	..	..
Harvested .. ..	..	..	..	..	..	..
Used in factory ..	..	..	..	..	..	..
Manufactured ..	4 8*	10	45 5	..	..	..
Issued or sold ..	2 0	..	91 0	4 13	..	65 5
Balance on 31st March	9 4	20	185 0	16 2£	10	161 9

	Cinchonidine salts.			Quinoidine.		
	Quantity.	Rate per lb.	Value.	Quantity.	Rate per lb.	Value.
1	2	3	4	5	6	7
	lbs. oz.	Rs.	Rs. A.	lbs. oz.	Rs.	Rs. A.
Balance on 1st April 1923	4 0	15	60 0	74 0	2	148 0
Purchased .. ..	..	..	..	..	..	..
Harvested .. ..	..	..	m#	..	..	..
Used in factory .. ..	..	..	#.	..	.. >	..
Manufactured .. ..	..	..	..	181 0	3	543 0
Issued or sold	4	..	68 0	89 0	..	607 0
Balance on 31st March 1924	nil	..	..	166 0	2	332 0

	Cinchona Febrifuge.			Cinchona Bark.		
	Quantity. ³	Rate per lb.	Value.	Quantity.	Rate per lb.	Value.
1	2	3	4	5	6	7
	lbs. oz.	Rs.	Rs. A.	lbs.	Annas.	Rs. A.
Balance on 1st April 1923 .. ..	..	..	..	168,928	5	52,790 3
Purchased .. ..	..	..	..	..	..	..
Harvested .. ..	..	..	..	651,452.	..	1,80,661 0
Used in factory .. ..	..	..	..	461,299	..	86,522 0
Manufactured	7,859 8	2	15,719 0	..	..	..
Issued or sold	7,859 8	..	67,197 4	4,000	8	2,000 0
Balance on 31st March 1924 .. ..	..	..	..	355,081	5	1,10,962 0

	Oil.			Chemicals and stores.	Grand Total.
	Quantity.	Rate per gallon.	Value.	Value.	Value.
1	2	3	4	5	6
	Gallons	Rs.	Rs. A. p.	Rs. A. p.	Rs. A. p.
Balance on 1st April 1923.	10,364	Various	9,804 5 6	19,905 3 0	7,19,373 12 6
Purchased ..	21,095	..	18,239 10 3	49,372 7 0	07,012 1 3
Harvested .. ..	..	..	....	....	1,80,001 0 0
Used in factory ..	18,572	..	10,701 7 9	56,765 15 0	1,59,989 0 9
Manufactured ..	..	..	....	....	1,34,970 7 0
Issued or sold ..	..	..	....	....	5,71,384 11 3
Balance on 31st March 1924.	13,487	..	11,342 8 0	12,658 0 9	0,97,584 3 9

APPENDIX C(2).

Detailed Stock Account of bark; fjr 1923-24.

	Cinchona Lodgeriana.			Cinchona officinalis.		
	Quantity.	Rate per lb.	Value.	Quantity.	Rate per lb.	Value.
1	2	3	4	5	6	7
	lbs.	Annas	Rs. A.	lbs.	Annas.	Rs. A.
Balance on 1st April 1923 ..	150,914	5	49,035 13	3,105	5	989 1
Harvested ..	558,240	•Various	1,04,335 0	19,610	2-7	3,309 0
Used in factory ..	414,520	..	77,995 0	15,814	2-7	2,668 0
Sold .. ..	..	..	..	..	..	..
Balance on 31st March 1924 ..	3,000	5	93,948 0	0,901	5	2,175 0

• 36 annas for Mungpoj bark and 27 annas for Mungsong bark.

				Cinchona succirubra.		
				Quantity.	Rate per lb.	Value.
1				2	3	4
				lbs.	Annas.	Rs. A
Balance on 1st April 1923	..	..	..	8,849	5	2,765 5
Harvested	..	..	..	29,882	Various*	65,129 0
Used in factory	..	..	..	8,174	•*	1,539 0
Sold	..	..	..	4,000	8	2,000 0
Balance on 31st March 1924	..	..	..	26,557	5	8,299 0

	Cinchona (Ledger x succirubra).			Cinchona (Ledger x officinalis).		
	Quantity	Rate per lb.	Value.	Quantity.	Rate per lb.	Value.
1	2	3	4	5	6	7
	lbs.	Annas	Rs.	lbs.	Annas	Rs.
Balance on 1st April 1923.	nil	..	..	nil	..	..
Harvested	42,391	* Various	7,664	1,329	2-7	224
Used in factory	21,462		4,096	1,329	2-7	224
Sold	..	..	..	..	..	..
Balance on 31st March 1924.	20,929	5	6,540	..	..	..

• 30 annas per lb. for Mungpoo and 27 annas for Munsong bark.

APPENDIX D.

r Expenditure for 1923-24.

I.—PLANTATIONS ACCOUNT.

A.—MUNGPOO PLANTATION.

Salaries.

	Rs.	A.	P.
1. Manager and Assistant Manager	8,848	0	3
2. Overseers	2,570	0	0
3. Duty allowance	1,200	0	0
4. Exchange compensation allowance .. .. .	....	

Establishment.

5. Sub-Overseer	1,420	0	0
6. Sub-Assistant Surgeon	1,856	1	0
7. Artificers	300	0	0
8. Sirdars and coolie	54,273	8	6

Allowances.

9. Travelling allowance	46	7	0
10. Pony allowances	1,038	0	0
11. Compensation for dearness of provisions .. .. .	....	

Contingencies.

12. Purchase and keep of ponies and bullocks	2,160	0	0
13. Purchase of manure .. .. .	....	
14. Purchase of seeds .. .. .	....	
15. Carriage charges	8	1	3
16. European stores	755	8	0
17. Freight	62	2	0
18. Buildings	911	10	0
19. Machinery and plant .. .. .	....	
20. Miscellaneous	4	086	0 3
21. Servants' clothing .. .. .	....	
22. Labour of malis	2	280	0 0

Total Mungpoo charges	81,948	8	0
-------------------------------	--------	---	---

B.—MUNSONQ PLANTATION.

Salaries.

	Rs.	A.	P.
1. Manager and Assistant Managers	16,612	11	0
2. Overseers	2,122	5	0
3. Duty allowance	1,600	0	0
4. Exchange compensation allowance .. .. .	....	

IX

Establishment.

						Rs.	A.	P.
5. Clerks	••	••	••	••	••	••••		
6. Sub-Assistant Surgeon	..	..	..	..	..	2,660	3	6
7. Artificers	..	..	..	..	..	••••
8. Sirdars and coolies	..	..	..	..	..	82,276	15	3

Allowances.

9. Travelling allowance	..	..	..	..	..	74	2	0
10. Pony allowances	..	A	..	..	..	1,440	0	0
11. Compensation for dearness of provisions				..	•	•••		

Contingencies.

12. Purchase and keep of ponies and bullocks	..	..	..	..	..	2,160	0	0
13. Purchase of manure	..	..	..	..	..	••••
14. Purchase of seed	..	..	..	..	..	•••••
15. Carriage charges	..	..	..	..	..	5,608	11	6
16. European stores	..	..	..	..	..	1,688	2	0
17. Freight	..	..	..	..	..	101	2	0
18. Buildings	..	..	..	..	..	1,999	14	0
19. Machinery and plant	..	..	..	..	..	••••
20. Miscellaneous	..	..	..	..	..	2,771	15	0
21. Afforestation charges	..	..	..	..	..	••••
22. Servant*?' clothing	..	..	..	..	..	••••
Total Munsong charges	..				..	1,21,116	1	3
Total for <i>both</i> plantations	..				..	2,03,064	9	3

II. -FACTORY ACCOUNT.

Salaries.

						Rs.	A.	p.
1. Quinologist	..	..	..	..	••	21,496	7	0
2. Assistant Quinologist	..	..	..	•	•	6,354	11	3
3. Manufacturing Chemist	..	..	••	••	••	••••

Establishment.

4. Clerks	..	..	..	..	..	815	0	p
5. Servants	..	..	..	..	..	••••
6. Artificers	..	..	..	..	..	••••
7. Sirdars and coolies	..	..	..	..	..	8,745	3	0

Allowances.

8. Travelling allowance	..	..	..	..	..	30	0	0
9. Compensation for dearness of provisions	..	..	..	..	..	••••

Contingencies.

						-K8. A. P.
10.	Purchase of machinery	..	..	..	..
11.	Buildings	..	..	..	..	3,497 15 0
12.	European stores	..	..	..	..	27,966 4 0
13.	Freight	..	..	..	..	4,220 13 0
14.	Chemicals	..	..	..	..	26,944 9 0
15.	Fuel (carriage and cutting up only)	..	..	..	..	10,063 12 0
16.	Purchase of bark (carriage only)	..	..	..	..	3,813 9 3
17.	Purchase of cinchona febrifuge	..	..	..	..	....
18.	Packing materials	..	..	..	..	2,527 15 0
19.	Distribution charges	..	..	..	..	337 5 0
20.	Miscellaneous	..	..	..	..	5,160 1 \$
21.	Servants' clothing	..	..	..	..	....
Total Factory charges						1,21,973 9 0

III.—GENERAL.

Salaries.

						Rs. A. P.
i	Q	,				
1.	Superintendent	..	..	..	..	2,400 0 0

Establishment.

2.	Clerks	..				
3.	Servants	..	"	"	"	5,776 7 0
						236 11 0

Allowances.

4.	Travelling allowances	..	..		..	....
5.	Compensation for dearness of provisions				..	....

Contingencies.

6.	Miscellaneous	..	..	..	..
7.	Postage and telegrams	..	..	..	..	390* 0 0
8.	Advertising charges	..	..	..	..	....
9.	Subscriptions to newspapers and periodicals	..	..	..	..	....
10.	Purchase and repair of furniture	..	..	..	..	....
11.	Road and Public Works Cess	..	..	..	..	1,814* 0 0
Total General charges						10,617 2 0

IV.—ABSTRACT.

						Rs. A. P.
Total	Mungpoo charges	..	..	..	mm	81 948 8 0
..	Munsong	..	..	..	!!	1^1'11B 1 *
..	Factory	..	..	..	..	1,21,973 9 0
..	General	..	..	..	..	10,617 2 0
GRAND TOTAL EXPENDITURE						3.35,055 4 3

APPENDIX E.

Profit and Loss Valuation, 1923-24.

---	Amount.			---	Amount.		
1	2			3	4		
	Rs.	A.	p.		Rs.	A.	p.
To -				By—			
Stock on 1st April 1923	7,19,373	12	6	Arrears recovered ..	4,171	3	0
Outstanding on 1st April 1923 ..	1,171	3	0	Salos during the year	5,73,935	10	3
Expenditure (less Rs. 29,000 capital expenditure) ..	3,06,655	4	3	Outstandings on 31st March 1924 ..	1,15,977	2	0
Depreciation on buildings ..	3,199	0	0	Stock on 31st March 1924 ..	6,97,584	3	9
Depreciation on machinery ..	3,719	0	0	Gain in revaluation of Cinchona trees ..	3,75,837	0	0
Balance (profit) ..	7,30,386	15	3	Timber trees ..	.....	
Total ..	17,67,505	3	0	Total ..	17,67,505	3	0

* Till* includes outstandings of Its. 70,756-12 against the Government of India.

APPENDIX F.

Block Account, 1923-24.

I.—MUNGPOO PLANTATION.

---	Amount.			---	Amount.		
1	2			3	4		
	Rs.	A.	p.		Rs.	A.	p.
To—				By -			
Value of buildings on 1st April 1923 ..	27,272	0	0	Depreciation on buildings at 2j per cent.	737	0	0
Machinery (Sirocco driers) ..	921	0	0	Value of buildings on 31st March 1924 ..	26,535	0	0
Value of plantation on 1st April 1923—				Depreciation on machinery at 5 per cent.	54	0	0
Cinchona trees ..	3,70,123	0	0	Value of machinery on 31st March 1924 ..	867	0	0
Timber trees ..	2,72,033	0	0	Value of plantation on 31st March 1924—			
Value of extensions at cost made in 1923-24—				Cinchona trees ..	3,92,616	0	0
Cinchona trees ..	15,000	0	0	Timber trees ..	2,72,733	0	0
Timber trees ..	700	0	0				
Gain on revaluation of plantations at end of 1923-24 (extensions for the year excluded)—							
Cinchona trees ..	7,493	0	0				
Timber trees ..	.....					
Total ..	6,93,542	0	0	Total ..	6,93,542	0	0

II,r-MUNSONG PLANTATION.

	Amount.		Amount.
1	«2	3	4
	Rs. A. p.		Rs. A. p.
To—		By—	
Value of buildings on 1st April 1923 ..	34,942 0 0	Depreciation on buildings at 2½ per cent.	944 0 0
Value of plantation on 1st April 1923—		»	
Cinchona trees ..	15,50,973 0 0	Value of buildings on 31st March 1924 ..	33,998 0 0
Timber trees ..	8,330 0 0		
Value of - extension at cost made in 1923-24—		Value of plantation on 31st March 1924—	
Cinchona trees ..	13,300 0 0	Cinchona ..	19,32,617 0 0
Timber trees ..	.....	Timber trees ..	8,330 0 0
Gain on revaluation of plantations at end of 1923-24 (extensions for the year excluded)—			
Cinchona trees ..	3,08,344 0 0		
Total ..	1,975,889 0 0	Total ..	1,975,889 0 0

III.—FACTORY.

	Amount.		Amount.
1	2	3	4
	Rs. A. p.		Rs. A. p.
To—		By—	
Value of buildings on 1st April 1923 ..	56,199 0 0	Depreciation on buildings at 2½ per cent.	1,518 0 0
Value of machinery on 1st April 1923 ..	62,321 0 0	Value of buildings on 31st March 1924 ..	54,681 0 0
		Depreciation on machinery at 5 per cent.	3,665 0 0
		Value of machinery on 31st March 1924 * ..	58,656 0 0
Total ..	1,18,520 0 0	Total ..	1,18,520 0 0

• Value of cinchona trees Rs. 23,25,233, timber trees Rs. 2,81,063, of buildings Rs. 1,15,214, Of machinery Rs. 59,523, total value Rs. 27,81,033.

APPENDIX Q.

Statement of sales of factory products during the official year 1923-24.

Particulars.	Quinine salts.	Cinchonine and cinchonidine salts.	Cinchona febrifuge.	Quinine salts and quinoidine.	Cinchona bark.	Total.
	lbs. oz.	lbs. oz.	lbs. oz.	lbs.	lbs.	lbs. oz.
<i>Assam.</i>						
Jails	So -	-	/S -	-	-	
Dispensaries <i>& Hospitals</i>	t/Lo 13		613 tx	7		
Missionary bodies						
Others						
<i>Bengal.</i>						
Jails						
Medical Store Depot						
Dispensaries <i>& Hospitals</i>						
Missionary <i>Do'drosvi</i>						
Others						
<i>Bihar and Orissa</i>						
Jails						
Dispensaries <i>& Hospitals</i>						
Missionary bodies						
Others						
<i>Punjab.</i>						
Jails						
Dispensaries <i>& Hospitals</i>						
Missionary bodies						
Others						
<i>Other Provinces and States.</i>						
Jails						
Dispensaries <i>& Hospitals</i>						
Missionary bodies						
Others						

'APPENDIX H.

Sale of sulphate of quinine in " treatment " tablets during 1923-14.

Consecutive No.	Months.	Total proceeds from sale of tablets.	Credited to Cinchona Department at half rate.
1	2	3	4
	1923	Rs. A. P.	Rs. A. P.
1	April	18,312 0 0	
2	May	30,907 13 0	9,156 0 0
3	June	34,651 8 3	15,463 14 6
4	July	46,529 13 0	17,325 12 1
5	Augivst	37,901 10 3	23,264 14 6
6	Septernbor	52,360 14 0	18,950 13 1
7	October	38,958 8 3	26,180 7 0
8	Novomber	*0,336 8 9	19,479 4 1
9	December	38,030 5 6	25,168 4 4
			19,015 2 9
	1924		
10	January	51,375 2 3	
11	February	21,649 11 0	25,687 9 1
12	March	15,932 0 0	10,824 13 6
			7,966 0 0
	Total ..	4,36,945 14 3	2,18,472 14 11

* Supplied by the Accouatant-General, BoDgal.

GOVERNMENT OF BENGAL.

REVENUE DEPARTMENT.

Cinchona.

CALCUTTA, THE 21ST NOVEMBER 1924.

RESOLUTION-No. 9275Cin.

READ—

The Sixty-Second Annual Report of the Government Cinchona Plantations and Factory in Bengal for the year 1923-24.

READ ALSO—

The Report of the previous year.

The Sixty-Second Annual Report of the Government Cinchona Plantations and Factory in Bengal, written by the officiating Superintendent Mr. Calder, is an interesting and satisfactory record of the work done during the year 1923-24.

The policy of the Government of Bengal is to maintain and, if possible, extend the Cinchona Plantations and at the same time to improve and develop the factory, in order to meet the requirements of the province. The extension of the plantations is limited by the fact that cinchona is a plant that requires a certain combination of soil, rainfall and elevation, and will not grow unless these three conditions are suitable. It is therefore a matter of satisfaction that in spite of a deficient rainfall in both the Mungpoo and Munsong plantations and difficulty in obtaining labour, the Superintendent is able to record an increase in the area under cinchona from 3,026 acres in 1922-23 to 3,055 acres in 1923-24. The Governor in Council hopes that it will be possible during the present year to make a further extension of the area.

The factory deals not only with the bark produced on the Bengal plantations, but also with Java bark purchased by the Government of India, which pays this Government for the cost of extraction. It depends on the supply of water for, its power, and was affected in the year under report by the deSeient rainfall. The Superintendent hopes to obtain a better supply of water from a new channel. The total products from both the local and Java bark were 56,822 lbs., of which 43,264 lbs. were quinine sulphate, being nearly the same as the quantities produced last year. The fact that analysis showed that the amount of quinine sulphate present in the bark was 47,535 lbs., whilst 43,204 lbs. were actually extracted, shows that the methods followed in the factory are efficient.

The price at which quinine sulphate was sold during the year was Rs. 27 to Rs. 29. The selling rate is based on and fluctuates with the market rate; it may be noted for comparison that before the War, the price was Rs. 11-8 and rose to Rs. 48 in 1922. The financial results to the province have naturally varied with the market rates, which are beyond the control of Government, but it is satisfactory to find that whilst the total expenditure on the department was Rs. 3,35,655, the total receipts were Rs. 7,92,480. These receipts include a sum of Rs. 2,18,473 credited to the Juvenile Jail, Alipore, in accordance with the arrangement by which that Jail manufactures quinine tablets and distributes quinine products. The profit and loss valuation shows a profit balance of Rs. 7,30,387. His Excellency in Council agrees with the Superintendent that this may be considered a very satisfactory result of the year's working.

The Government of Bengal takes this opportunity of placing on record
 the valuable work done by Lieutenant Colonel A. T. Shaw, who
 left during the many years he held charge of Government
 for the efficient working of the factory, beginning of the
 administration of the plantations.

By order of the Governor in Council,

W. S. HOPKYNs,

Secretary to the Government of Bengal (<>ffg.).

Published at the Bengal Secretariat Book Depot,
Writers' Buildings, Calcutta*

AGENTS IN INDIA.

Bengal:

MESSRS. A. H. WHEELER & Co., Calcutta.
MESSRS. B. BANERJEE & Co., 25, Oornwallis Street, Calcutta.
MESSRS. BUTTERWORTH * Co. (INDIA), LD., Calcutta.
MR. G. N. HALDER, Calcutta.
THE INDIAN SCHOOL SUPPLY DEPOT, 300, Bowbazar, Calcutta.
THE PROPRIETOR, INTERNATIONAL BUDDHIST BOOK DEPOT, 4, Onandney Ohowk, 1st Lano, Calcutta.
MESSRS. LALL OHAND & SONS, 76, Lower Circular Road, Calcutta.
HAI M. O. SARKAR BAHADUR & SONS, 90-2A, Harrison Road, Calcutta.
MESSRS. NEWMAN & Co., Calcutta.
MESSRS. R. OAMIUIAY & CO., Calcutta.
MESSRS. S. K. LAHIUI & Co., Printers and Booksellers, College Street, Calcutta.
THE STANDARD LITERATURE COMPANY, LD., 13-1, Old Court House Street, Calcutta.
MESSRS. THACKER, SPINK & Co., Calcutta.
THE WELDON LIBRARY, 18-5, Ohowringhee Road, Calcutta.
THE YOUNG MEN'S CHRISTIAN ASSOCIATION PRESS, Calcutta.
BABU JADUNATH HALDAR, Muktear and Revenue Agent, Gorabazar, Murshidabart.
BABU S. C. TALUKDAR, Proprietor, Students & Co., Ooch Behar.
BABU B. O. BASAK, Proprietor, The Albert Library, Nawabpur, Dacca,

Bombay.

MESSRS. A. H. WHEELER & Co., Bombay.
MESSRS. A. J. OOMBRIDGE & CO., Bombay.
MESSRS. D. B. TARAPOREVALLA & SONS, Booksellers, 100, Horuby Road, Fort, Bombay.
MESSRS. GOPAL NARAYAN * CO., Bombay.
MRS. RADHABAI ATMARAM SAGOON, Bombay.
MESSRS. RAMCHANDRA GOVIND & SON, Booksellers and Publishers, Kulbadevi, Bombay.
MR. RAMNATH SUNDER, Bombay.
MESSRS. THACKER & Co., LD., Bombay.
THE STANDARD BOOKSTALL, Karachi.
THE PROPRIETOR, New Kitabkhana, Poona.
MESSRS. KARSANDAS NARANDAS & SONS, Surat.
MR. MANGALDAS HARKIBANDAS, Surat.

Madras.

MESSRS. G. A. NATESAN & CO., Madras.
MESSRS. HIGGINBOTNAM & CO., Madras.
MESSRS. S. MURTHY & Co., Madras.
MESSRS. TEMPLE & CO., Madras.
MESSRS. THOMPSON & Co., Madras.
MESSRS. V. KALYANARAMA IYER & Co., Booksellers, etc., Madras.
M. R. RY. E. M. GOPALAKRISHNA KONE Madura.
MESSRS. VAS & Co., Madura.

Central Provinces.

THE MANAGER, "HITAVADA," Nogpur.

United Provinces.

MESSRS. A. H. WHEELER & Co., Allahabad.
THE PROPRIETOR OF THE NEWAL KISHORE PRESS, Lucknow.
MUNSUI SBETA RAM, Managing Proprietor, Indian Army Book Depot, Juhu, Oiiwuporc.
MANAGER, IMPERIAL BOOK DEPOT, Delhi.
OXFORD BOOK AND STATIONERY CO., Delhi.

Punjab.

RAI SAHIB M. GULAB SINGH & SONS, Proprietors of the Mufid-i-am Press, Lahore, Punjab.
MESSRS. RAMA KRISHNA & SONS, Anarkall Street, Lahore.
MESSRS. THACKER, SPIX & Co., Simla.

Burma.

THE SUPERINTENDENT, AMERICAN BAPTIST MISSION PRESS, Rangoon.

Ceylon-

MESSRS. A. M. AND J. FERGUSON, Ceylon.

AGENTS IN GREAT BRITAIN,

MESSRS. A. CONSTABLE & Co., 10, Orange Street, Licester Square, London, W. O.
MESSRS. GRINDLAY & Co., 54, Parliament Street, London, S. W.
MESSRS. KEGAN, PAUL, TRENCH, TROBNER & CO., 68-74, Carter Lane, London, E. C.; Oriental Department, 39, New Oxford Street, London, W. C.
MR. B. QUARITCE, 11, Oraftou Street, New Bond Street, London, W.
MESSRS. W. THACKER & Co., 2, Crocd Lane, Ludgate Hill, London, E. C.
MESSRS. P. S. KING & SON, 2 & 4, Ore: it Smith Street, Westminster, London, S. W.
MESSRS. EAST AND WEST, LD., 3, Viotoria Street, London, S. W. 1.

MR. B. H. BLACKWELL, 50-51, Broad Street, Oxford.
MESSRS. DKIGNTON BELL & CO., LD., Trinity Street, Cambridge.
MESSRS. LUZAC & CO., 46, Great Rnssoll Street, London, W. C.
MESSRS. OLIVER AND BOYD, Twcodduie Court, Edinburgh.
MESSRS. E. PONSONBY, LD., ii6, Graftou Street, Dublin.
MR. T. FISHER UNWIN, LD., I, Adolphi Terrace, London, W. O.
MESSRS. J. WIKLDON AND WESLEY, LD., 2, 3 and 4, Arthur Street, New Oxford Street, London, W. O. 2.

AGENTS ON THE CONTINENT.

MR. ERNEST LERODX, Rue Bonaparte, Paris, France.
MR. OTTO HARRASOWITZ, Leipzig.

MR. MAKTINUS NIJHOFF, The Hague, Holland.
MESSRS. R. FRIEDLANDER & SOHN, Berlin.

SIXTY-SECOND ANNUAL REPORT
OF THE
GOVERNMENT CINCHONA PLANTATIONS AND FACTORY
IN BENGAL FOR THE YEAR
1923-24.

1. General.—The year under review has been a normal one so far as plantation and factory work are concerned. No outstanding developments are for record but the Department pursues a steady course of expansion which will require to be intensified as and when the recommendations of the Quinine Conference, held at Delhi in December 1923, are carried into effect.

Weather conditions during the year were not altogether favourable. Mungpoo with 112.18 and Munsong with 87.9 inches rainfall are 10 and 8.5 inches respectively below the averages of past years. There have now been two successive years of drought on Mungpoo through which cinchona has had to struggle but the adverse conditions have been successfully countered by improved methods of cultivation and taking all the blocks together cinchona is looking as well on this plantation as the writer has ever seen it.

More difficult to counter than adverse weather conditions are the attacks of *Helopeltis*. On both plantations this pest is on the increase and indeed the attacks have reached and maintained a severity that renders hand-picking ineffectual. The incidence is worst at lower elevations where certain blocks have their growth completely suspended for several months of the year. Coppicing as a preventative is beneficial in so far as the affected portions are removed entire but the disease quickly reasserts itself when the fresh shoots break. There seems, unfortunately, to be no entirely satisfactory method of dealing with the pest. A season unfavourable to the development of the insect will probably accomplish more than all the counter measures that practice could adopt.

On both plantations methods of planting not hitherto adopted on any large scale are under experiment. All extensions on Mungpoo have gone out on narrow contour terraces along with the Soy bean and a species of *Tephrosia* as green manures and light shade, a departure in method which makes possible the cultivation of cinchona on slopes that would otherwise remain unutilised on account of dangers of excessive wash.

A somewhat different method but with the same underlying idea has been followed on Munsong. Here retaining walls on the contour system have been constructed at intervals of 25 to 50 yards according to the slope and at longer intervals parallel strips of secondary jungle consisting mainly of stout, deep-rooted grasses have been left uncleared. Shallow drains leading at every gradients to the main jhoras complete the arrangement. For both methods the extra expense in the preparation of the land for planting is negligible while the results so far as these can at this stage be predicted are markedly superior to those on control areas. Much of the Munsong extension is on land that has already borne one cinchona crop. The secondary jungle was cut down early in the season when, instead of burning as has hitherto been the practice, it was allowed to rot and afterwards dug in. This practice is, of course, merely a repetition of what is done yearly during cultivation but is new so far as the preparation of land for taking cinchona is concerned and has been rendered possible by the nature of the jungle coming up after the first crop.

Areas not carrying a full complement' of trees at coppicing time are being filled up. For this purpose two-year old plants are being tried as seedlings fail to compete with the rapid coppice growth.

Plantation bark sufficient to meet current provincial requirements of quinine only has been put through the factory, the balance required to keep the factory working being from imperial stocks of Java origin. As the bark agreement does not terminate till 1928 and as considerable quantities of foreign bark are due for delivery only the minimum of local barks is being cropped. The present limitation to the use of plantation barks is the capacity of the factory which some ten years ago could turn out 55,000 lbs. annually but which now requires overtime working for 50,000 lbs. and this only if sufficient power is available. The present year has been particularly deficient in water supplies for the turbines in spite of the fact that additional water was available from the partially constructed nullah referred to in last year's report. The factory ran for 250 days throughout the year, a limit set by the power supply as well as by the budget allotment which was insufficient for longer working. As power is mostly consumed in the grinding house arrangements have been made to lay in a stock of ground bark during the rains when running can be continuous to be used during the dry season when power fails for processes other than extraction. By this means and by the additional power expected from the nullah when completed factory work throughout the year should again become possible.

Although the quinine agreement has terminated bringing outside supplies apart from those in bark form, to an end, stocks of the drug continue to mount up. The condition of affairs leading to this result was the subject of a protracted examination by the Government of

India during December 1923 when the whole quinine position was reviewed and discussed. The Committee appointed to advise Government reached certain conclusions lately to have a far-reaching effect on the future of the Department as well as on the health of the peoples for whom the Department exists. Its findings embodied the view that while stocks were increasing they had not yet reached proportions that would allow of an intensive anti-malarial campaign being initiated and continued. The quinine used in India under present economic conditions is but a fraction of what could be usefully and remuneratively employed and public health officers hold the view that it would be unfair to promote the creation of a demand that even the very large stocks now in hand and supplies in sight could not continue to satisfy.

The general quinine position remains much as it was at this time last year. Reports of a world shortage of the drug appearing in the Press from time to time fail to distinguish between an actual shortage of the commodity and a shortage in purchasing power. While world stocks are, possibly, not ample for a demand that might exist under more stable and favourable world conditions of trade generally they are and have been throughout the year more than sufficient to meet all the demand the world could afford to put forward for them.

The view shared by the writer is that quinine is at a price when buyers limit their requirements to the minimum and when many people simply do without it. Prices are still largely under the control of the quinine ring. Agreement succeeds agreement to regulate supply and restrict production. The hoped-for fall in price has not materialised nor can any substantial fall be looked for in the absence of outside factors capable of affecting control.

2. **Extensions, Acreages and Crops.**—(a) *Mungpoo.*—*The* rainfall for the year was again below the average, being 112·18 inches only. The deficiency was most pronounced from October to March when 2·68 inches only were recorded. A series of somewhat violent windstorms in March uprooted many trees on exposed hill sides and was responsible for destruction to coolie houses but damage from such causes is of small consequence compared with the loss that goes on yearly through insect and fungus pests. Extensions comprised 50 acres *Cinchona Ledgeriana* on Labdah, 65 acres *C. succirubra* on Mungpoo and 35 acres *C. Ledger x succirubra* on Sittong divisions. Harvests were obtained by cutting out 93·5 acres of *C. Ledgeriana*, 9·8 acres of *C. succirubra* and 9·8 acres of *C. Hybrid* barks, the total of 113·1 acres giving 180,151 lbs. *C. Ledgeriana*, 26,140 lbs. *C. succirubra* and 9,075 lbs. *C. Hybrid*, or 215,366 lbs. in all. The average ages of the Ledger, succirubra and hybrid barks were 7·04, 11·2 and 8·3 years and the average annual bark increments per acre of the acreages 273, 237·2 and 111·6 lbs. respectively. The average age of all the acreages cut out is 7·5 years

and the average annual bark increment per acre calculated on these acreages is 253.3 lbs. The yield per acre over the period is therefore 1,900 lbs. This yield is not a true index of what the plantation reaches. The figure is vitiated by the fact that in past years one large block now finally uprooted was not written down fast enough with the result that the area appearing on the books was much above the area actually in existence.

Apart from sections of the Silake block where a southern exposure, poor soil and the ravages of *Helopeltis* combine to produce an effect fortunately rare on the plantation all blocks look well. Cinchona is seen at its best on Rungbee where an area recently put out is likely to prove of very special interest. The young plants here, the progeny of a single high grade tree, appear to be all of a type, a result very unusual even when great care is taken in the selection and crossing of the parent plants. If as there is some cause for hoping, these plants prove uniformly high in quinine content the result may be one of far-reaching importance to the plantations. The reputed high grade seed bought from Java some years ago is not proving up to its guaranteed standard. Indeed plants grown from this seed are no better than a type of plant common here now. At the end of the year there were 936.6 acres with a full complement of cinchona on Mungpoo Plantation. Details are available in Appendix A(1).

(b) *Munsong*.—Eainfall was 87.9 inches being 8.5 inches below the average of the past 23 years. From November to March 1.20 inch only was recorded. No excessive fall occurred, the highest being 3.57 inches, but with the rainfall in such pronounced defect the plantation had to suffer.

Another hailstorm, the severest ever experienced on the plantation, occurred towards the end of the year. Fortunately the damage was confined to a single strip running from the bottom of Munsong Division to above Kashyem bungalow. The violence of the storm is indicated by holes in the leaves of a large Agave plant near Munsong, measurement showing that the stones had gone through a $\frac{1}{2}$ inch of tough plant tissue. In the narrow track of the storm cinchona suffered badly. AH divisions are looking as well as they have done in past years. Extensions have been resumed and these in particular are looking fresh and promising. As far as can be managed slopes with a northern exposure are being selected, the deleterious effect on cinchona of a southern exposure being pronounced on this plantation. The blocks were given as much cultivation as was possible with the labour available. The scattered nature of much of the cinchona on Munsong makes it difficult to get in the requisite number of sicklings during the rains, for the plants spaced as they are give little assistance in keeping down weeds. Contract labour was short resulting in a saving in the budget allotment.

Extensions were 100 acres *C. Ledgeriana* on ^Kashyem and 40 acres, also *Ledger*, on Sangser. Harvests were obtained by cutting out 125-7 acres of *C. Ledgeriana*, 1 acre *C. succirubra*, 10-1 acres *C. officinalis*, 9-9 acres *C. Hybrid II* and -9 acre *C. Hybrid III*, the total of 147-6 acres giving 378,089 lbs. *C. Ledgeriana*, 3,742 lbs. *C. succirubra*, 19,610 lbs. *C. officinalis*, 33,316 lbs. *C. Hybrid II* and 1,329 lbs. *C. Hybrid III*, or 436,086 lbs. in all. The average ages of the barks in the above order were 7 -5, 9 -8, 9 *74, 8 -28 and 5 -22 years' and the average annual bark increments per acre of the acreages 400, 381-8, 200, 406-3 and 282-7 lbs. respectively. The average age of the total acreage cut out is 7-72 years and the average annual bark increment calculated on these acreages is 382·4 lbs. At the end of the year there were 2,118-4 acres with a full complement of cinchona on Munsong Plantation. Details are available in Appendix A(1).

(c) *Plantations as a whole.*—The total area under cinchona is 3,055 acres. Details of the species, the acreages going to be made up this total and their ages are available in Appendix A(2). In all cases the acreages are calculated as carrying their full complement of cinchona trees.

3. **Factory work.**—Besides 430,604 lbs. of Java bark for the Government of India 154,297 lbs. of Mungpoo bark (143,022 *Ledger*, 2,843 *succirubra* and 8,432 hybrid) and 307,002 lbs. Munsong bark (271,498 *Ledger*, 5,331 *succirubra* 15,814 *officinalis* and 14,359 hybrid) were worked up to produce about 19,207A lbs. quinine sulphate, 530| lbs. other quinine salts 4£ lbs. quinidine salts, 181 lbs. quinoidine, and 7,859£ lbs. cinchona febrifuge—a total of 27,782 lbs. provincial alkaloïds. Exact amounts are available in Appendix C(1). The Java bark produced 24,056j lbs. quinine sulphate and 4,983 lbs. cinchona febrifuge. The total production of quinine sulphate, both provincial and imperial, was 43,264 lbs., and the total products from all sources 56,822^ lbs. The amount of quinine sulphate proved by analysis to be present in the bark was 47,535 lbs.

4. **Cost and value of plantation bark.**—The average cost per lb. of all Mungpoo barks taken over a series of year is 3-6 annas and of Munsong barks 2-7 annas. The cost of the 215,366 lbs. Mungpoo bark harvest is, therefore, Rs. 54,707 and of the Munsong 436,086 lbs. harvest Rs. 73,589. The unit rate for bark being 1-5 annas, the average Mungpoo bark quinine percentage of 4-4, gives the harvest from this plantation a value of Rs. 88,839 or Rs. 34,132 more than it cost. On a basis of an average quinine percentage of 4-39 and the same unit rate the Munsong harvest valuation is Rs. 1,78,863 or Rs. 1,05,274 more than it cost. The year's expenditure for both plantations including their share of general charges is Rs. 2,09,697 while harvests costing Rs. L>28,296 and valued at Rs. 2,67,702 are the year's return for past expenditure.

5. Cost and value, of quinine produced.—(a) *Cost in the bark.*—The 19,207 lbs. of quinine extracted were contained in 461,299 lbs. of mixed Mungpoo and Munsong barks, which cost (154,297 lbs. at 3-6 annas and 307,002 lbs. at 2-7 annas per lb.) Us. 86,513. The cost per lb. of quinine in the bark was, therefore, Its. 4*5.

(b) *Cost of extraction, packing and delivery to railway.*—This is calculated on the total extraction of quinine both provincial and imperial. The total direct expenditure on the factory was Es. 1,21,973-9, general charges debatable to factory account Rs. 3,984-2, factory depreciation charges Rs. 5,183, stores (oil, chemicals, etc.) depreciation charges Rs. 5,855-5-6, the gross factory expenditure being, therefore, Rs. 1,36,996-0-6. From this has to be deducted expenditure on products both imperial and provincial other than quinine sulphate Rs. 27,647-7-5 leaving Rs. 1,09,348-9-1 net expended on the production of 43,264 lbs. provincial and imperial quinine sulphate. The cost of extraction, packing, etc, is, therefore, Rs. 2-527 per lb., a figure slightly below that of last year.

(c) *Total cost per lb. and value.*—This is made up of the cost in the bark—Rs. 4-5 and the cost of extraction, etc., Rs. 2*527, a total of Rs. 7-027. The present wholesale rate being Rs. 26 per lb., the 19,207^ lbs. provincial quinine manufactured are worth Rs. 4,99,395 but cost only Rs. 1,34,971.

6. Sales and selling rates.—A statement of the sales of factory products for 1923-24 is available in Appendix G. Sales of quinine sulphate have increased some 4,690 lbs. As an examination of distribution showed that the areas of supply allotted to the Governments of Bengal, Madras and India were not being strictly adhered to orders were issued to all Departments to regulate distribution in such a way as to prevent any district getting its supplies from other than the proper source. The amount of cinchona febrifuge sold was 12,478 lbs. of which 2,000 lbs., the cost of which was not borne by the Bengal Cinchona Department, were received from the Madras Cinchona Department and 2,621| lbs. belonged to the Government of India. Credit in these accounts is, therefore, taken for the proceeds from the sale of 7,856| lbs. provincial febrifuge only. The excess credit lying with Bengal will be adjusted hereafter in transfer account.

Selling rates were as follows: Quinine sulphate Rs. 27 to Rs. 29. Other quinine salts Rs. 35 to Rs. 40. Cinchonine and Cinchonidine salts Rs. 12 to Rs. 13. Quinoidine Rs. 6 to Rs. 8 and Cinchona febrifuge Rs. 8 to Rs. 10. All these rates are based on and are liable to fluctuate with market rates.

