M.R.O. I—77,006—8-6-37.

(1) Number of pages 18

(2) Date of repair 7-7-38

(3) Initials of the Reference 4

MADRAS RECORD OFFICE.

Government of Madras.

Revenue DEPARTMENT.

G.O. No. 1441 Press ~~Mis.~~

Dated 8-7 1879.

Not to be folded or roughly handled

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

8th July 1879, No. 1,441.

No. 100. READ THE FOLLOWING PAPER:—

Endorsement of the Assistant Secretary to the Government of Bengal, Financial Department (Agriculture), dated Calcutta, 19th June 1879, No. 164.

Read the following:—

RESOLUTION.

READ—

Letter from the Superintendent of the Royal Botanical Garden, Calcutta, and of the Government Chinchona Cultivation in Bengal, No. 47-C, dated 8th May 1879, submitting the Annual Report of the Government Chinchona Plantation in British Sikkim for the year 1878-79.

Letter from the Government Quinologist, No. 70, dated 13th May 1879, submitting his Annual Report for the year 1878-79.

BOTH Dr. King and Mr. Wood have been very punctual in the submission of their reports to Government.

The operations in the plantation during the past year were greatly retarded by the unusual drought of the cold season, which caused the death of a number of old trees and prevented the planting out of young trees. The consequence was that the plantation only admitted of being extended by 120¾ acres against 250 acres in the previous year, viz., 75 acres in the new or Sittong Division, and 45¾ acres in the old plantations at Rishap and Mungpoo.

2. During the year 353,415 red bark trees (*C. Succirubra*) were planted out, viz., 24,725 in Rishap and Mungpoo, to replace old plants uprooted in taking the bark crop, and 328,690 on new land—124,590 in Rishap and Mungpoo and 204,100 in Sittong. In addition to the above, 300 plants of a hybrid species were planted at Mungpoo and 3,328 at Sittong, and the nursery stock of it was considerably increased during the year. Special attention was paid to the propagation of the yellow bark tree (*C. Calisaya*), the most valuable of all the medicinal barks, and it is encouraging to find that at the end of the year there were in the nursery beds 60,000 cuttings and seedlings in the Mungpoo Division and 1,000 in the Sittong Division, which will all be shortly fit for transfer to the permanent plantations. This is also the first season during which *Chinchona Calisaya* has been cropped, and about 1,400 lbs. of the dry bark obtained. This tree is, however, very capricious in growth, and no locality with perfectly suitable climatic conditions for it has yet been found in British Sikkim. Dr. King has, therefore, been authorized to visit Java to ascertain the conditions under which the Dutch have there succeeded in growing the tree cheaply. In the meantime its cultivation should be pushed on as rapidly as circumstances will permit. The total number of chinchona plants of all varieties planted out at the close of the year under review was 4,028,055, of which 3,589,965 were of the red bark species.

3. As a considerable quantity of bark (278,958 lbs.) remained on the hands of the Quinologist at the close of 1877-78, it was not thought desirable to collect during the year under review more bark crop than was necessary to meet the requirements of the febrifuge factory. Only 261,659 lbs. were therefore taken,

viz., yellow bark 13,967 lbs; grey bark 812 lbs., and red bark 246,880 lbs. The aggregate bark yielded in former years amounted to 873,242 lbs., so that the total produce, including the crop of the past year, is 1,134,901 lbs.

4. As usual, the crop was taken by one of the three methods of harvesting—uprooting, coppicing, and thinning, thus—

	lbs.
Uprooting	52,484
Coppicing	14,464
Thinning	194,711
Total ...	261,659

The result of the operations of the year under review confirms the experience of previous years that about 2,000 lbs. per acre may be taken as the average yield on uprootal of red bark trees from seven to ten years old. Four acres of the yellow bark planted in 1871-72 yielded when coppiced 7,530 lbs., or at the rate of 1,882½ lbs. per acre.

5. The total expenditure on the plantation amounted to Rs. 64,650-5-10, of which Rs. 12,758-0-3 represented the capital expenditure and proportion of establishment for the Sittong Division, which has not yet come into bearing. The remaining sum of Rs. 51,892-5-7 was on account of the working and proportion of establishment of the older plantations (Rungbee, Rishap, and Mungpoo), and therefore forms the working expenditure of the year.

6. The continuous increase in the amount of febrifuge manufactured by Dr. Wood is very marked. The outturn of the last five years has been—

	lbs.	oz.
1874-75	48	10
1875-76	1,940	6
1876-77	3,750	12
1877-78	5,162	0
1878-79	7,007	0
Total ...	17,908	12

but notwithstanding this rapid development of the manufacture the increasing confidence in the efficacy of the febrifuge has raised the demand for it so much, that the consumption of the past year greatly exceeded the quantity manufactured. To meet this growing demand the scale of manufacture at Mungpoo has been extended. The cost of the febrifuge manufactured, including the cost of the bark, was Rs. 76,459-12-11, or at Rs. 10-14-7 per lb., which is nearly one rupee per lb. less than it was in the year 1877-78.

	lbs.	oz.
The quantity of febrifuge on stock on 1st April 1878 was ...	3,404	4
Manufactured during 1878-79	7,007	0
Total quantity for disposal ...	10,411	4

This quantity was thus distributed:—

To Medical depôt, Calcutta	4,000	0
To do. Bombay	1,200	0
To do. Madras	300	0
To Straits Settlements	30	0
Sold to the public	2,401	12
Samples, loss in packing, consumed in experiments, &c. ...	23	11
	7,955	7
In store on 31st March 1879	2,455	13
Total ...	10,411	4

7. The financial results of the year have been most satisfactory, the revenue from the sale of the drug to the Government depôts and to the public amounted to Rs. 1,32,519-1-0, as shown below:—

	Rs.	A.	P.	Rs.	A.	P.
Sold to the public	41,042	7	0			
Credit Medical depôt, Calcutta	66,200	0	0			
Do. Bombay	19,827	8	0			
Do. Madras	4,952	0	0			
Credit from Straits Settlements	497	2	0			
				1,32,519	1	0

The expenditure was as follows:—

On plantation as stated in paragraph 5 above	51,892	5	7			
Quinologist's expenses including the proportion of his salary	27,091	2	7			
				78,983	8	2

The excess of income over expenditure therefore amounts to Rs. 53,535-8-10, but from this should be deducted Rs. 11,123-1-3, being the reduction in the value of stock in hand due to the excess of sales over manufacture. This leaves a nett profit of Rs. 42,412-7-7.

8. The total amount of capital with interest at 4 per cent. that has been sunk in the chinchona plantations and in the manufactory is approximately 10 lakhs of rupees; the receipts for the year under review therefore, after paying all expenses, yielded interest of about 4¼ per cent. on the capital outlay, and even if subsequent years show no improvement, as it may be confidently assumed they will do, a sufficient annual income, on the system of accounts followed above, would almost have been realized.

9. But this system of computing profits fall very far short of doing justice to the real benefit which the Government has derived from the chinchona plantations. The 5,500 lbs. of alkaloid taken by the different medical departments replaced an equal amount of quinine that would otherwise have been purchased and supplied on indent to hospitals and dispensaries. At the very moderate rate of Rs. 80 per lb., the cost of this would have come to Rs. 4,40,000, and this amount, *plus* the actual sales to the public and Straits Settlements Rs. 41,540, in all Rs. 4,81,540, is the true measure of the gain to Government from the chinchona manufacture. Looking at the financial question in this way, as may most fairly be done, the plantations by the end of the current year will have cleared off the entire capital that has been invested in them.

10. The Lieutenant-Governor approves of the Superintendent's proposal to take 350,000 lbs. of bark as the estimated crop of the year 1879-80.

11. With a view to facilitate the systematic working of the new or Sittong Division, it is necessary that it should be surveyed and mapped as soon as possible. The Government of India will be moved to issue the necessary instructions on the subject to the Survey Department.

12. The Committee, which was appointed in 1877 to ascertain whether the febrifuge could be improved by eliminating any of its constituents, has not yet submitted its final report. But it is satisfactory to note that the further experience in the use of the drug during the past year has increased the confidence of the public and of the medical profession in its virtues, as is evidenced by the increasing demand for it.

13. The question of manufacturing a superior drug, which would not be exposed to the prejudices which have so long delayed the free distribution of the present febrifuge, is still under consideration, and awaits the report of the Specia Committee appointed to consider the subject. It will probably be found advisable to manufacture at a slightly increased cost a preparation composed of the three sulphates, Cinchonidine, Cinchonine, and Quinine in conjunction.

14. The Lieutenant-Governor thanks Dr. King aud Mr. Wood for their valuable services during the year; his acknowledgments are also due to Mr. Gammie, Resident Manager of the Chinchona Plantation, who continues to supervise the plantation and manufacture with singular efficiency and intelligence, and has well earned the approbation of the Superintendent.

ORDER.—Ordered that a copy of the Resolution, and of the reports referred to, be submitted to the Government of India, in the Department of Revenue, Agriculture and Commerce for information; also that copy be forwarded to the Superintendent, Botanical Garden, in charge of the Chinchona Plantation, and to the Government Quinologist for information.

Ordered, further, that copies be forwarded to the Government of Madras, and to the Surgeon-General, Bengal, and the Medical Department of this office for information.

(By order of the Lieutenant-Governor of Bengal.)

(Signed) H. L. HARRISON,
Offg. Secy. to the Govt. of Bengal.

COPY forwarded to the Secretary to the Government of Madras for information.

(By order of the Lieutenant-Governor of Bengal.)

(Signed) RAJENDRA NATH METRA,
Asst. Secy. to Govt. of Bengal.

No. 101. ORDER THEREON, 8th July 1879, No. 1,441.

Miscellaneous.

COMMUNICATED to the Revenue Board, the Surgeon-General, Indian Medical Department, the Conservator of Forests, and the Commissioner of the Nilgiris.

(True Extract.)

(Signed) J. H. GARSTIN,
Acting Secretary to Government.

To the Board of Revenue.
„ the Surgeon-General, Indian Medical Department.
„ the Conservator of Forests.
„ the Commissioner of the Nilgiris.
„ the Superintendent of Government Central Museum.

Exd. T. D. Ryan.

Govt. of India.

REVENUE.

To

THE BOARD OF REVENUE,

&c., &c., &c.

Dated July 8th.

Printed 16th.

Read.

Read.

G.O., *8th July* 1879, *No.* 1,441.

JULY.

Nos. 100-101.

Government Chinchona Plantation in British Sikkim.—Communicating to the Revenue Board, Surgeon-General, Indian Medical Department, Conservator of Forests, and to the Commissioner of the Nilgiris Resolution of the Government of Bengal reviewing the reports on — for the year 1878-79.

ANNUAL REPORT ON THE CINCHONA PLANTATIONS IN BRITISH SIKKIM FOR THE YEAR 1878-79.