Rupees 4,36,945-14-3 were obtained from the sale of 13,348 lbs. Quinine sulphate converted to tablets in the Juvenile Jail but of this sum half only is taken as credited to the> Cinchona Department. Details of the monthly receipts from this source are available in Appendix H.

7. **Expenditure and receipts.**—The total expenditure on the department detailed in Appendix D was Es. 3,35,655-4-3. The total receipts including Es. 550-15 received direct were Es. 7,92,480-9-3, of which Es. 1,39,684-7 were credit and Es. 6,52,724-2-3 cash. These receipts include the Jail share amounting to Es. 2,18,472-15 of proceeds from the sale of quinine tablets, but do not include proceeds from the sale of Cinchona febrifuge belonging to the Government of India. The net receipts properly creditable to the Cinchona Department are therefore Es. 5,73,935-10-3, but sums of Es. 60,790-12 and Es. 9,966 are still due from the Government of India to cover the cost of extracting 24,056½ lbs. Quinine sulphate at Es. 2-527 per lb. and 4,983 lbs. Cinchona febrifuge at Es. 2 per lb. Reference to the profit and loss valuation account will show that a further sum of Es. 45,220-6, all good debt, was outstanding at the end of the year.

8. **Quinine reserve and stock account.**—Full details of stocks in hand are available from Appendices C(1) and C(2). The provincial reserve of quinine is some 3,886 lbs. lower at the end of the year due to an increase in the consumption as compared with last year, and now stands at 27,799 lbs. 10½ oz. Stocks of other products are, however, slightly up on the years working. The 7,859½ lbs. provincial Cinchona febrifuge manufactured have been sold leaving all stocks of this product in hand at the end of the year both at the factory and jail the property of the Government of India.

The stock of plantation bark at the end of the year was 355,081 lbs. against 168,928 lbs. carried over from last year. This is a very large increase due to the amount of Java bark arriving and requiring to be worked up. Harvests from the plantations are being restricted by the removal of thinnings and casualty trees only and with half the Java bark now going to Madras, bark on balance at the end of the year should gradually become less. While the oil account shows a slight increase in the new carry over chemicals and stores are some Es. 7,307 down on the year's working. The total value of stock carried over is Es. 6,97,584-3-9 against an opening balance of Es. 7,19,373-12-6.

As regards valuation rates the figures employed last year have again been utilised, Quinine sulphate, the main item, is carried at Es. 20 per lb. a figure considerably below its present market value. It would conform more closely with commercial methods to value stocks at cost or market rate whichever is less but pending decision on the question of commercialising the accounts the old system of valuation has been retained.

9. **Block account.**—Excluding the value of extensions which for purposes of the block account are taken at cost price, the increase in value of Cinchona trees at the end of the year is Es. 3,75,837.

Each block of Cinchona has been valued separately on the basis of the analytical figure for its bark sample and a unit rate of 1-5 annas. The method of valuation is not as reliable as could be wished but it is difficult to devise a system that gives approximation to the results known only when the blocks are finally uprooted. The annual bark increment figures hitherto taken for Munsong will probably have to be reduced. In the writer's opinion the system leads to overvaluation of this plantation. Cinchona trees are valued at Es. 2,325,233; fuel and timber trees at Its. 2,81,063. & see Appendix F for further information.

10. **Profit and loss valuation.**—The valuation profit balance of Us. 7,30,386-15-3 may be considered a very satisfactory result of the year's working. It should be noted that outstandings in this account include a sum of Rs. 70,756-12* due from the Government of India for work done. The exchange account between the two Governments results in a net debit of Rs. 49,465-12* only against the Central Government but this account credits the local Government with proceeds from the sale of Cinchona febrifuge belong to India which the sales shown in Appendix E do not include.

11. **Land rent.**—From Mungpoo the sum of Rs. 5,266-8-9 was collected during the year and paid into the Darjeeling treasury. From Munsong Rs. 1,322-4-6, representing fees collected from cattle grazing within the cinchona boundary, were paid into the Kalimpong sub-treasury for credit to the Forest Department. No credit is taken for these sums in the accounts of the Cinchona Department.

12. **Staff.**—Lieut.-Colonel A. T. Gage, C.I.E., I.M.S., was on leave throughout the year during which time the writer officiated as Superintendent. Mr. G. E. Shaw, was Government Quinologist and Mr. S. C. Sen Assistant Quinologist throughout the year. Mr. H. Thomas was Manager, Messrs. Fothergill and Richards, Assistant Managers, Cinchona Plantation Munsong, throughout the year. Mr. Fothergill was on leave for one month from 14th January 1924, when Mr. J. Hulbert, Overseer, officiated in his place.

Mr. P. V. Osborne was Manager, Mr. P. W. Cresswell, Assistant Manager and Messrs. Holl and Ilarkaman Lama were Overseers, Cinchona Plantation, Mungpoo, throughout the year. The Head Clerk, Babu S. K. Mitra, was on leave from 2nd January 1924 till the end of the year during which time Babu A. T. Banerjee, 7th Clerk, officiated in his place. All officers of the plantations and factory and the clerical establishment have performed their duties satisfactorily.

13. **Medicinal plants other than cinchona.**—About 47,500 *Ipecacuanha* plants were raised from seed for planting in a new nursery

* Exclusive of pensionary charges.

500 feet or so higher than the old beds. During the cold season temperatures in the valley, where the old beds were situated, are believed to go lower than they do higher up. The change in site is an attempt to avoid the evil effects on *Ipecacuanha* of excessive daily fluctuations of temperature. Stocks of the plant are looking well. Already about 3 lbs. of Emetine hydrochloride have been extracted.

The cultivation of *Digitalis* is being continued but the limited demand makes it questionable whether it is worth while to go on with this crop.

C. C. CALDER,
Offg. Superintendent,
Royal Botanic Garden, Calcutta,
and of Cinchona Cultivation in Bengal.

APPENDIX A(D).

**Detailed statement of acreage with full complement of cinchona in the 62V3rnmait
Cinchona Plantations, Dirjealing district, on 31st March 1924.**

Species.	Number of acres carrying trees of—				Total No. of acres.
	0—5 years old.	6—10 years old.	11—15 years old.	16 years old and upwards.	
1	2	3	4	5	6
I.—MUNGPOO PLANTATION.					
<i>(a) Mungpoo Division.</i>					
Cinchona Ledgeriana ..	281.3	87.6	..	..	368.9
„ succirubra ..	(if)	2.6	..	39.8	107.4
„ (ledger x succirubra)	30.4	..	..	2.5	32.9
Total ..	376.7	90.2	..	42.3	509.2
<i>(b) Sittong Division.</i>					
Cinchona Ledgeriana ..	196.1	19.2	..	..	215.6
„ succirubra ..	15	..	..	..	15
„ (ledger x succirubra)	35	..	..	..	35
Total ..	246.4	19.2	..	..	265.6
<i>(c) Labdah Division.</i>					
Cinchona Ledgeriana ..	135	..	..	..	135
„ (ledger x succirubra)	26.8	..	..	..	26.8
Total ..	161.8	..	..	..	161.8
II.—MUNSONG PLANTATION.					
<i>* (a) Munsong Division.</i>					
Cinchona Ledgeriana ..	284.3	154.5	..	..	438.8
»» (ledger x officinalis)	6.9	..	..	..	6.9
„ (ledger x succirubra)	94.5	38.8	20.4	..	153.7
Total ..	385.7	193.3	20.4	..	599.4

Species.	Number of acres carrying trees of—				Total No. of acres.
	0—5 years old.	6—10 years old.	11—15 years old.	16 years old and upwards.	
1	2	3	4	5	6
II.—MUNSONG PLANTATION—<i>contd.</i>					
<i>(b) Kashyem Division.</i>					
Cinchona Ledgeriana ..	185	188.1	41.3	..	414.4
• „ officinalis ..	..	36.2	29.6	..	65.8
„ succirubra ..	..	..	1.5	..	1.5
M (ledger x officinalis)	34.8	..	..	..	34.8
„ (ledger x succirubra)	..	86	..	..	56
Total ..	219.8	280.3	72.4	..	572.5
<i>(c) Burmiak Division.</i>					
Cinchona Ledgeriana ..	122.2	293.3	35.4	..	450.9
„ officinalis ..	..	42.6	..	..	42.6
„ succirubra ..	..	8.6	..	..	8.6
„ (ledger x officinalis)	66.2	..	..	..	66.2
„ (ledger x succirubra)	..	13.6	..	..	13.6
Total ..	188.4	358.1	35.4	..	581.9
<i>(d) Sangser Division.</i>					
Cinchona Ledgeriana ..	261.2	71.9	..	..	333.1
„ succirubra ..	..	9	..	..	9
„ (ledger x succirubra)	..	22.5	..	..	22.5
Total	261.2	103.4	..	..	364.6

APPENDIX A(2).

Abstract of acreage with full complement of cinchona in the Government Cinchona Plantations, Darjeeling district, on the 31st March 1924.

Species.	Number of acres bearing trees of—				Total acreage.
	0—5 years old.	6—10 years old.	11—15 years old.	16 years old and over.	
1	2	3	4	5	6
Oinchona Ledgeriana ..	1,465.4	814.6	76.7	..	2,356.7
„ officinalis ..	..	78.8	2*9.6	..	108.4
„ succirubra ..	80	20.2	1.5	39.8	141.5
„ (ledger x officinalis)	107.9	..	..	..	107.9
„ (ledger x succirubra)	186.7	130.9	20.4	2.5	340.5
Total ..	1,840	1,044.5	128.2	42.3	3,055

APPENDIX B.

Receipts for 1923-24.

Transactions of the year.	Sales to Government Offices and institutions.		Sales to the public for cash payment.		Total.
	Cash sales.	Book credit.	In tablets.	In tins in powder form to Native, Statts. Municipal and Local Funds, Dispensaries, Missionary bodies and others.	
1	2	3	4	5	6
	Rs. A.	Rs. A.	Rs. A.	Rs. A.	Rs. A.
Quinine sulphate	1,07,615 12	1,24,122 4	2,18,472 15*	35,844 0	4,86,054 15
Other quinine salts	225 9	14,960 0	..	115 10	15,301 3
Cinchona febrifuge	..	..	..	..	69,1*7 4
Cinchonidine salts	51 0	17 0	..	..	68 0
Cinchonine salts	7 9	13 0	..	44 12	65 5
Quinidine salts ..	..	91 0	..	..	91 0
Quinoidine ..	149 0	80 0	..	378 0	607 0
Bark ..	25 0	..	..	1,975 0	2,000 0
Miscellaneous ..	149 12	401 3	..	..	550 15
Total ..	1,08,223 10	139,684 7	2,18,472 15	38,357 6	5,73,935 10

* This sum is half of Hs. 4,36,945-14-3 being value of 13,348 lbs. of quinine sulphate sold in form of treatments. The remaining sum of Us. 2,18,472-15-0 is credit to the Prison Department.

APPENDIX 0(1).

Stock Account, 1923-24.

	Quinine sulphate.			Other quinine salts.		
	Quantity.	Rate per lb.	Value.	Quantity.	Rate per lb.	Value.
1	2	3	4	5	6	7
	lbs. oz.	Rs.	Rs. A.	lbs. oz.	Rs.	Rs. A.
Balance on 1st April 1923	31,685 9	20	6,33,711 4	102 £	25	2,550 12
Purchased .. ..	..	..	..	..	..	..
Harvested .. ..	..	..	..	..	..	..
Used in factory ..	..	..	..	..	..	..
Manufactured ..	19,207 6|	7.027	1,34,970 7	530 7J	10	5,304 11
Issued or sold ..	23,093 5	..	4,86,054 15	394 8	..	15,301 3
Balance on 31st March	27,799 10|	..	5,55,993 2	238	..	5,950 0

	Quinidine sulphate.			Cinchonine salts.		
	Quantity.	Rate per lb.	Value.	Quantity.	Rate per lb.	Value.
1	2	3	4	5	6	7
	lbs. oz.	Rs.	Rs. A.	lbs. oz.	Rs.	Rs. A.
Balance on 1st April 1923.	0 11|	20	134 G	20 15J	10	209 11
Purchased .. ..	..	..	..	..	..	..
Harvested .. ..	..	..	..	..	..	..
Used in factory ..	..	..	..	..	..	..
Manufactured ..	4 8|	10	45 5	..	..	..
Issued or sold ..	2 0	..	91 0	4 13	..	65 5
Balance on 31st March	9 4	20	185 0	16 2|	10	161 9

	Cinchonidine salts.			Quinoidine.		
	Quantity.	Rate per lb.	Value.	Quantity.	Rate per lb.	Value.
1	2	3	4	5	6	7
	lbs. oz.	Rs.	Rs. A.	lbs. oz.	Rs.	Rs. A.
Baianco on 1st April 1923	4 0	15	60 0	74 0	2	148 0
Purchased .. .. .	..	..	..	..	..	..
Harvested .. .. .	..	..	..	..	..	..
Used in factory .. .. .	..	..	..	..	..	..
Manufactured .. .. .	..	..	..	181 0	3	543 0
Issued or sold	4	..	68 0	89 0	..	607 0
Balance on 31st March 1924	nil	..	..	166 0	2	332 0

	Cinchona Febrifuge.			Cinchona Bark.		
	Quantity.	Rate per lb.	Value.	Quantity.	Rate per lb.	Value.
1	2	3	4	5	6	7
	lbs. oz.	Rs.	Rs. A.	lbs.	Annas.	Rs. A.
Balance on 1st April 1923	..	..	..	168,928	5	52,790 3
Purchased .. .. .	..	..	..	..	..	..
Harvested .. .. .	..	..	..	651,452	..	1,80,661 0
Used in factory .. .. .	..	..	..	461,299	..	86,522 0
Manufactured	7,859 8	2	15,719 0	..	..	..
Issued or sold	7,859 8	..	67,197 4	4,000	8	2,000 0
Balance on 31st March 1924	..	..	..	355,081	5	1,10,962 0

	Oil.			Chemicals and stores.	Grand Total.
	Quantity.	Rate per gallon.	Value.	Value.	Value.
1	2	3	4	5	6
	Gallons	Rs.	Rs. A. r.	Rs. A. p.	Rs. A. p.
Balance on 1st April 1923.	10,364	Various	9,804 5 6	19,965 3 0	7,19,373 12 6
Purchased ..	21,695	..	18,239 10 3	49,372 7 0	67,612 1 3
Harvested .. ..	..	..	....	....	1,80,661 0 0
Used in factory ..	18,572	..	16,701 7 9	56,765 15 0	1,59,989 6 9
Manufactured ..	..	..	....	....	1,34,970 7 0
Issued or sold ..	..	..	....	....	5,71,384 11 3
Balance on 31st March 1924.	13,487	..	11,342 8 0	12,658 0 9	6,97,584 3 9

APPENDIX C(2).

Detailed Stock Account of barks for 1923-24.

	Cinchona Ledgeriana.			Cinchona officinalis.		
	Quantity.	Rate per lb.	Value.	Quantity.	Rate per lb.	Value.
1	2	3	4	5	6	7
	lbs.	Annas	Rfi. A.	lbs.	Annas.	Rs. A.
Balance on 1st April 1923	156,914	5	49,035 13	3,165	5	989 1
Harvested ..	558,240	•Various	1,04,335 0	19,610	2-7	3,309 0
Used in factory ..	414,520	..	77,995 0	15,814	2-7	2,668 0
Sold .. ..	..	..	..	..	..	..
Balance on 31st March 1924 ..	3,006	5	93,948 0	6,961	5	2,175 0

* 36 annas for Mungpoo bark and 27 annas for Mungsong bark.

	Cinchona succirubra.		
	Quantity.	Rate per lb.	Value.
1	2	3	4
	lbs.	Annas.	Rs. A.
Balance on 1st April 1923	8,849	5	2,765 5
Harvested	29,882	Various*	65,129 0
Used in factory	8,174	..	1,539 0
Sold	4,000	8	2,000 0
Balance on 31st March 1924	26,557	5	8,299 0

	Cinchona (Ledger x succirubra).			Cinchona (Ledger x officinal is).		
	Quantity	Rate per lb.	Value.	Quantity.	Rate per lb.	Value.
1	2	3	4	5	6	7
	lbs.	Annas	Rs.	lbs.	Annas	Rs.
Balance on 1st April 1923:	nil	..	..	nil	..	..
Harvested	42,391	* Various	7,664	1,329	2-7	224
Used in factory	21,462	..	4,096	1,329	2<7	224
Sold .. ..	..	..	..	..	..	..
Balance on 31st March 1924.	20,929	5	6,540	..	..	..

* 36 annas per lb. for Mungpoo and 27 annas for Munsong bark.

APPENDIX D.

Expenditure for 1923-24.

I.—PLANTATIONS ACCOUNT.

A.—MuNGroo PLANTATION.

Salaries.

						Rs.	A.	P.
1.	Manager and Assistant Manager	'	..	..	..	8,848	0	3
2.	Overseers	..	..	..	..	2,570	0	0
3.	Duty allowance	..	..	..	..	1,200	0	0
4.	Exchange compensation allowance	..	..	..	..	....

Establishment.

5.	Sub-Overseer	..	..	..	..	M20	0	0
C.	Sub-Assistant Surgeon	..	..	..	..	1,856	1	0
7.	Artificers	..	..	..	..	360	0	0
8.	Sirdars and coolie,?	..	..	..	..	54,273	8	6

Allowances.

9.	Travelling allowance	..	..	..	..	46	7	0
10.	Pony allowances	..	..	..	..	1,038	0	0
11.	Compensation for dearness of provisions	..	..	..	..	....

Contingencies.

12.	Purchase and koop of ponios and bullocks	..	..	..	..	2,160	0	0
13.	Purchase of manure	..	..	..	..	....
14.	Purchase of seeds	..	*	..	..	..
15.	Carriage charges	..	..	..	..	*81'	3	0
16.	European stores	..	..	..	..	755	8	0
17.	Freight	..	..	..	..	62	2	0
18.	Buildings	..	..	..	..	911	10	0
19.	Machinery and plant	..	..	..	..	....
20.	Miscellaneous	..	..	..	..	4,086	0	3
21.	Servants' clothing	..	..	..	..	....
22.	Labour of malis	..	..	..	..	2,280	0	0
Total Mungpoo charges						..	81,948	8 0

B.—MUNSONG PLANTATION.

Salaries.

						Rs.	A.	P.
1.	Manager and Assistant Managers	..	..	..	..	16,612	11	0
2.	Overseers	..	..	..	..	2,122	5	0
3.	Duty allowance	..	..	..	..	I* ⁶⁰⁰	0	0
4.	Exchange compensation allowance	..	..	..	..	....

						Rs.	A.	v.
<i>Establishment</i>								
5. Clerks	..	..	..	..	..	*
6. Sub-Assistant Surgeon	..	..	..	..	..	2	660	3 6
7. Artificers	..	..	..	..	..	....
8. Sirdars and coolies	..	..	..	..	..	82,276	15	3

<i>Allowances.</i>								
9. Travelling allowance	7	12	0
10. Pony allowances	M*0	0	0
11. Compensation for doariness of provisions		

<i>Contingencies.</i>								
12. Purchase and keep of ponies and bullocks	2,100	0	0
13. Purchase of manure		
14. Purchase of seed		
15. Carriage charges	5,608	11	6
16. European stores	1,688	2	0
17. Freight	101	2	0
18. Buildings	1,999	14	0
19. Machinery and plant		
20. Miscellaneous	2,771	15	0
21. Afforestation charges		
22. Servants' clothing		
Total Munsong charges						..	1,21,116	1 3
Total for both plantations						..	2,03,064	9 3

II.-FACTORY ACCOUNT.

<i>Salaries.</i>						Rs.	A.	P.
1. Quinologist	..	..	..	..	..	21,496	7	0
2. Assistant Quinologist	..	..	..	..	..	6,854	11	3
3. Manufacturing Chemist	..	..	..	..	..	....

<i>Establishment.</i>								
4. Clerks	815	0	0
5. Servants		
6. Artificers		
7. Sirdars and coolies	8,745	3	0

<i>Allowances.</i>								
8. Travelling allowance	30	0	0
9. Compensation for dearness of provisions		

Contingencies.

	Rs.	A.	P.
10. Purchase of machinery .. .. .	.....	
11. Buildings	3,497	15	0
12. European stores	27,966	4	0
13. Freight	4,220	13	0
14. Chemicals	26,944	9	0
15. Fuel (carriage and cutting up only)	10,063	12	0
16. Purchase of bark (carriage only)	3,813	9	3
17. Purchase of cinchona febrifuge .. .. .	.....	
18. Packing materials	2,527	15	0
19. Distribution charges	337	5	0
20. Miscellaneous	5,160	1	6
21. Servants* clothing .. .. .	.....	
Total Factory charges ..	1,21,973	9	0

III.—GENERAL.

Salaries.

	Rs.	A.	P.
1. Superintendent	2,400	0	0

Establishment.

2. Clerks	5,776	7	0
3. Servants	236	11	0

Allowances.

4. Travelling allowances .. .. .	.....	
5. Compensation for dearness of provisions .. .. .	.....	

Contingencies.

6. Miscellaneous .. .. .	.....	
7. Postage and telegrams	390	0	0
8. Advertising charges .. .. .	.....	
9. Subscriptions to newspapers and periodicals .. .. .	.....	
10. Purchase and repair of furniture .. .. .	.....	
11. Road and Public Works Cess	1,814	0	0

Total General charges ..	10,617	2	0
--------------------------	--------	---	---

IV.—ABSTRACT.

	Rs.	A.	P.
Total Mungpo charges	81,948	8	0
„ Munsong „	1,21,116	1	3
„ Factory „	1,21,973	9	0
„ General „	10,617	2	0
GRAND TOTAL EXPENDITURE ..	3,35,655	4	3

APPENDIX E.

Profit and Loss Valuation, 1923-24.

---	Amount.	---	Amount.
1	2	3	4
To -	Rs. A. p.	By -	Rs. A. p.
Stock on 1st April 1923	7,19,373 12 6	Arrears recovered ..	4,171 3 0
Outstanding on 1st April 1923 ..	4,171 3 0	Sales during the year	5,73,935 10 3
Expenditure (less Rs. 29,000 capital expenditure) ..*	3,06,655 4 3	Outstandings on 31st March 1924 ..	1,15,977 2 0
Depreciation on buildings ..	3,199 0 0	Stock on 31st March 1924 ..	6,97,584 3 9
Depreciation on machinery ..	3,719 0 0	Gain in revaluation of Cinchona trees ..	3,75,837 0 0
Balance (profit) ..	7,30,386 15 3	Timber trees ..	•••
Total ..	17,67,505 3 0	Total ..	17,67,505 3 0

* This includes outstandings of Jts. 70,756-12 against the Government of India.

APPENDIX F.

Block Account, 1923-24.

I.—MUNGPOO PLANTATION.

---	Amount.	---	Amount.
1	2	3	4
To -	Rs. A. p.	By -	Rs. A. p.
Value of buildings on 1st April 1923 ..	27,272 0 0	Depreciation on buildings at 2½ per cent.	737 0 0
Machinery (Sirocco driers) ..	921 0 0	Value of buildings on 31st March 1924 ..	26,535 0 0
Value of plantation on 1st April 1923—		Depreciation on machinery at 5 per cent.	54 0 0
Cinchona trees ..	3,70,123 0 0	Value of machinery on 31st March 1924 ..	867 0 0
Timber trees ..	2,72,033 0 0	Value of plantation on 31st March 1924—	
Value of extensions at cost made in 1923-24—		Cinchona trees ..	3,92,616 0 0
Cinchona trees ..	15,000 0 0	Timber trees ..	2,72,733 0 0
Timber trees ..	700 0 0		
Gain on revaluation of plantations at end of 1923-24 (extensions for the year excluded)—			
Cinchona trees ..	7,493 0 0		
Timber trees ..	••••		
Total ..	6,93,542 0 0	Total ..	6,93,542 0 0

IL—MUNSONG PLANTATION.

	Amount.		Amount.
1	2	3	4*
	Rs. A. p.		Rs. A. p.
To—		By—	
Value of buildings on 1st April 1923 ..	34,942 0 0	Depreciation on buildings at 2½ per cent.	944 0 0
Value of plantation on 1st April 1923—		Value of buildings on 31st March 1924 ..	33,998 0 0
Cinchona trees ..	15,50,973 0 0	Value of plantation on 31st March 1924—	
Timber trees ..	8,330 0 0	Cinchona ..	19,32,617 0 0
Value of extension at cost made in 1923-24—		Timber trees ..	8,330 0 0
Cinchona trees ..	13,300 0 0		
Timber trees ..	.....	
Gain on revaluation of plantations at end of 1923-24 (extensions for the year excluded)—			
Cinchona trees ..	3,58,344 0 0		
Total ..	1,975,889 0 0	Total ..	1,975,889 0 0

III.—FACTORY.

	Amount.		Amount.
1 "	2	3	4
	Rs. A. p.		Rs. A. p.
To—		By -	
Value of buildings on 1st April 1923 ..	56,199 0 0	Depreciation on buildings at 2½ per cent.	1,518 0 0
Value of machinery on 1st April 1923 ..	02,321 0 0	Value of buildings on 31st March 1924 ..	54,681 0 0
		Depreciation on machinery at 5 per cent.	3,665 0 0
		Value of machinery on 31st March 1924 * ..	58,656 0 0
Total ..	1,18,520 0 0	Total ..	1,18,520 0 0

* Value of cinchona trees Rs. 23,25,233, timber trees Rs. 2,81,003, of buildings Rs. 1,15,214, of machinery Rs. 59,523, total value Rs. 27,81,033.

APPENDIX Q.

Statement of sales of factory products during the official year 1923-24.

Particulars.	Quinine salts.	Cinchonine and cinchonidine salts.	Cinchona febrifuge.	Quinine salts and quinoidine.	Cinchona bark.	Total.
	lbs. oz.	lbs. oz.	lbs. oz.	lbs.	lbs.	lbs. oz.
<i>Assam.</i>						
Jails ..	37 8	..	1 8	..	..	39 0
Dispensaries ..	435 10	3 0	749 4	10	..	1,197 14
District Boards ..	1 0	..	..	..	..	1 0
Missionary bodies ..	7 0	..	80 8	..	..	87 8
Others ..	10 8	..	80 0	..	..	90 8
<i>Bengal.</i>						
Jails ..	13,539 12	..	33 0	..	..	13,572 12
Modical Store Depot ..	2,725 0	..	200 0	..	..	2,925 0
Dispensaries ..	2,176 10	..	7,053 8	4	50	9,284 2
District Boards ..	478 0	..	426 8	..	..	904 8
Missionary bodies ..	214 12	1 0	174 12	5	..	395 8
Others ..	278 4	1 12	748 0	34	3,950	5,012 0
<i>Bihar and Orissa</i>						
Jails ..	20 0	..	15 0	..	..	35 0
Dispensaries ..	1,439 0	0 1	606 0	1	..	2,046 3
District Boards ..	209 0	..	81 0	..	..	290 0
Missionary bodies ..	17 0	..	103 8	5	..	125 8
Others ..	195 0	..	30 8	..	..	225 8
<i>Punjab.</i>						
Jails ..	430 0	..	9 0	1	..	440 0
Dispensaries ..	227 0	..	43 0	..	..	270 0
District Boards ..	..	..	..	..	..	..
Missionary bodies ..	51 0	..	64 8	7	..	122 8
Others ..	18 0	3 0	24 0	1	..	46 0
<i>Other Provinces and States.</i>						
Jails ..	14 8	..	60 0	..	..	74 8
Dispensaries ..	373 4	..	615 0	..	..	988 4
District Boards ..	..	..	12 0	..	..	12 0
Missionary bodies * ..	85 8	..	337 0	23	..	445 8
Others ..	551 0	..	997 8	..	..	1,548 8
Total ..	23,534 6	8 13	12,545 0	91	4,000	40,179 3

"APPENDIX H.

Sale of sulphate of quinine in " treatment " tablets during 1923-24.

Consecutive No.	Months.	Total proceeds from sale of tablets.	Credited to Ginchona Department at half rate.
1	2	3	4
	1923	R8. A. P.	Rs. A. P.
1	April	18,312 0 0	9,156 0 0
2	May	30,907 13 0	15,453 14 6
3	June	34,651 8 3	17,325 12 1
4	July	46,529 13 0	23,264 14 6
5	August	37,901 10 3	* 18,950 13 1
6	September	52,360 14 0	26,180 7 0
7	October	38,958 8 3	19,479 4 1
8	November	50,336 8 9	25,168 4 4
9	December	38,030 5 6	19,015 2 9
	1924		
10	January	51,375 2 3	25,687 9 1
11	February	21,649 11 0	10,824 13 6
12	March	15,932 0 0	7,966 0 0
	Total ..	4,36,945 14 3	2,18,472 14 H

* Supplied by the Accountant-General, Bengal.

GOVERNMENT OF BENGAL.

REVENUE DEPARTMENT.

Cinchona.

CALCUTTA, THE 21ST NOVEMBER 1924.

RESOLUTION-No. 9275Cin.

READ—

The Sixty-Second Annual Report of the Government Cinchona Plantations and Factory in Bengal for the year 1923-24.

READ ALSO—

The Report of the previous year.

The Sixty-Second Annual Report of the Government Cinchona Plantations and Factory in Bengal, written by the officiating Superintendent Mr. Calder, is an interesting and satisfactory record of the work done during the year 1923-24.

The policy of the Government of Bengal is to maintain and, if possible, extend the Cinchona Plantations and at the same time to improve and develop the factory, in order to meet the requirements of the province. The extension of the plantations is limited by the fact that cinchona is a plant that requires a certain combination of soil, rainfall and elevation, and will not grow unless these three conditions are suitable. It is therefore a matter of satisfaction that in spite of a deficient rainfall in both the Mungpoo and Munsong plantations and difficulty in obtaining labour, the Superintendent is able to record an increase in the area under cinchona from 3,026 acres in 1922-23 to 3,055 acres in 1923-24. The Governor in Council hopes that it will be possible during the present year to make a further extension of the area.

The factory deals not only with the bark produced on the Bengal plantations, but also with Java bark purchased by the Government of India, which pays this Government for the cost of extraction. It depends on the supply of water for its power, and was affected in the year under report by the deficient rainfall. The Superintendent hopes to obtain a better supply of water from a new channel. The total products from both the local and Java bark were 56,822 lbs., of which 43,264 lbs. were quinine sulphate, being nearly the same as the quantities produced last year. The fact that analysis showed that the amount of quinine sulphate present in the bark was 47,535 lbs., whilst 43,204 lbs. were actually extracted, shows that the methods followed in the factory are efficient.

The price at which quinine sulphate was sold during the year was Rs. 27 to Rs. 29. The selling rate is based on and fluctuates with the market rate; it may be noted for comparison that before the War, the price was Rs. 11-8 and rose to Rs. 48 in 1922. The financial results to the province have naturally varied with the market rates, which are beyond the control of Government, but it is satisfactory to find that whilst the total expenditure on the department was Rs. 3,35,655, the total receipts were Rs. 7,92,480. These receipts include a sum of Rs. 2,18,473 credited to the Juvenile Jail, Alipore, in accordance with the arrangement by which that Jail manufactures quinine tablets and distributes quinine products. The profit and loss valuation shows a profit balance of Rs. 7,30,387. His Excellency in Council agrees with the Superintendent that this may be considered a very satisfactory result of the year's working.

The Governor in Council takes this opportunity of placing on record his appreciation of the valuable work done by Lieutenant-Colonel A. T. Gage, C.I.E., I.M.S., now on leave, during the many years he held charge of the plantations. The thanks of Government are also due to Mr. G. E. Shaw, Government Quinologist, for the efficient working of the factory, and to Mr. C. C. Calder, who has officiated as Superintendent since the beginning of 1923, for his interesting report and his successful administration of the plantations.

By order of the Governor in Council,

W. S. HOPKYNS,

Secretary to the Government of Bengal (offg.).

Published at the Bengal Secretariat Book Depot,
Writers¹ Buildings, Calcutta.

AGENTS IN INDIA.

Bengal

MESSRS. A. H. WHEELER & Co., Calcutta.
MESSRS. B. BANERJEE & Co., 25, Oorwallis Street, Calcutta.
MESSRS. BUTTERWORTH & Co. (INDIA), LD., Calcutta.
MR. G. N. HALDER, Calcutta.
THE INDIAN SCHOOL SUPPLY DEPOT, 300, Bowbazar, Calcutta.
THE PROPRIETOR, INTERNATIONAL BUDDHIST BOOK DEPOT, 4, Onaudney Ohowk, 1st Lane, Calcutta.
MESSRS. LALL OHAND & SONS, 76, Lower Circular Road, Calcutta.
UAI M. O. SARKAR BAHADUR & SONS, 90-2A, Harrison Road, Calcutta.
MESSRS. NEWMAN & Co., Calcutta.
MESSRS. R. CAMBRAY & Co., Calcutta.
MESSRS. S. K. LAHIRI & CO., Printers and Booksellers, College Street, Calcutta.
THE STANDARD LITERATURE COMPANY, LD., 13-1, Old Court House Street, Calcutta.
MESSRS. THACKER, SPINK & Co., Calcutta.
TUE WILSON LIBRARY, 18-5, Ohowringhee Road, Calcutta.
THE YOUNG MEN'S CHRISTIAN ASSOCIATION PRESS, Calcutta.
BABU JADUNATH HALDAR, Mukfear and Revenue Agent, Gorabazar, Murshidnbad.
BABU S. C. TALUKDAR, Proprietor, Students & Co., Oooch Behar.
BABU B. O. BASAK, Proprietor, The Albert Library* Nawabpur, Dacca.

Bombay*

MESSRS. A. U. WHEELER & Co., Bombay.
MESSRS. A. J. OOMBRIDGE & Co., Bombay.
MESSRS. D. B. TARAPOREYALLA * SONS, Booksellers, 190, Hornby Road, Fort, Bombay.
MESSRS. GOPAL NARAYAN & CO., Bombay.
MRS. KADHABAI ATMARAM SAQOON, Bombay.
MESSRS. RAMCHANDRA GOYIND & SON, Booksellers and Publishers, Klnbadavii Bombay.
MR. RAMNATH SUNDER, Bombay.
MESSRS. THACKER & Co., LD., Bombay.
THE STANDARD BOOKSTALL, Karachi.
THE PROPRIETOR, New Kitabkbana, Poona.
MESSRS. KARSANDAS NARANDAS & SONS, Surat.
MR. MANGALDAS HATVKIBANDAB, Surat.

Madras.

MESSRS. G. A. NATEAN & Co., Madras.
MESSRS. HIGGINBOTHAM *t Co., Madras.
MESSRS. S. MURTUY & Co., Madras.
MESSRS. TEMPLE & CO., Madras.
MESSRS. THOMPSON & Co., Madras.
MESSRS. V. KALYANARAMA IYER & Co., Booksellers, etc., Madras.
M. R. RY. E. M. GOPALAKRISHNA KONE Madura.
MESSRS. YAS & Co., Madura.

Central Provinces*

THE MANAGER, "HITAVADA," Nagpur.

United Provinces.

* MK33RS. A. H. WHEELER & CO., Allahabad.
THE PROPRIETOR OF THE NEWAL KISHORE PRESS, Lucknow.
MUNSUI SEETA HAM, Managing Proprietor, Indian Army Book Depot, Juhi, Cawnpore.
MANAGER, IMPERIAL BOOK DEPOT, Delhi.
OXFORD BOOK AND STATIONERY CO., Delhi.

Punjab*

RAI SAHIB M. GULAB SINGH & SONS, Proprietors of the Mufid-i-um Press, Lahore, Punjab.
MESSRS. RAMA KRISHNA & SONS, Anarknl Street, Lahore.
MESSRS. THACKER, SPINK & Co., Simla.

Burma.

THE SUPERINTENDENT, AMERICAN BAPTIST MISSION PRESS, Rangoon.

Ceylon*

MESSRS. A. M. AND J. FERGUSON, Ceylon.

AGENTS IN GREAT BRITAIN.

MESSRS. A. CONSTABLE & Co., 10, Orange Street, Licester Square, London W. 0.
MESSRS. GRINDLAY & Co., 54, Parliameut Street, London, S. W.
MESSRS. KEGAN, PAUL, TRENCH, TROBNER & CO., 68-74, Carter Laue, London, E.G.; Oriental Department, 39, New Oxford Street, London, W.C.
MR. B. QUARITCH, 11, Graf ton Street, New Bond Street, London, W.
MESSRS. W. THACKER & CO., 2, Crocd Laue, Ludgate Hill, London, E.C.
MESSRS. P. S. KING & SON, 2 * 4, Great Smith Street, Westminster, London, S.W.
MESSRS. EAST AND WEST, LD., 3, Victoria Street, London, S. W. 1.

MR. B. H. BLACKWELL, 50-51, Broad Street, Oxford.
MESSRS. DEIGHTON BELL & CO., LD., Trinity Street, Cambridge.
MESSRS. LUZAC & CO., 46, Great Russell Street, London, W.C.
MESSRS. OLIVER AND BOYD, Twieddale Court, Edinburgh.
MESSRS. E. PONSONBY, LD., 116, Grafton Street, Dublin.
MR. T. FISHER UNWIN, LD., 1, Adolphi Terrace, London, W.O.
MESSRS. J. WHELDON AND WESLEY, LD., 2, 3 and 4, Arthur Street, New Oxford Street, London, W.C. 2.

AGENTS ON THE CONTINENT.

MR. EBNEBT LBROUX, Rue Bonaparte.
Paris, France.
MR. OTTO HARRASSOWITZ, Leipzig.

MR. MARTINUS NIJHOFF, The Hague, Holland.
MESSRS. R. FIEDLANDER & SO UN, Berlin.



Sixty-Second
Annual Report of the
Government Cinchona Plantations
and Factory in Bengal

For the Year

1923-24

CALCUTTA -
Bengal Secretariat Book Depot,
1924.

SIXTY-SECOND ANNUAL REPORT
OF THE
GOVERNMENT CINCHONA PLANTATIONS AND FACTORY
IN BENGAL FOR THE YEAR
1923-24.

1. General.—The year under review has been a normal one so far as plantation and factory work are concerned. No outstanding developments are for record but the Department pursues a steady course of expansion which will require to be intensified as and when the recommendations of the Quinine Conference, held at Delhi in December 1923, are carried into effect.

Weather conditions during the year were not altogether favourable. Mungpoo with 112.18 and Munsong with 87.9 inches rainfall are 10 and 8.5 inches respectively below the averages of past years. There have now been two successive years of drought on Mungpoo through which cinchona has had to struggle but the adverse conditions have been successfully countered by improved methods of cultivation and taking all the blocks together cinchona is looking as well on this plantation as the writer has ever seen it.

More difficult to counter than adverse weather conditions are the attacks of *Helopeltis*. On both plantations this pest is on the increase and indeed the attacks have reached and maintained a severity that renders hand-picking ineffectual. The incidence is worst at lower elevations where certain blocks have their growth completely suspended for several months of the year. Coppicing as a preventative is beneficial in so far as the affected portions are removed entire but the disease quickly reasserts itself when the fresh shoots break. There seems, unfortunately, to be no entirely satisfactory method of dealing with the pest. A season unfavourable to the development of the insect will probably accomplish more than all the counter measures that practice could adopt.