No. 47C, dated Royal Botanical Garden, Howrah, near Calcutta, the 8th May 1879.

From—GEORGE KING, ESQ., M.B., Superintendent, Royal Botanical Garden, Calcutta, and in charge of Cinchona Cultivation in Bengal,

To—The Secretary to the Government of Bengal, Revenue Department.

I HAVE the honor herewith to submit the annual report on the Government Cinchona plantations in Bengal for the year ending 31st March 1879.

Seventeenth Annual Report on the Government Cinchona Plantations in British Sikkim, by Surgeon-Major George King, M.B., F.L.S., Superintendent of the Royal Botanical Garden, Calcutta, and of Cinchona Cultivation in Bengal.

THE year that has just closed has been remarkable for the dryness of its cold season. This unusual drought has not only caused the death of a good many trees on the ridges here and there all over the plantation, but it has most seriously interfered with the planting out of young trees, and the total area of new land which it has been possible to plant out is only 120 acres. The crop of bark taken during the year has been regulated mainly by the requirements of the febrifuge factory, and amounts to two hundred and sixty-one thousand pounds. A few new plantation roads have been made during the year, and the whole estate has been kept clean and in good order.

2. *Details of the year's planting.*—During the year, red bark trees to the number of over three hundred and fifty-three thousand, were planted as follows:—

	Plants.	Acres.
Planted on Rishap and Mungpoo on new land	124,590	45¾
„ on Sittong on ditto	204,100	75
„ to replace uprooted plants on Rishap and Mungpoo	24,725	...
Total ...	353,415	120¾

But, besides these, a number of seedlings were used in filling up death vacancies in the planting of the past and previous years. The nursery stock of red barks at the end of the year consisted of 490,000 seedlings fit for transplantation, and of 180,000 rooted cuttings and seedlings of smaller size. For the reception of these, two hundred acres of land stood ready prepared for months, but the nearly total failure of the cold weather showers made the planting of them out an impossibility. Three hundred plants of a hybrid species of cinchona to which reference has frequently been made in former reports, were permanently planted out at Mungpoo, and the nursery stock of it was considerably increased during the year. Steady efforts have also been made to propagate the *calisaya* or yellow bark tree, and the nursery beds at the end of the season contained sixty thousand cuttings and seedlings of this valuable sort. The total number of cinchona trees of all kinds planted out on the estate at the end of the year (after deducting 24,725 uprooted during the taking of the crop) stood at 4,028,055, and of these 3,589,965 (rather more than seven-eighths) are red barks. And in addition to these there were in the nurseries stock plants for propagation, seedlings, and cuttings to the number of 853,000.

3. *Details of the year's crop.*—At the end of the year 1877-78 a considerable quantity of bark (278,953lb) remained in store at the plantation, and it was considered, by both Mr. Wood and myself, undesirable to collect more bark during the past year than could be worked up by the factory. The crop for the year was accordingly regulated by the requirements of the factory, and only 261,659lb were taken. With the exception of about 14,000lb of yellow, and 800lb of grey, the crop consisted of red bark. During previous years the plantation had yielded in all 873,242lb, so that the crop of the past year brings the total produce of these plantations from the beginning up to considerably over a million of pounds. The crop, as in former years, was

taken by one of the three methods of thinning, coppicing, or uprooting. A statement of the amount of bark taken by each method will be found in one of the tables accompanying this report. The figures for the present year confirm the experience of former years that (although the outturn differs in different parts of the plantation according to varying circumstances of soil, exposure, and drainage) about 2,000lb per acre may be taken as the average yield on uprootal of red bark trees from seven to ten years old. An eight-acre patch of trees on lower Rishap, eleven years old, yielded, as will be observed, at the rate of 2,114lb of dry bark per acre, while a patch of twelve and a half acres, at a higher elevation on the same spur, although a year younger, yielded 2,618lb per acre. The most interesting feature in the details of the crop is the fact that four acres of yellow barks (*cinchona calisaya*) planted during 1871-72, yielded *when coppiced* at the rate of no less than 1,882lb per acre. The present is the first season during which *calisaya* has been cropped, and if this result can be taken as an indication of the rate of produce to be expected, the future prospects of the cultivation of this species are reassuring. But with a tree so capricious in growth, it would be unsafe to trust too much to the results obtained from a single small patch.

4. *Expenditure for the year.*—The budget allotment for the year amounted to Rs. 75,625; but on this there has been a saving of Rs. 10,974-10-2. The expenditure for the year (including Rs. 1,851-5-4, for stores sent out by the India Office) amounts to Rs. 64,650-5-10. This sum divides itself into two parts, viz. into the amount spent on the young plantation at Sittong (not yet in bearing), and which is chargeable to capital, and the amount spent on the upkeep and working of the old plantations (Rungbee, Rishap, and Mungpoo) which forms the working expenditure for the year, and against which has to be set the crop. The account therefore stands thus:—

			Rs.	A.	P.
Total expenditure for the year (including cost of stores from India Office Rs. 1,851-5-4)			64,650	5	10
Capital—					
Chargeable to Sittong	8,997	6 9			
Proportion of establishment	3,760	7 6			
		12,758	0	3	
Working Expenditure.					
Upkeep and working of Rungbee, Rishap, and Mungpoo ...	36,596	14 4			
Proportion of establishment ...	15,295	7 3			
		51,892	5	7	
			64,650	5	10

In return for the expenditure on the old plantation (viz., Rs. 51,892-5-7) there is the crop for the year, viz. 261,659lb of dry bark, and, in accordance with the arrangement adopted last year, the whole of this bark has been made over to the Quinologist, and the entire working expenses for the year (Rs. 51,892-5-7) are taken over by him. The avowed object in maintaining the plantation is not to grow bark for sale, but to grow it as a raw material from which to manufacture cinchona febrifuge. The financial success of the plantation is therefore to be judged by the outturn and sale of the product manufactured by the Quinologist, and it simplifies accounts if the amounts annually spent on working the plantation and factory are both made debit items of one account, on the credit side of which appear the proceeds of the sale of febrifuge. The financial results of the year's working will thus appear in the Quinologist's report.