On both plantations methods of planting not hitherto adopted on any large scale are under experiment. All extensions on Mungpoo have gone out on narrow contour terraces along with the Soy bean and a species of Tephrosia as green manures and light shade, a departure in method which makes possible the cultivation of cinchona on slopes that would otherwise remain unutilised on account of dangers of excessive wash.

A somewhat different method but with the same underlying idea has been followed on Munsong. Here retaining walls on the contour system have been constructed at intervals of 25 to 50 yards according to the slope and at longer intervals parallel strips of secondary jungle consisting mainly of stout, deep-rooted grasses have been left uncleared. Shallow drains leading at every gradients to the main jhoras complete the arrangement. For both methods the extra expense in the preparation of the land for planting is negligible while the results so far as these can at this stage be predicted are markedly superior to those on control areas. Much of the Munsong extension is on land that has already borne one cinchona crop. The secondary jungle was cut down early in the season when, instead of burning as has hitherto been the practice, it was allowed to rot and afterwards dug in. This practice is, of course, merely a repetition of what is done yearly during cultivation but is new so far as the preparation of land for taking cinchona is concerned and has been rendered possible by the nature of the jungle coming up after the first crop.

Areas not carrying a full complement¹ of trees at coppicing time are being filled up. For this purpose two-year old plants are being tried as seedlings fail to compete with the rapid coppice growth.

Plantation bark sufficient to meet current provincial requirements of quinine only has been put through the factory, the balance required to keep the factory working being from imperial stocks of Java origin. As the bark agreement does not terminate till 1928 and as considerable quantities of foreign bark are due for delivery only the minimum of local barks is being cropped. The present limitation to the use of plantation barks is the capacity of the factory which some ten years ago could turn out 55,000 lbs. annually but which now requires overtime working for 50,000 lbs. and this only if sufficient power is available. The present year has been particularly deficient in water supplies for the turbines in spite of the fact that additional water was available from the partially constructed nullah referred to in last year's report. The factory ran for 250 days throughout the year, a limit set by the power supply as well as by the budget allotment which was insufficient for longer working. As power is mostly consumed in the grinding house arrangements have been made to lay in a stock of ground bark during the rains when running can be continuous to be used during the dry season when power fails for processes other than extraction. By this means and by the additional power expected from the nullah when completed factory work throughout the year should again become possible.

Although the quinine agreement has terminated bringing outside supplies apart from those in bark form, to an end, stocks of the drug continue to mount up. The condition of affairs leading to this result was the subject of a protracted examination by the Government of

India during December 1923 when the whole quinine position was reviewed and discussed. The Committee appointed to advise Government reached certain conclusions lately to have a far-reaching effect on the future of the Department as well as on the health of the peoples for whom the Department exists. Its findings embodied the view that while stocks were increasing they had not yet reached proportions that would allow of an intensive anti-malarial campaign being initiated and continued. The quinine used in India under present economic conditions is but a fraction of what could be usefully and remuneratively employed and public health officers hold the view that it would be unfair to promote the creation of a demand that even the very large stocks now in hand and supplies in sight could not continue to satisfy.

The general quinine position remains much as it was at this time last year. Reports of a world shortage of the drug appearing in the Press from time to time fail to distinguish between an actual shortage of the commodity and a shortage in purchasing power. While world stocks are, possibly, not ample for a demand that might exist under more stable and favourable world conditions of trade generally they are and have been throughout the year more than sufficient to meet all the demand the world could afford to put forward for them.

The view shared by the writer is that quinine is at a price when buyers limit their requirements to the minimum and when many people simply do without it. Prices are still largely under the control of the quinine ring. Agreement succeeds agreement to regulate supply and restrict production. The hoped-for fall in price has not materialised nor can any substantial fall be looked for in the absence of outside factors capable of affecting control.

2. **Extensions, Acreages and Crops**—(a) *Mungpoo*.—The rainfall for the year was again below the average, being 112-18 inches only. The deficiency was most pronounced from October to March when 2-68 inches only were recorded. A series of somewhat violent windstorms in March uprooted many trees on exposed hill sides and was responsible for destruction to coolie houses but damage from such causes is of small consequence compared with the loss that goes on yearly through insect and fungus pests. Extensions comprised 50 acres *Cinchona Ledgeriana* on Labdah, 65 acres *C. succirubra* on Mungpoo and 35 acres *C. Ledger x succirubra* on Sittong divisions. Harvests were obtained by cutting out 93*5 acres of *C. Ledgeriana*, 9*8 acres of *C. succirubra* and 9-8 acres of *C. Hybrid* barks, the total of 113-1 acres giving 180,151 lbs. *C. Ledgeriana*, 26,140 lbs. *C. succirubra* and 9,075 lbs. *C. Hybrid*, or 215,366 lbs. in all. The average ages of the Ledger, succirubra and hybrid barks were 7-04, 11-2 and 8-3 years and the average annual bark increments per acre of the acreages 273, 237-2 and 111-6 lbs. respectively. The average age of all the acreages cut out is 7·5 years

and the average annual bark increment per acre calculated on these acreages is 253-3 lbs. The yield per acre over the period is therefore 1,900 lbs. This yield is not a true index of what the plantation reaches. The figure is vitiated by the fact that in past years one large block now finally uprooted was not written down fast enough with the result that the area appearing on the books was much above the area actually in existence.

Apart from sections of the Silake block where a southern exposure, poor soil and the ravages of *Helopeltis* combine to produce an effect fortunately rare on the plantation all blocks look well. Cinchona is seen at its best on Rungbee where an area recently put out is likely to prove of very special interest. The young plants here, the progeny of a single high trade tree, appear to be all of a type, a result very unusual even when great care is taken in the selection and crossing of the parent plants. If as there is some cause for hoping, these plants prove uniformly high in quinine content the result may be one of far-reaching importance to the plantations. The reputed high grade seed bought from Java some years ago is not proving up to its guaranteed standard. Indeed plants grown from this seed are no better than a type of plant common here now. At the end of the year there were 936-6 acres with a full complement of cinchona on Mungpoo Plantation. Details are available in Appendix A(1).

(b) *Munsong*.—Rainfall was 87-9 inches being 8-5 inches below the average of the past 23 years. From November to March 1-20 inch only was recorded. No excessive fall occurred, the highest being 3-57 inches, but with the rainfall in such pronounced defect the plantation had to suffer.

Another hailstorm, the severest ever experienced on the plantation, occurred towards the end of the year. Fortunately the damage was confined to a single strip running from the bottom of Munsong Division to above Kashyem bungalow. The violence of the storm is indicated by holes in the leaves of a large Agave plant near Munsong, measurement showing that the stones had gone through a \ inch of tough plant tissue. In the narrow track of the storm cinchona suffered badly. All divisions are looking as well as they have done in past years. Extensions have been resumed and these in particular are looking fresh and promising. As far as can be managed slopes with a northern exposure are being selected, the deleterious effect on cinchona of a southern exposure being pronounced on this plantation. The blocks were given as much cultivation as was possible with the labour available. The scattered nature of much of the cinchona on Munsong makes it difficult to get in the requisite number of sicklings during the rains, for the plants spaced as they are give little assistance in keeping down weeds. Contract labour was short resulting in a saving in the budget allotment.

Extensions were 100 acres *C. Ledgeriana* on Jashyem and 40 acres, also *Ledger*, on Sangser. Harvests were obtained by cutting out 125*7 acres of *C. Ledgeriana*, 1 acre *C. succirubra*, 10-1 acres *C. officinalis*, 9-9 acres *C. Hybrid II* and -9 acre *C. Hybrid III*, the total of 147-6 acres giving 378,089 lbs. *C. Ledgeriana*, 3,742 lbs. *C. succirubra*, 19,610 lbs. *C. oflicinalis*, 33,816 lbs. *C. Hybrid II* and 1,329 lbs. *C. Hybrid III*, or 436,086 lbs. in all. The average ages of the barks in the above order were 7-5, 9-8, 9-74, 8-28 and 5-22 years* and the average annual bark increments per acre of the acreages 400, 381-8, 200, 406-3 and 282-7 lbs. respectively. The average age of the total acreage cut out is 7»72 years and the average annual bark increment calculated on these acreages is 382.4 lbs. At the end of the year there were 2,118-4 acres with a full complement of cinchona on Munsong Plantation. Details are available in Appendix A(1).

(c) *Plantations as a whole.*—The total area under cinchona is 3,055 acres. Details of the species, the acreages going to be made up this total and their ages are available in Appendix A(2). In all cases the acreages are calculated as carrying their full complement of cinchona trees.

3. **Factory work.**—Besides 430,604 lbs. of Java bark for the Government of India 154,297 lbs. of Mungpoo bark (143,022 *Ledger*, 2,843 *succirubra* and 8,432 *hybrid*) and 307,002 lbs. Munsong bark (271,498 *Ledger*, 5,331 *succirubra* 15,814 *officinalis* and 14,359 *hybrid*) were worked up to produce about 19,207^ lbs. quinine sulphate, 530J lbs. ofier quinine salts 4£ lbs. quinidine salts, 181 lbs. quinoidine, and 7,859j lbs. cinchona febrifuge—a total of 27,782 lbs. provincial alkaloïds. Exact amounts are available in Appendix C(1). The Java bark produced 24,056l lbs. quinine sulphate and 4,983 lbs. cinchona febrifuge. The total production of quinine sulphate, both provincial and imperial, was 43,264 lbs., and the total products from all sources 56,822^ lbs. The amount of quinine sulphate proved by analysis to be present in the bark was 47,535 lbs.

4. **Cost and value of plantation bark.**—The average cost per lb. of all Mungpoo barks taken over a series of year is 3-6 annas and of Munsong barks 2-7 annas. The cost of the 215,366 lbs. Mungpoo bark harvest is, therefore, Rs. 54,707 and of the Munsong 436,086 lbs. harvest Rs. 73,589. The unit rate for bark being 1-5 annas the average Mungpoo bark quinine percentage of 4*4, gives the harvest from this plantation a value of Rs. 88,839 or Rs. 34,132 more than it cost. On a basis of an average quinine percentage of 4-39 and the same unit rate the Munsong harvest valuation is Rs. 1,78,863 or Rs. 1,05,274 more than it cost. The year's expenditure for both plantations including their share of general charges is Rs. 2,09,697 while harvests costing Rs. 1,28,296 and valued at Rs. 2,67,702 are the year's return for past expenditure.

5. Cost and value, of quinine produced.—(a) *Cost in the bark.*—The 19,207 lbs. of quinine extracted were contained in 461,299 lbs. of mixed Mungpoo and Mimsong barks, which cost (154,297 lbs. at 3-6 annas and 307,002 lbs. at 2-7 annas per lb.) Es. 86,513. The cost per lb. of quinine in the bark was, therefore, Es. 4-5.

(b) *Cost of extraction, packing and delivery to railway.*—This is calculated on the total extraction of quinine both provincial and imperial. The total direct expenditure on the factory was Es. 1,21,973-9, general charges debitable to factory account Es. 3,984-2, factory depreciation charges Es. 5,183, stores (oil, chemicals, etc.) depreciation charges Es. 5,855-5-6, the gross factory expenditure being, therefore, Es. 1,36,996-0-6. From this has to be deducted expenditure on products both imperial and provincial other than quinine sulphate Es. 27,647-7-5 leaving Es. 1,09,348-9-1 net expended on the production of 43,264 lbs. provincial and imperial quinine sulphate. The cost of extraction, packing, etc, is, therefore, Es. 2-527 per lb., a figure slightly below that of last year.

(c) *Total cost per lb. and value.*—This is made up of the cost in the bark—Es. 4-5 and the cost of extraction, etc., Bs. 2-527, a total of Es. 7-027. The present wholesale rate being Rs. 26 per lb., the 19,207 lbs. provincial quinine manufactured are worth Bs. 4,99,395 but cost only Es. 1,34,971.

6. Sales and selling rates—A statement of the sales of factory products for 1923-24 is available in Appendix G. Sales of quinine sulphate have increased some 4,690 lbs. As an examination of distribution showed that the areas of supply allotted to the Governments of Bengal, Madras and India were not being strictly adhered to orders were issued to all Departments to regulate distribution in such a way as to prevent any district getting its supplies from other than the proper source. The amount of cinchona febrifuge sold was 12,478 lbs. of which 2,000 lbs., the cost of which was not borne by the Bengal Cinchona Department, were received from the Madras Cinchona Department and 2,621 lbs. belonged to the Government of India. Credit in these accounts is, therefore, taken for the proceeds from the sale of 7,856 lbs. provincial febrifuge only. The excess credit lying with Bengal will be adjusted hereafter in transfer account.

i Selling rates were as follows: Quinine sulphate Es. 27 to Es. 29. Other quinine salts Es. 35 to Es. 40. Cinchonine and Cinchonidine salts Es. 12 to Es. 13. Quinoidine Es. 6 to Es. 8 and Cinchona febrifuge Es. 8 to Es. 10. All these rates are based on, and are liable to fluctuate with market rates.

Eupees 4,36,945-14-3 were obtained from the sale of 13,348 lbs. Quinine sulphate converted to tablets in the Juvenile Jail but of this sum half only is taken as credited to the Cinchona Department. Details of the monthly receipts from this source are available in Appendix H.

7. Expenditure and receipts.—The total expenditure on the department detailed in Appendix D was Rs. 3,35,655-4-3. The total receipts including Rs. 550-15 received direct were Rs. 7,92,480-9-3, of which Rs. 1,39,684-7 were credit and Rs. 6,52,724-2-3 cash. These receipts include the Jail share amounting to Rs. 2,18,472-15 of proceeds from the sale of quinine tablets, but do not include proceeds from the sale of Cinchona febrifuge belonging to the Government of India. The net receipts properly creditable to the Cinchona Department are therefore Rs. 5,73,935-10-3, but sums of Rs. 60,790-12 and Rs. 9,966 are still due from the Government of India to cover the cost of extracting 24,056½ lbs. Quinine sulphate at Rs. 2-527 per lb. and 4,983 lbs. Cinchona febrifuge at Rs. 2 per lb. Reference to the profit and loss valuation account will show that a further sum of Rs. 45,220-6, all good debt, was outstanding at the end of the year.

8. Quinine reserve and stock account.—Full details of stocks in hand are available from Appendices C(1) and C(2). The provincial reserve of quinine is some 3,886 lbs. lower at the end of the year due to an increase in the consumption as compared with last year, and now stands at 27,799 lbs. 10½ oz. Stocks of other products are, however, slightly up on the years working. The 7,859½ lbs. provincial Cinchona febrifuge manufactured have been sold leaving all stocks of this product in hand at the end of the year both at the factory and jail the property of the Government of India.

The stock of plantation bark at the end of the year was 355,081 lbs. against 168,928 lbs. carried over from last year. This is a very large increase due to the amount of Java bark arriving and requiring to be worked up. Harvests from the plantations are being restricted by the removal of thinnings and casualty trees only and with half the Java bark now going to Madras, bark on balance at the end of the year should gradually become less. While the oil account shows a slight increase in the new carry over chemicals and stores are some Rs. 7,307 down on the year's working. The total value of stock carried over is Rs. 6,97,584-3-9 against an opening balance of Rs. 7,19,373-12-6.

As regards valuation rates the figures employed last year have again been utilised, Quinine sulphate, the main item, is carried at Rs. 20 per lb. a figure considerably below its present market value. It would conform more closely with commercial methods to value stocks at cost or market rate whichever is less but pending decision on the question of commercialising the accounts the old system of valuation has been retained,

9. Block account.—Excluding the value of extensions which for purposes of the block account are taken at cost price, the increase in value of Cinchona trees at the end of the year is Rs. 3,75,837.

Each block of Cinchona[^] has been valued separately on the basis of the analytical figure for its bark sample and a unit rate of 1-5 annas. The method of valuation is not as reliable as could be wished but it is difficult to devise a system that gives approximation to the results known only when the blocks are finally uprooted. The annual bark increment figures hitherto taken for Munsong will probably have to be reduced. In the writer's opinion the system leads to overvaluation of this plantation. Cinchona trees are valued at Es. 2,325,233; fuel and timber trees at Es. 2,81,063. See Appendix F for further information.

10. **Profit and loss valuation.**—The valuation profit balance of Es. 7,30,386-15-3 may be considered a very satisfactory result of the year's working. It should be noted that outstandings in this account include a sum of Es. 70,756-12* due from the Government of India for work done. The exchange account between the two Governments results in a net debit of Es. 49,465-12* only against the Central Government but this account credits the local Government with proceeds from the sale of Cinchona febrifuge belong to India which the sales shown in Appendix E do not include.

11. **Land rent.**—From Mungpoo the sum of[^] Es. 5,266-8-9 was collected during the year and paid into the Darjeeling treasury. From Munsong Es. 1,322-4-6, representing fees collected from cattle grazing within the cinchona boundary, were paid into the Kalimpong sub-treasury for credit to the Forest Department. No credit is taken for these sums in the accounts of the Cinchona Department.

12. **Staff.**—Lieut.-Colonel A. T. Gage, C.I.E., I.M.S., was on leave throughout the year during which time the writer officiated as Superintendent. Mr. G. E. Shaw, was Government Quinologist and Mr. S. C. Sen Assistant Quinologist throughout the year. Mr. H. Thomas was Manager, Messrs. Fothergill and Richards, Assistant Managers, Cinchona Plantation Munsong, throughout the year. Mr. Fothergill was on leave for one month from 14th January 1924, when Mr. J. Hulbert, Overseer, officiated in his place.

Mr. P. V. Osborne was Manager, Mr. P. W. Cresswell, Assistant Manager and Messrs. Holl and Harkaman Lama were Overseers, Cinchona Plantation, Mungpoo, throughout the year. The Head Clerk, Babu S. K. Mitra, was on leave from 2nd January 1924 till the end of the year during which time Babu A. T. Banerjee, 7th Clerk, officiated in his place. All officers of the plantations and factory and the clerical establishment have performed their duties satisfactorily.

13. **Medicinal plants other than cinchona.**—About 47,500 *Ipecacuanlia* plants were raised from seed for planting in a new nursery

* Exclusive of pensionary charges.

500 feet or so higher than the old beds. During the cold season temperatures in the valley, where the old beds were situated, are believed to go lower than they do higher up. The change in site is an attempt to avoid the evil effects on *Ipecacuanha* of excessive daily fluctuations of temperature. Stocks of the plant are looking well. Already about 3 lbs. of Emetine hydrochloride have been extracted.

The cultivation of *Digitalis* is being continued but the limited demand makes it questionable whether it is worth while to go on with this crop.

C. C. CALDER,
Oftg. Superintendent,
Royal Botanic Garden, Calcutta,
and of Cinchona Cultivation in Bengal.

APPENDIX A(D).

Detailed statement of acreage with full complement of cinchona in the Government Cinchona Plantations, Darjeeling district, on 31st March 1924.

Species.	Number of acres carrying trees of—				Total No. of acres.
	0—5 years old.	6—10 years old.	11—15 years old.	16 years old and upwards.	
1	2	3	4	5	6
I.—MUNGPOO PLANTATION.					
<i>(a) Mungpoo Division.</i>					
Cinchona Ledgeriana ..	281.3	87.6	..	..	368.9
„ succirubra ..	..	2.6	..	39.8	107.4
„ (ledger x succirubra)	30.4	..	..	2.5	32.9
Total ..	376.7	90.2	..	42.3	509.2
<i>(b) Sittong Division.</i>					
Cinchona Ledgeriana ..	196.4	19.2	..	..	215.6
„ succirubra ..	15	..	..*	..	15
„ (ledger x succirubra)	35	..	..	..	35
Total ..	246.4	19.2	..	..	265.6
<i>(c) Labdah Division.</i>					
Cinchona Ledgeriana ..	135	..	..	..	135
„ (ledger x succirubra)	26.8	..	..	..	26.8
Total ..	161.8	..	..	..	161.8
II.—MUNSONG PLANTATION.					
<i>(a) Munsong Division.</i>					
Cinchona Ledgeriana ..	284.3	154.5	..	..	438.8
„ (lodger x officinalis)	6.9	..	..	..	6.9
„ (ledger x succirubra)	94.5	38.8	20.4	..	153.7
Total ..	385.7	193.3	20.4	..	599.4

Species.	Number of acres carrying trees of—				Total No. of acre?.
	0—5 years old.	6—10 years old.	11—15 years old.	16 years old and upwards.	
1	2	3	4	5	6
II.—MUNSONG PLANTATION—<i>contd.</i>					
<i>(b) Kashyem Division.</i>					
Cinchona Ledgeriana ..	185	188.1	41.3	..	414.4
„ officinalis ..	..	36.2	29.6	..	65.8
„ succirubra ..	..	..	1.5	..	1.5
„ (ledger x officinalis)	34.8	..	..	..	34.8
„ (ledger x succirubra)	..	16	..	..	56
Total ..	219.8	280.3	72.4	..	572.6
<i>(c) Burmiak Division.</i>					
Cinchona Ledgeriana ..	122.2	293.3	35.4	..	450.9
„ officinalis ..	..	42.6	..	..	42.6
„ succirubra ..	..	8.6	..	..	8.6
„ (ledger x officinalis)	66.2	..	..	..	66.2
„ (ledger x succirubra)	..	13.6	..	..	13.6
Total ..	188.4	358.1	35.4	..	581.9
<i>(a) Sangser Division.</i>					
Cinchona Ledgeriana ..	261.2	71.9	..	..	333.1
„ succirubra ..	..	9	..	..	9
„ (ledger x succirubra)	..	22.5	..	..	22.5
Total	261.2	103.4	..	..	364.6

APPENDIX A(2).

Abstract of acreage with full complement of cinchona in the Government Cinchona Plantations, Darjeeling district, on the 31st March 1924.

Species.	Number of acres bearing trees of—				Total acreage.
	0—5 years old.	6—10 years old.	11—15 years old.	16 years old and over.	
1	2	3	4	5	6
Cinchona Ledgoriana ..	1,465.4	814.6	76.7	..	2,356.7
„ officinalis ..	..	78.8	29.6	..	108.4
„ succirubra ..	80	20.2	1.5	39.8	141.5
„ (ledger x officinalis)	107.9	..	..	..	107.9
„ (ledger x succirubra)	186.7	130.9	20.4	2.5	340.5
Total ..	1,840	1,044.5	128.2	42.3	3,055

APPENDIX B.

Receipts for 1923-24.

Transactions of the year.	Sales to Government Offices and institutions.		Sales to the public for cash payment.		Total.
	Cash sales.	Book credit.	In tablets.	In tins in powder form to Native States, Municipal and Local Funds, Dispensaries, Missionary bodies and others.	
1	2	3	4	5	6
	Rs. A.	Rs. A.	Rs. A.	Rs. A.	Rs. A.
Quinine sulphate	1,07,615 12	1,24,122 4	2,18,472 15*	35,844 0	4,86,054 15
Other quinine salts	225 9	14,960 0	..	115 10	15,301 3
Cinchona febrifuge	..	..	..	..	69,197 4
Cinchonidine salts	51 0	17 0	..	..	68 0
Cinchonine salts	7 9	13 0	..	44 12	65 5
Quinidine salts ..	..	91 0	..	..	91 0
Quinoidine ..	149 0	80 0	..	378 0	607 0
Bark	25 0	..	..	1,975 0	2,000 0
Miscellaneous ..	149 12	401 3	..	..	550 15
Total ..	1,08,223 10	139,684 7	2,18,472 15	38,357 6	5,73,935 10

* This sum is half of Rs. 4,36,945-14-3 being value of 13,348 lbs. of quinine sulphate sold in form of treatments. The remaining sum of Rs. 2,18,472-15-0 is credit to the Prison Department.

APPENDIX 0(1).

Stock Account, 1923-24.

	Quinine sulphate.			Other quinine salts.		
	Quantity.	Rate per lb.	Value.	Quantity.	Rate per lb.	Value.
1	2	3	4	5	6	7
	lbs. oz.	Rs.	Rs. A.	lbs. oz.	Rs.	Rs. A.
Balance on 1st April 1923	31,685 9	20	6,33,711 4	102 1	25	2,550 12
Purchased .. ..	..	..	..	..	..	..
Harvested .. ..	..	..	..	..	..	..
Used in factory ..	..	..	..	..	..	..
Manufactured ..	19,207 61	7.027	1,34,970 7	530 71	10	5,304 11
Issued or sold ..	23,093 5	..	4,86,054 15	394 8	..	15,301 3
Balance on 31st March	27,799 101	..	5,55,993 2	238	..	5,950 0

	Quinidine sulphate.			Cinchonine salts.		
	Quantity.	Rate per lb.	Value.	Quantity.	Rate per lb.	Value.
1	2	3	4	5	6	7
	lbs. oz.	Rs.	Rs. A.	lbs. oz.	Rs.	Rs. A.
Balance on 1st April 1923.	6 Hi	20	134 6	20 151	10	209 11
Purchased .. ..	..	..	..	..	..	..
Harvested .. ..	..	..	..	..	..	..
Used in factory ..	..	..	..	..	..	..
Manufactured ..	4 8J	10	45 5	..	..	..
Issued or sold ..	2 0	..	91 0	4 13	..	65 5
Balance on 31st March	9 4	20	185 0	16 24	10	161 9

	Cinchonidine salts.			Quinoidine.		
	Quantity.	Rate per lb.	Value.	Quantity.	Rate per lb.	Value.
1	2	3	4	5	6	7
	lbs. oz.	Rs.	Rs. A.	lbs. oz.	Rs.	Rs. A.
Balance on 1st April 1923	4 0	15	60 0	74 0	2	148 0
Purchased .. .. .	..	..	..	..	..	..
Harvested .. .. .	..	..	..	..	..	..
Used in factory .. .. .	..	..	..	..	..	..
Manufactured .. .. .	..	..	..	181 0	3	543 0
Issued or sold	4	..	68 0	89 0	..	607 0
Balance on 31st March 1924	nil	..	..	166 0	2	332 0

	Cinchona Febrifuge.			Cinchona Bark.		
	Quantity.	Rate per lb.	Value.	Quantity.	Rate per lb.	Value.
1	2	3	4	5	6	7
	lbs. oz.	Rs.	Rs. A.	lbs.	Annas.	Rs. A.
Balance on 1st April 1923	..	..	..	168,928	5	52,790 3
Purchased .. .. .	..	..	..	..	*..	..
Harvested .. .. .	..	..	..	651,452	..	1,80,661 0
Used in factory .. .. .	..	..	..	461,299	..	86,522 0
Manufactured	7,859 8	2	15,719 0	..	..	..
Issued or sold	7,859 8	..	67,197 4	4,000	8	2,000 0
Balance on 31st March 1924	..	..	..*	355,081	5	1,10,962 0

	Oil.			Chemicals and stores.	Grand Total.
	Quantity.	Rate per gallon.	Value.	Value.	Value.
1	2	3	4	5	6
	Gallons	Rs.	Rs. A. p.	Rs. A. p.	Rs. A. P.
Balance on 1st April 1923.	10,304	Various	9,804 5 0	19,905 3 0	7,19,373 12 0
Purchased ..	21,095	..	18,239 10 3	49,372 7 0	07,012 1 3
Harvested .. ..	..	..	....	....	1,80,001 0 0
Used in factory ..	18,572	..	10,701 7 9	50,705 15 0	1,59,989 0 9
Manufactured ..	..	..	....	....	1,34,970 7 0
Issued or sold ..	..	..	....	....	5,71,384 11 3
Balance on 31st March 1924.	13,487	..	11,342 8 0	12,058 0 9	0,97,584 3 9

APPENDIX C(2).

Detailed Stock Account of barks for 1923-24.

	Cinchona Ledgeriana.			Cinchona officinalis.		
	Quantity.	Rate per lb.	Value.	Quantity.	Rate per lb.	Value.
1	2	3	4	5	6	7
	lbs.	Annas	Rs. A.	lbs.	Annas.	Rs. A. .
Balance on 1st April 1923 ..	150,914	5	49,035 13	3,105	5	989 1
Harvested ..	558,240	•Various	1,0^,335 0	19,010	27	3,309 0
Used in factory ..	414,520	..	77,995 0	15,814	2-7	2,608 0
Sold .. ..	..	..	..	..	..	..
Balance on 31st March 1924 ..	3,006	5	93,948 0	0,901	5	2,175 0

* 3*6 annas for Mungpo) bark ami 27 annas for Mungsong bark.

				Cinchona succirubra.		
				Quantity.	Rate per lb.	Value.
1				2	3	4
				lbs. «	Annas.	Rs. A.
Balance on 1st April 1923	..	..	..	8,849	5	2,765 5
Harvested	..	..	..	29,882	Various*	% 65,129 0
Used in factory	..	..	..	8,174	..	1,539 0
Sold	..	..	..	4,000	8	2,000 0
Balance on 31st March 1924	..	..	..	26,557	5	8,299 0

1	Cinchona (Ledger x succirubra).			Cinchona (Ledger x officinalis).		
	Quantity	Rate per lb.	Value.	Quantity.	Rate per lb.	Value.
2	3	4	5	6	7	
lbs.	Annas	Rs.	lbs.	Annas	Rs.	
Balance on 1st April 1923. ^N	nil	..	..	nil	..	..
Harvested	42,391	* Various	7,664	1,329	2-7	224
Used in factory	21,462		4,096	1,329	2-7	224
Sold	..	..	..	..	..	..
Balance on 31st March 1924.	20,929	5	6,540	..	..	..

* 3*6 annas per lb. for Mungpoo and 2*7 annas for Munsong bark.

APPENDIX D.

Expenditure for 1923-24.

I.—PLANTATIONS ACCOUNT.

A.—MUNOROO PLANTATION.

Salaries.

					Rs.	A.	r.
1.	Manager and Assistant Manager	..	..	..	8,848	0	3
2.	Overseers	..	..	..	2,570	0	0
3.	Duty allowance	..	..	..	1,200	0	0
4.	Exchange compensation allowance	..	..	..	.....

Establishment.

5.	Sub-Overseer	..	..	..	1,420	0	0
6.	Sub-Assistant Surgeon	..	..	..	1,856	1	0
7.	Artificers	..	..	..	300	0	0
8.	Sirdars and coolie,?	..	..	..	54,273	8	6

Allowances.

9.	Travelling allowance	..	..	% m m m	46	7	0
10.	Pony allowances	..	..	—	1,038	0	0
11.	Compensation for dearness of provisions			%	.....	

Contingencies.

12.	Purchase and keep of ponies and bullocks	..	•	•	2,160	0	0
13.	Purchase of manure	..	..	..	.....
14.	Purchase of seeds	..	..	..	.....
15.	Carriage charges	..	..	..	8	13	0
16.	European stores	..	..	..	755	8	0
17.	Freight	..	..	..	62	2	0
18.	Buildings	..	..	..	911	10	0
19.	Machinery and plant	..	..	..	.....
20.	Miscellaneous	..	..	..	4,086	0	3
21.	Servants' clothing	..	..	..	.....
22.	Labour of malis	..	..	..	2,280	0	0
	Total Mungpoo charges	..			81,948	8	0

B.—MUNSONG PLANTATION.

Salaries.

					Rs.	A.	P.
1.	Manager and Assistant Managers	..	..	..	16,612	11	0
2.	Overseers	..	..	..	2,122	5	0
3.	Duty allowance	..	..	..	1,600	0	0
4.	Exchange compensation allowance	..	..	..	.....

IX

Establishment,

		Pis.	A.	P.
5. Clerks	••	••••		
6. Sub-Assistant Surgeon	••	2,600	3	6
7. Artificers	••	••••		
S. Sirdars and coolies	••	82,276	15	3

Allowances.

9. Travelling allowance	•	74	2	0
10. Pony allowances	-•	1,440	0	0
11. Compensation for dearness of provisions	••••			

Contingencies.

12. Purchase and keep of ponies and bullocks .. * -	•	2,100	0	0
13. Purchase of manure	•	—		
14. Purchase of seed	•	••••		
15. Carriage charges	•	5,608	11	6
16. European stores	•	1,688	2	0
17. Freight	•	101	2	0
18. Buildings	•	1,999	14	0
19. Machinery and plant	•	••••		
20. Miscellaneous	•	2,771	15	0
21. Afforestation charges	•	••••		
22. Servants' clothing	•	—		
Total Munsong charges ..		1,21,116	1	3
Total for both plantations ..		2,03,064	9	3

It.-FACTORY ACCOUNT.

Salaries.

		R3.	A.	P.
1. Quinologist	•	21,496	7	0
2. Assistant Quinologist	•	6,354	11	3
3. Manufacturing Chemist	•	••••		

Establishment.

4. Clerks	•	815	-0	0
5. Servants	•	••••		
6. Artificers	•	—		
7. Sirdars and coolies	•	8,745	3	0

Allowances.

8. Travelling allowance	•	30	0	0
9. Compensation for dearness of provisions	•	••••		

X

Contingencies.

	Rs.	A.	P.
10. Purchase of machinery .. .. .	.....	
11. Buildings	3,497	15	0
12. European stores	27,966	4	0
13. Freight	4,220	13	0
14. Chemicals	26,944	9	0
15. Fuel (carriage and cutting up only)	10,063	12	0
16. Purchase of bark (carriage only)	3,813	9	3
17. Purchase of cinchona febrifuge .. .. .	.....	
18. Packing materials	2,527	15	0
19. Distribution charges	337	5	0
20. Miscellaneous	5,160	1	6
21. Servants' clothing .. .. .	.....	
Total Factory charges ..	1,21,973	9	0

III.—GENERAL.

Salaries.

	Rs.	A.	P.
1. Superintendent	2,400	0	0

Establishment.

2. Clerks	5,716	7	0
3. Servants	236	H	0

Allowances.

4. Travelling allowances .. .. .	.....	
5. Compensation for dearness of provisions .. .. .	.....	

Contingencies.

6. Miscellaneous .. .. .	.....	
7. Postage and telegrams "	^90	0	0
8. Advertising charges .. .. .	.....	
9. Subscriptions to newspapers and periodicals .. .. .	.....	
10. Purchase and repair of furniture .. .. .	.....	
11. Road and Public Works Cess	1,814	0	0
Total General charges ..	10,617	2	0

IV.—ABSTRACT.

	Rs.	A.	P.
Total Mungpoo charges	81,948	8	0
„ Munsong „	1,21,116	1	3
„ Factory „	1,21,973	9	0
„ General „	10,617	2	0
GRAND TOTAL EXPENDITURE ..	3,35,655	4	3

APPENDIX E.

Profit and Loss Valuation, 1923-24.

---	Amount.			---	Amount.		
1	2			3	4		
	Rs.	A.	p.		Rs.	A.	p.
To -				By—			
Stock on 1st April 1923	7,19,373	12	6	Arrears recovered ..	4,171	3	0
Outstanding on 1st April 1923 ..	4,171	3	0	Sales during the year	5,73,935	10	3
Expenditure (less Rs. 29,000 capital expenditure) ..	3,06,655	4	3	Outstandings on 31st March 1924 ..	1,15,977	2	0
Depreciation on buildings ..	3,199	0	0	Stock on 31st March 1924 ..	6,97,584	3	9
Depreciation on machinery ..	3,719	0	0	Gain in revaluation of Cinchona trees ..	3,75,837	0	0
Balance (profit) ..	7,30,386	15	3	Timber trees ..	.....	
Total ..	17,67,505	3	0	Total ..	17,67,505	3	0

* This includes outstandings of Js. 70,756-12 against the Government of India.

APPENDIX F.

Block Account, 1923-24.

I.—MUNGPOO PLANTATION.

---	Amount.			---	Amount.		
1	2			3	4		
	Rs.	A.	p.		Rs.	A.	P.
To—				By—			
Value of buildings on 1st April 1923 ..	27,272	0	0	Depreciation on buildings at 2½ per cent.	737	0	0
Machinery (Sirocco driers) ..	921	0	0	Value of buildings on 31st March 1924 ..	26,535	0	0
Value of plantation on 1st April 1923—				Depreciation on machinery at 5 per cent.	54	0	0
Cinchona trees ..	3,70,123	0	0	Value of machinery on 31st March 1924 ..	867	0	0
Timber trees ..	2,72,033	0	0	Value of plantation on 31st March 1924—			
Value of extensions at cost made in 1923-24—				Cinchona trees ..	3,92,616	0	0
Cinchona trees ..	15,000	0	0	Timber trees ..	2,72,733	0	0
Timber trees ..	700	0	0				
Gain on revaluation of plantations at end of 1923-24 (extensions for the year excluded)—							
Cinchona trees ..	7,493	0	0				
Timber trees ..	.....					
Total ..	6,93,542	0	0	Total ..	6,93,542	0	0

II.—MUNSONG PLANTATION.

	Amount.		Amount.
1	2	3	4
	Rs. A. p.		Rs. A. r.
To—		By -	
Value of buildings on 1st April 1923 ..	34,942 0 0	Depreciation on buildings at 2½ per cent.	944 0 0
Value of plantation on 1st April 1923—		Value of buildings on 31st March 1924 ..	33,998 0 0
Cinchona trees ..	15,50,973 0 0	Value of plantation on 31st March 1924—	
Timber trees ..	8,330 0 0	Cinchona ..	19,32,017 0 0
Value of extension at cost made in 1923-24—		Timber trees ..	8,330 0 0
Cinchona trees ..			
Timber trees ..			
Gain on revaluation of plantations at end of 1923-24 (extensions for the year excluded)—	13,300 0 0		
Cinchona trees ..			
Total ..	1,97,57,889 0 0	Total ..	1,97,57,889 0 0

III.—FACTORY.

	Amount.		Amount.
1	2	3	4
	Rs. A. p.		Rs. A. p.
To—		By -	
Value of buildings on 1st April 1923 ..	56,199 0 0	Depreciation on buildings at 2½ per cent.	1,518 0 0
Value of machinery on 1st April 1923 ..	62,321 0 0	Value of buildings on 31st March 1924 ..	54,681 0 0
		Depreciation on machinery at 5 per cent.	3,665 0 0
		Value of machinery on 31st March 1924 * ..	58,656 0 0
Total ..	1,18,520 0 0	Total ..	1,18,520 0 0

*Value of cinchona trees Rs. 23,25,233, timber trees Rs. 2,81,063, of buildings Rs. 1,15,214, of machinery Rs. 59,523, total value Rs. 27,81,033.

APPENDIX CL

Statement of sales of factory products during the official year 1923-24.

Territories.	Quinine salts.	Cinchonine and cinchonidine salts.	Cinchona febrifuge.	Quinine salts and quinine.	Cinchona bark.	Total.
	lbs. oz.	lbs. oz.	lbs. <z.	lbs.	lbs.	lbs. <DZ.
<i>Assam.</i>						
Jails ..	37 8	..	1 8	..	..	39 0
Dispensaries ..	435 10	3 0	749 4	10	..	1,197 14
District Boards ..	1 0	..	..	..	..	1 0
Missionary bodies ..	7 0	..	80 8	..	..	87 8
Others ..	10 8	..	80 0	..	..	90 8
<i>Bengal.</i>						
Jails ..	13,539 12	..	33 0	..	..	13,572 12
Medical Store Depot ..	2,725 0	..	200 0	..	..	2,926 0
Dispensaries ..	2,176 10	..	7,053 8	4	50	9,284 2
District Boards ..	478 0	..	425 8	..	..	904 8
Missionary bodies ..	214 12	..	174 12	5	..	395 8
Others ..	278 4	1 12	748 0	34	3,950	5,012 0
<i>Bihar and Orissa</i>						
Jails ..	20 0	..	15 0	..	..	35 0
Dispensaries ..	1,439 0	0 1	(506 0	1	..	2,046 3
District Boards ..	209 0	..	81 0	..	..	290 0
Missionary bodies ..	17 0	..	103 8	5	..	125 8
Others ..	195 0	..	30 8	..	..	225 8
<i>Punjab.</i>						
Jails ..	430 0	..	9 0	1	..	440 0
Dispensaries ..	227 0	..	43 0	..	..	270 0
District Boards ..	..	..	..	..	..	..
Missionary bodies ..	51 0	..	64 8	7	..	122 8
Others ..	18 0	3 0	24 0	1	..	46 0
<i>Other Provinces and States.</i>						
Jails ..	14 8	..	60 0	..	..	74 8
Dispensaries ..	373 4	..	615 0	..	..	988 4
District Boards ..	..	..	12 0	..	..	12 0
Missionary bodies ..	85 8	..	337 0	23	..	445 8
Others ..	551 0	..	997 8	..	..	1,548 8
Total ..	23,534 6	8 13	12,545 0	91	4,000	40,179 8

"APPENDIX H.

Sale of sulphate of quinine in " treatment " tablets during 1923-14.

Consecutive No.	Months.	Total proceeds from sale of tablets.	Credited to Cinchona Department at half rate.
1	2	3	4
	1923	Re. A. P.	Rs. A. P.
1	April	18,312 0 0	9,156 0 0
2	May	30,907 13 0	15,453 14 6
3	June	34,651 8 3	17,325 12 1
4	July	46,529 13 0	23,264 14 6
8	August	37,901 10 3	18,950 13 1
6	September	52,360 14 0	26,180 7 0
7	October	38,958 8 3	19,479 4 1
8	November	50,336 8 9	25,168 4 4
9	December	38,030 5 6	19,015 2 9
	1924		
10	January	51,375 2 3	25,687 9 1
11	February	21,649 11 0	10,824 13 0
12	March	15,932 0 0	7,966 0 0
	Total ..	4,36,945 14 3	2,1M72 14 11

*¹ Supplied by the Accountant-General, Bengal.

GOVERNMENT OF BENGAL.

REVENUE DEPARTMENT.

Cinchona.

CALCUTTA, THE 21ST NOVEMBER 1924.

RESOLUTION-No. 9275Cin.

"READ—

The Sixty-Second Annual Report of the Government Cinchona Plantations and Factory in Bengal for the year 1923-24.

READ ALSO—

The Report of the previous year.

The Sixty-Second Annual Report of the Government Cinchona Plantations and Factory in Bengal, written by the officiating Superintendent Mr. Calder, is an interesting and satisfactory record of the work done during the year 1923-24.

The policy of the Government of Bengal is to maintain and, if possible, extend the Cinchona Plantations and at the same time to improve and develop the factory, in order to meet the requirements of the province. The extension of the plantations is limited by the fact that cinchona is a plant that requires a certain combination of soil, rainfall and elevation, and will not grow unless these three conditions are suitable. It is therefore a matter of satisfaction that in spite of a deficient rainfall in both the Mungpoo and Munsong plantations and difficulty in obtaining labour, the Superintendent is able to record an increase in the area under cinchona from 3,026 acres in 1922-23 to 3,055 acres in 1923-24. The Governor in Council hopes that it will be possible during the present year to make a further extension of the area.

The factory deals not only with the bark produced on the Bengal plantations, but also with Java bark purchased by the Government of India, which pays this Government for the cost of extraction. It depends on the supply of water for its power, and was affected in the year under report by the deficient rainfall. The Superintendent hopes to obtain a better supply of water from a new channel. The total products from both the local and Java bark were 56,822 lbs., of which 43,264 lbs. were quinine sulphate, being nearly the same as the quantities produced last year. The fact that analysis showed that the amount of quinine sulphate present in the bark was 47,535 lbs., whilst 43,204 lbs. were actually extracted, shows that the methods followed in the factory are efficient.

The price at which quinine sulphate was sold during the year was Rs. 27 to Rs. 29. The selling rate is based on and fluctuates with the market rate ; it may be noted for comparison that before the War, the price was Rs. 11-8 and rose to Rs. 48 in 1922. The financial results to the province have naturally varied with the market rates, which are beyond the control of Government, but it is satisfactory to find that whilst the total expenditure on the department was Rs. 3,35,655, the total receipts were Rs. 7,92,480. These receipts include a sum of Rs. 2,18,473 credited to the Juvenile Jail, Alipore, in accordance with the arrangement by which that Jail manufactures quinine tablets and distributes quinine products. The profit and loss valuation shows a profit balance of Rs. 7,30,387. His Excellency in Council agrees with the Superintendent that this may be considered a very satisfactory result of the year's working.

The Governor in Council takes this opportunity of placing on record his appreciation of the valuable work done by Lieutenant-Colonel A. T. Gage, C.i.E., I.M.S., now on leave, during the many years he held charge of the plantations. The thanks of Government are also due to Mr. G. B. Bhow, Government Quinologist, for the efficient working of the factory, and to Mr. C. G. Calder, who has officiated as Superintendent since the beginning of 1923, for his interesting report and his successful administration of the plantations.

By order of the Governor in Council,

W. S. HOPKYNS,

Secretary to the Government of Bengal (offg.).

AGENTS IN INDIA.

Bengal-

MESSRS. A. H. WHEELER A Co., Calcutta.
MESSRS. B. BANERJEE A Co., 26, Coru-
wallis Street, Calcutta.
MESSRS. BUTTERWORTH A CO. (INDIA),
LD., Calcutta.
Mn. G. N. HALDER, Calcutta.
THE INDIAN SCHOOL SUPPLY DEPOT,
309, Bowbazar, Calcutta.
THE PROPRIETOR, INTERNATIONAL
BUDDHIST BOOK DEPOT, 4, Oimudoe
Chowk, 1st Laue, Calcutta.
MESSRS. LALL OH AND A SONS, 70, Lower
Circular Road, Calcutta.
HAI M. O. SARKAR BAHADUR A SONS,
80-2A, Harrison Koad, Calcutta.
MESSRS. NEWMAN A Co., Calcutta.
MESSRS. R. OAMBRAT A Co., Calcutta.
MESSRS. S. K. LAIHKI A Co., Printers
and Booksellers, College Street, Calcutta.
THE STANDARD LITERATURE COMPANY,
LD., 13-1, Old Court Hovi9e Street,
Calcutta.
MESSRS. THACKER, SPINK A CO., Calcutta.
THE WELDON LIBRARY, 18-5, Ohowringhee
Hoad, Calcutta.
THE YOUNG MEN'S CHRISTIAN ASSOCIA-
TION PRESS, Calcutta.
BABU JADUNATn HALDAR, Muktear and
Revenue Agent, Gorabazar, Murshidabarf.
BABU S. C. TALUKDAR, Pioprietor,
Students A Co., Ooch Behar.
BABU B. O. BASAK, Proprietor, The Albert
Library, Nawabpur, Dacca,

Bombay.

MESSRS. A. II. WHEELER A Co., Bombay.
MESSRS. A. J. OOMBRIDGE A CO.,
Bombay.
MESSRS. D. B. TARAPOREVALLA & SONS,
Booksellers, 190, Hornby Road, Fort,
Bombay.
MESSRS. GOPAL NARAYAN A CO.,
Bombay.
MRS. RADHABAI ATMARAM SAGOON,
Bombay.
MESSRS. RAMCnANDRA GOVIND A SON,
Booksellers and Publishers, Kulbadevi,
Bombay.
MR. RAMNATH SUNDER, Bombay.
MESSRS. THACKER A Co., LD., Bombay.
THE STANDARD BOOKSTALL, Karachi.
THE PROPRIETOR, New Kitabkhana, Pooua.
MESSRS. KARSANDAS NARANDAS A SONS,
Sarat
MR. MANGALDAS HARKIBANDAS, Surat.

Madras:

MESSRS. G. A. NATE8AN A CO., Madras.
MESSRS. HIGOINBOTnAH & Co., Madrns.
MESSRS. S. MURTHY A Co., Madras.
MESSRS. TEMPLE A Co., Madras.
MESSRS. THOMPSON A Co., Madras.
MESSRS. V. KALYANARAMA IYER A Co.,
Booksellers, etc., Madras.
M. R. RY. E. M. GOPALAKRISHXA KONE
Madura.
MESSRS. VAS A CO., Madura.

Central Provinces.

THE MANAGER, "HITAVADA," Nngpur.

United Provinces.

MESSRS. A. H. WHEELER A, CO.,
Allahabad.
THE PROPRIETOR OF THE NEWAL
KISHORE PRESS, Luck now.
MUNSUI SEETA RAM, Managing Proprietor,
Indian Army Book Depöt, Juhi, Cawnpore.
MANAGER, IMPERIAL BOOK DEPOT, Delhi.
OXFORD HOOK AND STATIONERY CO.,
Delhi.

Punjab.

RAI SAHIB M. GULAB SINGH A SONS,
Proprietors of the Mufid-i-um Press,
Lahore, Punjab.
MESSRS. RAMA KRISHNA A SONS,
Anarkali Street, Lahore.
MESSRS. THACKER, SPINK A Co., Simla.

Burma.

THE SUPERINTENDENT, AMERICAN
BAPTIST MISSION PRESS, Rangoon.

Ceylon*

MESSRS. A. M. AND J. FERGUSON, Ceylon:

AGENTS IN GREAT BRITAIN:

MESSRS. A. CONSTABLE A CO., 10, Orange
Street, Licester Square, London, W. O.
MESSRS. GRINDLAT A CO., 54, Parliament
Street, London, S. W.
MESSRS. KEGAN, PAUL, TRENCH,
TRÜBNER & CO., 68-74, Court Lane,
London, E.C.; rnta
39, New Oxford St London 7 t,
MR. B. QUAIUTCn, 11, Oraftoi. Street, New
Bond Street, London, W.
MESSRS. W. THACKER A CO., 2, Crued
Lane, Ludgato Hill, Lpudon, E.a
MESSRS. P. S. KING A SON, 2 A 4 Great
Smith Street, W-tminster, London S.W.
MESSRS. EAST AND WKST, LD., 3,
Vitoria Street, London, S. tt 1.

MR. B. H. BLACKWELL, 50-51, Broad
Street, Oxford.
MESSRS. DEIGHTON BELL A CO., LD.,
Trinity Street, Cambridge.
MESSRS. LUZAC A CO., 46, Great Russell
Street, London, W.C.
MESSRS. OLIVER AND BOYD, Twceddale
Court, Edinburgh.
MESSRS. E. PONSONBY, LD., 116,
Gnifton Street, Dublin.
MR. T. FisnER UNWIN, LD., 1,
Adclpli Terrace, London, W.O.
MKSSRS. J. WHELDON AND WESLEY,
LD., 2, 3 and 4, Arthur Street, New
Oxford Street, London, W.O. 2.

AGENTS ON THE CONTINENT.

MR. ERNEST LBROUX. Rue Bonaparte,
Paris, France.
MR. OTTO HARBASSOWITZ, Leipzig.

MR. MAKTINUS MIJHOFF, The Hague,
Holland.
MESSRS. R. FuiEDLANDER & SOHN, Berllu.



Sixty-Third
Annual Report of the
Government Cinchona Plantations
and Factory in Bengal

For the Year

1924-25

CALCUTTA:
Bengal Secretariat Book Depot.
1925.

Price—Indian, Re. 1-2 ; English, Is. 10d.



Sixty-Third
Annual Report of the
Government Cinchona Plantations
and Factory in Bengal

For the Year

1924-25

CALCUTTA:
Jtengal Secretariat Book Depot.
1925.

Published by the Bengal Secretariat Book Depot, Writers' Buildings, Calcutta.

Agents in India.

Messrs. S. K. Lahiri & Co., Printers and Booksellers, College Street, Calcutta.

Messrs. Thacker, Spink & Co., Calcutta.

**Customers *in* the United Kingdom and the Continent of Europe
may obtain publications either direct from the High Commissioner's office
or through any book-seller.**

**SIXTY-THIRD ANNUAL REPORT OF THE GOVERNMENT
CINCHONA PLANTATIONS AND FACTORY IN BENGAL
FOR THE YEAR 1924-25.**

1. **General.**—Affairs in the cinchona and quinine trades show no outstanding developments during the year but a conscious effort through the medium of a Committee of the League of Nations to focus public and international opinion on the problems of future supply at reasonable rates is worthy of record. The fact of such a subject being referred to a body of such standing may be taken as evidence of an awakening consciousness of responsibility towards the welfare of those vast fever-stricken populations of the world to whom quinine is little more than a name.

The importance thus emphasized of an abundant and cheap supply of the drug has elicited a volume of opinion expressed in the press and elsewhere on the reasons for the present shortage and on policy necessary to increase the supply and to bring it within the reach of the millions. The opinion is almost as divided as it is diverse. It ranges from aspersions on the combine to expressions of despair at the attitude of the sufferer who would confine his treatment prophylactic and therapeutic to the wearing of charms. It sees a solution or partial solution of the difficulties of supply in a modification of medical opinion as regards the relative value of the different alkaloids in the bark, in an alteration of the ratio now fixed for distributing profits between planters and manufacturers and in a reduction of costs by the substitution of a half purified febrifuge containing all the alkaloids for quinine.

Much of the opinion is enlightening on one or more aspects of the quinine shortage problem. All of it; consciously or otherwise admits the need for action resulting in an increased supply at rates possible for world buyers. It is in the limit of its grasp that the writer sees some of it deficient.

Against the advice to increase supply by the introduction of cinchona to areas not yet tried stands the position of the quinine trade as statistics to-day reveal it. There is on the one hand a vast impoverished malaria-stricken population in the world calling for the remedy and on the other the remedy at a price and in quantity not merely beyond its reach but beyond the full purchasing power of the richer nations of the world.

From the commercial point of view there is no quinine shortage Problem. In this sense there is a drug in the market. Planters and manufacturers both fail to dispose of all their products and bark and quinine stocks awaiting a market continue to mount up.

These are conditions that suggest overproduction rather than shortage. In view of the world's urgent need for quinine they suggest, also, an economically unhealthy state of the industry.

Blame for all this condition of affairs has been freely ascribed to the combine but before it is condemned it may be matter for argument whether a very much worse state would not now prevail but for the fact that a combine arose to organise and direct the economic relationships of the industry. In order to appreciate the present position

properly it is necessary to go back to examination of the conditions that prevailed some few years before the outbreak of war. The price per unit of quinine in bark was then but a fraction of that now quoted. A policy of unrestricted competition had already brought thoughtful planters and investors to doubt the wisdom of continuing cultivation of the cinchona tree, and, indeed, there was evidence of areas of this cultivation already giving place to the cultivation of more profitable products. A condition of affairs parallel in all but one sense to the conditions that faced the Ceylon planter in the Eighties of last century had arisen. The earlier cause was overproduction on a stupendous scale while the root cause of the latter was a slight commercial overproduction combined with lack of organization on the part of the Java planting community. Ceylon found its answer to the situation in the cultivation of tea, Java its answer in the combine. The immediate relevant point is that, had the combine not been formed, history might have repeated itself with results for more serious than those now discussed under the mistaken title of quinine shortage. It should be recalled that the alternative course for Java would have brought on the world a quinine shortage as real in the commercial sense as in the sense of real need and would have done so on a world that knew Java as the best and almost the only home for the economic production of the drug. When, therefore, there is inclination to blame the combine for the present so-called shortage and inflated prices it is well to remember what the alternative to the combine might have resulted in and not speculate on what prices might have been reached in the absence of its controlling power.

Meantime the planter is not more than satisfied with the return he obtains for his bark and the manufacturer points to increased cost in all directions to warrant the proportion of net profits allotted to him from the industry. Both claim, and one must admit the relevance of the fact, that in comparison with other commodities the price of quinine is not so vastly above the cost of its production as to attract capital to the industry. * The reason for this may well be that capitalists already seeing overproduction in the commercial sense feel chary of supporting an industry so hazardous as that of cinchona cultivation. The whole chequered history of the industry suggests the need for foresight and organisation as well as the application of the best known scientific methods. It is not unnatural that capital should feel timid.

But the reasons may lie deeper in an as yet unexpressed belief that the production of quinine is already sufficient for the needs of those who can afford to pay a price sufficient for the economic stability of the industry, and that the success of further production would depend on the dubious support obtainable from the philanthropic activities of Governments.

There is something tragic in correlating such a view with the statistics of mortality from malaria in India and with figures representing the incidence of the disease in Russia. It is estimated that in 1923 deaths from this cause in India amounted to 1,300,000 and that in Russia during 1923 there were ten million cases of malaria.

The most interesting and important problem of the whole situation lies in determining whether an anti-malarial remedy from cinchona can be produced at a price sufficiently low to reach the millions and in this connection an analysis of costs by Heer C. M. Pleyte d'Ailly* Managing director of the Kina Cultuur Maatschappij, is of special interest. Heer Pleyte, d'Ailly claims, in order that cinchona may be

saved displacement by other crops in Java, that a minimum unit price of 10 Dutch cents must be secured to the planter, and that the manufacturer may have a reasonable return on his capital a minimum of 8 Dutch guilders must be secured per kilogram of quinine extracted. Expressed in Indian currency this means that quinine would have to fetch about Rs. 14 per lb. to save the industry from displacement. This figure may be criticized as high in the presence of other figures in this report but it should be remembered that the accounts here presented are not commercial in the strict sense, and that various liabilities avoided by a department financed directly by Government would rest on the same industry supported by private enterprise.

Let us, however, assume that Heer Pleyte d'Ailly's figures of cost are higher than the case warrants and strike a figure of Rs. 12 per lb. for quinine and then put the question whether the financial conditions of the mass of India's malarial population can be expected by unaided purchase to maintain the industry on an economic basis at this figure. It is feared that those best qualified to judge the income and responsibilities of the average Indian victim would answer in the negative.

The net conclusion reached would seem to indicate that quinine at a price based on and of the order of the cost of its production is still well beyond the reach of the great malaria-stricken populations of the world.

Decision therefore on the question whether the maintenance of the worker in a state of better health is worth to industry or the State the cost it would entail will probably be the determining consideration for the extension of cinchona cultivation on any considerable scale. In this connection it is interesting to follow the trend of public opinion in India as expressed through the new Legislative Councils. The supply of quinine and its availability at rates within the purchasing power of the masses tends more and more to become a question of political importance. There is a widespread and not unnatural objection to viewing the only known remedy for malaria as a luxury for the rich. The cry is for quinine for every victim. The interest evinced is worthy the importance of the subject. If it supplies the impetus to an effort at solution commensurate with the magnitude of the quinine shortage problem no humanitarian will grudge public opinion its success.

2. Extensions, Acreages and Crops.—(a) Mungpoo. Rainfall for the year on this plantation was 7 inches above the average and on the whole, with the exception of January when frosts descended on plants in the nurseries and field, the year was favourable for cinchona cultivation. Extensions comprised 45 acres *Cinchona Ledgeriana* on Mungpoo, 19 acres *C. succirubra* on Talleh and 20 acres *C. succirubra* on Sittong divisions. Excellent weather conditions prevailed at the time of planting and, in consequence, the young plants have made an exceptionally good start.

Harvests were obtained by cutting out-68-5 acres *C. Ledgeriana*,** acre *C. succirubra* and-**-acres *C. Hybrid* barks, the total of £Y-? acres Riving 160 292 lbs. *C. Ledgeriana*, 4,530 lbs. *C. succirubra* and 9,230 lbs. *C. Hybrid* or 174,057 lbs. in all. The average ages of the Ledger, *svccirabra* and *Hybrid* barks were 5-6, 12:6 and 6 years and the average annual bark increments per acre of the acreages 451, 360 and -ibX lbs: respectively. The average age of all the acreages cut out is 05 years and the average annual bark increment calculated on these acreages

4.5-430
37 Sittong
Talleh
210 698 Talleh
194459 Sittong
3316 Sittong
12923 Sittong

443 lbs. The yield per acre over the period is, therefore, 2,570 lbs. ^Considering the lower average harvesting age this is a distinct improvement on last year's yield.

With the exception of blocks at lower elevations where the ravages of *Helopeltis* effect a suspension of growth for months at a time, all blocks look well. Extensions were again planted on the contour system and experiments with light shade and green manure species carried on. Some 100 acres of cinchona sick land or land useless for this cultivation were reafforested during the year.

Although the unusually low temperatures prevailing during the cold weather* adversely affected the Ipecacuanha nurseries no lasting ill effects were noticeable. Some 8,550 plants were raised from seed and planted out during the year.

At the end of the year there were 1000.7 acres with a full complement of cinchona on Mungpoo plantation, the net increase in the acreage being 37.3 acres. Details are available in Appendix A (1).

(;) *Munsong*.—Rainfall on this plantation was 19 inches below the average only and as on Mungpoo the year, on the whole, was favourable for cinchona cultivation. Severe frosts were experienced late in the year and damage much more extensive than suffered by the sister plantation is, unfortunately, to be recorded. This arises from the fact that a considerable area of cinchona on Munsong occupies elevations not utilised for this cultivation on Mungpoo. Some thousands of plants had to be coppiced or uprooted according to the extent of the damage and one block of *C. officinalis* on Burmiak division was practically wiped out. There is no record of such extensive damage being caused by frost before on Munsong.

New blocks planted 12 acres *C. Ledgeriana* on Kashyem and 60 acres also ledger on Burmiak.

Harvests were obtained by cutting out 667 acres of *C. ledgeriana*, 1 acre *C. succirubra*, 224 acres *C. officinalis*, 105 acres *C. Hybrid 2*, and 4.1 acres *C. Hybrid 3*, the total of 104.2 acres giving 196,915 lbs. *C. Ledgeriana*, 2,521 lbs. *C. succirubra*, 21,565 lbs. *C. officinalis*, 33,881 lbs. *C. Hybrid 2*, and 3,614 lbs. *C. Hybrid 3*, or 258,496 lbs. in all.

The average ages of the barks in the above order were 7.6, 11.4, 10.8, 82 and 5.1 years and the average annual bark increments per acre of the acreages 385, 442, 88, 390 and 172 lbs. respectively. The average age of the total acreage cut out is 8.3 years and the average annual bark increment calculated on the total acreage 298 lbs. The yield per acre over the period is therefore 2,473 lbs.

At the end of the year there were 2,086 acres with a full complement of cinchona on Munsong or about 32 acres less than what the year began with.

(c) *Plantations as a whole*.—The total area under cinchona is 3,060 acres. Details of the species, the acreages going to make up this total and their ages are, available in Appendix A (2). In all cases the acreages are calculated as carrying a full complement of cinchona trees.

3. **Factory work**.—Besides 471,558 lbs. of Java bark for the Government of India, 178,403 lbs. of Mungpoo bark (166,067 Ledger, 5,626 *succimbrp* and 6,710* *Hybrid*) and 286,037 lbs. Munsong bark (247,451 Ledger, 1*510 *succiYabra*, 6,961 *officinalis* and 30,115 *Hybrid*) were worked up to produce about* 19,230 lbs. quinine sulphate, 245 lbs. other quinine

salts, 1 lb. quinidine salt, 5 lbs. cinchonine salts and 8,098 lbs cinchona febrifuge—a total of 27,580 lbs. provincial alkaloids. Exact amounts are available in Appendix C (1). The Java bark produced 26,723 lbs. quinine sulphate and 6,695 lbs. cinchona febrifuge. The total production of quinine sulphate, both provincial and imperial, was 45,954 lbs., and the total products from all sources 60,998 lbs. The amount of quinine sulphate proved by analysis to be present in the bark was 50,517 lbs.

4. **Cost and value of plantation bark.**—The average cost per lb. of all Mungpoo barks taken over a series of years is 36 annas and of Munsong barks 27 annas. The cost of the 174,057 lbs. Mungpoo bark harvest is, therefore, Rs. 39,163 and of the Munsong 258,496 lbs. harvest Rs. 43,621. The unit rate for bark being 1.5 annas the average Mungpoo quinine percentage of 48 gives the harvest from this plantation a value of Rs. 78,426 or Rs. 39,162 more than it cost. On a basis of an average quinine percentage of 45 and the same unit rate the Munsong harvest valuation is Rs. 1,09,053 or Rs. 65,432 more than it cost. The year's expenditure for both plantations including their share of general charges is Rs. 2,13,151 while harvests costing Rs. 82,784 and valued at Rs. 1,87,378 are the year's return for past expenditure.

5. **Cost and value of quinine produced.**—(a) *Cost in the bark.*—The 19,230 lbs. of quinine extracted were contained in 464,440 lbs. of mixed Mungpoo and Munsong barks, which cost (178,403 lbs. at 3.6 annas and 286,037 lbs. at 2.7 annas per lb.) Rs. 88,408. The cost per lb. of quinine in the bark was, therefore, Rs. 4.6.

(b) *Cost of extraction, packing and delivery to railway.*—This is calculated on the total extraction of quinine both provincial and imperial. The total direct expenditure on the factory was Rs. 1,16,526-7-6, general charges debitable to factory account Rs. 3,948-7, factory depreciation charges Rs. 5,183, stores (oil, chemicals, etc.) depreciation charges Rs. 1,723-14-9, the gross factory expenditure being, therefore, Rs. 1,27,381-13-3. From this has to be deducted expenditure on products both provincial and imperial other than quinine sulphate Rs. 30,333-2 leaving Rs. 97,048-11-3 net expended on the production of 45,954 lbs. provincial and imperial quinine sulphate. The cost of extraction, packing, etc. is therefore, Rs. 2.12 per lb.

(c) *Total cost per lb. and value.*—This is made up of the cost in the bark—Rs. 4.6 and the cost of extraction, etc., Rs. 2.12, a total of Rs. 6.72. The present wholesale rate being Rs. 24 per lb., the 19,230 lbs. provincial quinine manufactured are worth Rs. 4,61,520 but cost only Rs. 1,29,225.

6. **Sales and selling rates.**—A statement of the sales of factory products for 1924-25 is available in Appendix G. Sales and issues of quinine sulphate have decreased some 3,322 lbs. This decrease is probably due to the brisk demand for cinchona febrifuge and is balanced by the increased amount of this product sold. Increased sales of cinchona febrifuge were made possible by purchase of 5,000 lbs. from Madras. The sale of quinine sulphate is also affected by the transfer to India of part of the area of distribution formerly belonging to Bengal.

The total amount of cinchona febrifuge issued or sold was 19,152 lbs. of which 3,395 lbs.,—the cost of which was not borne by the Bengal Cinchona Department, were received from the Madras Cinchona Department and 7,658 lbs. belonged to the Government of India. Credit in these accounts is, therefore, taken for the proceeds from the sale of 8,098 lbs. provincial febrifuge only. Of this 8,098 lbs., 5,965 lbs.

were powder bringing in Us. 54,010-4 and 2,133 lbs. tablets bringing in Rs. 22,160-4. The excess credit on account of sale of Government of India febrifuge will be adjusted hereafter in transfer account.

Selling rates which underwent an alteration during the year were as follows: Quinine sulphate Rs. 24 to Rs. 28. Other quinine salts Rs. 30 to Rs. 37. Cinchonine salts Rs. 13 to Rs. 15. Cinchonidine salts Rs. 27 to Rs. 29. Quinoidine Rs. 6 to Rs. 8 and cinchona febrifuge Rs. 9 to Rs. 11. All these rates are based on and are liable to fluctuate with market rates. Changes in the rates for cinchona products have followed fluctuations in the exchange rates.

Rupees 3,18,240-0-9 were obtained from the sale of quinine sulphate converted to tablets at the Juvenile Jail but of this sum half only is taken as credited to the Cinchona Department. Details of the monthly receipts from this source are available in Appendix H.

7. **Expenditure and receipts.**—The total expenditure on the Department detailed in Appendix D was Rs. 3,33,626-12-9. The total receipts including Rs. 4594 miscellaneous received direct were Rs. 7,76,560-1-9, of which Rs. 2,51,069-6 were credit and Rs. 5,25,490-11-9 cash. These receipts include the Jail share amounting to Rs. 1,59,120-0-5 of proceeds from the sale of quinine sulphate tablets, also Rs. 69,337-8 on account of Government of India febrifuge (powder) sold and Rs. 30,736-4 on account of the sale of Madras bought febrifuge. The net amount for credit to the Cinchona Department is therefore Rs. 5,17,366-5-4, but sums of Rs. 56,588 and Rs. 13,390 are still due from the Government of India to cover the cost of extracting 26,723 lbs. sulphate at Rs. 2* 12 per lb. and 6,695 lbs. febrifuge at Rs. 2 per lb. Further, the net credit here given does not include the balance in the exchange account paid by the Government of India during¹ 1924-25 for work done during 1923-24. Reference to the profit and loss valuation account will show that a further sum of Rs. 79,305-1, all considered good debt, was outstanding at the end of the year.

8. **Quinine reserve and stock account.**—Full details of stocks in hand are available from Appendices C (1) and C (2). The provincial reserve of quinine is some 540 lbs. lower at the end of the year and now stands at 27,259 lbs. The carry-over of subsidiary products is also lower all round. The 8,098J lbs. provincial febrifuge manufactured have been sold. All stocks of this product carried at the factory belong to the Government of India. All carry-over stocks at the Jail are taken as Madras bought febrifuge and, therefore, outside these accounts.

Bark in hand at the end of the year shows a reduction of 35,393 lbs. on the opening balance. While the oil account shows a slight increase in the new carry-over chemicals and stores are Rs. 3,777 down on the year's working. The total value of stock carried is Rs. 6,69,554 against an opening balance of Rs. 6,97,584-3-9.

As regards valuation rates the figures employed in recent reports have again been utilised; quinine sulphate, the main item, is carried at Rs. 20 per lb., a figure that may be looked upon as safe in the present state of quinine affairs.

9. **Block account.**—Excluding the value of extensions which for purposes of the block account are taken at cost price, the increase in value of cinchona trees at the end of the year is Rs. 73,378. For Mungpoo each block of cinchona has been valued separately on the basis of the analytical figures for its bark sample and a unit rate of 1*5 annas

and the income above is almost entirely absorbed by this plantation, In following figure Munsong one arrives at, what to the writer is the correct figure. We figure of Rs. 29,19,701 as the block value, value of this plantation and leave its block value as per last year's report plus capital charges for the timber trees on both plantations are valued at Rs. 24,18,051, Rs. 55,84,85,863, buildings at Rs. 1,13,269 and machinery at Rs. 28,72,987. See Appendix F for further information.

Rs. 10,21,511 - The valuation profit balance is Rs. 9,48,511. In this account include a sum of Rs. 7,68,189 from Government of India for work done and as at 31-3-61 for unrealised sale proceeds.

Establishmen L

					Ks.	Rs.	p.
5. Clerks	..	..	..	..	..	..	..
6. Sub-Assistant Surgeon	..	..	..	..	2,597	1	0
7. Artificers	..	..	..	..	....	..	..
8. Sirdars and coolies	..	..	..	..	82,711	2	3

Allowance*.

9. Travelling allowance	..	..	..	..	7	8	0
10. Pony allowances	..	..	..	..	1,770	0	0
11. Compensation for deamess of provisions	..	..	..	..	....	..	..

Contingen cies.

12. Purchase and keep of ponies and bullocks	..	..	..	..	2,460	0	0
13. Purchase of manure	..	..	..	..	....	..	..
14. Purchase of seed	..	..	..	..	....	..	..
15. Carriage charges	..	..	..	..	4,372	11	9
16. European stores	..	..	..	..	2,030	0	0
17. Freight	..	..	..	..	117	4	0
18. Buildings	..	..	..	..	2,247	13	3
19. Machinery and plant	..	..	..	..	....	..	..
20. Miscellaneous	..	..	..	..	2,289	5	0
21. Afforestation charges	..	..	..	..	....	..	..
22. Servants' clothing	..	..	..	..	....	..	..

Total Munsong charges	..	..	..	..	1,18,639	9	3
Total for both plantations	..	..	..	..	2,06,166	15	3

II.—FACTORY ACCOUNT.

Salaries.

1. Quinologist	..	..	..	..	11,508	4	0
2. Assistant Quinologist	..	..	..	..	5,998	5	3
3. Manufacturing Chemist	..	..	..	..	....	..	..

Establishment.

4. Clerks	..	..	..	..	845	0	0
5. Servants	..	..	..	..	....	..	..
6. Artificers	..	..	..	..	....	..	..
7. Sirdars and coolies	..	..	..	..	8,722	11	3

Allowances

8. Travelling allowance	..	..	..	..	42	0	0
9. Compensation for dearness of provisions	..	..	..	..	....	..	..

Contingencies.

	Rs.	A.	P.
10. Purchase of machinery .. • • .. • •	.....	
11. Buildings .. •• •• .. ••	10,510	13	3
12. European stores	29,141	14	0
13. Freight •• •• • • .. •	3,556	9	0
14. Chemicals ••	27,465	11	6
15. Fuel (carriage and cutting up only)	8,604	14	9
16. Purchase of bark (carriage only)	709	1	3
17. Purchase of cinchona febrifuge .. .. ..	.....	
18. Packing materials	4,724	15	3
19. Distribution charges	4,253	3	0
20. Miscellaneous	443	1	0
21. Servants' clothing .. .. ..	.....	
Total Factory charges	•• 1,16,526	7	6

III.—GENERAL.

Salaries.

I. Superintendent	2,400	0	0
----------------------------	-------	---	---

Establishment.

2. Clerks	6,091	6	0
3. Servants	228	0	0

Allowances.

4. Travelling allowances .. •• •• .. ••	.....	
5. Compensation for dearness of provisions .. .. ..	.....	

Contingencies.

6. Miscellaneous .. •• •• .. ••	.....	
7. Postage and telegrams	m m	^QQ	Q Q
8. Advertising charges .. .. ..	.....	
9. Subscription to newspapers and periodicals .. .. ..	.....	
10. Purchase and repair of furniture .. .. ..	.....	
11. Road and Public Works Cess	1,814	0	0

Total General charges

•• 1,10,933 g n

IV.—ABSTRACT.

Total Mungpoo charges	87	52	7	6	0
„ Munsong		U S ^	9	3	
„ Factory		1,16,526	7	6	
„ General		1,0,933	6	0	
GRAND TOTAL EXPENDITURE		3,33,626	12	9	

APPENDIX Q.

Statement of sales of factory products during the official year 1924-25.

Particulars.	Quinine salts.		Cincho- nine and cincho- nidine salts.	Cinchona febrifuge		Quini- dine salts and quino- idine	Cin- chona bark.	Total.			
	lbs.	oz.		lbs.	oz.			lbs.	oz.		
<i>Assam.</i>											
Jails	5	0	..	10	8	..	..	15	8
Dispensaries ..	361	4	..	1,136	4	7	4	1,504	12		
District Boards ..	28	8	..	39	0	..	..	67	8
Missionary bodies ..	31	0	..	74	0	6	0	111	0		
Others ..*	60	12	..	157	8	2	1	220	5		
<i>Bengal.</i>											
Jails	9,576	0	*	81	4	..	..	9,657	4
Medical Store Depôt ..	2,567	0	..	1,064	0	..	..	3,631	0
Dispensaries ..	3,757	10	..	6,586	0	11	0	10,354	10		
District Boards ..	544	8	..	734	4	..	..	1,278	12
Missionary bodies ..	138	8	..	218	8	7	0	364	0		
Others	515	12	4	0	3,200	0	26	4	3,706	7,452	0
<i>Bihar and Orissa.</i>											
Jails	4	0	..	..	..	..	..	4	0
Dispensaries ..	1,313	6	..	1,061	4	58	2	2,432	12		
District Boards ..	128	8	..	493	0	..	..	621	8
Missionary bodies ..	44	12	..	86	0	2	0	132	12		
Others	144	2	..	66	0	..	..	210	2
<i>Punjab.</i>											
Jails	645	0	..	7	0	..	..	652	0
Dispensaries ..	..	..	..	522	8	..	..	522	8
District Boards ..	..	..	..	..	..	..	..	..	..
Missionary bodies ..	20	0	6	0	27	8	2	0	55	8	
Others	5	0	150	0	9	0	164	0	
Medical Store Depôt ..	80	0	..	400	0	..	..	480	0
<i>Oilier Provinces and States.</i>											
Jails .. ..	..	..	..	4	0	..	..	4	0
Dispensaries ..	110	0	..	2,428	8	3	0	2,547	8		
District Boards ..	..	..	..	59	0	..	..	59	0
Missionary bodies ..	37	12	..	306	4	9*	0	354	0		
Others	20	8	..	226	8	..	..	247	0
Total ..	20,139	14	16	0	19,138	12	142	11	3,706	4,3143	5

* Include* Government of India and Madras bought stocks.

* APPENDIX H.

Sale of sulphate of quinine in "treatment " tablets daring 1924-25.

Consecutive No.	Months.	Total proceeds from sale of tablets.	Credited to Cinchona Department at half rate.
1	2	3	4
	1924.	Rs. A. P.	Rs. A. P.
1	April	1,237 2 6	618 9 3
2	May	3,836 0 0	1,918 0 0
3	June	20,783 14 0	10,391 15 0
4	July	27,940 12 0	13,970 6 0
5	August	43,309 13 6	21,654 14 9
6	September	26,805 2 0	13,402 9 0
7	October	29,453 9 9	14,726 12 10
8	November	40,900 7 3	20,450 3 7
9	December	54,649 5 3	27,324 10 8
	1925.		
10	January	30,540 11 0	15,270 5 6
11	February	16,274 8 0	8,137 4 0
12	March	22,508 11 6	11,254 5 9
	Total ..	3,18,240 0 9	1,59,120 0 4

* Supplied by the Accountant-General, B^hi gal.

GOVERNMENT OF BENGAL.

REVENUE DEPARTMENT.

Cinchona.

CALCUTTA, THE 22^{yp} JANUARY 1926.

RESOLUTION—No. 899.

READ—

The sixty-third annual report of the Government Cinchona Plantations and Factory in Bengal for the year 1924-25.

READ ALSO—

The report of the previous year.

Mr. C. C. Calder officiated as Superintendent throughout the year.

The area under cinchona at the end of the year was 3,060 acres. No extension of any importance was carried out at Mungpoo and Munsong, but other ranges have been explored with the result that an area of about 600 acres has been found in the Latpanchor forest with conditions sufficiently favourable to justify the cultivation of experimental plots.

The quantity of cinchona harvested during the year was considerably less than in the year 1923-24. This appears to have been due to the large stocks of bark already held at the factory as the total quantity of bark worked up at the factory was some 54,000 lbs. more than in the previous year. Rather more than half of this bark was Java bark belonging to the Government of India.

The quantities of quinine sulphate and other alkaloids prepared from provincial bark were almost the same as last year, the figures being 19,230 lbs. of quinine sulphate and 8,348 lbs. of other alkaloids. There was a considerable increase in the total outturn of the factory, but this was in products from Java bark.

The manufacture of quinine tablets for sale through post offices has been transferred from the Juvenile Jail, Alipore, to the Presidency Jail. Machines for the manufacture of these tablets have been ordered and will be installed at the Mungpoo factory. The manufacture of the tablets will then be transferred to Mungpoo. Provision has also been made for the erection of ferro-concrete tanks for storing quinine in the crude form, as storage in tins has been found unsatisfactory.