5. *Distribution of seed.*—There was not much demand for seed of *Cinchona succirubra* during the year. The applications for seed of *Calisaya* were numerous, but as nearly all our seed of this species is required for our own use, a few ounces only were given away.

6. *Land rent.*—No credit for land revenue has ever been taken in the accounts of the plantation, and the sum of Rs. 1,208-7, received during the year as rent from settlers within the cinchona reserve was paid into the Darjeeling treasury as usual.

7. *Survey of the Sittong plantation.*—The new plantation at Sittong remains still unsurveyed; but, as a proper map is of great use in many ways, it is hoped that Government may soon be able to arrange for a small party to undertake the work, which could be easily put through during a single recess season.

8. *Estimated crop of* 1879-80.—I propose, as last year, to make the crop to be taken depend upon the requirements of the factory. And as this is being gradually extended, probably about 350,000lb will be wanted.

9. According to the arrangement at present in force, the whole of the febrifuge produced at the factory is disposed of by me, and an account of the sales is given to the Quinologist. The financial result of the year's working will be treated of by Mr. Wood in his report, but I would venture to make a few remarks on the general aspect of the matter. The total amount of febrifuge disposed of during the year was 7,934lb 11oz., being about 2,500lb in excess of the issues for 1877-78. Of this amount 4,000lb were taken by the Government Medical Depôt at Calcutta, 1,200lb by the Depôt at Bombay, and 300lb by that at Madras, the remainder having been sold to the general public. The 5,500lb thus supplied to the medical depôts supplanted an equal amount of quinine, and the saving to Government on this account can have been little short of three lakhs and a half of rupees. The saving during the two previous years was calculated to have amounted to about four lakhs and a quarter, so that the total saving effected by the use of febrifuge in Government hospitals and dispensaries already amounts to about seven and three quarter lakhs of rupees. In addition to this the results of the year's working show an actual profit, after paying interest at four per cent., on the total capital sunk on these plantations since their beginning. That capital amounts, including compound interest at four per cent., to only about ten lakhs of rupees, so that by the end of the year that has now begun, the savings effected by the use of febrifuge will actually exceed the total expenditure on plantations and factory. This result may, I hope, be regarded by Government as favourable. As for the febrifuge itself, extended experience of its administration appears to have increased the confidence both of the medical profession and of the general public in its virtues as a febrifuge. Complaints of its nauseating effects are now seldom heard of, and there appears to be little doubt that these were originally largely due to the practice of giving too large doses of a drug which is really about as powerful a febrifuge as quinine.

10. Mr. Pantling, an assistant selected by Sir Joseph Hooker for the plantation, joined his appointment towards the end of the cold weather. During the year the plantation has been under the able executive charge of Mr. Gammie, to whom, with Mr. Lister, my best acknowledgments are due for continued good service.

11. The usual returns (four in number) are appended.

Table showing the Number and Distribution of Cinchona Plants in the Government Plantations, Mungpoo Division, on the 1st April 1879.

NAMES OF SPECIES OF CINCHONA.	Number in permanent plantation on 1st April 1878.	Uprooted during the year 1878-79.	Planted during the year 1878-79.	Number in permanent plantation on 1st April 1879.	Number of stock plants for propagation.	Number of seedlings or rooted cuttings in nursery beds for permanent plantations.	Number of rooted plants in seed or cutting beds.	Total nursery stock at 1st April 1879.
New variety	21,000	... ...	300	21,300	10,000	5,000	65,000	80,000
Succrubra	2,634,600	24,725	124,590	2,734,465	.....	250,000	180,000	430,000
Calisaya	354,500	.....	.....	354,500	6,000	.....	60,000	66,000
Micrantha	20,000	.....	.....	20,000	.....	.....	.....	.....
Officinalis and varieties ...	25,000	.....	.....	25,000	.....	.....	.....	.....
Ludiana	5,092	.....	.....	5,092	.....	.....	.....	.....
Total ...	3,060,192	24,725	124,890	3,160,357	16,000	255,000	305,000	576,000

Table showing the Number and Distribution of Cinchona Plants in the Government Plantation, Sittong Division, on the 1st April 1879.

Names of species of Cinchona.	In permanent plantation on 1st April 1878.	Planted during the year 1878-79.	Number in permanent plantation on 1st April 1879.	Number of stock plants for propagation.	Number of seedlings or rooted cuttings in nursery beds for permanent plantations.	Number of rooted plants in seed and cutting beds.	Total nursery stock at 1st April 1879.
C. New variety	8,870	3,328	12,198	.....	36,000	.....	36,000
C. Succirubra	651,400	204,100	855,500	.....	240,000	.....	240,000
C. Calisaya	.....	.....	.....	.....	1,000	.....	1,000
Total ...	660,270	207,428	867,698	.....	277,000	.....	277,000

Account of Dry Cinchona Bark collected during Season 1878-79.

	Year of planting.	Distance apart of planting.	Original number of plants.	Approximate area in acres.	Total. Root.	Stem.	Branch.	Total.	Totals of each species.
Succirubra.		Feet.			lb	lb	lb	lb	lb
Lower Rishap—									
Uprooting	1867-68	6 × 6	9,600	8	6,174	6,881	3,855	16,910	
Upper Rishap—									
Uprooting	1868-69	6 × 6	15,125	12½	13,763	9,965	9,000	32,728	
Thinning	1868-71	6 × 6	.....	.....	43,936	37,320	37,812	119,068	
Munspoo Ridge—									
Coppicing	1872-73	4 × 4	.....	5½	80	4,867	1,987	6,934	
Thinning	"	4 × 4	.....	.....	7,974	22,065	14,918	44,957	
Tukdo Ridge—									
Thinning	1873-74	4 × 4	.....	.....	2,106	1,427	1,648	5,181	
Ryeing—									
Uprooting	1866-67	6 × 6	.....	.....	1,554	.....	480	2,034	
Rungbee—									
Thinning	1867-69	6 × 6	.....	.....	8,973	5,615	4,480	19,068	
	.....	.....	.....	.....	84,560	88,140	74,180	246,880	246,880
Calisaya—									
Mongvot—									
Coppicing	1871-72	6 × 6	.....	4	.....	4,890	2,640	7,530	
Thinning...	"	6 × 6	.....	.....	356	5,000	1,081	6,437	
	.....	.....	.....	.....	356	9,890	3,721	13,967	13,967
Micrantha—									
Munspoo—									
Uprooting	1871-72	6 × 6	.....	.....	220	250	342	812	812

J. GAMMIE.

Table showing the Produce of the Government Cinchona Plantations in British Sikkim.

	Rs.
Dry bark collected by pruning and thinning during 1869-70 ...	2,400
Ditto ditto ditto 1870-71 ...	12,500
Ditto ditto ditto 1871-72 ...	39,000
Ditto ditto ditto 1872-73 ...	Nil.
Ditto ditto ditto 1873-74 ...	16,000
Ditto ditto ditto 1874-75 ...	39,405
Crop of 1875-76	211,931
Ditto 1876-77	207,781
Ditto 1877-78	344,225
Ditto 1878-79	261,659
Total ...	1,134,901

E. F. M.—Reg. No. 2268—150—30-5-79.

6

ANNUAL REPORT OF THE GOVERNMENT QUINOLOGIST FOR 1878-79.

No. 70, dated Calcutta, the 13th May 1879.

From—C. H. WOOD, Esq., Government Quinologist and Chemical Examiner,
To—The Secretary to the Government of Bengal, Revenue Department.

I HAVE the honor herewith to submit the annual report of the Quinologist for the year ending 31st March 1879.

QUINOLOGIST'S REPORT FOR 1878-79.

A considerable increase in the demand for cinchona febrifuge has occurred during the past year, and the scale of manufacture at Mongpoo has been much extended. The total quantity of febrifuge produced in the 12 months is 7,007lb or 1,845lb more than was made in the previous year. Even with this increased production the total demand for the Medical Department and the public has exceeded the amount manufactured by 948lb; but as there was a large stock in hand at the beginning of the year, no delay has occurred in meeting all requirements.

2. The following statement gives the details of the cost of manufacture for the year:—

	Rs.	A.	P.
Acid, 23,865½lb	5,105	5	3
Packages for do.	217	12	0
Carriage of do.	2,906	15	6
Do. of empty jars	1,463	15	6
Soda, 48,249lb	2,413	1	8
Carriage of do.	797	0	0
Charcoal	203	2	0
Tin plates and enamelled pans	515	0	9
Casks and other plant	973	7	10
Carriage of do.	282	7	9
Sundry expenditure	1,077	6	0
Labour in factory	2,631	9	0
Quinologist	5,200	0	0
Travelling expenses	188	8	0
Carriage of febrifuge	560	12	3
Tins for do.	1,358	13	3
Advertisement charges	687	12	6
Labour in packing, &c.	333	7	6
	26,916	8	9
Bark, 265,120lb at Rs. 0-2-11·9	49,543	4	2
Febrifuge produced 7,007lb at Rs. 10-14-7·088 per lb	76,459	12	11
or per pound of febrifuge—			
Manufacturing and selling	3	13	$5\frac{343}{1000}$
Bark	7	1	$1\frac{343}{1000}$
	10	14	$7\frac{086}{1000}$

3. The cost of acid and soda appear disproportionately large in this account. The amounts of these substances actually used, however, have not exceeded the usual proportion. In the case of the acid it was found desirable to keep a larger stock at Mongpoo than had formerly been maintained, but

for simplicity of accounts it has been charged as if it had been used. The excess in the cost for soda represents the loss that has occurred in the storage and carriage of this chemical during several years. When the febrifuge was first introduced, no accurate estimate could be formed of the scale on which its manufacture would have to be conducted; and as the soda is all imported direct from England, it was thought desirable to keep a large supply on hand. The bulk of the stock has recently been transferred from Calcutta to a godown at Kurseong, and this has afforded an opportunity for ascertaining its exact weight. All the deterioration from storage and carriage has been charged to this year's manufacture. Now that the production of febrifuge is assuming more regular proportions, it will be possible to reduce the stock of soda without an undue risk of the supply falling short of the requirements.