The financial results were again satisfactory, although the surplus receipts over expenditure fell from Rs. 4,56,825 in 1923-24 to Rs. 4,42,934 in the year under report, and the value of stock at the end of the year was almost Rs. 30,000 less than at the beginning. The total expenditure was Rs. 3,33,626, being slightly lower than in the previous year. The receipts including the jail share for the sale of quinine tablets were Rs. 7,76,560 and were some Rs. 16,000 less than in 1923-24.

Although the quantity of quinine salts supplied to dispensaries and District Boards in Bengal increased by more than 1,600 lbs., there was a decrease of more than 3,300 lbs. in the total quantities sold. This decrease was compensated for by an increased demand for cinchona febrifuge, to meet which 6,000 lbs. had to be obtained from Madras. The price of quinine sulphate fell during the year from Rs. 28 to Rs. 24, and there were similar reductions in prices of other products.

The thanks of Government are due to Mr. Calder for his sound administration of the plantations, and to Mr. Shaw, Government Quinologist, for the successful working of the factory.

.. ORDER—Ordered that this resolution be published in the *Calcutta gazette* and that a copy with a copy of the report be submitted to the Government of India.

By order of the Governor in Council,

W. S. HOPKYNS,

Secretary to the Government of Bengal.

No. 1797Cin.

Copy forwarded to the Saperinttm lent, Cinchona Cultivations in Bengal, for information.

By order of the (Jovornor in Council.

M. N. GUPTA,

Assistant Secretary to the Government of Bengal.

CALCUTTA,
The 22nd January 1920.



Sixty-Fourth
Annual Report of the
Government Cinchona Plantations
and Factory in Bengal

For the Year
1925-26

CALCUTTA:
Bengal Secretariat Book Depot.
1926.

Price—Indian, 14 annas ; English, Is. 6d.



Sixty-Fourth
Annual Report of the
Government Cinchona Plantations
and Factory in Bengal

**For the Year
1925-26**

LJAJLUUTXA:
Bengal Secretariat Book Depot
1926,

Published by the Bengal Secretariat Book Depot, Writers' Buildings, Calcutta.

Agents in India.

Messrs. S. K. Lahiri & Co., Printers and Booksellers, College Street, Calcutta
Messrs. Thacker, Spink & Co., Calcutta.

**Customers *In* the United Kingdom and the Continent of Europe
may obtain publications either direct from the High Commissioner's office
or through any book-seller,**

SIXTY-FOURTH ANNUAL REPORT
OF THE
GOVERNMENT CINCHONA PLANTATIONS AND FACTORY
IN BENGAL FOR THE YEAR
1925-26.

1. General.—From a commercial point of view the outstanding feature in cinchona matters is the sudden fall in the value of quinine at the end of the year, when the price was abruptly lowered from 2s. 3d.—at which it had remained for over three years—to Is. 8d. In last year's report it was recorded that a Committee of the League of Nations was endeavouring to focus public opinion on the problem of supply at reasonable rates and there is no doubt that this, together with the ensuing agitation in the press, has had a great deal to do with the drop in price. Probably too the accumulation of unused stocks in Java and Amsterdam formed a large factor in forcing the decision. Evidently it is anticipated that the lower price will result in increased demands. Other factors that may have been taken into consideration are the great success of the Hoshi Quinine Works in Japan which takes bark from planters outside the convention, and the fact that Italy's plantation in Java will render her quite independent in a very few years now.

So far as the Bengal plantations are concerned there is little beyond normal development to record. There is an increase in the area of planted cinchona of 93 acres and arrangements have been made for larger increases during the next few years. The Munsong Plantation, however, is now practically all planted over for the second time and there is very little land available for further extensions. In Mungpoo the possible land in sight is only sufficient for a very few years. Therefore it is necessary to seek other sites for plantations and a beginning has been made by reserving forest-land at Latpanchor and planting out 30 acres of *C. Ledgeriana* as an experiment. Next year it is intended to plant 30 acres of *C. succirubra* there and by that time it is expected that it will be possible to tell whether planting on a larger scale is advisable. Latpanchor is several miles beyond the Sittong division of Mungpoo and 13 miles from the factory. Whether this plantation proves a success or not, other sites will have to be found and for them we shall have to go further afield.

For several years now green manuring has been carried out at Mungpoo. Various leguminous plants have been planted between the

cinchona trees and on attaining the flowering stage such small plants as soy have been dug in to enrich the soil. With larger leguminous plants only the fallen leaves have been so utilised. The ordinary jungle growing at the same time has of course also been dug in with these. In some favourably placed blocks leaf mould from the forest has been used and the results have been most marked, not only in increased yield of bark but also in carrying the cinchona through attacks of *Helopeltis* and borers with much less permanent* damage than before. The recent introduction of the contour system of terracing and planting has also proved very successful. The blocks so planted withstood the abnormal rainfall last September with exceptionally little loss.

Iii the 1923-24 report it was mentioned that plants grown for two years in the nurseries were being used for filling up vacancies. A block of 22 acres of these plants was also put out and the whole of the stems cut down, some in the nurseries before planting out and others four months afterwards. This block, now 3 years old, is in excellent condition and is equivalent to a good block of ordinary seedlings planted out at the same time. This experiment is worth recording, for it shows what can be done with seedlings that have to be left in the nurseries but it also shows that there is no advantage to be gained by leaving the plants in the nursery for the extra year.

2. **Extensions, acreages and crops.**—(a) *Mungpoo.*—The rainfall for the year was 153 inches which is 30 above the average. A great deal of this excess was due to an extremely heavy fall on September 13th when 16·74 inches fell and heavy rain continued for three more days bringing the total for the four days to 32·743 inches. The effect of this abnormal rainfall on the cinchona was remarkably slight but it was disastrous for roads and the coolie houses. Repairing the damage meant a heavy drain on the labour force for many weeks and a large expenditure of money, though as much as possible has been left to be completed gradually when labour is available. With the exception of this period weather conditions were favourable; the cinchona planting was quite successful and the year may be classed as a good one. New blocks planted included 45 acres of *Cinchona Ledgeriana* on Labdah division and another 30 acres on Latpanchor; also 32 acres of *C. succirubra* on Sittong, a total of 107 acres. The block on Latpanchor is an experimental one on a site some miles from Sittong where some six hundred acres or more of forest land will be available if the experiment succeeds. The year's harvest was 210,698 lbs. of bark; 194,457 lbs. from 74 acres of *C. Ledgeriana*, 3,316 lbs. from 0·9 acre of *C. succirubra* and 12,925 lbs. from 5·3 acres of hybrid. The total acreage cut out was 80·2 acres and the average ages of the *Ledgeriana*, *succirubra* and hybrid barks was 6J, 7 and 7 years, or on the whole area 66 years. No block was entirely cut out and therefore the usual custom was

followed of calculating the acreage harvested by assuming an average annual increment of 400 lbs. of bark per acre on the area felled. One hundred acres were planted with forest trees during the year. In two field nurseries at elevations of 1,000 feet and 2,700 feet, respectively, there are now 100,633 *Ipecacuanha* plants of various ages. Stock is increased yearly from seed and also by propagation of root and stem cuttings. The earlier expensive methods of raising plants in glass houses with artificial heat has been abandoned, as it has been found that seed germinates more freely when sown direct in sheltered beds in the valley, and this means a considerable reduction in the cost of cultivation.

On March 31st 1926 there were 1,000·7 acres with a full complement of cinchona on the Mungpoo plantation. The net increase in the area planted being 26·8 acres.

Details are available in Appendix A(1),

(b) *Munsong*.—The rainfall here was 119·41 inches, 22·48 inches above normal. From September 14th to 17th, 11·24 inches fell and the roads suffered considerably but again very little damage was done to the cinchona. In January 1926 a heavy fall of snow covered the upper *officinalis* blocks at Burmiak and some of it remained for two days, but except when branches were broken off by the weight of the snow the cinchona was apparently unharmed. Frosts were slight, not enough to affect the cinchona. General cultivation was carried out in the usual way but shortage of labour prevented any green manuring. Pests and diseases were rampant, *Helopeltis* and Rust increasing. The greater part of the *C. Ledgeriana* planted last year at Burmiak has been extremely slow in starting growth and affords a great contrast to the lower part of the block. Evidently the soil in the upper part is poor but very few of the plants have died. Still on the whole the plantation is doing really well. Planting has been quite successful this year and the new blocks include 97 acres of *Cinchona Ledgeriana* and 12 acres of *C. succirubra* on Kashyem 32·5 acres of *C. Ledgeriana* on Burmiak and 5 on Sangser:—a total of 146·5 acres.

Harvests were obtained from 10· acres of *C. Ledgeriana* completely taken out, 5 acres coppiced and the uprooting of sickly plants. The equivalent of a total of 90·12 acres was thus removed yielding 255,102 lbs. of *Ledgeriana* from 65·72 acres, 23,995 lbs. *officinalis* from 7·7 acres, 1,136 lbs. *succirubra* from 0·3 acre, 6,682 lbs. hybrid No. 3 from 4 acres, and 41,170 lbs. hybrid No. 2 from 12·4 acres:—a total of 328,085 lbs.

The average ages of the blocks taken out were *Ledgeriana*, 9 years; *officinalis*, 12 years and 6 months; hybrid No. 2, 9 years and 4 months; hybrid No. 3, 5 years and 6 months and *succirubra*, 11 years and 4 months. The average age of the whole was 9·1 years. As in Mungpoo

the acreage cut out has been calculated by assuming an average annual increment of 700 lbs. bark per acre. Forty acres of fuel and timber trees were added making a total of 410 acres planted forest.

At the end of the year there were 2,142 *6 acres with a full complement of cinchona or 56 -4 acres more than that at the beginning of the year.

(c) *Plantations as a whole.*—The total area under cinchona is 3,153'0 acres. Details of the species, the acreages to make up this total and their ages are available in Appendix A(2). These acreages are calculated as carrying a full complement of cinchona trees but the actual area of ground to be kept cultivated is considerably more than this. The total harvest was 538,783 lbs. of bark.

3. **Factory work.**—In addition to 626,137 lbs. of Java bark for tin; Government of India, 188,889 lbs. of Mungpoo bark (162,695 *Lethjeriana*, 14,920 hybrid and 11,274 *sucvirubra*) and 234,886 lbs. Munsong bark (182,820 *Ledgeriana*, 20,959 hybrid, 30,831 *officinalis* and 276 *succirubra*) were worked up and produced 17,378 lbs. quinine sulphate, 649^ lbs. other quinine salts, 97 lbs. other crystalline salts, 250 lbs. of quinoidine and 9,168 lbs. cinchona febrifuge. Details are available in Appendix C (1). The Java bark produced 38,036 lbs. quinine sulphate and 9,769 lbs. cinchona febrifuge. The total production of quinine sulphate, both provincial and imperial, was 55,414 lbs. of cinchona febrifuge 18,937 lbs. and of other products 997 lbs. and the total extraction is apparently equivalent to practically 100 per cent. This excellent result, however, must be discounted by the fact that a small but indefinite amount of quinine was carried over from last year's working by the apparatus in use at the time, and last year's figure 96 '4 per cent, should be correspondingly increased. A large store has been built of ferro-concrete at a cost of Rs. 5,000 in which to keep quinine sulphate in a partially purified condition. When the quinine is completely purified, it will only retain its crystalline and saleable form if hermetically sealed in tins, and these tins cannot be stored for any number of years without rusting. It has therefore been arranged to complete the purification of only enough quinine for a few years' supply in tins ready for despatch.

Samples of bark from 310 seed trees were analysed for the plantation during the year.

4. **Cost and value of plantation bark.**—The average cost per lb. of all Mungpoo barks taken over a series of years is still 3 -6 annas and of Munsong barks very little under 27 annas. The cost of the 210,698 lbs. of the Mungpoo bark harvest is therefore Rs. 47,407 and of the Munsong harvest of 328,085 lbs. Rs. 55,364. The unit rate being 1 -5 annas, the average Mungpoo quinine percentage of 4 \S gives the harvest from this plantation a value of Rs. 94,814—exactly double what it cost.

On the basis of an average quinine percentage of 4*5 and the same unit rate the Munsong harvest valuation is Rs. 1,38,410 or Rs. 83,046 more than it cost. The year's expenditure of both plantations including their share of general charges is Rs. 2,23,396, while harvests costing Rs. 1,02,771 and valued at Rs. 2,33,224 are the year's return for past expenditure.

5. **Cost and value of quinine produced.**—(a) *Cost in the bark.*—The 423,775 lbs. of mixed Mungpoo and Munsong bark, which cost (188,889 lbs. at 3 -6 annas and 234,886 lbs. at 2 -7 annas per lb.) Rs. 82,137, contained not only the 17,378 lbs. of quinine sulphate extracted as such, but also 721 lbs. used for other salts and 1,562 lbs. left in the cinchona febrifuge. The cost per lb. of all this quinine in the bark was therefore Rs. 4*18.

(b) *Cost of extraction, packing and delivery to railway.*—This is calculated on the total extraction of quinine, both provincial and imperial. The total direct expenditure by the Factory was Rs. 1,44,562-2-9 plus general charges debitable to factory account Rs. 4,910-15 and factory depreciation charges Rs. 5,183, making the gross 'factory expenditure Rs. 1,54,656-1-9. From this has to be deducted capital expenditure on new buildings and machinery—Rs. 6,546; expenditure on products, both provincial and imperial other than quinine sulphate—Rs. 33,393; and increase in the value of stores over last year's value—Rs. 1,984-2-9; leaving Rs. 1,12,732-15 net expended on the production of 55,414 lbs. 9 oz. of provincial and imperial quinine sulphate. The cost of extraction, packing, etc., is therefore Rs. 2 -03 per lb.

(c) *Total cost per lb. and value.*—This is made up of the cost in the bark—Rs. 4*18 and the cost of extraction, etc., Rs. 2 -03—a total of Rs. 6-21. The present wholesale rate even after the recent fall in price being Rs. 18 per lb., the 17,378 lbs. provincial quinine manufactured are worth Rs. 3,12,804 but cost only Rs. 1,07,918 to produce.

6. **Sales and selling rates.**—A statement of the sales of 'factory products for 1925-26 is available in Appendix G. Sales of quinine have increased by 730 lbs., while those of febrifuge have decreased by 1,582 lbs. The total amount of cinchona febrifuge issued- or sold was 17,556 lbs. of which 1,605 lbs., (the cost of which has not been borne by the Bengal Cinchona Department), had been received from Madras and carried over from last year, while 6,734 lbs. belonged to the Government of India. Credit in these accounts is therefore taken for the proceeds from the sale of 9,218 lbs. provincial febrifuge only. Of this 9,218 lbs. 6,652 lbs. were powder bringing in *Rs. 60,264-11 and 2,566 lbs. was in tablets, bringing in Rs. 26,174. The excess credit on account of the sale of Government of India febrifuge will be adjusted hereafter in transfer account.

Selling rates during the year was as follows :-^quinine sulphate Rs. 24 to Rs. 26; other quinine salts Rs. 30 to 34; cinchona salts

Rs. 13 to Rs. 15; cinchonidine salts Rs. 27 to Rs. 29; quinidine salts Rs. 30; quinoidine Rs. 6 to Rs. 8; cinchona febrifuge Rs. 9 to Rs. 11. These rates are based on and are liable to fluctuate with market rates and will be lower in 1926-27. Rupees 3,92,340-8-5 were obtained from the sale of quinine sulphate converted to tablets at the Presidency Jail, but of this sum half only is taken as credited to the Cinchona Department. Details of the monthly receipts from this source are available in Appendix H.

7. Expenditure and receipts.—The total expenditure of the Department as detailed in Appendix D. was Rs. 3,72,870-7-9. The total receipts (including Rs. 475-8 miscellaneous received direct) were Rs. 7,58,289-13 of which Rs. 1,98,062-6 were credit and Rs. 5,60,227-7 cash. These receipts include the Jail share amounting to Rs. 1,96,170-4-2 of proceeds from the sale of quinine sulphate tablets, also Rs. 61,009-13 on account of Government of India febrifuge (powder) sold and Rs. 14,534 on account of the sale of Madras bought febrifuge. The net amount for credit to the Cinchona Department is therefore Rs. 4,86,575-11-10, but sums of Rs. 77,213-8 and Rs. 19,538 are still due from the Government of India to cover the cost of extracting 38,036 lbs. 3 oz. of sulphate of quinine at Rs. 2*03 per lb. and 9,769 lbs. of febrifuge at Rs. 2 per lb. Further, the net credit given here does not include the balance in the exchange account paid by the Government of India during 1925-26 for work done during 1924-25. Reference to the profit and loss valuation account will show that a further sum of Rs. 46,511-12, all considered good debt, was outstanding at the end of the year.

8. Quinine reserve and stock account.—Full details of stocks in hand are available from Appendix C (1) and C (2). The provincial reserve of quinine is some 2,954 lbs. lower at the end of the year and now stands at 24,305 lbs. The subsidiary products stand at a slightly higher figure than last year.

The whole of the 9,168 lbs. of provincial febrifuge manufactured has been sold and the stocks now carried at the factory and the Jail belong to the Government of India. Bark in hand at the end of the year shows an increase of 110,986 lbs. on the opening balance. The oil account shows a decrease of Rs. 1,52.1 in the new carry-over, but chemicals and stores an increase of Rs. 3,505. The total value of stock carried is Rs. 6,02,033 against an opening balance of Rs. 6,69,554.

In view of the recent fall in price quinine sulphate, the main item is carried at Rs. 18 per lb. instead of Rs. 20 as before, but other valuation rates have been left at the figures employed in recent reports.

9. Block account.—Excluding value of the new blocks planted in 1925-26, which for the purposes of this account are taken at cost price, the increase in value of cinchona trees at the end of the year is Rs. 73,092.

As was the case last year the whole of this increase is written to Mungpoo, each block there being valued separately on the basis of the analytical figures for its bark sample and a unit rate of 1.5 annas.

By following the same method for Munsong the improbable figure of Rs. 22,98,417 is obtained as the block value. This would mean a value of Rs. 1,072 per acre, while by leaving the block value as it appeared in last year's report, *plvs* capital charges for the year, the much more probable value of Rs. 913 per acre is obtained. This course has therefore been followed. Cinchona trees on both plantations are valued at Rs. 25,16,493, tinber trees at Rs. 2,88,063, buildings at Rs. 1,15,612 and machinery at Rs. 53,089—total value Rs. 29,73,857. See Appendix F for further information.

10. **Profit and loss valuation.**—The valuation profit balance is Rs. 1,93,566-0-4. Outstandings in this account include a sum of Rs. 39,961-2-6 due from the Government of India for work done and Rs. 6,550-9-6 for unrealised sale-proceeds.

11. **Land rent.**—From Mungpoo the sum of Rs. 5,180-10-9 was collected during the year and paid into the Darjeeling treasury. From Munsong Rs. 720-9-0 representing fees collected from cattle grazing within the cinchona boundary were paid into the Kalimpong sub-treasury for credit to the Forest Department. No credit is taken for these sums in the accounts of the Cinchona Department.

12. **Staff.**—Lieut.-Colonel A. T. Gage, T.M.S., C.T.E., who was on leave, retired from public service on the 2nd May 1925 and Mr. C. C. Calder was confirmed in his officiating appointment from that date. Mr. G. E. Shaw, Government Quinologist, was on leave for three weeks from 10th August 1925, during which period Mr. S. C. Sen, Assistant Quinologist, acted in his place. Before Mr. IT. Thomas, Manager, Government Cinchona Plantation, Munsong, proceeded to England on long leave for 14 months, *viz.*, 8 months' leave on average pay and the remaining period on half average pay, commencing from the 23rd August 1925; he was on leave for 19 days from 21st May 1925 and again for one month from 6th July 1925. During Mr. Thomas' absence on leave Mr. G. H. Fothergill, First Assistant Manager, Munsong Cinchona Plantation, officiated in his place and Mr. L. G. Richards acted for Mr. Fothergill. The only change in the Munsong staff to be recorded is the temporary transfer of the second assistant managership to the Mungpoo Cinchona Plantation and the appointment of Mr. G. Holl, Overseer, Mungpoo Cinchona Plantation, thereto. Mr. J. A. Hulbert was Overseer throughout the year. Mr. P. V. Osborne was Manager, and Mr. P. W. Cresswell Assistant Manager of the Mungpoo Cinchona Plantation, throughout the year under report. Mr. G. Holl was Overseer up to 22nd August 1925; thereafter he acted as Second Assistant Manager till the end of the year. The post of overseer of the Mungpoo Cinchona Plantation, which was temporarily transferred to Munsong from 23rd August

1925, was vacant from that date till the end of the year. Mr. Harkaimm Lama was Overseer and Mr. Kaziman Moktan was Sub-Overseer throughout the year. Babu S. K. Mitra, Head Clerk, went on leave for 28 months preparatory to retirement, viz., 8 months' leave on average pay and the remaining period on half average pay, commencing from the 12th June 1925, and Babu A. T. Banerji, seventh clerk, was promoted to act as Head Clerk from that date. All the officers of the plantations and Factory and the clerical staff have performed their duties satisfactorily.

G. E. SIPAW,

Offg. Superintendent,

*Royal Botanic Garden, Calcutta, and, of
Cinchona Cultivation in Bengal.*

APPENDIX A(2).

Abstract of acreage with full complement of cinchona in the Government Cinchona Plantations, Darjeering district, on the 31st March 1926.

Species.	Number of acres bearing trees of—				Total, acreage.
	0—5 years old.	6—10 years old.	11—15 years old.	16 years old and over.	
1	2	3	4	5	6
Cinchona Ledgeriana ..	917-1	1,102-4	334-8	..	2,414-3
„ officinalis ..	..	18-9	52-5	69	78-3
„ succirubra ..	183-5	<M>	10-8	39-5	242-8
„ Ledger X officinalis	20-2	79-6	..	..	99-8
„ (Ledger x succirubra).	88-7	178-3	49-3	1-8	3181
Total ..	1,209-5	1,448-2	447-4	48-2	3,153-3

APPENDIX B.

Receipts for 1925-26.

Transactions of the year.	Sales to Government Offices and institutions.		Sales to the public for cash payment.		Total.
	Cash sales.	Book credit.	In tablets.	In tins in powder form to Native States, Municipal and Local Funds, Dispensaries, Missionary bodies and others.	
1	2	3	4	5	6
	Rs. A.	Rs. A.	Rs. A.	Rs. A.	Rs. A.
Quinine sulphate	9,806 8	1,00,876 10	3,92,340 8	71,956 8	5,74,980 2
Other quinine salts	41 0	16,932 0	.....	531 1	17,504 1
Cinchona fobrifuge	8,744 0	79,167 12	.....	74,070 12	1,61,982 8
Cinchonidine salts	.....	290 0	.....	3 10	293 10
Cinchonino salts	84 0	75 0	.....	30 0	189 0
Quinidine salts ..	.....	345 0	.....	.....	315 0
Quinoidine ..	105 0	77 0	.....	327 0	509 0
Bark ..	.....	61 0	.....	1,950 0	2,011 0
Miscellaneous ..	237 8	238 0	.....	.....	475 8
Total ..	19,018 0	1,98,062 6	3,92,340 8	1,48,868 15	7,58,289 13

APPENDIX C(1).

Stock Account, 1925-26.

	Quinine sulphate.			Other quinine salts.		
	Quantity.	Rate per lb.	Value.	Quantity.	Rate per lb.	Value.
1	2	3	4	5	6	7
	lbs. oz.	Rs.	Rs. A.	lbs. oz.	Us.	Rs. A.
Balance on 1st April 1925.	27,259 2J	20	5,45,183 2	83 0	25	2,075 0 0
Purchased ..	..	..	..	..	..	..
Harvested ..	..	..	..	..	..	..
Used in factory	..	..	..	..	..	..
Manufactured ..	17,378 6	0-21	1,07,919 11	011) 8J	10	0,495 5 0
Issued or sold ..	20,331 13	Vari-ous.	1,82,639 10	556 9	Vari-ous.	17,504 1 U
Balance on 31st March 1926.	24,305 11f	18	4,37,502 14	174 15A	25	4,374 3 0

	Quinidine sulphate.			Cinchonino salts.		
	Quantity.	Rate per lb.	Value.	Quantity.	Rate per lb.	Value.
1	2	3	4	5	6	7
	lbs. oz.	Rs.	Rs. A.	lbs. oz.	Rs.	Rs. A.
Balance on 1st April 1925.	Nil	..	..	5 2	10	51 4
Purchased ..	..	..	..	..	..	..
Harvested ..	..	..	..	..	..	..
Used in factory	..	..	..	..	..	..
Manufactured : ..	20 6	10	203 12	44 2J	5	220 12
Issued or sold ; ..	11; 8	30	345 0	13 0	..	189 0
JJalance on 31st March 1926.	8 14	20	177 8	36 4J	10	302 13

	Cinchonidine salts.			Quinidine.		
	Quantity.	Rate per lb.	Value.	Quantity.	Rate per lb.	Value.
1	2	3	4	5	6	7
	lbs.. oz.	Rs.	Rs. A.	lbs. oz.	Rs.	Rs. A.
Balance on 1st April 1925.	Nil	..	..	33 0	2	66 0
Purchased .. ..	..	..	..	..	..	..
Harvested .. ..	..	..	..	..	..	..
Used in factory ..	..	..	..	..	..	..
Manufactured ..	32 12½	5	103 14	250 3	2	500 0
Issued or sold ..	10 2	..	293 10	08 8	..	509 0
Balance on 31st March 1920.	22 10½	15	339 13	214 11	2	429 0

	Cinchona febrifuge.			(Cinchona bark.		
	Quantity.	Rate per lb.	Value.	Quantity.	Rate per lb.	Value.
1	2	3	4	5	6	7
	lbs. oz.	Rs.	Rs. A.	lbs.	Annas.	Rs. A.
Balance on 1st April 1925.	Nil	..	..	319,088	5	99,902 0
Purchased .. ..	..	..	..	..	..	..
Harvested .. ..	..	..	..	538,783	Various	102,770 2
Used in factory ..	..	..	..	423,775	Various	82,130 15
Manufactured ..	9,108*	2	18,430 0	..	..	..
Issued <i>dt</i> sold ..	9,218	..	86,438 11	4,022	8	2,011 0
Balance on 31st March 1920.	Nil	..	..	430,674	5	134,585 10

*Includes 50 lbs. lost in 1923 on the Railway, the cost of which is now recovered.

	Oil.			Chemicals and stores.	Grand Total.
	Quantity.	Rate per gallon.	Value.	Value.	Value.
lj	2	3	4	5	0
	Gallons.	Rs.	j Rs. A. P.	Rs. A. r.	Rs. A. P.
Balance on 1st April 1925.	15,274	7877	13,395 5 0	8,881 5 0	0,09,554 0 0
Purchased ..	21,708	800	18,850 10 3	51,835 11 0	70,080 5 3
Harvested ..	..	..	..	..	1,02,770 2 0
Used in factory ..	23,330	Various	..	48,330 12 3	1,50,839 1 6
Manufactured ..	..	..	20,371 0 3	..	1,33,939 12 0
Issued or sold ..	..	..	..	..	2,89,930 0 0
Balance on 31st March 1920.	13,712	800	11,874 9 0	12,380 3 9	0,02,033 0 3

APPENDIX C(2).

Detailed Stock Account of barks for 1925-26.

	Cinchona Ledgeriana.			Cinchona officinalis.		
	Quantity.	Rate per lb.	Value.	Quantity.	Rate per lb.	Value.
1	2	3	4	5	6	7
	lbs.	Annas.	Rs. A.	lbs.	Annas.	Rs. A.
Balance on 1st April 1925.	244,323	5	70,351 0	21,505	5	0,739 0
Harvested ..	449,559	Various.	80,801 5	23,995	2-7	4,047 14
Used in factory ..	345,515	..	07,457 4	30,831	2-7	5,202 11
Sold ..	..	..	..	..	..	..
Balance on 31st March 1920.	348,307	5	1,08,804 11	14,729	5	4,002 13

*3-6 annis for Mungpoo bark and 2*7 annas for Mungsong bark.

	Cinchona succirubra.		
	Quantity.	Rate per lb.	Value.
1	2	3	4
	lbs.	Annas.	Rs. A.
Balance on 1st April 1925	22,766	5	7,114 0
Harvested	4,452	Various* ..	937 13
Used in factory	11,550	>>	2,583 3
Sold	4,022	8	2,011 0
Balance on 31st March 1926	11,646	5	3,639 6

	Cinchona (Ledger x succirubra).			Cinchona (Ledger x officinalis).		
	Quantity.	Rate per lb.	Value.	Quantity.	Rate per lb.	Value.
1	2	3	4	5	6	7
	lbs.	Annas.	Rs. A.-	lbs.	Annas.	Rs. A.
Balance on 1st April 1925.	29,034	5	9,073 0*	2,000	5	625 0
Harvested	54,095	Vari- ous.*	9,855 9	6,682	2-7	1,127 9
Used in factory	29,837	,,	5,874 4	6,042	2-7	1,019 9
Sold .. ..	..	..	..	..	..	..
Balance on 31st March 1926.	53,292	5	16,653 12	2,640	5	825 0

*6 annas per lb. for Mungpoo and 27 annas for Mi nseng bark.

APPENDIX D.

Expanditura for 1225-26.

I.—PLANTATIONS ACCOUNT.

A.—MUNGPOO PLANTATION.

<i>Pay of Establishment.</i>		Rs.	A.	P.	Rs.	A.	P.
I. Salaries—							
1.	Manager (Non-voted)	5,892	14	0	7,092	14	0
2.	Duty allowance	1,200	0	0			
3.	Assistant Manager (Voted) ..	3,336	0	0			
4.	Overseers ..	4,236	0	0			
5.	Sub-Overseer ..	600	0	0			
6.	Sub-Assistant Surgeon ..	1,338	2	0	9,870	2	0
7.	Artificer ..	360	0	0			
<i>Allowances, honoraria, etc.</i>							
II. Travelling allowance—							
1.	Travelling allowance (Voted) ..	36	12	0	1,116	12	0
2.	Pony allowance ..	1,080	0	0			
III. House rent and other allowances—							
1.	Hill allowance (Voted) ..	334	7	0	634	7	0
2.	Special allowance ..	300	0	0			
<i>Supplies and services.</i>							
IV. Carriage, packing and distribution charges—							
1.	Carriage of stores (Voted) ..	2	13	0			
2.	Landing and clearing charges of Europe stores ..	....			21	3	0
V. Purchase and feed of horses ..							
		....			2,160	0	0
VI. Purchase of stores and implements, etc.— ..							
1.	European stores (Voted) ..	1,767	13	0	1,938	12	0
2.	Freight on above ..	170	15	0			
VII. Customs duty on imported stores ..							
			
<i>Contingencies.</i>							
VIII. Petty construction and repairs (Voted) ..							
		....			504	15	0
IX. Other contingent charges—							
1.	Sirdars and coolies (Voted) ..	63,871	15	6			
2.	Labour of malis ..	2,352	0	0			
3.	Miscellaneous ..	973	15	6			
4.	Cost of medical stores ..	515	13	0	67,713	12	0
Total Mungpoo chafes		....			91,052	13	0

B.—MUNSONG PLANTATION.

<i>Pay of Establishment.</i>		Rs.	A.	P.	Rs.	A.	P.
I. Overseers and skilled staff—							
1.	Manager (Non-voted)	3,238	11	0			
2.	Duty allowance ..	1,387	15	0			
3.	Assistant Managers ..	8,916	12	0	13,543	6	0
4.	Overseer (Voted) ..	2,220	0	0			
5.	Sub-Assistant Surgeon ..	1,899	1	0	4,119	1	0

Allowances, honoraria, etc.

			Us.	A.	P.	Rs.	A.	P.
II.	Travelling allowance—							
	1. Travelling allowance	(Voted)	..	178	7	0		
	2. Pony allowance		..	1,611	4	0	1,789	11 0
III.	House rent and other allowances—							
	1. Hill allowance	(Voted)	..	476	8	0		
	2. Special allowance		..	300	0	0	776	8 0

Supplies and Services.

IV.	Carriage, packing and distribution charges—							
	1. Carriage of bark	(Voted)	..	4,913	3	0		
	2. Carriage of stores		..	243	15	0		
	3. Landing and clearing charges of Europe stores		..	17	0	0	5,174	2 0
V.	Purchase and feed of horses		..	.....			2,160	0 • 0
VI.	Purchase of stores, impliments, etc.—							
	1. Europe stores	(Voted)	..	3,252	5	0		
	2. Freight on above		..	212	11	0	3,465	0 0
VII.	Customs duty on imported stores		..	.....			.....

Contingencies.

VIII.	Petty construction and repairs		..	.....			1,994	11 9
IX.	Other contingent charges—							
	1. Sirdars and coolies		..	90,346	12	3		
	2. Miscellaneous		..	880	13	0		
	3. Cost of medical stores		..	754	12	0	91,982	5 3
	Total Munsong charges		..	.....			1,25,004	13 0
	Total for both plantations		..	.....			2,16,057	0 0

II.—FACTORY ACCOUNT.

Pay of Officers.

			Rs.	A.	P.	Rs.	A.	p.
I.	Quinologist and other gazetted officers—							
	1. Quinologist	(Non-voted)	..	.....			19,885	14 0
	2. Assistant Quinologist	(Voted)	..	.....			5,727	0 3

Pay of Establishment.

II.	Clerks—							
	1. Clerk	(Voted)	..	.....			700	0 0

Allowances, honoraria, etc.

III.	Travelling allowance—							
	1. Travelling allowance	(Voted)	..	231	2	0	231	2 0
IV.	House rent and other allowances—							
	1. Hill allowance	(Voted)	..	175	0	0	175	0 0

<i>Supplies and Services.</i>				lrs.	A.	P.	Rs.	A.	*.
V.	Carriage, packing and distribution charges—								
	1.	Packing materials	(Voted) ..	2,912	4	3			
	2.	Distribution charges	„ * <	403	14	0			
	3.	Carriage of stores	„ ..	5,732	12	0			
	4.	Landing and clearing charges of European stores.	„ .-	1,607	7	0	10,656	5	3
VI.	Purchase of stores, implements, etc.—								
	1.	European stores	(Voted) ..	38,438	13	0			
	2.	Freight on above	„ ..	5,781	9	0			
	3.	Chemicals	„ ..	34,120	11	3	78,341	1	3
VII.	Customs duty on imported stores			„ ..	....		245	15	0
<i>Contingencies.</i>									
VIII.	Petty construction and repairs (Voted)			„ ..	....		7,474	9	9
IX.	Other contingent charges—								
	1.	Sirdars and coolies	(Voted) ..	12,194	13	0			
	2.	Fuel (carriage and cutting up only).	„ ..	0,501	4	9			
	3.	Purchase of bark (carriage only).	„ ..	1,753	9	0			
	4.	Miscellaneous	„ ..	<u>075</u>	<u>8</u>	<u>0</u>	21,125	3	3^
	Total Factory charges			„ ..	....		<u>1,44,562</u>	<u>2</u>	<u>9#</u>

III.—GENERAL.

Pay of Officers.

I.	Gazetted officers—								
	1	Superintendent	(Non- voted)	....			2,400	0	0

Pay of Establishment.

II.	Clerks—								
	1	Clerk	(Voted) ..	....			7,308	11	0
III.	Servant—								
	1	Servant	(Voted) ..	....			228	0	0

Contingencies.

IV.	Other contingent charges—								
	1.	Postage and telegrams	(Voted) ..	500	0	0			
	2.	Road and Public Works c^ls	„ ..	1,814	0	0	2,314	0	0
	Total General charges			„ ..	....		<u>12,250</u>	<u>11</u>	<u>0</u>

IV.—ABSTRACT.

Total	Mungpoo charges	..	..	..	91,052	13	0		
„	Munsong	„	..	..	1,25,004	13	0		
„	Factory	„	..	..	1,44,562	2	9		
„	General	„	..	..	<u>12,250</u>	<u>11</u>	<u>0</u>		
	Grand total expenditure			„ ..	<u>3,72,870</u>	<u>7</u>	<u>9</u>		

APPENDIX E.

Profit and Loss Valuation, 1925-26.

—	Amount.	—	Amount.
1	2	3	4
	Rs. A. p.		Rs. A. p.
To—		By—	
Stock on 1st April 1925	6,69,554 0 0	Arrears recovered ..	79,305 1 0
Outstanding on 1st April 1925 ..	79,305 1 0	Sales during the year	4,86,575 11 10
Expenditure (less Rs. 34,696 capital expenditure) ..	3,38,174 7 9	Outstandings on 31st March 1926 ..	46,511 12 0*
Depreciation on buildings ..	3,199 0 0	Stock on 31st March 1926 ..	6,02,033 0 3
Depreciation on machinery ..	3,719 0 0	Gain in revaluation of Cinchona trees ..	73,092 0 0
Balance (profit) ..	1,93,566 0 4	Timber trees ..	.....
Total ..	12,87,517 9 1	Total ..	12,87,517 9 1

* This includes outstandings of Rs. 9,001-2-6 against the Government of India.

APPENDIX F.

Block Account, 1925-26.

I.—MUNGPOO PLANTATION.

—	Amount.	—	Amount.
1	2	3	4
	Rs. A. p.		Rs. A. p.
To—		By -	
Value of buildings on 1st April 1925 ..	25,798 0 0	Depreciation on buildings at 2½ per cent.	737 0 0
Machinery (Sirocco driers) ..	813 0 0	Value of buildings on 31st March 1926 ..	25,061 0 0
Value of plantation on 1st April 1925—		Depreciation on machinery at 5 per cent.	54 0 0
Cinchona trees ..	4,76,494 0 0	Value of machinery on 31st March 1926 ..	759 0 0
Timber trees ..	2,76,733 0 0	Value of plantation on 31st March 1926—	
Value of new planting at cost made in 1925-26—		Cinchona trees ..	5,60,286 0 0
Cinchona trees ..	10,700 0 0	Timber trees ..	2,78,733 0 0
Timber trees ..	2,000 0 0		
Gain on revaluation of plantations at end of 1925-26 (extensions for the year excluded)—			
Cinchona trees ..	73,092 0 0		
Timber trees ..	.....	
Total ..	8,65,630 0 0	Total ..	8,65,630 0 0

II.—MUNSONG PLANTATION.

	Amount.		Amount.
1	2	3	4
	Rs. A. p.		Rs. A. p.
To—		By—	
Value of buildings on 1st April 1925 ..	34,308 0 0	Depreciation on buildings at 2½ per cent.	944 0 0
Value of plantation on 1st April 1925—		Value of buildings on 31st March 1926 ..	33,364 0 0
Cinchona trees ..	19,41,557 0 0	Value of plantation on 31st March 1926—	
Timber trees ..	9,130 0 0	Cinchona ..	19,56,207 0 0
Value of new planting at cost made in 1925-26—		Timber trees ..	9,930 0 0
Cinchona trees ..	14,650 0 0		
Timber trees ..	800 0 0		
Gain on revaluation of plantations at end of 1925-26 (extensions for the year excluded)—			
Cinchona trees ..	Nil		
Timber trees ..	Nil		
Total ..	20,00,445 0 0	Total ..	20,00,445 0 0

III.—FACTORY.