4. It will be seen from the preceding statement that the cost of the febrifuge manufactured during the past year (1878-79) without interest on capital, is Rs. 10-14-7 per lb, or nearly one rupee per lb. less than it was in 1877-78. This cost, moreover, includes the expense of erecting new sheds and extending the factory generally. If exceptional expenditure of this kind be deducted, the cost of the febrifuge is brought to about 10 annas an ounce. The reduction in cost has resulted partly from the increased scale of manufacture and partly from the introduction of improvements in the process whereby an increased yield of alkaloid from the bark has been obtained.

5. A still cheaper rate of production will probably be attained in a short time. The price of the acid employed is an important item in the cost of manufacture. This has been reduced by one-seventh since the commencement of 1879. The charges for the carriage of goods have hitherto been very heavy, but the much lower rates now prevailing will sensibly reduce expenditure. Moreover, additions are still being made to the factory with a view to obtaining greater economy in manufacture. Taking all these points into consideration it is not unreasonable to anticipate that the cost of the febrifuge will ultimately be brought to about eight annas an ounce.

6. It was stated in last year's report that an arrangement had been made for the simplification of accounts, whereby the whole expenditure on the plantations is charged to the Quinologist, and he receives in return the entire bark crop. The cost of the bark each year is then obtained by dividing the year's expenditure on the plantation by the weight of the bark crop. In accordance with this arrangement I received, in 1877-78, a large stock of bark, of which a considerable quantity remained on hand at the end of that year. But it was thought undesirable to keep a large amount of bark in store, and Dr. King consequently arranged to take only a small crop in 1878-79. The bark crop of the year therefore has been only 261,659lb, and the expenditure on the plantations has been Rs. 51,892-5-7, making the price of the bark per lb Rs. 0-3-2·08. The bark used in the factory during the year has been made up of bark in stock from the previous year at Rs. 0-2-8·295, and bark taken during the year at Rs. 0-3-2·08, giving, at the quantities of each used, an average price of Rs. 0-2-11·9 per lb, as shown in the manufacturing account above.

7. The quantity of febrifuge disposed of during the year has been 7,955lb 7oz., as shown in the following statement:—

	lb.	oz.
To the Medical Depôt, Calcutta	4,000	0
Ditto ditto, Bombay	1,200	0
Ditto ditto, Madras	300	0
To the Straits Settlements	30	0
Sold to the public	2,401	12
Samples, loss in packing, consumed in experiments, &c. ...	23	11
Total ...	7,955	7

8. The revenue that has resulted from the sale of febrifuge to the Government Depôts and to the public has amounted to Rs. 1,32,519-1,

and has exceeded the total expenditure on the plantations and factory by Rs. 53,535-8-10, as shown in the following account:—

EXPENDITURE—1878-79.

	Rs.	A.	P.
Cash from Treasury for manufacturing expenses	18,599	14	4
Cash from Treasury for travelling expenses	188	8	0
Stores from England	3,102	12	3
Quinologist, proportion of consolidated pay	5,200	0	0
Expenditure on plantations ...	51,892	5	7
	78,983	8	2
Excess of Income over Expenditure	53,535	8	10
	1,32,519	1	0

Stock, 31*st March* 1878.

	Rs.	A	P.
Soda and stores	9,679	3	1
Bark	16,930	5	2
Febrifuge 3,404lb, @ Rs. 11-14-1·068	40,444	6	5
	67,053	14	8

INCOME—1878-79.

	Rs.	A.	P.
Cash paid into Bank of Bengal ...	41,042	7	0
Credit from Medical Depôt, Calcutta	66,200	0	0
Ditto ditto, Bombay	19,827	8	0
Ditto ditto, Madras	4,952	0	0
Ditto Straits Settlements ...	492	2	0
	1,32,519	1	0

Stock, 31*st March* 1879.

	Rs.	A.	P.
Soda and stores	9,853	12	11
Bark	19,279	6	7
Febrifuge 2,455lb 13oz., @ Rs. 10-14-7·088	26,797	9	11
	55,930	13	5
Decrease in value of stock ...	11,123	1	3
	67,053	14	8

9. As the quantity of febrifuge sold in the year has exceeded the amount manufactured, the value of the articles in stock has been diminished by the sum of Rs. 11,123-1-3; but if this amount be carrried to the reduction of capital, there remains a net profit on the year's work of Rs. 42,412-7-7, or about $4\frac{1}{4}$ per cent. on the entire capital. (The total expenditure by Government on cinchona in Sikkim, from the very commencement, with yearly additions of interest, has been taken in round numbers at ten lakhs.) In my report for last year (1877-78) I pointed out that this result could be attained when the sales of febrifuge reached 8,000lb. I trust the speedy realization of what was there indicated will be deemed satisfactory by Government.

10. Should the consumption of febrifuge increase during the coming year in the same ratio that it has done in the past twelve months, the means of production at Mongpoo will be somewhat severely tested; but extensions are being made as rapidly as possible to meet such a contingency, and we still start with a fair stock in hand. Hitherto, I believe, the febrifuge has been only issued to medical officers in partial substitution for the supplies of quinine they formerly received. But it is possible that Government may now sanction a somewhat larger expenditure of so cheap a drug in districts where fever is very prevalent.

11. The following table shows the total quantity of febrifuge hitherto manufactured, and the manner in which it has been disposed of:—

Febrifuge produced from commencement to 31*st March* 1879.

	lb.	oz.
Manufactured in 1874-75	48	10
Ditto in 1875-76	1,940	6
Ditto in 1876-77	3,750	12
Ditto in 1877-78	5,162	0
Ditto in 1878-79	7,007	0
Total ...	17,908	12

	lb.	oz.
Supplied to Medical Depôt, Calcutta	8,954	3
Supplied to ditto, Bombay	1,600	0
Supplied to ditto, Madras	300	0
Supplied to Straits Settlements ...	30	0
Sold for cash	4,485	5
Samples, &c.	83	7
Stock in hand on 31st March 1879 ...	2,455	13
Total ...	17,908	12

12. During the past year experiments have been in progress on the manufacture of pure sulphate of quinine from the calisaya bark yielded by the plantations. Experiments have also been conducted on the economy of preparing pure alkaloids from the succirubra bark. But, as the consideration of these results involves some points under investigation by the Febrifuge Committee, they cannot be advantageously reported at this stage.

C. H. WOOD,
Government Quinologist.

E. F. M.—Reg. No. 2750—150—2-6-79.

FINANCIAL DEPARTMENT.

AGRICULTURE.

CALCUTTA, THE 19TH JUNE 1879.

RESOLUTION.

READ—

Letter from the Superintendent of the Royal Botanical Garden, Calcutta, and of the Government Cinchona Cultivation in Bengal, No. 47C, dated 8th May 1879, submitting the Annual Report of the Government Cinchona Plantation in British Sikkim for the year 1878-79

Letter from the Government Quinologist, No. 70, dated 13th May 1879, submitting his Annual Report for the year 1878-79.

BOTH Dr. King and Mr. Wood have been very punctual in the submission of their reports to Government.

The operations in the plantation during the past year were greatly retarded by the unusual drought of the cold season, which caused the death of a number of old trees, and prevented the planting out of young trees. The consequence was that the plantation only admitted of being extended by 120¾ acres, against 250 acres in the previous year, namely, 75 acres in the new or Sittong division, and 45¾ acres in the old plantations at Rishap and Mungpoo.

2. During the year, 353,415 red bark trees (*C. Succirubra*) were planted out, namely 24,725 in Rishap and Mungpoo, to replace old plants uprooted in taking the bark crop, and 328,690 on new land,—124,590 in Rishap and Mungpoo, and 204,100 in Sittong. In addition to the above, 300 plants of a hybrid species were planted at Mungpoo, and 3,328 at Sittong, and the nursery stock of it was considerably increased during the year. Special attention was paid to the propagation of the yellow bark tree (*C. Calisaya*), the most valuable of all the medicinal barks, and it is encouraging to find that at the end of the year there were in the nursery beds 60,000 cuttings and seedlings in the Mungpoo division and 1,000 in the Sittong division, which will all be shortly fit for transfer to the permanent plantations. This is also the first season during which *Cinchona Calisaya* has been cropped, and about 1,400 lb. of the dry bark obtained. This tree is, however, very capricious in growth, and no locality with perfectly suitable climatic conditions for it has yet been found in British Sikkim. Dr. King has therefore been authorized to visit Java to ascertain the conditions under which the Dutch have there succeeded in growing the tree cheaply. In the meantime its cultivation should be pushed on as rapidly as circumstances will permit. The total number of cinchona plants of all varieties planted out at the close of the year under review was 4,028,055, of which 3,589,965 were of the red bark species.

3. As a considerable quantity of bark (278,958lb) remained on the hands of the Quinologist at the close of 1877-78, it was not thought desirable to collect during the year under review more bark crop than was necessary to meet the requirements of the febrifuge factory. Only 261,659lb were therefore taken, namely, yellow bark 13,967lb, grey bark 812lb, and red bark 2,46,880lb. The aggregate bark yielded in former years amounted to 873,242lb, so that the total produce, including the crop of the past year, is 1,134,901lb.

4. As usual, the crop was taken by one of the three methods of harvesting—uprooting, coppicing and thinning, thus :—

	lbs.
Uprooting	52,484
Coppicing	14,464
Thinning	194,711
Total ...	261,659

The result of the operations of the year under review confirms the experience of previous years that about 2,000lb per acre may be taken as the average yield on uprootal of red bark trees from seven to ten years old. Four acres of the yellow bark planted in 1871-72 yielded when coppiced 7,530lb, or at the rate of 1,882½lb per acre.

5. The total expenditure on the plantation amounted to Rs. 64,650-5-10, of which Rs. 12,758-0-3 represented the capital expenditure and proportion of establishment for the Sittong division, which has not yet come into bearing. The remaining sum of Rs. 51,892-5-7 was on account of the working and proportion of establishment of the older plantations (Rungbee, Rishap and Mungpoo), and therefore forms the working expenditure of the year.

6. The continuous increase in the amount of febrifuge manufactured by Dr. Wood is very marked. The outturn of the last five years has been—

	lbs.	oz.
1874-75	48	10
1875-76	1,940	6
1876-77	3,750	12
1877-78	5,162	0
1878-79	7,007	0
Total ...	17,908	12

but notwithstanding this rapid development of the manufacture the increasing confidence in the efficacy of the febrifuge has raised the demand for it so much, that the consumption of the past year greatly exceeded the quantity manufactured. To meet this growing demand the scale of manufacture at Mungpoo has been extended. The cost of the febrifuge manufactured, including the cost of the bark, was Rs. 76,459-12-11, or at Rs. 10-14-7 per lb, which is nearly one rupee per lb less than it was in the year 1877-78.