	Amount.		Amount.
1	2	3	4
	Rs. A. P.		Rs. A. P.
To—		By—	
Value of buildings on 1st April 1925 ..	53,163 0 0	Depreciation on buildings at 2½ per cent.	1,518 0 0
Additions to buildings made in 1925-26 ..	5,542 0 0	Value of buildings on 31st March 1926 ..	57,187 0 0
Value of machinery on 1st April 1925 ..	54,991 0 0	Depreciation on machinery at 5 per cent.	3,665 0 0
Additions to machinery made in 1925-26 ..	1,004 0 0	Value of machinery on 31st March 1926 ..	52,330 0 0
Total ..	1,14,700 0 0	Total ..	1,14,700 0 0

APPENDIX G.

Statement of sales of factory products during the official year 1925-26.

Particulars.	Quinine salts.	Cinchonine and cinchonidine salts.	Cinchona febrifuge.	Quinine salts and quinoidine.	Cinchona bark.	Total.
<i>Assam.</i>						
	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.
Jails	18 8	..	47 0	..	..	65 8
Dispensaries ..	499 8	..	1,312 0	5 0	..	1,816 8
District Boards ..	6 0	..	1 0	..	..	7 0
Missionary bodies ..	18 12	..	46 12	..	..	65 8
Others	0 12	..	92 12	..	..	93 8
<i>Bengal.</i>						
Jails	12,962 8	..	29 4	..	..	12,991 12
Medical Store Depots	2,271 9	..	980 0	1 8	..	3,253 1
Dispensaries ..	2,605 6	6 0	6,287 8	..	..	8,898 14
District Boards ..	445 8	..	1,015 8	..	..	1,461 0
Missionary bodies ..	113 8	..	184 8	1 0	..	299 0
Others	89 12	2 0	1,159 0	2 8	3,900 0	5,153 4
<i>Bihar and Orissa.</i>						
Jails	4 0	..	1 0	..	..	5 0
Dispensaries ..	1,154 9	..	1,404 0	24 0	..	2,582 9
District Boards ..	169 4	..	480 0	1 0	..	650 4
Missionary bodies *	50 4	..	120 8	..	..	170 12
Others	170 13	0 2	315 4	4 0	..	490 3
<i>Punjab.</i>						
Jails	2 0	..	50 0	..	..	67 0
Dispensaries ..	..	5 0	1,115 4	..	..	1,120 4
District Boards ..	..	..	..	..	..	..
Missionary bodies ..	..	..	19 8	4 0	..	23 8
Others .. ..	..	5 0	278 4	5 0	..	288 4
Medical Store Depot	230 0	..	206 0	..	..	436 0
<i>Other Provinces and States.</i>						
Jails .. ..	..	..	47 12	..	..	47 12
Dispensaries ..	7 14	5 0	824 0	..	..	836 14
District Boards ..	..	..	73 0	..	..	73 0
Missionary bodies ..	9 8	..	234 4	..	..	243 12
Others	39 10	..	812 8	27 0	122 0	1,001 2
Medical Store Depots	..	..	405 0	5 0	..	410 0
Total ..	20,869 9	23 2	17,556 8*	80 0	4,022 0	42,551 3

* Includes Government of India and Madras borghit stocks,

APPENDIX H.*

Sale of Sulphate of Quinine in "treatment"¹¹ tablets during 1925-26.

Consecutive No.	Months.	Total proceeds from sale of tablets.	Credited in Cinchona Department at half rate.
1	2	3	4
	1925.	Rs. A. P.	Rs. A. P.
1	April	11,555 12 0	5,777 14 0
2	May	10,725 9 6	5,362 12 9
3	June	14,074 6 6	7,037 3 3
4	July	23,675 4 0	11,837 10 0
5	August	36,604 4 1	18,302 2 0
6	September	24,301 7 0	12,150 11 6
7	October	58,482 12 3	29,241 6 2
8	November	85,884 12 0	42,942 6 0
9	December	60,740 9 0	30,370 4 6
	1926.		
10	January	25,591 13 0	12,795 14 6
11	February	33,387 12 0	16,693 14 0
12	March	7,316 3 1	3,658 1 6
	Total	3,02,340 8 5	1,96,170 4 2

*Supplied by the Accountant General, Bengal.

GOVERNMENT OF BENGAL.

REVENUE DEPARTMENT.

Cinchona.

CALCUTTA, THE 4TH JANUARY 1927.

RESOLUTION—No. 153Cin.

READ—

The sixty-fourth annual report of the Government Cinchona Plantations and Factory in Bengal, for the year 1925-26.

READ ALSO—

The reports of the previous three years.

Mr. C. C. Calder held charge of the office of Superintendent throughout the year.

J. The Government Cinchona Department works two plantations, one at Mungpoo and the other at Munsong, both in the district of Darjeeling, and has also a factory at Mungpoo where quinine and its by-products are manufactured from the bark of trees grown in these plantations and also from Java bark obtained from the Government of India. The area under cinchona at the end of the year was 3,153 acres, showing an increase of 93 acres over the previous year's area of 3,060*. The quantity of bark harvested was 538,783 lbs. as against 432,553 lbs* in the previous year. The full outturn could not however be utilised in the factory as there was a large stock of Java bark which required to be treated first. On the whole 1,039,912 lbs. of bark were treated in the factory against 935,998 lbs. in the previous year.

There is considerable difficulty in securing suitable soil for further extension of the plantations. The result of the experiment in the Latpanchor Spur is not hopeful, and the proposal for an experiment in the Samsing area is under examination.

2. The quantity of factory-produce sold during the year was 42,551 lbs. against 43,143 lbs. in the previous year. The decrease was due to a decrease in the sale of Cinchona Febrifuge which had an exceptionally large sale in the previous year. The sale-rates of Quinine Sulphate and other quinine salts which were reduced in the previous year were further reduced during the year under review. Receipts from sales amounted to Rs. 7,58,290, and the total expenditure was Rs. 3,72,870. The profit and loss valuation gives a balance of Rs. 1,93,566 on the profit side, and although this last item was less than in the previous year, the financial results on the whole have been satisfactory.

The preparation of a working plan for the plantations based on an up-to-date survey of the trees, which are now bearing bark and can be expected to bear bark in the next twenty years, is urgently needed.

In the absence of such a survey the figures given for stock in the profit and loss accounts cannot be held to be accurate. Nevertheless there does not seem to be any apprehension of the plantations falling below their present output in the near future, and the thanks of Government are due to Mr. Caldett for his efficient administration of the department.

ORDER.—Ordered that this resolution be published in the *Calcutta Gazette* and that a copy with a copy of the report be submitted to the Government of India.

By order of the Governor in Council,

F. A. SACHSE,

Secretary to the Government of Bengal (offg.).

Nos. 1135-1135^.

Copy forwarded to the (1) Superintendent, Cinchona Cultivation, Bengal, for information and necessary action on the point mentioned in paragraph 2 of the Resolution, (2) Agriculture and Industries Department of this Government for information.

By order of the Governor in Council,

M. N. GUPTA,

Assistant Secretary to the Government of Bengal.

CALCUTTA,

The 4th January 1927.



Government of Bengal

Sixty-Fifth
Annual Report of the
Government Cinchona Plantations
and Factory in Bengal

For the Year
1926-27

CALCUTTA
Bengal Secretariat Book Depot
1927

Price—Indian, 13 annas ; English, 1s. 3d.



Government of Bengal

Sixty-Fifth
Annual Report of the
Government Cinchona Plantations
and Factory in Bengal

For the Year

1926-27

CALCUTTA
Bengal Secretariat Book Depot
1927

Published by the Bengal Secretariat Book Depot, Writers' Buildings, Calcutta.

Agents in India.

Messrs. S. K. Lahiri & Co., Printers and Booksellers, College Street, Calcutta.

Messrs. Thacker, Spink & Co., Calcutta.

**Customers in the United Kingdom and the Continent of Europe
may obtain publications either direct from the High Commissioner's office
or through any book-seller.**

Sixty-Fifth Annual Report of the Government Cinchona Plantations and Factory in Bengal for the year 1926-27.

1. **General.**—Since the fall in the price of quinine in April 1926, there has been no outstanding development in the quinine and cinchona trades, information being merely to the effect that the consumption of quinine has been well maintained. The Hoffmann Chemical Works of Bale and the Hoshi Factory in Japan entered the convention during the year, so that there is only one independent factory left—a small factory in Amsterdam. The Cinchona Agreement between the Java planters and manufacturers expires in 1928 and it is not unlikely that it will be renewed. In common with India, various countries continue their endeavour to attain a certain independence with regard to quinine. Russia talks of growing cinchona on the Black Sea coast, France is considering how much of her cinchona requirements might be produced in her African colonies and Italy, whose estates in Java are approaching the harvesting stage, will shortly be independent of foreign quinine.

2. Attention has been directed to cinchona matters in India, through the sittings of the Royal Commission on Agriculture, which has taken evidence from Sir David Prain, Colonel Graham and others, who have emphasised particularly the need for taking active steps for increasing the land under cinchona and also the question of centralisation. It is shown in the evidence given in the Royal Commission's report that for many years there has been comparatively little advance in the extension of cinchona cultivation in India. Bengal is not free from criticism in this respect.

3. The scheme for extending the Bengal Cinchona Plantations has so far resulted in the planting of only 31 acres at Latpanchor. The greater part of this area was planted late in the season 1925-26, and although the late planting must have been a handicap, the plants are by no means robust. This area is also not free from difficulties with regard to water and cinchona blocks would be very scattered; labour and adequate supervision would be difficult.

4. Another area at Samsing in the Kalimpong Forest Division has been explored and gives promise of about 2,000 acres of excellent cinchona land, of very much better quality and much easier of access than the land at Latpanchor with, however, the drawback that the rainfall is considerably above the *optimum*. This disadvantage may not prove serious as the land is well drained, and arrangements are being made for experimental planting in this locality.

5. The condition of the younger blocks in the Bengal Plantations is very satisfactory. Large areas, especially in Munsong plantation are, however, occupied by trees which have passed the economic age for harvesting and the condition of the majority of these blocks is such that they should be harvested as soon as possible. This state of affairs is due principally to the fact that the harvesting has been conserved owing to the necessity of having a large supply of bark in stock on the expiration of the agreement with Messrs. Howards & Co. in 1898. The increment of the whole plantation would have undoubtedly been greater and the problem of finding land for cultivation would not have been so acute, had godowns been built and the bark stored in them instead of on the trees.

6. Definite figures regarding the amount of quinine per acre yielded by the various species have now been prepared. *Cinchona officinalis* produces in Bengal less than half the amount obtained from other species. It is, therefore, scarcely worth cultivation, and as in the majority of the *officinalis* blocks are overmature they will be the first among those to be removed and the land will be reafforested preparatory to replanting with cinchona. With this afforestation the Forest Department have undertaken to help.

7. Hitherto in the Bengal Plantations, planting and harvesting has depended largely upon immediate circumstances. The area planted has usually been determined by such factors as labour, land and money immediately available. The harvesting has been regulated by the needs of the factory and the supplies of foreign bark. As long as large areas were available for planting, this was of no great consequence, but now that the whole of the suitable land on Munsong has been planted and many of the blocks instead of being harvested and afforested so as to be ready for a second crop of cinchona, have been left with only a few scattered overmature cinchona trees, the problem of maintaining a sustained annual yield is a difficult one.

8. With the object of ascertaining the maximum annual yield which both plantations can produce, and to regulate planting and harvesting so that it may be maintained, a working scheme, the need for which was expressed in the resolution attached to last year's report, is being prepared. A great deal of data has been collected and during the year a complete enumeration of all the standing trees was made.

9. The figures in Appendix A of reports for a number of years have been misleading, in that the number of acres shown as bearing a full complement of cinchona had no relation to the actual area under cinchona and being cultivated. The significance of the figures given related to the quantity of standing bark, not to actual area. From the original area planted one acre was deducted for every 400 lbs. of bark harvested, multiplied by the age of the block at the time of

harvest. Thus the area of a block gradually disappeared. With a forward harvesting policy, this system was accurate enough for practical purposes, as the yield of bark is on an¹ average about 4,000 lbs. per acre in 10 years, although not 400 lbs. per year. When however, harvests amount practically only to thinnings, as they have for the past 5-6 years, or under a system of coppicing, and without the quinquennial check which was first intended, there is a large accumulative error in this system which is evidenced in one block of 100 acres, to all appearance fully stocked, having been shown as 5 acres.

10. In the current report the areas under cinchona are taken as the original acreages planted. These agree closely with the area actually under cinchona and requiring cultivation, and pending a survey are the most accurate figures available.

In order to obtain accurate figures with reference to stocking, a complete enumeration of all the standing trees was made and the estimate of bark given in Appendix A is based on these figures and the average weight of bark on trees of different ages as given by measurements of over 4,000 trees.

The average bark increment per acre per annum has also been ascertained and can be used for purposes of valuation, etc. Blocks when they attain the age of four and eight years, the critical years for harvesting, will be enumerated, and thus errors due to deviation from the average stocking will be eliminated.

It is estimated that on both plantations there are 21,762,500 lbs. of green bark, which would be equivalent in dry bark to about 8,605,000 lbs.

11. By the end of the year, preliminaries had been discussed in connection with the commercialisation of accounts. A visit was paid to the plantations by the Director-General of Commercial Audit, and the new system was discussed. It is hoped to bring it into operation by the beginning of 1928.

12. **The Plantations.**—*Mungpoo.*—The rainfall for the year was 129*46 inches, only slightly above the average for the last 45 years. On Mungpoo Plantation, a very considerable portion of the area is under young forest from 1—20 years old, so that this land is now ready for replanting with cinchona.

During the year, between May and July 1926, 45 acres of *Cinchona Ledgeriana* were planted on Labdah, 32 acres of *Cinchona Succiruhra* on Sittong and 30 acres at Latpanchor, a total of 107 acres.

13. The area under cinchona and requiring tending and cultivation is approximately 1,295 acres. This area is, however, not all completely stocked. The standing green bark is estimated at 7,496,100 lbs. Reckoning on the old system, the plantation would now be considered to have a total area of 1,038 acres fully stocked.

14. A method of planting, which has recently been tried on Mungpu, is on terraces 4 feet wide. One of the chief difficulties is to maintain a 4' x 4' spacing without reducing the terraces, so that little room is left for root expansion. The cost of making terraces is also heavy. Even better results appear to have been obtained, at much less cost at Munsong, by making small individual terraces round each plant. This method, combined with contour weeding has given excellent results and has been adopted this year, except on the very steepest land, and on gently sloping land where no terraces are required.

15. The dry bark harvest for the year consisted of 210,352 lbs. of *Ledgeriana*, 9,620 lbs. of Hybrid and 6,361 lbs. of *SucaVubra*, a total of 226,333 lbs. Although this harvest is the largest for some years, it has been obtained entirely from thinnings, and the uprooting of scattered dead and dying trees. There was actually no reduction on the area to be cultivated, although under the old system, the area would have been reduced by 79.2 acres, a figure very much in excess of the area of the vacancies caused by the removal of dead and dying trees, since the greater part of the harvest was obtained merely by removing branches from standing trees which were growing too close together.

16. The experimental plantation at Latpanchor, which was started in May 1926, is so far not very successful. A large number of deaths have occurred and the remaining plants have, for the most part, made little growth. This may be partly due to the fact that, the area being remote, plants had to be carried from a long distance, and were planted late in the season.

17. The stock of Ipecacuanha plants, which last year was 100,603, has been increased this year by some 50,000 cuttings, which look extremely promising. No root was harvested during the year, but arrangements have been made to harvest a considerable quantity during 1927. There is still a demand for *Digitalis*, that from Mungpu being considered of high quality. A large number of *new* plants were put out and altogether 395 lbs. were harvested and sold.

18. *Munsong*.—The rainfall for the official year was 95 * 35 inches. An excessively dry spell occurred from the middle of October to the end of December, when only .08 inches of rain was registered. Rain fell in January and came before much damage had been done by the drought, so that the year was on the whole quite favourable as regards weather conditions. On exposed ridges, plants suffer considerably from the effect of too much direct sunlight.

19. The condition of the blocks under 8 years old is extremely satisfactory, and one of the most noticeable features is that areas planted subsequently to 1921 with 4' x 4' spacing are in a much better condition and likely to yield much heavier crops than areas

planted with 6' x & spacing. There have been fewer deaths; they have yielded more bark in thinnings and there is a comparative absence of weeds, which are kept in check by the cinchona trees themselves. The appearance of the plantation as a whole is, however, marred by the older blocks, which represent a very considerable proportion of the area, as may be seen from the data in Appendix I. They contain only widely scattered trees and should have been harvested much earlier. Appearance, however, is secondary to the loss in increment, to the loss involved in cultivating large areas for the sake of only a few trees, and in the holding up of land which should be growing forest crops, in preparation for further crops of cinchona. The area under cinchona and requiring cultivation is approximately 3,447 acres, whereas under the old system the area would be recorded as about 2,100 acres. The standing green bark is estimated at 14,266,400 lbs., the equivalent of about 5,706,600 lbs. of dry bark.

20. On ridges, especially those facing south and south-east, plants suffer considerably from over-exposure to the sun. This is evidenced by the condition of the plants, as compared with those on less exposed situations, and by the fact that they invariably flower and fruit at a very early age. Although in the Nilgiris cinchona must be grown under shade, it has been found unnecessary in Bengal. It is thought, however, that shade may be very beneficial in such situations and experiments are being tried, *Ahius nepalensis* being the species selected. Sample plots were also laid out to test the expediency of picking off the flowers when trees flowered at an early age.

21. The area planted during the year, consisted of 97 acres of *Cinchona Ledgeriana* and 12 acres of *Cinchona Succirubra* on Kashyem, 32*5 acres of *Cinchona Ledgeriana* on Burmiak and 5 acres on Sangseer, a total of 146-5 acres.

22. As in the case of Mungpu, harvest was taken only from thinnings and dead and dying trees and amounted to 442,734 lbs.

23. **Cost and valuation of bark.**—The average cost per lb. of all Mungpu barks taken over the past 25 years is 3-6 annas and of Munsong barks 2-7 annas. The cost of producing the 226,332 lbs. of Mungpu bark, which was harvested during the year is, therefore, Us. 50,925. At a unit rate of 1-5 annas and with an average quinine percentage of *Ledgeriana* 5-07, of *Succirubra* 3;0 and of Hybrid 4^24, the commercial value of the bark amounts to Us. 1,06,942 or over double what it cost.

24. The Munsong harvest, 442,734 lbs. at 3*7 annas per lb. cost Es. 74,711 to produce, and as the quinine percentage was 4:85 for *Ledgeriana*, 4-52 for Hybrid, 4:16 for *Offidnalis* and 3-01 for *Succirubra*, the commercial value of the bark would be about Rs. 1,97,570, showing a decidedly higher profit than Mungpo.

25. **The Factory.**—The total quantity of quinine sulphate manufactured in the year was 55,136* lbs. and represents practically the limit of which the Factory is capable. The quantity of cinchona febrifuge produced amounted to 19,197 lbs., 980 lbs. more than last year, while 24| lbs. of quinoidine sulphate, 24£ lbs. of cinchonidine sulphate and 116£ lbs. of quinoidine were also manufactured. From part of the quinine sulphate, 389* lbs. of other quinine salts were prepared. To produce this quinine, 211,609 lbs. of Mungpu bark, 372,195 ~~lbt-~~ of Munsong bark and 543,714 lbs. of Java bark were utilised, the extraction from Java bark being on behalf of the Government of India. The Mungpu bark included 203,318 lbs. of *Ledgeriana* containing 5*07 per cent., 7,973 lbs. of Hybrid, containing 4*24 per cent, and 318 lbs. of *Succirubra* with 3 per cent, of quinine sulphate. The Munsong *Ledgeriana* gave only 4*85 per cent, from 301,520 lbs.; the Hybrid 4 -52 per cent, from 53,783 lbs.; the *Officinalis* 4 • 16 per cent, from 14,479 lbs. and the *Succirubra* 3-01 per cent, from 2,413 lbs. of bark. It is scarcely fair, however, to judge the plantations on these percentages as, had a system of harvesting blocks on maturity% been in force, there is no doubt that the percentages of cinchona would* have been higher. In the quinine sulphate, as sent out from the Factory, there was an average of 3 -45 per cent, of cinchonidine sulphate and in the cinchona febrifuge the equivalent of 18·5 per cent, of quinine sulphate. Both these figures represent a very high level of quality. The Java bark accounted for 28,529£ lbs. of quinine sulphate and 8,506 lbs. of cinchona febrifuge and Bengal bark for 26,607 lbs. of quinine sulphate and 11,411 lbs. of cinchona febrifuge; 2,953f lbs. of quinine have been left in the crude state. Allowing for the 3-45 per cent, of the *Cinchonidine Sulphate*, the quinine manufactured, would be 53,234 lbs., that in the cinchona febrifuge 3,6844 lbs., so that the total production was 56,918^ lbs. As analysis of the bark after grinding showed the presence of 58,153-9 lbs., the extraction yield was 97*88 per cent., a satisfactory figure.

26. The tablet manufacture was transferred from the Jail to the Factory and at the beginning of October six machines had been installed and they are working satisfactorily. During the later half of the year 8,644 lbs. of quinine were converted into tablets. Samples of bork of 245 trees were analysed for the plantation during the year.

27. **Cost and value of quinine produced**—(a)'Cost in the fear*.—The 583,804 lbs. of mixed Mungpu and Munsong bark which cost (211,609 lbs. at 3:6 annas and 372,195 lbs. at 2 -7 annas per pound) Es. 1,10,420, contained not only the 26,607 lbs. of quinine sulphate extracted as such, but also 2,111 lbs. left in the cinchona febrifuge. The cost per pound of the quinine in the bark was, therefore. Rs. 3-85.

28. (b) *Cost of extraction.*—The quinine extracted in the Factory belonged partly to the Government of Bengal and partly to the Central

Government. The cost of extraction, owing to the large quantity manufactured, is considerably less than what would have been the case if only Bengal plantation bark had been manufactured, and is determined as follows:—

The total direct expenditure by the Factory was Us. 1,36,948. General charges debitable to the Factory amount to Its. 4,841, depreciation on buildings and machinery amounts to Its. 5,321, making the gross Factory expenditure Its. 1,47,110. From this has to be deducted capital expenditure *on new* plant and machinery amounting to Its. 8,840; also the increase in the value of stores at the end of the year, Its. 21,898, and the expenditure on the manufacture of products other than quinine sulphate, viz., 19,917 lbs. of cinchona febrifuge, at Re. 1-6 per pound, 389 lbs. of other quinine salts at Its. 3 per pound and 161 £ lbs. of other products at Its. 2 per pound, totalling Its. 28,870. The net expenditure on the production of 55,136-J lbs. is, therefore, Us. 87,496, which is Its. 1 #59 a pound, a very much lower figure than has hitherto been attained.

29. (c) *Total cost per pound and value of the quinine produced.*—The cost of the quinine in the bark is Us. 3-84 and the cost of extraction is Rs. 1 -59. The total of the cost of production of quinine per pound is accordingly Its. 5*43. The 26,607 lbs. of provincial quinine manufactured are worth at Its. 18 per pound (the present selling price) Its. 4,78,926, but cost only Its. 1,44,476 to produce.

30. *Distribution and sales.*—The distribution and sale of cinchona products was, as usual, undertaken by the Jail. As the tablet-making has, however, been transferred to the Factory, there is no longer suitable work for prisoners, and the question of relieving the Jail of the responsibility is being considered. There are certain disadvantages in the use of the Jail as the distributing centre and the distributing costs are heavy, being estimated by the Jail authorities at about Re. 1 per pound. A centre especially for distribution would permit of more speedy returns of payments, a larger turnover and adequate attention to propaganda.

31. A statement of the sales of factory products for the year 1926-27 is available in Appendix G.

Under quinine salts the total sales, as shown by the distributors, amount to 14,908 lbs. This includes the quantity of quinine sulphate sold[#] by the Jail as tablets during the first six months of the year; but excludes 4,858 lbs. of quinine sulphate sold as tablets after the manufacture was transferred from the Jail. The total sales, therefore, amount to 19,766 lbs. as against 20,869 lbs. in the previous year. There has been an increase of 280 lbs. in the sale of powder, and a decrease of 1,382 lbs. in the sale of tablets.

In the Bengal area the sale of febrifuge has decreased by 755 lbs. and for the first time there has been a considerable stock in hand at the

end of the year. The total amount of cinchona febrifuge issued or sold was 17,081\$ lbs., of which 7,771 lbs. belonged to the Government of India. Credit is therefore taken in these accounts for the sale of 9,310£ lbs. The 7,771 lbs. include 5,961 lbs. sold in the Government of India area and 1,810 lbs. sold in the Bengal area. Credit for the whole of the 7,771 lbs., amounting to Rs. 71,942-15, has therefore to be given by the Government of Bengal to the Government of India,

Of the 9,310* lbs., 2,3254 lbs. were tablets, bringing in Rs. 23,496-15 and 6,985 lbs. were powder, bringing in Rs. 63,369-2,

As the result of the fall in the world price, selling rates were lowered at the beginning of the year to__

			Rs.	Rs.
Quinine sulphate	—	...	18	to 20
Other quinine salts	...	...	23	to 27
Cinchonine salts	...	...	12	to 14
Cinchonidine salts	...	...	25	to 27
Quininidine salts	...	...	20	to 22
Quinoidine	...	...	5	to 6
Cinchona febrifuge	...	...	9	to 11

The price of quinine treatments was also lowered from 6 annas to 4J annas.

The lower selling rates have not yet been followed by an increase in the sales; there has been instead a falling off in the sale of tablets. There is consequently a considerable fall in revenue due to the reduced price. Rupees 2,74,793-1-11 were obtained from the sale of quinine sulphate in the form of tablets. Of this sum half the proceeds for the first six months were credited to the Jail Department as the Jail were then manufacturing tablets.

32. **Expenditure and Receipts.**—The total expenditure of the Department (including pensionary charges), as detailed in Appendix D, was Rs. 3,89,751-8-6. The total receipts were Rs. 5,98,651-8. These include the Jail share of proceeds from the sale of quinine sulphate tablets, amounting to Rs. 74,750-10-9. The net amount for credit to the Cinchona Department is therefore Rs. 5,23,900-13-3. Sums of Rs. 45,361-14-6 and Rs. 11,695-12 are still due from the Government of India to cover the cost of extracting 28,f>29| lbs. of sulphate of quinine at Re. 1*59 per pound and 8,506 lbs. of cinchona febrifuge# at Re. 1-6 per pound, and the sum of Rs. 71,942-15 is due by the Government of Bengal to the Government of India on account of febrifuge sold on their behalf. The gross earnings for the year are therefore Rs. 5,09,015-8-9.

33. **Quinine Reserve and Stock Account.**—Full details of stocks are given in Appendices C (1), C (2) and C (3). The stock of harvested bark at the end of the year stood at 512,135 lbs., an accumulation accounted for chiefly by difficulties of transport.

The provincial reserve of quinine has increased during the year by 2,839 lbs. to 27,144 lbs. The stock of cinchona febrifuge stands at 2,136 lbs.

Stocks have hitherto been valued at their selling price. Discussions in connection with the proposed commercialisation of accounts has shown that the cost price is a much sounder basis of valuation. Values have, therefore, in this report, been shown at cost, as nearly as can be determined with the present accounting system, although this means a depreciation in value of nearly Us. 4,00,000.

34. **Block Account.**—It was noted in last year's report that the valuation of the plantations, based on the acreage figures in Appendix A of that report, gave an improbable figure, and accordingly the value has been taken as a constant figure for the past two years. It has also been noted that the valuation of the plantations differed greatly from year to year. This was due to the fact that the value of a block was based on the quinine content of ten trees selected annually from each block, by which method the quinine content of a block has been found to vary by as much as 30 per cent, from year to year. Statistics are now available showing the average quinine content of barks of different ages, so that the variation due to chance of selection can be eliminated.

The unit rate has hitherto been taken at 1:5 annas. This figure is in excess of the rate obtainable in the open market, and as the cost of harvesting, etc., must be deducted before the value of the standing bark is ascertained, the unit rate is now taken at the safe figure of 1 anna.

Thus, although the enumerations show that there is a much larger quantity of standing bark than was supposed, its value has to be reduced to within one per cent, of last year's figure.

Bark on Mungpu plantation is¹ valued at Us. 8,08,254 and on Munsong at Rs. 18,05,057, the total for both plantations being Rs. 26,13,311.

35. Timber trees on Mungpu were valued last year at Rs. 2,78,733. As the timber is grown primarily to prepare the soil for a second crop of cinchona, and is at present only saleable as firewood to the factory, the value cannot be regarded as more than Rs. 45 per acre. There are about 1,000 acres of timber on Mungpu, and the value of timber has consequently had to be reduced to Rs. 45,000. The timber planted on Munsong, valued at Rs. 9,930, has been cut down during the past 3 years and must be written off in entirety. Details will be found in Appendix E.

36. **Profit and LOSS Valuation.**—Particulars of profit and loss valuation are given in Appendix F.

The difference due to the carrying of stores at cost instead of at selling price is Rs. 3,95,419, that due to the revaluation of timber, Rs. 2,43,663, a total of Rs. 6,39,082. In view of the pending commercialisation of accounts it is advisable to write off the whole of this sum

during the current year. The increase in the value of the plantations due to alteration in the method of valuation is Rs. 23,726.

As the deficit balance in the profit and loss account amounts to Rs. 2,57,792, the actual profit for the year, had the previous valuations been maintained, would have been Rs. 3,57,565, while at the same time stocks of quinine have been considerably increased.

This is Rs. 1,02,990 more than the profits for last year, which were Rs. 2,54,575-13-4 and not Rs. 1,93,566-0-4, as shown by error in the report, the difference being due to the fact that the proceeds of the sale of Government of India febrifuge were twice deducted.

37. **Land Rent.**—From Mungpu the sum of Rs. 5,597-7 was collected during the year and paid into the Darjeeling Treasury. From Munsong Rs. 821-10, representing fees collected from cattle grazing within the Cinchona Boundary, were paid into the Kalimpong Sub-Treasury for credit to the Forest Department. No credit is taken for these sums in the accounts of the Cinchona Department.

38. *Staff.*—Mr. C. C. Calder held charge as Superintendent up to the 20th May 1926. Mr. G. E. Shaw, Government Quinologist, officiated as Superintendent from 21st May to 4th July 1926. Thereafter he went on leave, making over charge to Mr. V. Narayanswaini, the then officiating Curator of the Herbarium of the Royal Botanic Gardens, Calcutta, who carried on the current duties of Superintendent till the 11th July 1926. Dr. J. M. Cowan took over charge on the 12th July which he held till the end of the year. Mr. Shaw, Government Quinologist, proceeded on leave on the 5th July 1926, and Mr. S. C. Sen, Assistant (quinologist), officiated. From 1st September 1926 to 4th March 1927, Mr. R. C. Sen acted temporarily as Assistant Quinologist. Mr. H. Thomas, Manager of the Government Cinchona Plantation, Munsong, who was on leave for 14 months, returned to duty on the 20th October 1926. Mr. G. H. Fothergill, Assistant Manager, Munsong, held charge as Manager of that Plantation till Mr. Thomas returned. Mr. J. P. Macdonald officiated as Overseer on the Munsong Plantation till the 3rd October 1926. Mr. George Toll, Overseer, Mungpu Plantation, officiated as Assistant Manager of that Plantation till the 27th October 1926. Balm S. K. Mitra was on leave, preparatory to retirement, and Balm A. T. Bannerjee, Seventh Clerk, officiated as Head Clerk throughout the year. The officers of the Plantations and the Factory and the clerical staff have performed their duties satisfactorily.

J. M. COWAN,

Superintendent,

*Royal Botanic Garden, Calcutta, and of
Cinchona Cultivation in Bengal (Offg.).*

APPENDIX A.

Statement of Areas and Standing Bark.

Species.	Age.	Area in acres.			Estimated standing green bark.		
		Mung- pu.	Mun- song.	Total.	100 lbs.		
					Mnngpu.	Munsong.	Total.
Cinchona Ledgeriana	15	..	140	140	..	72-8	72-8
	14	..	170	170	..	443 •0	443 •0
	13	..	300	300	..	1,507-9	1,507-9
	12	90	302	392	119-3	754-4	873 -7
	11	40	200	240	242 •0	700 -4	942-4
	10	35	185	220	70 -6	1,052 •1	1,122-7
	9	53	205	258	322-7	794 -4	1,117-1
	8	122	258	380	1,011 -9	2,123-1	3,135 •0
	7	227	315	542	1,616-2	2,224 -6	3,840 -8
	6	89	174	263	1,182-4	948 -8	2,131 -2
	5	70	59	12 i	741 -8	482 -4	1,224-2
	4	100	35	135	672-2	272-4	944 -6
	3	50	163	213	231-4	678 -9	910-3
2	45	72	117	155 -5	144-8	300-3	
1	45	134	179	..	..	..
Total ..	..	966	2,712	3,678	6,366 •0	12,200 •0	18,566-0
Cinchona Succirubra	24	48	..	48	109 •0	..	109 •0
	14	..	14	14	..	53-3	53-3
	13	2	5	7	26 •1	18-9	45 •0
	12	4	7	11	15-2	34-3	49 -5
	10	..	5	5	..	57 •1	57 •1
	9	..	5	5	..	89-8	89-8
	6	15	..	15	98 -8	..	98-8
	3	65	..	65	238 -2	..	238-2
	2	60	..	60	110-3	..	110-3
	1	32	12	44	..	..	..
Total ..	..	226	48	274	597-6	253-4	851 -0

Species	Age.	Area in acres.			Estimated standing green bark-		
		Mung- pu.	Mun- song.	Total.	100 lbs.		
					Mungpu.	Munsong.	Total.
Cinchona Offioinalis	17	..	19	19	..	5-9	5-9
	16	..	15	15	..	7-1	7-1
	15	..	24	24	..	3-7	3-7
	14	..	27	27	..	10-7	10-7
	13	..	99	99	..	78-0	78-0
	12	..	19	19	..	7-3	7-3
	10	..	20	20	..	18-5	18-5
	9	..	9	9	..	2-0	2-0
Total ..	..	..	232	232	..	1,33-2	133-2
Cinchona (Ledgeriana X Succirubra).	22	8	..	8	15-6	..	15-6
	15	..	15	15	..	41-3	41-3
	14	..	22	22	..	98-3	98-3
	13	..	44	44	..	185-1	185-1
	12	..	50	50	..	158-7	158-7
	11	..	50	50	..	133-8	133-8
	10	..	40	40	..	52-4	52-4
	9	..	18	18	..	245-1	245-1
	8	10	42	52	146-6	204-8	351-4
	7	28	40	68	111-8	307-9	419-7
	G	22	14	36	157-6	80-6	238-2
	3	35	..	35	100-9	..	100-9
Total ..	..	103	335	438	532-5	1,508-0	2,040-5
Cinchona (Ledgeriana X Officinalis).	8	..	30	30	..	33-1	33-1
	7	..	57	57	..	81-0	81-0
	G	..	22	22	..	45-4	45-4
	5	..	10	10	..	12-3	12-3
Total ..	..	..	119	119	..	171-8	171-8
GRAND TOTAL	..	1,295	3,447	4,742	7,496-1	14,266-4	21,762-5

APPENDIX B.

Receipts for 1926-27.

Transactions of the year.	Sales to Government Offices and institutions.				Sales to the public for cash payment.				Total.
	Cash sales.		Book credit.		In tablets.		In tins in powder form to Native States, Municipal and Local Funds, Dispensaries, Missionary bodies and others.		
	2	3	4	5	6				
1	2	3	4	5	6				
	Its. A.	Its. A.	Its. A.	Ks. A.	Rs. A.				
Quinine sulphate ..	3,470 0	82,634 0	2,74,793 2	66,395 4	4,27,292 6				
Other quinine salts ..	83 13	8,120 6	....	837 7	9,041 10			
Cinchona febrifuge ..	13,481 12	80,053 12	....	65,263 8	1,58,809 0			
Cinchonidine salts ..	....	136 11	....	121 8	258 3		
Cinchonine salts ..	....	70 14	....	42 0	112 14		
Quinidine salts ..	..	1 6	....	259 8	260 14		
Quinoidine ..	....	62 4	....	111 0	373 4		
Bark ..	....	....	....	1,900 0	1,900 0	
Miscellaneous ..	"257 3	"340 2	....	....	603 5		
Total ..	17,292 12	1,71,435 7	2,74,793 2	1,35,130 3	5,98,651 8				

APPENDIX C(D).

Bark Stock Account.

1	Cinchona Ledgeriana.			Cinchona Officinalis.			Cinchona Succimbra.
	Quantity.	Rate per lb.	Value.	Quantity.	Rate per lb.	Value.	Quantity.
	2	3	4	5	6	7	8
	lbs.	A.	Its. A.	lbs.	A.	Rs. A.	lbs.
Balance on 1st April 1926.	348,367	5	1,08,864 11	14,729	5	4,602 13	11,646
Harvested—							
Mungpu ..	210,351	3-6	47,328 15	9,360	2-7	4,679 8	6,361
Munsong ..	366,754	2-7	61,889 12	..	..	..	3,591
Used in Factory—							
Mungpu ..	203,318	3-6	45,716 8	14,479	2-7	2,443 5	318
Munsong ..	301,520	2-7	50,881 8	..	..	2,117 5*	2,413
			44,961 12*				
Sold ..	..	..	....	..	..	....	3,800
Balance on 31st March 1927—							
Mungpu ..	97,931	3-6	22,034 8	9,610	2-7	1,621 11	10,393
Munsong ..	322,703	2-7	54,456 2	..	..	..	4,674

* Differences due to altering rate so that stocks are carried at cost price.

	Cinchona Succirubra.		Hybrid.			Total.		Value.	
	Rate per lb.	Value.	Quantity.	Rate per lb.	Value.	Quantity.	Rate per lb.		
	9	10	11	12	13	14	15	16	
	A.	Its. A.	lbs.	A.	Us. A.	lbs.	A.	Rs. A.	
Balance on 1st April, 1920	5	3,039 0	55,932	5	17,478 12	430,074	5	134,585 10	
Harvested—									
MunKpu ..	3-0	1,431 3	9,020	3-0	2,107 8	220,332	3-0	M,924 10	
Munsong ..	2-7	000 0	03,029	2-7	10,030 2	442,734	2-7	74,711 6	
Used in Factory—									
Mungpu ..	3-0	71 9	7,974	3-0	1,794 2	211,010	3-0	47,012 3	
Munson>? ..	2-7	407 3	53,783	2*7	9,075 14	372,195	2-7	02,807 14	
		1,215 10*			7,909 1*			50,206 12*	
Sold ..	3-0	855 0	..	..	....	3,800	3-0	855 0
Balance on 31st March 1927									
Mungpu ..	3-0	2,338 7	2,911	3-0	055 0	111,235	3-0	25,027 1*	
Munsong ..	2-7	788 12	03,913	2-7	10,785 5	400,900	2-7	07,051 14	

* Difference; due to altering rate so that stocks are carried at cost price.

APPENDIX C(2).

Stock Account of Factory Products, 1926-27.

	Quinine Sulphate.			Quinine Sulphate Tablets.		
	Quantity.	Rate per lb.	Value.	Quantity.	Rate per lb.	Value.
	lbs.	Rs.	Rs. A.		Rs.	Rs.
Balance on 1st April 1920	24,305-7	18	437,520, 14	.. ..	..	....
Manufactured ..	26,007	0	1,59,042 0	lbs. 1,573-7	7	11,016
				boxqs 64,385	1	64,385
Used in factory ..	9,188*	0	55,128 0	.. ..	..	..
Issued or sold ..	14,580-5	0	f 87.; 83 0	lbs. 1,259	7	8,813
			I 2,91,086 14t	boxes 33,094	1	33,094
Balance on 31st March 1927	27,144-2	0	1,02,805 0	lbs. 314-7	7	2,203
				boxes 30,091	1	30,691

	Other Quinine Salts.			Qu'nidim Sulphate.		
	Quantity.	Rate per lb.	Value.	Quantity.	Rate per lb.	Value.
	lbs.	Rs.	Us. A. P.	lbs.	Rs.	Rs. A. P.
Balance on 1st April 1920	175	25	4,374 3 0	8-9	20	177 8 0
Manufactured ..	389-2	10	3,982 0 0	20-3	20	400 8 0
Used in factory ..	..	..	....	..	..	.. ..
Issued or sold ..	351	10	3,510 0 0	12-3	20	240 0 0
			2,714 3 ot			
Balance on 31st March 1927	213-2	10	2,132 0 0	10-9	20	338 0 0

* Includes 8,076 lbs. used for tablet manufacture.

t Differences due to altering rate, so that stocks are carried at cost price,

	Cinchonine Salts.			Cinchonidine Salts.		
	Quantity.	Rate per lb.	Value.	Quantity.	Rate per lb.	Value.
	lbs.	Rs.	Rs. A. P.	lbs.	Rs.	Rs. A. P.
Balance on 1st April 1926	36-3	10	362 13 0	22-7	15	339 13 0
Manufactured .. ..	..	..	....	24-7	10	247 0 0
Used in factory	0-7	10	6 13 0	..	..	....
Issued or sold	8-1	10	81 0 0	9-6	10	96 0 0 112 13 0*
Balance on 31st March 1927	27-5	10	275 0 0	37-8	10	378 0 0

	Quinoidine.			Cinchona Febrifuge Powder.		
	Quantity.	Rate per lb.	Value.	Quantity.	Rate per lb.	Value.
	lbs.	Rs.	Rs. A. P.	lbs.	Rs.	Rs. A. P.
Balance on 1st April 1926	214-7	2	429 6 0 858 5 0*	..	..	....
Manufactured	114-5	6	687 8 0	8,764t	6	52,584 0 0
Used in factory .. ..	..	..	....	..	..	....
Issued or sold	64-2	6	385 3 0	8,764	6	52,584 0 0
Balance on 31st March 1927	265	6	1,590 0 0	..	..	....

	Cinchona Febrifuge Tablets.			Total.
	Quantity.	Rate per lb.	Value.	Value.
	lbs.	Rs.	Rs.	Rs. A. P.
Balance on 1st April 1926 ..	....	....	....	4,44,062 14 6
Manufactured	4,457	7	31,199	3,24,149 0 0
Used in factory .. ..	....	....	....	55,134 13 0
Issued or sold	2,320-5	7	16,244	4,97,650 1 6
Balance on 31st March 1927	2,136-5	7	14,955	2,15,427 0 0

* Differences due to altering rate, so that stocks are carried at cost price,
t Includes 1,810 lbs. transferred from Government of India.

APPENDIX C(3).

Stock of Oil and Chemicals.

		Rs.	A.	P.
Balance on 1st April 1926	..	24,260	13	0
Purchased	..	89,880	8	0
Used in Factory	..	67,982	2	0
Balance on 1st April 1927	..	46,159	3	0

APPENDIX D.

Expenditure for 1926-27.

I.—PLANTATIONS ACCOUNT.

A.—MUNGPOO PLANTATION.

<i>Pay of Establishment.</i>		Rs.	A.	P.	Rs.	A.	P.
I. Salaries—							
1.	Manager (Non-voted)	..	6,132	15	0		
2.	Duty allowance	..	1,200	0	0		
3.	Assistant Managers (Voted)	..	5,703	15	0		
4.	Overseers	..	2,629	11	0		
5.	Sub-Overseer	..	630	0	0		
6.	Sub-Assistant Surgeon	..	1,518	3	0		
7.	Artificer	..	360	0	0		
8.	Temporary clerk	..	40	0	0	18,214	12 0
	Pensionary charges	..	.....			3,035	12 9
<i>Allowances, honoraria, etc.</i>							
II. Travelling allowance—							
1.	Travelling allowance (Non-voted)	..	125	0	0		
	Ditto (Voted)	..	43	3	0		
2.	Pony allowance (Non-voted)	..	720	0	0		
	Ditto (Voted)	..	784	13	0	1,673	0 0
III. House rent and other allowances—							
1.	Hill allowance (Voted)	..	349	2	0		
2.	Special allowance	..	300	0	0	649	2 0
<i>Supplies and Services.</i>							
IV. Carriage, Packing and distribution charges—							
1.	Carriage of stores (Voted)	..	122	10	6		
2.	Landing and clearing charges of Europe stores (Voted)	..	40	1	0	162	11 6
V. Purchase and feed of horses (Voted) .. 2,160 0 0 2,160 0 0							
VI. Purchase of stores and implements, etc.—							
1.	Europe stores (Voted)	..	614	4	0		
2.	Freight on above	..	41	11	3		
3.	Loss or gain by exchange	..	218	10	6		
4.	Stores (locally purchased)(Voted)	..	486	12	3	1,361	6 3
VII. Customs duty on imported stores (Voted) 100 0 0 100 0 0							

<i>Contingencies.</i>		Rs.	A.	P.	<u>Rs.</u>	A.	P.
VIII.	Petty construction and repairs (Voted) ..	679	4	0	679	4	0
IX.	Other contingent charges—						
	1. Sirdars and Coolies (Voted) ..	71,828	3	0			
	2. Labour of malies ..	2,318	12	0			
	3. Miscellaneous ..	2,344	5	0			
	4. Cost of Medical stores ..	420	6	0			
	5. Road and Public Works cess ..	608	2	0	77,519	12	0
	Total Mungpu charges ..	....			<u>1,05,555</u>	<u>12</u>	<u>6</u>

B.—MUNSONG PLANTATION.

Pay of Establishment.

I.	Overseers and skilled staff—						
	1. Manager (Non-voted) ..	2,385	15	0			
	2. Duty allowance ..	1,200	0	0			
	3. Assistant Managers ..	9,396	12	0			
	4. Overseers (Voted) ..	2,220	0	0			
	5. Sub-Assistant Surgeon ..	1,959	1	0			
	6. Temporary Overseer ..	674	3	0	17,835	15	0
	Pensionar}' charges ..	....			2,972	10	6
	<i>Allowances, honoraria, etc.</i>						
II.	1. Travelling allowances (Non-voted)..	1,961	2	0			
	Ditto (Voted) ..	12	1	0			
	2. Pony allowance (Non-voted) ..	1,203	14	0			
	Ditto (Voted) ..	360	0	0	3,537	1	0
III.	House rent and other allowances—						
	1. Hill allowance (Voted) ..	489	12	0			
	2. Special allowance ..	300	0	0	789	12	0
	<i>Supplies and Services.</i>						
IV.	Carriage, packing and distribution charges—						
	1. Carriage of bark (Voted) ..	5,454	3	0			
	2. Carriage of stores ..	222	15	0			
	3. Landing and clearing charges of Europe stores (Voted) ..	21	3	0	5,698	5	0
V.	Purchase and feed of horses (Voted) ..	2,510	0	0	2,510	0	0
VI.	Purchase of stores, implements, etc.—						
	1. Europe stores (Voted) ..	990	4	9			
	2. Freight on above ..	80	0	0			
	3. Loss or gain by exchange ..	356	12	0			
	4. Stores locally purchased ..	1,373	11	0	2,800	11	9
VII.	Customs duty on imported stores ..	100	0	0	100	0	0
	<i>Contingencies.</i>						
VIII.	Petty construction and re- pairs (Voted) ..	1,496	14	3	1,496	14	3
IX.	Other contingent charges—						
	1. Sirdars and coolies (Voted) ..	93,318	10	9			
	2. Miscellaneous' ..	1,094	5	6			
	3. Cost of medical stores ..	469	14	0			
	4. Road and Public works cess ..	1,303	15	0	96,186	13	3
	Total Munsong charges ..	....			<u>1,33,928</u>	<u>2</u>	<u>9</u>

II—FACTORY ACCOUNT.

Pay of Officers.

I. Quinologist and other gizzted officers—	Rs.	A.	P.	Rs.	A.	P.
1. Quinologist (Non-voted) ..	4,441	15	0			
Ditto (Voted) ..	6,028	6	0	12,510	10	0
2. Assistant Quinologist ..	2,040	5	0			

Pay of Establishment.

II. Clerks--						
Clerk (Voted) ..	724	0	0	724	0	0
Pensionary charges ..	.....			2,205	12	3

Allowance, honoraria, etc.*

III. Travelling allowance—						
Travelling allowance (Non-voted) ..	259	10	0	259	10	0
IV. House rent and other allowances—						
Hill allowance (Voted) ..	181	0	0	181	0	0
Cost of passage granted under Superior Civil Service Rules ..	3,377	10	0	3,377	10	0

Supplies and Services.

V. Carriage, packing and distribution charges—						
1. Packing materials (Voted) ..	5,646	6	9			
2. Distribution charges ..	461	5	0			
3. Carriage of stores ..	5,071	5	6			
4. Landing and clearing charges of Europeo stores. ..	2,310	9	9	13,489	11	0
VI. Purchase of stores, implements, etc.—						
1. Europe stores (Voted) ..	18,566	4	6			
2. Freight on above ..	2,529	14	0			
3. Loss or gain by exchange ..	7,040	5	6			
4. Chemicals ..	33,498	2	6	61,634	10	6
VII. Customs duty on im-ported stores (Voted) ..	2,266	5	0	2,266	5	0

Contingencies.

VIII. Petty construction and repairs ..	3,997	4	0	3,997	4	0
IX. Other contingent charges—						
1. Sirdars and coolies (Voted) ..	11,559	15	9			
2. Fuel (carriage and cutting up only) ..	9,754	12	0			
3. Purchase of bark (carriage only) ..	418	6	6			
4. Miscellaneous ..	510	15	3			
5. Tablet manufacture ..	14,056	15	0	36,301	0	6

Total Factory charges			1,36,947	9	3
--------------------------	-------	--	--	----------	---	---

III.—GENERAL.

Pay of Officers.

		Rs.	A.	P.
I. Gazetted officers—				
Superintendent	(Non-voted) ..	3,133	6	0

Pay of Establishment.

II. Clerks-				
Clerk (Voted)	..	7,64	7	9 0
III. Servant-				
Servant (Voted)	..	228	0	0
IV. Pensionary charges (Voted)	..	1,811	1	0

Contingencies.

V. Other contingent charges—				
Postage and telegrams (Voted)	..	500	0	0
Total General Charges	..	13,320	0	0

IV.—ABSTRACT.

Total Mungpu charges	..	..	..	1,05,555	12	6
„ Munsong	„	..	..	1,33,928	2	9
„ Factory	„	..	..	1,36,947	9	3
„ General	„	..	..	13,320	0	0
Grand total expenditure	..	..	..	3,89,751	8	6

APPENDIX E.

Block Account.

I.—MUNGPU PLANTATION.

To—	Rs.	By—	Rs.
Value of buildings on 1st April 1926	25,061	Depreciation on buildings at 21 per cent. ..	737
Value of machinery on 1st April 1926	759	Value of buildings on 31st March 1927.. ..	24,324
Value of plantation on 1st April 1926—		Depreciation on machinery at 5 per cent. ..	54
Cinchona	5,60,286	Value of machinery on 31st March 1927	705
Timber	2,78,733	Valuation of plantation on 31st March 1927—	
Gain on the revaluation of the plantation at the end of 1926-27—		Cinchona	8,08,254
Cinchona	2,47,968	Timber	45,000
Timber .. ..	....	Loss on the revaluation of the plantation at the end of 1926-27—	
		Cinchona .. ..	....
		Timber	2,33,733
Total	11,12,807	Total	11,12,807

II.—MUNSONG PLANTATION.

		Rs.	Rs.	
To—			By -	
Value of buildings on 1st April 1926	33,364		Depreciation on buildings at 2½ per cent. ..	944
Additions to buildings, 1926-27	696		Value of buildings on 1st April 1926	33,116
Value of Plantation on 1st April 1926—			Value of Plantation on 1st April 1926—	
Cinchona	19,56,270		Cinchona	18,05,057
Timber	9,930		Timber .. ..	....
			Loss on revaluation of the plantation at the end of 1926-27—	
			Cinchona	1,51,213
			Timber	9,930
Total	<u>20,00,200</u>		Total	<u>20,00,260</u>

III.—FACTORY.

		Rs.	Rs.	
To—			By -	
Value of buildings on 1st April 1926	57,187		Depreciation on buildings at 2½ per cent. ..	1,656
Addition to buildings, 1926-27	2,540		Value of buildings on 31st March 1927	58,071
Value of machinery on 1st April 1926	52,330		Depreciation on machinery at 5 per cent. ..	3,665
Addition to machinery, 1926-27	6,300		Value of machinery on 31st March 1927	54,965
Total	<u>1,18,357</u>		Total	<u>1,18,357</u>

APPENDIX F.

Profit and Loss valuation, 1926-27.

		Rs.	A.	r.	Rs.	A.	P.
To -					By -		
Stock on 1st April 1926	6,02,033	0	3		Arrears recovered ..	46,511	12 0
Outstanding on 1st April 1926	46,*511	12	0		Sales during the year ..	5,23,900	13 «*
Sales of Government of India cinchona febrifuge	71,942	15	0		Outstanding on 31st March 1927	15,722	5 î
Expenditure (less capital expenditure, Rs. 8,840)	3,80,911	8	6		Cost of manufacture of Government of India products ..	57,057	10 0
Depreciation on buildings	3,337	0	0		Stock on 31st March 1927	3,54,266	0 0
Depreciation on machinery	3,719	0	0		Valuation of Plantations on 31st March 1927—		
Value of Plantations on 1st April 1926—					Cinchona	26,13,311	0 0
Cinchona	25,16,493	0	0		Timber	45,000	0 0
Timber	2,88,663	0	0		Balance	2,57,841	11 0
Total	<u>39,13,611</u>	<u>3</u>	<u>9</u>		Total	<u>39,13,611</u>	<u>3 9</u>

APPENDIX C.

Statement of sales of factory products during the official year 1926-27.

Particulars.	Quinine salts.	Quinonine and cinchonidine salts.	Cinchona febrifuge.	Quinine salts and quinoidine.	Cinchona bark.	Total.
	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.
<i>Assam.</i>						
Jails	16 0	..	62 0	..	..	78 0
Dispensaries ..	761 15	..	829 12	5 0	..	1,596 11
District Boards ..	8 0	..	..	..	..	8 0
Missionary bodies ..	25 0	..	52 0	..	..	77 0
Others	24 0	..	200 0	..	..	224 0
<i>Bengal.</i>						
Jails	6,721 8	..	101 0	..	..	6,822 8
Medical Store Depdts	2,390 1	..	700 0	..	..	3,090 1
Dispensaries ..	2,984 6	..	2,132 12	..	..	5,117 2
District Boards ..	396 8	..	4,254 0	2 0	..	4,652 8
Missionary bodies ..	224 0	..	372 12	..	..	596 12
Others	26 2	3 0	828 4	1 0	3,600 0	4,458 6
<i>Bihar and Orissa.</i>						
Jails .. ..	..	..	..	..	..	..
Dispensaries ..	867 3	2 0	1,309 12	13 0	..	2,191 15
District Boards ..	87 8	..	7 8	..	..	95 0
Missionary bodies ..	15 4	..	131 12	2 0	..	149 0
Others	174 8	..	139 0	..	..	313 8
<i>Punjab.</i>						
Jails .. ..	..	..	210 0	..	..	210 0
Dispensaries ..	3 4	0 8	1,438 0	..	..	1,441 12
District Boards ..	..	..	..	..	..	..
Missionary bodies ..	2 0	2 0	41 0	..	..	45 0
Others .. ..	..	10 0	59 0	..	100 0	169 0
Medical Store Depôt	160 0	..	504 0	10 0	..	674 0
<i>Other Provinces and States.</i>						
Jails .. ..	..	..	68 0	..	..	68 0
Dispensaries ..	5 15	..	3,092 8	12 4	..	3,110 11
District Boards ..	..	..	1 4	..	..	1 4
Missionary bodies ..	..	..	334 8	24 0	..	358 8
Others	15 6	0 2	212 12	7 5	100 0	335 9
Medical Store Depôt	..	..	..	2 0	..	2 0
Total	14,908 8	17 10	17,081 8	78 9	3,800 0	35,886 8

•APPENDIX H.

Sale of sulphate of quinine in " treatment " tablets during 1926-27.

Consecutive No.	Months.			Total proceeds from sale of tablets.			Credited to Cinchona Department.		
	1	2		3			4		
	1926.			Rs.	A.	P.	Rs.	A.	P.
1	April	..	..	20,092	3	0	10,046	1	6
2	May	..	..	24,440	13	9	12,220	6	10
3	June	..	..	22,992	1	0	11,496	0	6
4	July	..	..	31,338	12	0	15,669	6	0
5	August	..	..	23,233	10	6	11,616	13	3
6	September	..	..	27,403	13	5	13,701	14	8
7	October	..	..	20,636	14	10	20,636	14	10
8	November	..	..	50,057	13	3	50,057	13	3
9	December	..	..	19,003	7	1	19,003	7	1
	1927.								
10	January	..	..	21,098	12	4	21,098	12	4
11	February	..	..	7,971	2	9	7,971	2	9
12	March	..	..	6,523	10	0	6,523	10	0
			Total	2,74,793	1	11	2,00,042	7	0

* Supplied by the Accountant-General, Bengal.

GOVERNMENT OF BENGAL.

Revenue Department.

Cinchona.

CALCUTTA, THE 9TH JANUARY, 1928.

RESOLUTION—No. 422.

READ—

The sixty-fifth annual report of the Government Cinchona Plantations and Factory in Bengal for the year 1926-27.

HEAD ALSO—

The reports of the previous three years.

Mr. C. C. Calder held charge as Superintendent up to the 20th May, 1926. Mr. G. E. Shaw, Government Quinologist, officiated as Superintendent from the 21st May to the 4th July, 1926, when he went on leave, Mr. V. Narayanswami, the then officiating Curator of the Herbarium of the Royal Botanic Gardens, Calcutta, carried on the current duties of the Superintendent until Dr. J. M. Cowan took over charge on the 12th July. This officer was in charge for the rest of the year.

2. In the Resolution on the Report for the year 1925-26 it was stated that an up-to-date survey of the plantations was urgently needed and that in the mean time very little reliance could be placed on the figures for stock in the profit and loss accounts. Since that resolution was published an officer of the Auditor-General has visited Mungpoo and prepared an elaborate scheme of commercialized accounts for the department. A survey of the plantations has been arranged for in the cold weather of 1927-28 through the agency of the Survey of India, and pending this survey a complete enumeration of all the standing trees has been made. Data have also been collected of the amount of quinine yielded per acre by the various species of cinchona and by trees of different ages.

3. (a) Hitherto the records of area have been based on the principle that roughly every 4,000 lbs. of bark harvested is equivalent to the deduction of one acre from the total area planted at various times.

(b) This system has for many years been considered the best way of estimating the stock of quinine on the plantations, but it has had the result of giving a misleading idea as to the area under the charge of the Managers and requiring cultivation.

(c) The 669,000 lbs. of dry bark which was harvested in the year of report came mainly from thinnings and from dead and drying trees and for several years there has been very little clear felling. Even from the point of view of calculating stock it is possible that the figure of 3,153 acres, given in last year's report as the area under Cinchona, has been unduly reduced by the operation of this system through a course of years.

(d) In this year's report, therefore, Mr. Cowan has restored the area which has actually to be cultivated, viz., 4,742 acres. A part of this area is only very sparsely covered with productive trees, but not sufficient to throw any doubt on the conservatism of the estimates of stock arrived at in Appendix A of the Report.

(e) The total amount of green bark which could be harvested from the Mungpoo and Munsong plantations at the present moment is estimated at 21,762,500 lbs. of green bark equivalent to 86,05,000 lbs. of dried bark. The value of this bark is at least Rs. 15,80,000 reckoned at the rates which have hitherto been adopted for calculating the value of the plantations according to the average cost of production. In the block account the Mungpoo plantation has been valued at Rs. 8,08,254 and the Munsong plantation at Rs. 18,05,057. The basis of this calculation is 1 anna 5 pies for every unit of quinine in each pound of bark. Owing to the enumeration of the trees the Superintendent has been able to show a considerable increase over last year, but on the other hand he has written down the value of the timber, which is mainly grown as a means of preparing the land for another crop of cinchona and is cut down before it is mature.

5. In this connection it may be mentioned that there is a small plantation of Ipecacuanha at Mungpoo which is ready for harvesting and would realise a large sum at the present market rates.

6. The quantity of dried bark used in the factory during the year was 11,27,519 lbs. of which 5,87,000 lbs. was Bengal bark, the rest Java bark belonging to the Government of India. Altogether 55,136 lbs. of quinine sulphate and febrifuge was manufactured at a cost of Rs. 159 a pound and 19,197 lbs. of febrifuge at Re. 1-6 per pound, 387 lbs. of other quinine salts at Rs. 3 per pound, and 161 lbs. of other products at Rs. 2 a pound. Even at the reduced rate of Rs. 18 a pound introduced from the beginning of 1926 quinine sulphate therefore gives a profit of Rs. 13- a pound.

The share of the products of the factory which belongs to the Government of Bengal was 47,731 lbs. of which about two-thirds were sold. Provided the demand continues on the present scale it would appear that the existing supply of bark on the plantations would suffice for the needs of about 24 years. But if India as a whole is to become self dependent, it will be necessary to find new areas for plantation. With this object in view the Forest Department has agreed to an experiment in the reserved forest at Samsing in the Kalimpong subdivision where 2,000 acres of excellent land are available provided the disadvantages of an excessive rainfall prove to be counterbalanced by the good drainage and other natural advantages. For the first time in the appendices of the Annual Report the value of the stock has been taken as the cost of bark plus the cost of manufacture instead of the selling value. This change has resulted in a nominal loss of Rs. 2,57,842 in the profit and loss account.

All the figures and facts compressed with Mr. Cowan's last report give welcome indications that good progress has been made during the year under report* and that in the cinchona plantations and the factory the local Government has a very useful and profitable property. The Governor in Council is pleased to record his appreciation of the thoughtful work Mr. Cowan has done for the department during his tenure of office and to thank Mr. Shaw and the other officers who have assisted the Superintendent with the utmost loyalty.

Order.—Ordered that this resolution be published in the *Calcutta Gazette* and that a copy, with a copy of the Report, be submitted to the Government of India.

By order of the Governor in Council,

F. A. SACHSE,

Secretary to the Government of Bengal.

Nos. 423-24.

Copy forwarded to the Superintendent, Cinchona Cultivation, Bengal, and Agriculture and Industries Department of this Government for information.

By order of the Governor in Council,

M. N. GUPTA,

*Assistant Secretary to the Government of Bengal**



Government of Bengal

Sixty-Fifth
Annual Report of the
Government Cinchona Plantations
and Factory in Bengal

For the Year
1926-27

CALCUTTA
Bengal Secretariat Book Depot
1927

Price—Indian, 13 annas ; English, Is. 3d.



Government of Bengal

Sixty-Fifth
Annual Report of the
Government Cinchona Plantations
and Factory in Bengal

For the Year
1926-27

CALCUTTA
Bengal Secretariat Book Depot
1927

Published by the Bengal Secretariat Book Depot, Writers' Buildings, Calcutta.

Agents in India.

Messrs. S. K. Lahiri & Co., Printers and Booksellers, College Street, Calcutta.

Messrs. Thacker, Spink & Co., Calcutta.

**Customers in the United Kingdom and the Continent of Europe
may obtain publications either direct from the High Commissioner's office
or through any book-seller.**

Sixty-Fifth Annual Report of the Government Cinchona Plantations and Factory in Bengal for the year 1926-27,

1. **General.**—Since the fall in the price of quinine in April 1926, there has been no outstanding development in the quinine and cinchona trades; information being merely to the effect that the consumption of quinine has been well maintained. The Hoffmann Chemical Works of Bale and the Hoshi Factory in Japan entered the convention during the year, so that there is only one independent factory left—a small factory in Amsterdam. The Cinchona Agreement between the Java planters and manufacturers expires in 1928 and it is not unlikely that it will be renewed. In common with India, various countries continue their endeavour to attain a certain independence with regard to quinine. Russia talks of growing cinchona on the Black Sea coast, France is considering how much of her cinchona requirements might be produced in her African colonies and Italy, whose estates in Java are approaching the harvesting stage, will shortly be independent of foreign quinine.

2. Attention has been directed to cinchona matters in India, through the sittings of the Royal Commission on Agriculture, which has taken evidence from Sir David Prain, Colonel Graham and others, who have emphasised particularly the need for taking active steps for increasing the land under cinchona and also the question of centralisation. It is shown in the evidence given in the Royal Commission's report that for many years there has been comparatively little advance in the extension of cinchona cultivation in India. Bengal is not free from criticism in this respect.

3. The scheme for extending the Bengal Cinchona Plantations has so far resulted in the planting of only 31 acres at Latpanchor. The greater part of this area was planted late in the season 1925-26, and although the late planting must have been a handicap, the plants are by no means robust. This area is also not free from difficulties with regard to water and cinchona blocks would be very scattered; labour and adequate supervision would be difficult.

4. Another area at Samsing in the Kalimpong Forest Division has been explored and gives promise of about 2,000 acres of excellent cinchona land, of very much better quality and much easier of access than the land at Latpanchor with, however, the drawback that the rainfall is considerably above the *optimum*. This disadvantage* may not prove serious as the land is well drained, and arrangements are being made for experimental planting in this locality.

5. The condition of the younger blocks in the Bengal Plantations is very satisfactory. Large areas, especially in Munsong plantation are, however, occupied by trees which have passed the economic age for harvesting and the condition of the majority of these blocks is such that they should be harvested as soon as possible. This state of affairs is due principally to the fact that the harvesting has been conserved owing to the necessity of having a large supply of bark in stock on the expiration of the agreement with Messrs. Howards & Co. in 1928. The increment of the whole plantation would have undoubtedly been greater and the problem of finding land for cultivation would not have been so acute, had godowns been built and the bark stored in them instead of on the trees.

6. Definite figures regarding the amount of quinine per acre yielded by the various species have now been prepared. *Cinchona officinalis* produces in Bengal less than half the amount obtained from other species. It is, therefore, scarcely worth cultivation, and as the majority of the *officinalis* blocks are overmature they will be the first among those to be removed and the land will be reafforested preparatory to replanting with cinchona. With this afforestation the Forest Department have undertaken to help.

7. Hitherto in the Bengal Plantations, planting and harvesting has depended largely upon immediate circumstances. The area planted has usually been determined by such factors as labour, land and money immediately available. The harvesting has been regulated by the needs of the factory and the supplies of foreign bark. As long as large areas were available for planting, this was of no great consequence, but now that the whole of the suitable land on Munsong has been planted and many of the blocks instead of being harvested and afforested so as to be ready for a second crop of cinchona, have been left with only a few scattered overmature cinchona trees, the problem of maintaining a sustained annual yield is a difficult one.

8. With the object of ascertaining the maximum annual yield which both plantations can produce, and to regulate planting and harvesting so that it may be maintained, a working scheme, the need for which was expressed in the resolution attached to last year's report, is being prepared. A great deal of data has been collected and during the year a complete enumeration of all the standing trees was made.

9. The figures in Appendix A of reports for a number of years have been misleading, in that the number of acres shown as bearing a full compliment of cinchona had no relation to the actual area under cinchona and being cultivated. The significance of the figures given related to the quantity of standing bark, not to actual area. From the original area planted one acre was deducted for every 400 lbs. of bark harvested, multiplied by the age of the block at the time of

harvest. Thus the area of a block gradually disappeared. With a forward harvesting policy, this system was accurate enough for practical purposes, as the yield of bark is on an¹ average about 4,000 lbs. per acre in 10 years, although not 400 lbs. per year. When however, harvests amount practically only to thinnings, as they have for the past 5-6 years, or under a system of coppicing, and without the quinquennial check which was first intended, there is a large accumulative error in this system which is evidenced in one block of 100 acres, to all appearance fully stocked, having been shown as 5 acres.

10. In the current report the areas under cinchona are taken as the original acreages planted. These agree closely with the area actually under cinchona and requiring cultivation, and pending a survey are the most accurate figures available.

In order to obtain accurate figures with reference to stocking, a complete enumeration of all the standing trees was made and the estimate of bark given in Appendix A is based on these figures and the average weight of bark on trees of different ages as given by measurements of over 4,000 trees.

The average bark increment per acre per annum has also been ascertained and can be used for purposes of valuation, etc. Blocks when they attain the age of four and eight years, the critical years for harvesting, will be enumerated, and thus errors due to deviation from the average stocking will be eliminated.

It is estimated that on both plantations there are 21,762,500 lbs. of green bark, which would be equivalent in dry bark to about 8,605,000 lbs.

11. By the end of the year, preliminaries had been discussed in connection with the commercialisation of accounts. A visit was paid to the plantations by the Director-General of Commercial Audit, and the new system was discussed. It is hoped to bring it into operation by the beginning of 1928.

12. **The Plantations.**—*Mungpoo.*—The rainfall for the year was 129.46 inches, only slightly above the average for the last 45 years. On Mungpoo Plantation, a very considerable portion of the area is under young forest from 1—20 years old, so that this land is now ready for replanting with cinchona.

During the year, between May and July 1926, 45 acres of *Cinchona Ledgeriana* were planted on Labdah, 32 acres of *Cinchona Sucdrubra* on Sittong and 30 acres at Latpanchor, a total of 107 acres.

13. The area under cinchona and requiring tending and cultivation is approximately 1,295 acres. This area is, however, not all completely stocked. The standing green bark is estimated at 7,496,100 lbs. Eeckoning on the old system, the plantation would now be considered to have a total area of 1,038 acres fully stocked.

14. A method of planting, which has recently been tried on Mungpu, is on terraces 4 feet wide. One of the chief difficulties is to maintain a 4' x 4' spacing without reducing the terraces, so that a little room is left for root expansion. The cost of making terraces is also heavy. Even better results appear to have been obtained, at much less cost at Munsong, by making small individual terraces round each plant. This method, combined with contour weeding has given excellent results and has been adopted this year, except on the very steepest land, and on gently sloping land where no terraces are required.

15. The dry bark harvest for the year consisted of 210,352 lbs. of *Ledgeriana*, 9,620 lbs. of Hybrid and 6,361 lbs. of *Sudruba*, a total of 226,333 lbs. Although this harvest is the largest for some years, it has been obtained entirely from thinnings, and the uprooting of scattered dead and dying trees. There was actually no reduction on the area to be cultivated, although under the old system, the area would have been reduced by 79*2 acres, a figure very much in excess of the area of the vacancies caused by the removal of dead and dying trees, since the greater part of the harvest was obtained merely by removing branches from standing trees which were growing too close together.

16. The experimental plantation at Latpanchor, which was started in May 1926, is so far not very successful. A large number of clearings have occurred and the remaining plants have, for the most part, made little growth. This may be partly due to the fact that, the area being remote, plants had to be carried from a long distance, and were planted late in the season.

17. The stock of Ipecacuanha plants, which last year was 100,633, has been increased this year by some 50,000 cuttings, which look extremely promising. No root was harvested during the year, but arrangements have been made to harvest a considerable quantity (during 1927). There is still a demand for *Digitalis*, that from Mungpu being considered of high quality. A large number of new plants were planted out and altogether 395 lbs. were harvested and sold.

18. *Munsong*.—The rainfall for the official year was 95.35 inches. An excessively dry spell occurred from the middle of October to the end of December, when only .08 inches of rain was registered. Bam fell in January and came before much damage had been done by the drought, so that the year was on the whole quite favourable as regards weather conditions. On exposed ridges, plants suffer considerably from the effect of too much direct sunlight.

19. The condition of the blocks under 8 years old is extremely satisfactory, and one of the most noticeable features is that areas planted subsequently to 1921 with 4' x 4' spacing are in a much better condition and likely to yield much heavier crops than areas

planted with 6' x 6' spacing. There have been fewer deaths; they have yielded more bark in thinnings and there is a comparative absence of weeds, which are kept in check by the cinchona trees themselves. The appearance of the plantation as a whole is, however, marred by the older blocks, which represent a very considerable proportion of the area, as may be seen from the data in Appendix I. They contain only widely scattered trees and should have been harvested much earlier. Appearance, however, is secondary to the loss in increment, to the loss involved in cultivating large areas for the sake of only a few trees, and in the holding up of land which should be growing forest crops, in preparation for further crops of cinchona. The area under cinchona and requiring cultivation is approximately 3,447 acres, whereas under the old system the area would be recorded as about 2,100 acres. The standing green bark is estimated at 14,266,400 lbs., the equivalent of about 5,706,600 lbs. of dry bark.

20. On ridges, especially those facing south and south-east, plants suffer considerably from over-exposure to the sun. This is evidenced by the condition of the plants, as compared with those on less exposed situations, and by the fact that they invariably flower and fruit at a very early age. Although in the Nilgiris cinchona must be grown, under shade, it has been found unnecessary in Bengal. It is thought, however, that shade may be very beneficial in such situations and experiments are being tried, *Alnus nepalensis* being the species selected. Sample plots were also laid out to test the expediency of picking off the flowers when trees flowered at an early age.

21. The area planted during the year, consisted of 97 acres of *Cinchona Ledgeriana* and 12 acres of *Cinchona Succirubra* on Kashyem, 32*5 acres of *Cinchona Ledgeriana* on Burmiak and 5 acres on Sangseer, a total of 146*5 acres.

22. As in the case of Mungpu, harvest was taken only from thinnings and dead and dying trees and amounted to 442,734 lbs.

23. **Cost and valuation of bark—**'The average cost per lb. of all Mungpu barks taken over the past 25 years is 3*6 annas and of Munsong barks 2*7 annas. The cost of producing the 226,332 lbs. of Mungpu bark, which was harvested during the year is, therefore, Rs. 50,925. At a unit rate of 1-5 annas and with an average quinine percentage of *Ledgeriana* 5-07, of *Succimbra* 3*0 and of Hybrid 4^24, the commercial value of the bark amounts to Us. 1,06,942 or over double what it cost.

24. The Munsong harvest, 442,734 lbs. at 3*7 annas per lb. cost Rs. 74,711 to produce, and as the quinine percentage was 4*85 for *Ledgeriana*, 4:52 for Hybrid, 4:16 for *Officinalis* and 3-01 for *Succirubra*, the commercial value of the bark would be about Rs. 1,97,570, showing a decidedly higher profit than Mungpo.

25. The Factory.—The total quantity of quinine sulphate manufactured in the year was 55,130A lbs. and represents practically the limit of which the Factory is capable. The quantity of cinchona febrifuge produced amounted to 19,197 lbs., 980 lbs. more than last year, while 24½ lbs. of quinoidine sulphate, 24¼ lbs. of cinchonidine sulphate and 110½ lbs. of quinoidine were also manufactured. From part of the quinine sulphate, 389± lbs. of other quinine salts were prepared. To produce this quinine, 211,609 lbs. of Mungpu bark, 372,195 lb* of Munsong bark and 543,714 lbs. of Java bark were utilised, the extraction from Java bark being on behalf of the Government of India. The Mungpu bark included 203,318 lbs. of *Ledgeriana* containing 5.07 per cent., 7,973 lbs. of Hybrid, containing 4.24 per cent, and 318 lbs. of *buccirubra* with 3 per cent, of quinine sulphate. The Munsong *Ledgeriana* gave only 4.85 per cent, from 301,520 lbs.; the Hybrid 4.52 per cent, from 53,783 lbs.; the *Officinal*** 4.16 per cent, from 14,479 lbs. and the *Succiruhra* 3.01 per cent, from 2,413 lbs. of bark. It is scarcely fair, however, to judge the plantations on these percentages as, had a system of harvesting blocks on maturity been in force, there is no doubt that the percentages of cinchona would have been higher. In the quinine sulphate, as sent out from the Factory, there was an average of 3.45 per cent, of cinchonidine sulphate and in the cinchona febrifuge the equivalent of 18.5 per cent, of quinine sulphate. Both these figures represent a very high level of quality. The Java bark accounted for 28,529J lbs. of quinine sulphate and 8,506 lbs. of cinchona febrifuge and Bengal bark for 20,007 lbs. of quinine sulphate and 11,411 lbs. of cinchona febrifuge; 2,953J lbs. of quinine have been left in the crude state. Allowing for the 3.45 per cent, of the *Cinchonidine Sulphate*, the quinine manufactured, would be 53,234 lbs., that in the cinchona febrifuge 3,684* lbs., so that the total production was 56,918J lbs. As analysis of the bark after grinding showed the presence of 58,153.9 lbs., the extraction yield was 97.88 per cent., a satisfactory figure.

26. The tablet manufacture was transferred from the Jail to the Factory and at the beginning of October six machines had been installed and they are working satisfactorily. During the later half of the year 8,644 lbs. of quinine were converted into tablets. Samples of bark of 245 trees were analysed for the plantation during the year.

27. Cost and value of quinine produced—(a) *Cost in the bark**.—The 583,804 lbs. of mixed Mungpu and Munsong bark which cost (211,609 lbs. at 3:6 annas and 372,195 lbs. at 2.7 annas per pound) Rs. 1,10,420, contained not only the 26,607 lbs. of quinine sulphate extracted as such, but also 2,111 lbs. left in the cinchona febrifuge. The cost per pound of the quinine in the bark was, therefore, Rs. 3.85.

28. (6) *Cost of extraction*.—The quinine extracted in the Factory belonged partly to the Government of Bengal and partly to the Central

Government. The cost of extraction, owing to the large quantity manufactured, is considerably less than what would have been the case if only Bengal plantation bark had been manufactured, and is determined as follows:—

The total direct expenditure by the Factory was Rs. 1,36,948. General* charges debitable to the Factory amount to Rs. 4,841, depreciation on buildings and machinery amounts to Rs. 5,321, making, the gross Factory expenditure Rs. 1,47,110. From this has to be deducted capital expenditure on new plant and machinery amounting to Rs. 8,840; also the increase in the value of stores at the end of the year, Rs. 21,898, and the expenditure on the manufacture of products other than quinine sulphate, viz., 19,917 lbs. of cinchona febrifuge, at Re. 1-6 per pound, 389 lbs. of other quinine salts at Rs. 3 per pound and 161½ lbs. of other products at Rs. 2 per pound, totalling Rs. 28,876. The net expenditure on the production of 55,136½ lbs. is, therefore, Rs. 87,496, which is Rs. 1-59 a pound, a very much lower figure than has hitherto been attained.