	lbs.	oz.
The quantity of febrifuge on stock on 1st April 1878 was ...	3,404	4
Manufactured during 1878-79	7,007	0
Total quantity for disposal ...	10,411	4

This quantity was thus distributed:—

To Medical depôt, Calcutta	4,000	0
Ditto, Bombay	1,200	0
Ditto, Madras	300	0
To Straits Settlements	30	0
Sold to the public	2,401	12
Samples, loss in packing, consumed in experiments, &c. ...	23	11
	7,955	7
In store on 31st March 1879	2,455	13
Total ...	10,411	4

7. The financial results of the year have been most satisfactory, the revenue from the sale of the drug to the Government depôts and to the public amounted to Rs. 1,32,519-1, as shown below:—

	Rs.	A.	P.	Rs.	A.	P.
Sold to the public	41,042	7	0			
Credit Medical depôt, Calcutta ...	66,200	0	0			
Ditto, Bombay ...	19,827	8	0			
Ditto, Madras ...	4,952	0	0			
Credit from Straits Settlements ...	497	2	0			
				1,32,519	1	0
The expenditure was as follows:—						
On plantation as stated in paragraph 5 above	51,892	5	7			
Quinologist's expenses including the proportion of his salary ...	27,091	2	7			
				78,983	8	2

The excess of income over expenditure therefore amounts to Rs. 53,535-8-10, but from this should be deducted Rs. 11,123-1-3, being the reduction in the value of stock in hand due to the excess of sales over manufacture. This leaves a nett profit of Rs. 42,412-7-7.

8. The total amount of capital with interest at 4 per cent., that has been sunk in the cinchona plantations and in the manufactory, is approximately 10 lakhs of rupees; the receipts for the year under review therefore, after paying all expenses, yielded interest of about 4¼ per cent. on the capital outlay, and even if subsequent years show no improvement, as it may be confidently

assumed they will do, a sufficient annual income, on the system of accounts followed above, would almost have been realized.

9. But this system of computing profits fall very far short of doing justice to the real benefit which the Government has derived from the cinchona plantations. The 5,500 lb. of alkaloid taken by the different medical departments replaced an equal amount of quinine that would otherwise have been purchased and supplied on indent to hospitals and dispensaries. At the very moderate rate of Rs. 80 per lb., the cost of this would have come to Rs. 4,40,000, and this amount, *plus* the actual sales to the public and Straits Settlements Rs. 41,540, in all Rs. 4,81,540, is the true measure of the gain to Government from the cinchona manufacture. Looking at the financial question in this way, as may most fairly be done, the plantations by the end of the current year will have cleared off the entire capital that has been invested in them.

10. The Lieutenant-Governor approves of the Superintendent's proposal to take 350,000 lb. of bark as the estimated crop of the year 1879-80.

11. With a view to facilitate the systematic working of the new or Sittong division, it is necessary that it should be surveyed and mapped as soon as possible. The Government of India will be moved to issue the necessary instructions on the subject to the Survey Department.

12. The Committee, which was appointed in 1877 to ascertain whether the febrifuge could be improved by eliminating any of its constituents, has not yet submitted its final report. But it is satisfactory to note that the further experience in the use of the drug during the past year has increased the confidence of the public and of the medical profession in its virtues, as is evidenced by the increasing demand for it.

13. The question of manufacturing a superior drug which would not be exposed to the prejudices which have so long delayed the free distribution of the present febrifuge is still under consideration, and awaits the report of the Special Committee appointed to consider the subject. It will probably be found advisable to manufacture at a slightly increased cost a preparation composed of the three sulphates, Cinchonidine, Cinchonine and Quinine in conjunction.

14. The Lieutenant-Governor thanks Dr. King and Mr. Wood for their valuable services during the year; his acknowledgments are also due to Mr. Gammie, resident manager of the cinchona plantation, who continues to supervise the plantation and manufacture with singular efficiency and intelligence and has well earned the approbation of the Superintendent.

ORDER.—Ordered that a copy of the Resolution, and of the reports referred to, be submitted to the Government of India, in the Department of Revenue, Agriculture and Commerce for information; also that copy be forwarded to the Superintendent, Botanical Garden, in charge of the Cinchona Plantation, and to the Government Quinologist for information.

Ordered, further, that copies be forwarded to the Government of Madras, and to the Surgeon-General, Bengal, and the Medical Department of this office for information.

By order of the Lieutenant-Governor of Bengal,

H. L. HARRISON,

Offg. Secretary to the Govt. of Bengal.

No. 164

COPY forwarded to the Secy. to the Government of Madras for information

By order of the Lieutenant-Governor of Bengal,

Rajendra Nath Mukerjea

Assistant Secretary to the Govt. of Bengal.

CALCUTTA,
The 19th June 1879.

T. Y.—Reg. No. 3210—21-6-79.

Copy of Petition
Enclosed
Dated 8 July 1879
Rec'd 8 July 1879
No 1441 8 July 1879

Copy of Petition of Inhabitants of Greenville, Queens County, New Brunswick, to the Lieut. Governor of the said Province, praying that the Legislature may be convened for the purpose of passing an Act to authorize the Corporation of the County of Queens to borrow money for the purpose of building a Court House and Gaol in Gagetown in the said County

Gaol No 1441

Commd. by the Rt. Bd. the Surveyor Genl. of the Customs, with Copy of Petition

8 July 1879

14 Lieut. Governor Rec'd 19 July
b. the Surveyor Genl. of Customs
21 the Commissioners of Customs
7 the Commissioners of Inland Revenue
2 " Sheriff of Queens County