29. (c) *Total cost per pound and value of the quinine produced*,—The cost of the quinine in the bark is Rs. 3-84 and the cost of extraction is Rs. 1-59. The total of the cost of production of quinine per pound is accordingly Rs. 5*43. The 26,607 lbs. of provincial quinine manufactured are worth at Rs. 18 per pound (the present selling price) Rs. 4,78,926, but cost only Rs. 1,44,476 to produce.

30. *Distribution and sales*.—The distribution and sale of cinchona products was, as usual, undertaken by the Jail. As the tablet-making has, however, been transferred to the Factory, there is no longer suitable work for prisoners, and the question of relieving the Jail of the responsibility is being considered. There are certain disadvantages in the use of the Jail as the distributing centre and the distributing costs are heavy, being estimated by the Jail authorities at about Re. 1 per pound. A centre especially for distribution would permit of more speedy returns of payments, a larger turnover and adequate attention to propaganda.

31. A statement of the sales of factory products for the year 1926-27 is available in Appendix G.

Under quinine salts the total sales, as shown by the distributors, amount to 14,908 lbs. This includes the quantity of quinine sulphate sold by the Jail as tablets during the first six months of the year; but excludes 4,858 lbs. of quinine sulphate sold as tablets after the manufacture was transferred from* the Jail. The total sales, therefore, amount to 19,766 lbs. as against 20,869 lbs. in the previous year. There has been an increase of 280 lbs. in the sale of powder, and a decrease of 1,382 lbs. in the sale of tablets.

In the Bengal area the sale of febrifuge has decreased by 755 lbs. and for the first time there has been a considerable stock in hand at the

end of the year. The total amount of cinchona febrifuge issued or sold was 17,081½ lbs., of which 7,771 lbs. belonged to the Government of India. Credit is therefore taken in these accounts for the sale of 9,310½ lbs. The 7,771 lbs. include 5,961 lbs. sold in the Government of India area and 1,810 lbs. sold in the Bengal area. Credit for the whole of the 7,771 lbs., amounting to Rs. 71,942-15, has therefore to be given by the Government of Bengal to the Government of India.

Of the 9,310½ lbs., 2,3254 lbs. were tablets, bringing in Rs. 23,496-10 and 6,985 lbs. were powder, bringing in Rs. 63,369-2.

As the result of the fall in the world price, selling rates were lowered at the beginning of the year to—

			RH.	Rs.
Quinine sulphate	...	...	18	to 20
Other quinine salts	...	...	23	to 27
Cinchonine salts	...	...	12	to 14
Cinchonidine salts	...	...	25	to 27
Quininidine salts	...	...	20	to 22
Quinoidine	...	...	5	to 6
Cinchona febrifuge	...	...	9	to 11

The price of quinine treatments was also lowered from 6 juuias to 4½ annas.

The lower selling rates have not yet been followed by an increase in the sales; there has been instead a falling off in the sale of tablets. There is consequently a considerable fall in revenue due to the reduced price. Rupees 2,74,793-1-11 were obtained from the sale of quinine sulphate in the form of tablets. Of this sum half the proceeds for the first six months were credited to the Jail Department as the Jail were then manufacturing tablets.

32. **Expenditure and Receipts.**—The total expenditure of the Department (including pensionary charges), as detailed in Appendix D, was Rs. 3,89,751-8-6. The total receipts were Rs. 5,98,651-8. These include the Jail share of proceeds from the sale of quinine sulphate tablets, amounting to Rs. 74,750-10-9. The net amount for credit to the Cinchona Department is therefore Rs. 5,23,900-13-3. Sums of Rs. 45,361-14-6 and Rs. 11,695-12 are still due from the Government of India to cover the cost of extracting 28,529½ lbs. of sulphate of quinine at Re. 1*59 per pound and 8,506 lbs. of cinchona febrifuge at Re. 1C per pound, and the sum of Rs. 71,942-15 is due by the Government of Bengal to the Government of India on account of febrifuge sold on their behalf. The gross earnings for the year are therefore Rs. 5,09,015-8-9.

33. **Quinine Reserve and Stock Account.**—Full details of stocks are given in Appendices C (1), C (2) and C (3). The stock of harvested bark, at the end of the year stood at 512,135 lbs./an accumulation accounted for chiefly by difficulties of transport.

The provincial reserve of quinine has increased during the year by 2,839 lbs. to 27,144 lbs. The stock of cinchona febrifuge stands at 2,136 lbs.

Stocks have hitherto been valued at their selling price. Discussions in connection with the proposed commercialisation of accounts has shown that the cost price is a much sounder basis of valuation. Values have, therefore, in this report, been shown at cost, as nearly as can be determined with the present accounting system, although this means a depreciation in value of nearly Its. 4,00,000.

34. **Block Account.**—It was noted in last year's report that the valuation of the plantations, based on the acreage figures in Appendix A of that report, gave an improbable figure, and accordingly the value has been taken as a constant figure for the past two years. It has also been noted that the valuation of the plantations differed greatly from year to year. This was due to the fact that the value of a block was based on the quinine content of ten trees selected annually from each block, by which method the quinine content of a block has been found to vary by as much as 30 per cent, from year to year. Statistics are now available showing the average quinine content of barks of different ages, so that the variation due to chance of selection can be eliminated.

The unit rate has hitherto been taken at 1:5 annas. This figure is in excess of the rate obtainable in the open market, and as the cost of harvesting, etc., must be deducted before the value of the standing bark is ascertained, the unit rate is now taken at the safe figure of 1 anna.

Thus, although the enumerations show that there is a much larger quantity of standing bark than was supposed, its value has to be reduced to within one per cent, of last year's figure.

Bark on Mungpu plantation is valued at Es. 8,08,254 and on Munsong at Us. 18,05,057, the total for both plantations being Us. 26,13,311.

35. Timber trees on Mungpu were valued last year at Its. 2,78,733. As the timber is grown primarily to prepare the soil for a second crop of cinchona, and is at present only saleable as firewood to the factory, the value cannot be regarded as more than Its. 45 per acre. There are about 1,000 acres of timber on Mungpu, and the value of timber has consequently had to be reduced to Its. 45,000. The timber planted on Munsong, valued at Es. 9,930, has been cut down during the past 3 years and must be written off in entirety. Details will be found in Appendix E.

36. **Profit and LOSS Valuation.**—Particulars of profit and loss valuation are given in Appendix F.

The difference due to the carrying of stores at cost instead of at selling price is Es. 3,95,419, that due to the revaluation of timber, Es. 2,43,063, a total of Es. 6,39,082. In view of the pending commercialisation of accounts it is advisable to write off the whole of this sum

during the current year. The increase in the value of the plantations due to alteration in the method of valuation is Its. 23,726.

As the deficit balance in the profit and loss account amounts to Its. 2,57,792, the actual profit for the year, had the previous valuations been maintained, would have been Us. 3,57,565, while at the same time stocks of quinine have been considerably increased.

This is Es. 1,02,990 more than the profits for last year, which were Us. 2,54,575-13-4 and not Its. 1,93,560-0-4, as shown by error in the report, the difference being due to the fact that the proceeds of the sale of Government of India febrifuge were twice deducted.

37. **Land Rent.**—From Mungpu the sum of Its. 5,597-7 was collected during the year and paid into the Darjeeling Treasury. From Munsong Us. 821-10, representing fees collected from cattle grazing within the Cinchona Boundary, were paid into the Kalimpong Sub-Treasury for credit to the Forest Department. No credit is taken for these sum* in the accounts of the Cinchona Department.

38. *Staff.*—Mr. C. C. Calder held charge as Superintendent up to the 20th May 1926. Mr. G. E. Shaw, Government Quinologist, officiated as Superintendent from 21st May to 4th July 1926. Thereafter he went on leave, making over charge to Mr. V. Narayanswami, the then officiating Curator of the Herbarium of the Royal Botanic Gardens, Calcutta, who carried on the current duties of Superintendent till the 11th July 1926. Dr. J. M. Cowan took over charge on the 12th July which he held till the end of the year. Mr. Shaw, Government Quinologist, proceeded on leave on the 5th July 1926, and Mr. S. C. Sen, Assistant Quinologist, officiated. From 1st September 1926 to 4th March 1927, Mr. It. C. Sen acted temporarily as Assistant Quinologist. Mr. H. Thomas, Manager of the Government Cinchona Plantation, Munsong, who was on leave for 14 months, returned to duty on the 20th October 1926. Mr. G. H. Fothergill, Assistant Manager, Munsong, held charge as Manager of that Plantation till Mr. Thomas returned. Mr. T. D-Maonald officiated as Overseer on the Munsong Plantation till the 3rd October 1926. Mr. George Holl, Overseer, Mungpu Plantation, officiated as Assistant Manager of that Plantation till the 27th October 1926. Balm S. K. Mitra was on leave, preparatory to retirement, and Balm A. T. Bannerjee, Seventh Clerk, officiated as Head Clerk throughout the year. The officers of the Plantations and the Factory and the clerical staff have performed their duties satisfactorily.

T. M. COWAN,

Superintendent,

*Royal Botanic Garden, Calcutta, and of
Cinchona Cultivation in Bengal (Offc.).*

APPENDIX A.

Statement of Areas and Standing Bark.

Species.	Age.	Area in acres.			Estimated standing green bark.		
		Mung- pu.	Mun- song.	Total.	100 lbs.		
					Mungpu.	Mvmsong.	Total.
Cinchona Ledgeriana	15	..	140	140	..	72-8	72-8
	14	..	170	170	..	443-0	443-0
	13	..	300	300	..	1,507-9	1,507-9
	12	90	302	392	119-3	754-4	873-7
	11	40	200	240	242-0	700-4	942-4
	10	35	185	220	70-6	1,052-1	1,122-7
	9	53	205	258	322-7	794-4	1,117-1
	8	122	258	380	1,011-9	2,123-1	3,135-0
	7	227	315	542	1,616-2	2,224-6	3,840-8
	6	51	174	263	1,182-4	948-8	2,131-2
	5	70	51	12^	741-8	482-4	1,224-2
	4	100	35	135	672-2	272-4	944-6
3	50	163	213	231-4	678-9	910-3	
2	45	72	117	155-5	144-8	300-3	
1	45	134	179	..	..	..
Total ..	..	966	2,712	3,678	6,366-0	12,200-0	18,566-0
Cinchona Succirubra	24	48	..	48	109-0	..	109-0
	1*	..	14	14	..	53-3	53-3
	13	2	5	7	26-1	18-9	45-0
	12	4	7	11	15-2	34-3	49-5
	10	..	5	5	..	57-1	57-1
	9	..	5	5	..	89-8	89-8
	6	15	..	15	98-8	..	98-8
	3	65	..	65	238-2	..	238-2
	2	60	..	60	110-3	..	110-3
1	32	12	44	..	..	..
Total ..	..	226	48	274	597-6	253-4	851-0

Species.	Age.	Area in acres.			Estimated standing green bark.		
		Mung- pu.	Mun- song.	Total.	100 lbs.		
					Mungpu.	Munsong.	Total.
Cinchona Officinalis	17	..	19	19	..	5-9	5-9
	10	..	15	15	..	7-1	7-1
	15	..	24	24	..	3-7	3-7
	14	..	27	27	..	10-7	10-7
	13	..	99	99	..	78-0	78-0
	12	..	19	19	..	7-3	7-3
	10	..	20	20	..	18-5	18-5
	9	..	9	9	..	2-0	2-0
Total ..	..	..	232	232	..	1,33-2	133-2
Cinchona (Ledgeriana X Succirubra).	22	8	..	8	15-6	..	15-6
	15	..	15	15	..	41-3	41-3
	14	..	22	22	..	98-3	98-3
	13	..	44	44	..	185-1	185-1
	12	..	50	50	..	158-7	158-7
	11	..	50	50	..	133-8	133-8
	10	..	40	40	..	52-4	52-4
	9	..	18	18	..	245-1	245-1
	8	10	42	52	146-6	204-8	351-4
	7	28	40	68	111-8	307-9	419-7
	6	22	14	36	157-6	80-6	238-2
3	35	..	35	100-9	..	100-9	
Total ..	..	103	335	438	532-5	1,508-0	2,040-5
Cinchona (Ledgeriana X Officinalis).	8	..	30	30	..	33-1	33-1
	7	..	57	57	..	81-0	81-0
	6	..	22	22	..	45-4	45-4
	5	..	10	10	..	12-3	12-3
Total ..	..	..	119	119	..	171-8	171-8
GRAND TOTAL	..	1,295	3,447	4,742	7,496-1	14,266-4	21,762-5

APPENDIX B.

Receipts for 1926-27.

Transactions of the year.	Sales to Government Offices and institutions.		Sales to the public for cash payment.		Total.
	Cash sales.	Book credit.	In tablets.	In tins in powder form to Native States, Municipal and Local Funds, Dispensaries, Missionary bodies and others.	
1	2	3	4	5	6
Quinine sulphate ..	3,470 0	82,034 0	2,74,793 2	66,395 4	4,27,292 6
Other quinine salts ..	83 13	8,120 0	....	837 7	9,041 10
Cinchona febrifuge ..	13,481 12	80,003 12	....	65,263 8	1,58,809 0
Cinchonidine salts ..	....	11 11	....	121 8	258 3
Cinchonine salts ..	....	70 14	....	42 0	112 14
Quinidine salts ..	..	1 0	....	259 8	260 14
Quinoidine ..	....	02 4	....	311 0	373 4
Bark ..	....	....	....	1,100 0	1,900 0
Miscellaneous ..	257 3	340 2	....	....	603 5
Total ..	17,292 12	1,71,435 7	2,74,793 2	1,35,130 3	5,98,651 8

APPENDIX C(1).

Bark Stock Account.

1	Cinchona Ledgeriana.			Cinchona Officinalis.			Cinchona Succirubra.
	Quantity.	Rate per lb.	Value.	Quantity.	Rate per lb.	Value.	Quantity.
	2	3	4	5	6	7	8
Balance on 1st April 1926.	lbs. 348,367	A. 5	Rs. A. 1,08,864 11	lbs. 14,729	A. 6	Rs. A. 4,002 13	lbs. 11,010
Harvested—							
Mungpu ..	210,351	3.0	17,328 15	..	..	..	0,301
Munsong ..	366,754	2.7	01,889 12	9,300	2.7	1,579 8	3,591
Used in Factory—							
Mungpu ..	203,318	3.0	45,740 8	..	..	..	318
Munsong ..	301,520	2.7	50,881 8	14,479	2.7	2,443 5	2,413
			44,901 12*			2,117 5*	
Sold ..	..	..	....	..	..	....	3,800
Balance on 31st March 1927—							
Mungpu ..	97,931	3.6	22,034 8	9,610	2.7	Y,021 11	10,393
Munsong ..	322,703	2.7	54,450 2	..	..	..	4,674

* Differences due to altering rate so that stocks are carried at cost price.

	Cinchona Succirubra.		Hybrid.			Iota 1.		Value.	
	Rate per lb.	Value.	Quantity.	Rate per lb.	Value.	Quantity.	Rate per lb.	Jil	
	9	10	11	12	13	14	15	Rs.	A.
Balance on 1st April, 1926	A. 5	Rs. 3,639 6	lbs. 55,932	A. 5	Rs. 17,478 12	lbs. 430,674	A. 5	134,585	10
Harvested—									
Munxpu ..	3-6	1,431 3	9,620	3-6	2,167 8	226,332	3-6	12,924	10
Munsong ..	2-7	606 0	63,029	2-7	10,636 2	442,734	2-7	74,711	6
Used in Factory—									
Mungpu ..	3-6	71 9	7,974	3-6	1,794 2	211,610	3-6	47,612	3
Munsong ..	2-7	407 3	53,783	2-7	9,075 14	372,195	2-7	62,807	U
Sold ..	3-6	1,215 10* 855 0	..	..	7,969 1*	3,800	3-6	56,266	12*
Balance on 31st March 1927								855	0
Mungpu ..	3-6	2,338 7	2,911	3-6	0	111,235	3-6	25,027	10
Munsong ..	2-7	788 12	63,913	2-7	10,785 5	400,900	2-7	67,651	14

Differences due to altering rate so that stocks are carried at cost price.

APPENDIX C (2).

Stock Account of Factory Products, 1926-27.

	Quinine Sulphate.			Quinine Sulphate Tablets.		
	Quantity.	Rate per lb.	Value.	Quantity.	Rate per lb.	Value
	lbs.	Rs.	Rs. A.		Rs.	Rs.
Balance on 1st April 1926	24,305-7	18	437,520, 14	....	..	....
Manufactured ..	26,607	6	1,59,642 0	lbs. 1,573-7	7	11,016
Used in factory ..	9,188*	6	55,128 0	boxes 64,385	1	64,385
Issued or sold ..	14,580-5	6	87,783 0	....	..	..
Balance on 31st March 1927	27,144-2	6	2,91,686 0	lbs. 1,259	7	8,813
			1,62,865 0	boxes 33,694	1	33,694
				lbs. 314-7	7	2,203
				boxes 30,691	1	30,691

	Other Quinine Salts.			Quinine Sulphate.		
	Quantity.	Rate per lb.	Value.	Quantity.	Rate per lb.	Value.
	lbs.	Rs.	Rs. A. P.	lbs.	Rs.	Rs. A. P.
Balance on 1st April 1926	175	25	4,374 3 6	8-9	20	177 8 0
Manufactured ..	389-2	10	3,982 0 0	20-3	20	406 8 0
Used in factory ..	..	..	....	..	..	..
Issued or sold ..	351	10	3,510 0 0	12-3	20	246 0 0
Balance on 31st March 1927	2L3-2	10	2,714 3 (it) 2,132 0 0	16-9	20	338 0 0

* Includes 8,676 lbs. used for tablet manufacture.

t Differences due to altering rate, so that stocks are carried at cost price.

	Qinchonine Salts.			Cinchonidine Salts.		
	Quantity.	Rate per lb.	Value.	Quantity.	Rate per lb.	Value.
	lbs.	Rs.	Rs. A. P.	lbs.	Rs.	Rs. A. P.
Balance on 1st April 1926	36-3	10	362 13 0	22-7	15	339 13 0
Manufactured .. ..	..	..	....	24-7	10	247 0 0
Used in factory ..	0-7	10	6 13 0	..	..	....
Issued or sold	8-1	10	81 0 0	9-6	10	96 0 0 112 13 0*
Balance on 31st March 1927	27-5	10	275 0 0	37-8	10	378 0 0

	Quinoidine.			Cinchona Febrifuge ^t Powder.		
	Quantity.	Rate per lb.	Value.	Quantity.	Rate per lb.	Value.
	lbs.	Rs.	Rs. A. P.	lbs.	Rs.	Rs. A. P.
Balance on 1st April 1926	214-7	2	429 6 0 858 5 0*	..	..	....
Manufactured	114-5	6	687 8 0	8,764 ^f	6	52,584 0 0
Used in factory ..	..	..	....	..	..	....
Issued or sold	64-2	6	385 3 0	8,764	6	52,584 0 0
Balance on 31st March 1927	265	6	1,590 0 0	..	..	....

	Cinchona Febrifuge Tablets.			Total.
	Quantity.	Rate per lb.	Value.	Value.
	lbs.	Rs.	Rs.	Rs. A. P.
Balance on 1st April 1926 ..	....	....	....	4,44,062 14 6
Manufactured	4,457	7	31,199	3,24,149 0 0
Used in factory ..	....	....	....	55,134 13 0
Issued or sold	2,320-5	7	16,244	4,97,650 1 6
Balance on 31st March 1927	2,136-5	7	14,955	2,15,427 0 0

* Differences due to altering rate, so that stocks are carried at cost price,
^t Includes 1,810 lbs. transferred from Government of India.

APPENDIX C(3).

Stock of Oil and Chemicals.

		Rs.	A.	P.
Balance on 1st April 1926	..	24,260	13	0
Purchased	..	89,880	8	0
Used in Factory	..	67,982	2	0
Balance on 1st April 1927	..	46,159	3	0

APPENDIX D.

Expenditure for 1926-27.

I.—PLANTATIONS ACCOUNT.

A.—MUNGPOO PLANTATION.

<i>Pay of Establishment.</i>		Rs.	A.	P.	Rs.	A.	P.
I. Salaries—							
1.	Manager (Non-voted)	..	6,132	15	0		
2.	Duty allowance	..	1,200	0	0		
3.	Assistant Managers (Voted)	..	5,703	15	0		
4.	Overseers	..	2,629	11	0		
5.	Sub-Overseer	..	530	0	0		
6.	Sub-Assistant Surgeon	..	1,518	3	0		
7.	Artificer	..	300	0	0		
8.	Temporary clerk	..	40	0	0	18,214	12
	Pensionary charges	..	....			3,035	12
							0
<i>Allowances, honoraria, etc.</i>							
II. Travelling allowance—							
1.	Travelling allowance (Non-voted)	..	125	0	0		
	Ditto (Voted)	..	43	3	0		
2.	Pony allowance (Non-voted)	..	720	0	0		
	Ditto (Voted)	..	784	13	0	1,673	0
							0
III. House rent and other allowances—							
1.	Hill allowance (Voted)	..	349	2	0		
2.	Special allowance	..	300	0	0	649	2
							0
<i>Supplies and Services.</i>							
IV. Carriage, Packing and distribution charges—							
1.	Carriage of stores (Voted)	..	122	10	6		
2.	Landing and clearing charges of Europe stores (Voted)	..	40	1	0	162	11
							6
V. Purchase and feed of horses (Voted) .. 2,160 0 0 2,160 0 0							
VI. Purchase of stores and implements, etc.—							
1.	Europe stores (Voted)	..	4	4	0		
2.	Freight on above	..	41	11	3		
3.	Loss or gain by exchange	..	218	10	6		
4.	Stores (locally purchased)(Voted)	..	486	12	6	1,361	6
							3
VII. Customs duty on imported stores (Voted) 100 0 0 100 0 0							

<i>Contingencies.</i>		Rs.	A.	V.	Rs.	A.	P.
VIII.	Petty construction and repairs (Voted) ..	679	4	0	679	4	0
IX.	Other contingent charges—						
	1. Sirdars and Coolies (Voted) ..	71,828	3	0			
	2. Labour of malies ..	2,318	12	0			
	3. Miscellaneous ..	2,344	5	0			
	4. Cost of Medical stores ..	420	6	0			
	5. Road and Public Works cess ..	608	2	0	77,519	12	0
	Total Mungpu charges ..	....			<u>1,05,555</u>	<u>12</u>	<u>6</u>

B.—MUNSONG PLANTATION.

<i>Pay of Establishment.</i>							
I.	Overseers and skilled staff—						
	1. Manager (Non-voted) ..	2,385	15	0			
	2. Duty allowance ..	1,200	0	0			
	3. Assistant Managers ..	9,396	12	0			
	4. Overseers (Voted) ..	2,220	0	0			
	5. Sub-Assistant Surgeon ..	1,959	1	0	17,83k	15	0
	6. Temporary Overseer ..	674	3	0	2,072	10	6
	Pensionary charges ..	....				
	<i>Allowances, honoraria, etc.</i>						
II.	1. Travelling allowances (Non-voted)..	1,961	2	0			
	Ditto (Voted) ..	12	1	0			
	2. Pony allowance (Non-voted) ..	1,203	14	0	3,537	1	0
	Ditto (Voted) ..	360	0	0			
III.	House rent and other allowances—						
	1. Hill allowance (Voted) ..	489	12	0			
	2. Special allowance ..	300	0	0	789	12	0
	<i>Supplies and Services.</i>						
IV.	Carriage, packing and distribution charges—						
	1. Carriage of bark (Voted) ..	5,454	3	0			
	2. Carriage of stores ..	222	15	0			
	3. Landing and clearing charges of Europe stores (Voted) ..	21	3	0	5,698	5	0
V.	Purchase and feed of horses (Voted) ..	2,510	0	0	2,510	0	0
VI.	Purchase of stores, implements, etc.—						
	1. Europe stores (Voted) ..	990	4	9			
	2. Freight on above ..	80	0	0			
	3. Loss or gain by exchange ..	356	12	0			
	4. Stores locally purchased ..	1,373	11	0	2,800	11	9
VII.	Customs duty on imported stores ..	100	0	0	100	0	0
	<i>Contingencies.</i>						
VIII.	Petty construction and re- pairs (Voted) ..	1,496	14	3	1,496	14	3
IX.	Other contingent charges—						
	1. Sirdars and coolies (Voted) ..	93,318	10	9			
	2. Miscellaneous ..	1,094	5	6			
	3. Cost of medical stores ..	469	14	0			
	4. Road and Public works cess ..	1,303	15	0	96,186	13	3
	Total Munsong charges ..	....			<u>1,33,928</u>	<u>2</u>	<u>9</u>

II—FACTORY ACCOUNT.

Pay of Officers.

I.	Quinologist and other gazetted officers—	Rs.	A.	P.	Rs.	A.	*•
1.	Quinologist (Non-voted) ..	4,441	15	0			
	Ditto (Voted) ..	6,028	6	0			
2.	Assistant Quinologist ..	2,040	5	0	12,510	10	0

Pay of Establishment.

II.	Clerks-						
	Clerk (Voted) ..	724	0	0	724	0	0
	Pensionary charges ..	....			2,205	12	3

Allowances, honoraria, etc.

III.	Travelling allowance—						
	Travelling allowance (Non-voted) ..	259	10	0	259	10	0
IV.	«House rent and other allowances—						
	Hill allowance (Voted) ..	181	0	0	181	0	0
	Cost of passage granted under Superior Civil Service Rules	3,377	10	0	3,377	10	0

Supplies and Services.

V.	Carriage, packing and distribution charges—						
	1. Packing materials (Voted) ..	5,646	6	9			
	2. Distribution charges	461	5	0			
	3. Carriage of stores	5,071	5	6			
	4. Landing and clearing charges of Europe stores.	2,310	9	9	13,489	11	0
VI.	Purchase of stores, implements, etc.—						
	1. Europe stores (Voted) ..	18,566	4	6			
	2. Freight on above	2,529	14	0			
	3. Loss or gain by exchange	7,040	5	6			
	4. Chemicals	33,498	2	6	61,634	10	6
VII.	Customs duty on imported stores (Voted) ..	2,266	5	0	2,266	5	0

Contingencies.

VIII.	Petty construction and repairs ..	3,997	4	0	3,997	4	0
IX.	Other contingent charges—						
	1. Sirdars and coolies (Voted) ..	11,559	15	9			
	2. Fuel (carriage and cutting up only)	9,754	12	0			
	3. Purchase of bark (carriage only)	418	6	6			
	4. Miscellaneous	510	15	3			
	5. Tablet manufacture	14,056	15	0	36,301	0	6
	Total Factory charges ..	....			<u>1,36,947</u>	<u>9</u>	<u>3</u>

III.—GENERAL.

<i>Pay of Officers.</i>		Rs.	A.	P.
I. Gazetted officers—				
Superintendent	(Non-voted) ..	3,133	6	0
 <i>Pay of Establishment.</i>				
II. Clerks—				
Clerk (Voted)	..	7,64	7	9 0
III. Servant—				
Servant (Voted)	..	228	0	0
IV. Pensionary charges (Voted)	..	1,811	1	0
 <i>Contingencies.</i>				
V. Other contingent charges—				
Postage and telegrams (Voted)	..	500	0	0
Total General Charges	..	<u>13,320</u>	<u>0</u>	<u>0</u>

IV.—ABSTRACT.

Total Mungpu charges	..	..	..	1,05,555	12	6
„ Munsong	„	..	..	1,33,928	2	9
„ Factory	„	..	..	1,36,947	9	3
„ General	„	..	..	13,320	0	0
Grand total expenditure	..	..	..	<u>3,89,751</u>	<u>8</u>	<u>6</u>

APPENDIX E.

Block Account.

I.—MUNGPU PLANTATION.

fo-	Rs.	By-	Rs.
Value of buildings on 1st April 1926	25,061	Depreciation on buildings at 21 percent. ..	737
Value of machinery on 1st April 1926	759	Value of buildings on 31st March 1927.. ..	24,324
Value of plantation on 1st April 1926—		Depreciation on machinery at 5 per cent. ..	54
Cinchona	5,60,285	Value of machinery on 31st March 1927	705
Timber	2,78,733	Valuation of plantation on 31st March 1927—	
Gain on the revaluation of the plantation at the end of 1926-27—		Cinchona	8,08,254
Cinchona	2,47,968	Timber	45,000
Timber .. ..	.....	Loss on the revaluation of the plantation at the end of 1926-27—	
		Cinchona .. ..	.....
		Timber	<u>2,33,733</u>
Total	<u>11,12,807</u>	Total	<u>11,12,807</u>

II.—MUNSONG PLANTATION.

		Rs.		Rs.
To—			By -	
Value of buildings on 1st April 1926	33,364		Depreciation on buildings at 2½ per cent. ..	944
Additions to buildings, 1926-27	696		Value of buildings on 1st April 1926	33,116
Value of Plantation on 1st April 1926—			Value of Plantation on 1st April 1926—	
Cinchona	19,56,270		Cinchona	18,05,057
Timber	9,930		Timber .. ..	.....
			Loss on revaluation of the plantation at the end of 1926-27—	
			Cinchona	1,51,213
			Timber	9,930
Total	20,00,260		Total	20,00,260

III.—FACTORY.

		Rs.		Rs.
To—			By -	
Value of buildings on 1st April 1926	57,187		Depreciation on buildings at 2½ per cent. ..	1,656
Addition to buildings, 1926-27	2,540		Value of buildings on 31st March 1927	58,071
Value of machinery on 1st April 1926	52,330		Depreciation on machinery at 5 per cent. ..	3,665
Addition to machinery, 1926-27	6,300		Value of machinery on 31st March 1927	54,965
Total	1,18,357		Total	1,18,357

APPENDIX F.

Profit and Loss valuation, 1926-27.

		Rs.	A.	p.		Rs.	A.	P.
To -					By -			
Stock on 1st April 1926	6,02,033	0	3		Arrears recovered ..	46,511	12	0
Outstanding on 1st April 1926	46,511	12	0		Sales during the year	5,23,900	13	0
Sales of Government of India cinchona febrifuge	71,942	15	0		Outstanding on 31st March 1927	15,722	5	0
Expenditure (less capital expenditure, Rs. 8,840)	3,80,911	8	6		Cost of manufacture of Government of India products	57,057	10	6
Depreciation on buildings	3,337	0	0		Stock on 31st March 1927	3,54,266	0	0
Depreciation on machinery	3,719	0	0		Valuation of Plantations on 31st March 1927—			
Value of Plantations on 1st April 1926—					Cinchona	26,13,311	0	0
Cinchona	25,16,493	0	0		Timber	45,000	0	0
Timber	2,88,663	0	0		Balance	2,57,841	11	0
Total	39,13,611	3	9		Total	39,13,611	3	9

APPENDIX C.

Statement of sales of factory products during the official year 1926-27!

Particulars.	Quinine salts.	Cinchonine and cinchonidine salts.	Cinchona febrifuge.	Quinine salts and quinoidine.	Cinchona bark.	Total.
	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.
<i>Assam.</i>						
Jails	16 0	..	62 0 1	..	..	78 0
Dispensaries ..	761 1 ⁵	..	829 12	5 0	..	1,596 11
District Boards ..	8 0	..	..	..	..	8 0
Missionary bodies ..	25 0	..	52 0	..	..	77 0
Others	24 0	..	200 0	..	..	224 0
<i>Be 7i gal.</i>						
Jails	6,721 8	..	101 8	..	..	6,822 8
Medical Store Depôts	2,390 1	..	700	..	..	3,090 1
Dispensaries ..	2,984 6 ¹	..	2,132 12	..	..	5,117 2A
District Boards ..	396 8	..	4,254 12	2 0	..	4,652 8"
Missionary bodies ..	224 0	..	372 12	..	..	596 12
Others	26 2	3 0	828 4	r 0	3,600 0	4,458 6
<i>Bihar and Orissa.</i>						
Jails .. ..	..	..	1,309 12	J 3 0	..	2,191 15
Dispensaries ..	867 3	2 0	..	..	..	95 0
District Boards ..	87 8	..	7 8	9 0	..	149 0
Missionary bodies ..	15	..	131 12	z u	..	313 8
Others	174	..	139 0	..	..	..
<i>Punjab.</i>						
Jails .. ..	..	..	210 0	..	..	210 0
Dispensaries ..	3 4	0 8	1,438 0	..	..	1,441 12
District Boards ..	..	..	..	..	..	45 0
Missionary bodies ..	..	2 0	41 0	1 * *	..	169 0
Others .. ..	..	10 0	59 0	1 1 0	100 0	674 0
Medical Store Depôt	160 0	..	504 0	..	..	..
<i>Other Provinces and States.</i>						
Jails .. ..	..	..	68 0	..	..	68 0
Dispensaries ..	5 15	..	3,092 8	12* 4	..	3,110 11
District Boards ..	..	..	1 4	..	..	1 4
Missionary bodies ..	..	..	99 4 0	94 0	..	358 8
Others	is 6	0 2	212 12	7 5	100 0	335 9
Medical Store Depôt	..	..	..	2 0	..	2 0
Total	14,908 8 ¹	17 10	17,081 8	78 9	3,800 0	35,886

'APPENDIX H.

Sale of sulphate of quinine in " treatment " tablets during 1926-27.

Conse- cutive No.	Months.			Total proceeds from sale of tablets.			Credited to Cin- chona Depart- ment.		
	1	2		3			4		
	<i>1926.</i>			Rs.	A.	p.	Rs.	A.	p.
1	A pril	..	..	20,092	3	0	10,040	1	6
2	May	..	..	24,440	13	9	12,220	0	¹⁰
3	June	..	..	22,992	1	0	11,496	0	6
4	July	..	..	31,338	12	0	15,609	6	0
5	August	..	..	23,233	10	6	11,010	13	3
6	September	..	..	27,403	13	5	13,701	14	8
7	October	..	..	20,636	14	10	20,030	14	¹⁰
8	November	..	..	50,057	13	3	50,057	13	3
9	December	..	..	19,003	7	1	19,003	7	1
	<i>1927.</i>								
10	January	..	..	21,098	12	4	21,098	12	4
11	February	..	..	7,971	2	9	7,971	2	9
12	March	..	..	0,523	10	0	0,523	10	0
			Total	2,74,793	1	11	2,00,042	7	0

* Supplied by the Accountant-General, JSengal.

GOVERNMENT OF BENGAL.

Revenue Department.

Cinchona.

CALCUTTA, THE 9TH JANUARY, 1928.

RESOLUTION—No. 422.

READ—

The sixty-fifth annual report of the Government Cinchona Plantations and Factory in Bengal for the year 1926-27.

READ ALSO—

The reports of the previous three years.
Mr. C. C. Calder held charge as Superintendent up to the 12th May, 1926. Mr. G. E. Shaw, Government Quarters, Superintendent from the 21st May to the 4th July, 1926 when he

current duties of the Superintendent until 12th July. This officer was in charge for the rest of the year.

2. In the Resolution on the Report for the year 1925-26 it was stated that an up-to-date survey of the plantations was urgently needed and that in the mean time very little reliable information was placed on the figures for stock in the profit and loss account. In pursuance of this resolution was published an officer of the Audit-General's Office, Mungpoo and prepared an elaborate scheme for the department. Accounts for the department were arranged for in the cold weather of 1927-28 through the Survey of India, and pending this survey a preliminary survey was made of all the standing trees in the plantations. Various species of cinchona and by trees of different ages.

3. Up to hitherto the records of area have been based on the principle of deducting roughly every 4,000 lbs of quinine from the total area at various

This system has for many years been in vogue of estimating the stock of quinine on the area under the charge of the Managers and requiring cultivation.

(c) The 669,000 lbs. of dry bark which was harvested in the year of report came mainly from thinnings and from dead and drying trees and for several years there has been very little clear felling*. Even from the point of view of calculating stock it is possible that the figure of 3,153 acres, given in last year's report as the area under Cinchona, has been unduly reduced by the operation of this system through a course of years.

(d) In this year's report, therefore, Mr. Cowan has restored the area which has actually to be cultivated, viz., 4,742 acres. A part of this area is only very sparsely covered with productive trees, but not sufficient to throw any doubt on the conservatism of the estimates of stock arrived at in Appendix A of the Report.

4. The total amount of green bark which could be harvested from the Mungpoo and Munsong plantations at the present moment is estimated at 21,762,500 lbs. of green bark equivalent to 86,05,000 lbs. of dried bark. The value of this bark is at least Rs. 15,80,000 reckoned at the rates which have hitherto been adopted for calculating the value of the plantations according to the average cost^{o*} production. In the block account the Mungpoo plantation has been valued at Rs. 8,08,254 and the Munsong plantation at Rs. 18,05,007. The basis of this calculation is 1 anna 5 pies for every unit of quinine in each pound of bark. Owing to the enumeration of the trees^{the} Superintendent has been able to show a considerable increase^{er} of timber last year, but on the other hand he has written down the value of^{ie} timber, which is mainly grown as a means of preparing the land⁰¹ for another crop of cinchona and is cut down before it is mature.

5. In this connection it may be mentioned that there is a smallⁱⁱ plantation of Ipecacuanha at Mungpoo which is ready for harvesting and would realise a large sum at the present market rates.

6. The quantity of dried bark used in the factory during the year was 11,27,519 lbs. of which 5,87,000 lbs. was Bengal bark, the rest Java bark belonging to the Government of India. Altogether 55,136 lbs. of quinine sulphate and febrifuge was manufactured at a cost of Rs. 159 a pound and 19,197 lbs. of febrifuge at Re. 1-6 per pound, 387 lbs. of other quinine salts at Rs. 3 per pound, and 161 lbs. of other products at Rs. 2 a pound. Even at the reduced rate of Rs. 18 a pound introduced from the beginning of 1926 quinine sulphate therefore gives a profit of Rs. 13 j a pound.

The share of the products of the factory which belongs to the Government of Bengal was 47,731 lbs. of which about two-thirds were sold. Provided the demand continues on the present scale it would appear that the existing supply of bark on the plantations would suffice for the needs of about 24 years. But if India as a whole is to become self dependent, it will be necessary to find new areas for plantation. With this object in view the Forest Department has agreed to an experiment in the reserved forest at Samsing in the Kalimpong subdivision where 2,000 acres of excellent land are available provided the disadvantages of an excessive rainfall prove to be counterbalanced by the good drainage and other natural advantages. For the first time in the appendices of the Annual Report the value of the stock has been taken as the cost of bark *phis* the cost of manufacture instead of the selling value. This change has resulted in & nominal loss of Rs. 2,57,842 in the profit and loss account.

All the figures and facts compressed with Mr. Cowan's report give welcome indications that good work has been done in the year under report and that in the cinchona plantation factory the local Government has a very useful and profitable property. The Governor in Council is pleased to record the thoughtful work Mr. Cowan has done during his tenure of office and to thank Mr. X officers who have assisted the Superintendent with the utmost fidelity.

Order.—Ordered that this resolution be pushed in the Calcutta Gazette and that a copy, with a copy of the Report, be submitted to the Government of India.

By order of the Governor in Council,

F. A. SACHSE,

Secretary to the Government of Bengal.

Nos. 423-24.

Copy forwarded to the Superintendent, Cinchona, Cultivation, Bengal, and Agriculture and Industries Department of this Government for information.

By order of the Governor in Council,

M. N. GUPTA,

Assistant Secretary to the Government of Bengal.

INDIAN BOTANIC GARDEN LIBRARY
BOTANICAL SURVEY OF INDIA

