M.R.O.—1—77,006—8-6-37.

(1) Number of pages _____

(2) Date of repair _____

(3) Initials of the Referencer _____

MADRAS RECORD OFFICE.

Government of Madras.

Revenue DEPARTMENT.

G.O. No. 975 5 A B C Press Mis.

Dated 22 9 18 92.

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GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

READ—the following letter from M. A. LAWSON, Esq., Government Botanist and Director of Government Cinchona Plantations, &c., Nílgiris, to the Secretary to Government, Revenue Department, dated Ootacamund, 9th July 1892, No. 38 :—

I have the honour to submit the Annual Report on the Government Cinchona Plantations, Nílgiris, for the year ending 31st March 1892.

ADMINISTRATION REPORT OF THE GOVERNMENT CINCHONA DEPARTMENT, NILGIRIS, FOR THE YEAR 1891-92.

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I. SEASON AND RAINFALL.—The rainfall on all the estates was below the average for the last ten years, but, with the exception of Dodabetta, was much greater than that which fell during the previous year. The rainfall in October was unusually heavy all over the plateau, the amount registered being—

	INCHES.
Dodabetta	15·94
Wood	10·66
Hooker	10·95
Naduvatam	10·64

There was no unusual drought on any of the estates during the year. On all the western estates heavy rain fell on the last day of February; good rains also occurred in March. Frost did little damage. The weather was again remarkable for its comparative stillness, there being no excessively high winds, or violent storms. The season, taken as a whole, was a good one.

(*a*) *Dodabetta.*—On this estate the quantity of rain registered during the year was 46·33 inches, or 7·76 inches less than the average for the past ten years.

(*b*) *Naduvatam.*—The amount of rain registered here was 100·84 inches. July and August were the wettest months, but not abnormally so. The amount of rain which fell was nearly up to the average of the last ten years.

(*c*) *Pykara*—(1) *Hooker.*—The rain registered on this plantation was 75·56 inches, or 21·02 inches less than the average for the past ten years.

(2) *Wood.*—62·75 inches of rain were gauged here, and this was 17·35 inches below the average.

II. FINANCIAL—(*a*) *Receipts.*—In October 1890, when framing the budget estimate of receipts for 1891–92, it was calculated that Rs. 40,000 would probably be realized during the year; but this, at the time, was more or less a guess. In G.O., No. 886 of 7th November 1890, Revenue, Government raised this sum to Rs. 60,000. The revised estimate for the year was fixed at Rs. 60,600, this amount having been actually paid into the treasury, but in consequence of subsequent indents for quinine and febrifuge having been received, this was raised to Rs. 71,000; but in G.O., No. 1116 of 23rd November 1891, when passing the revised estimates for the year, Government raised the estimate again to Rs. 75,000. Against this anticipated income the actual receipts aggregated Rs. 77,066–10–2, detailed thus:—

	RS.	A.	P.
Value of quinine supplied to the Medical Stores Departments of Madras, Bombay and Ceylon, &c.	49,016	10	5
Febrifuge supplied to the Medical Stores of Madras, Bombay and Cochin, &c.	26,246	0	0
Bark sold to Medical Stores, Madras and Bombay	576	0	0
Bark sold to Mysore Durbar, &c.	462	13	6
Miscellaneous sale of seed and plants, percentage of fees of Government Quinologist, &c.	765	2	3
Total ...	77,066	10	2

The actual receipts were thus Rs. 2,066–10–2 above the revised estimate.

(*b*) *Expenditure.*—In G.O., No. 886 of 7th November 1890, Revenue, Government sanctioned Rs. 76,000 as the budget estimate for the year; and in G.O., No. 1116 of 23rd November 1891, Revenue, Government accepted the same figure as the revised estimate. The actual expenditure was Rs. 75,805–1–7, which was Rs. 194–14–5 less than the budget and revised estimates. This was mainly due to savings resulting from the clerk at Naduvatam being on deputation at the Census office, Madras. Out of the expenditure for the year of Rs. 75,805–1–7, the Quinologist's Department cost Rs. 23,906–7–0, and the maintenance of the general establishment and the upkeep of the estates Rs. 51,898–10–7.

The financial result of the working of the department for the year may be shown as follows:—

	RS.	A.	P.
Receipts	77,066	10	2
Expenditure	75,805	1	7
Balance ...	1,261	8	7

III. GENERAL CONDITION (*a*) *Dodabetta.*—Nearly the whole of this estate has been either trenched or pitted, and manured; and may be said to be in very good condition. Considerable damage was, however, done to some of the plants put out last season by grub; and in one plot no less than two out of every three were destroyed.

During the present season the pits in which the plants are to be put out will be freely manured with quick-lime, in the hope that this may kill the grubs.

(*b*) *Naduvatam.*—The trees on that part of the estate, which was trenched and manured two years ago, are doing well, and the amount of quinine in them has been increased. The trees about the Chinamen's lines have been thinned out, and the ground on which they stand has been trenched, and it is expected they will be fit for barking next year. Taken altogether, the estate has much improved during the past twelve months. Ten acres of old succirubras were uprooted in January and February last. These trees were very old and bad, and only yielded 40,150 lb. of dry bark, and this too of a very inferior quality, from a manufacturing point of view. The ground uprooted was replanted in March and April. This is much earlier than customary; but it is in accordance with horticultural principles, and the result so far has proved satisfactory.

(*c*) *Pykara* (1) *Hooker.*—Trenching and manuring have been the chief operations carried out on this plantation during the year. The trees on Hooker are like young children, whose sole duty for the next few years will be to grow.

(2) *Wood.*—Nothing particular has to be noticed about this plantation. The trees planted out some years ago are coming on well.

IV. UPKEEP.—The usual work connected with upkeep has been properly attended to during the year, and all the buildings, roads, bridges, drains, &c., have been well maintained, and are in good order.

V. MANURE.—At Dodabetta 400 cart-loads of cattle manure were made in the estate, and 1,394 cart-loads were obtained from outside. At Naduvatam 200 cart-loads were used during the year, and at Hooker 650 were put into the trenches and pits.

VI. NURSERIES.—Particular attention has been paid during the last few years to the harvesting of cinchona seed, and to the raising of the young plants in the nurseries. It has been often stated that the seed of cinchona is deteriorating, and this may be true in certain cases; but experience would tend to show that when the seed is collected from healthy trees, and taken only when quite ripe, it is perfectly sound; that it germinates freely, and produces vigorous plants. The cause of the great mortality which used to take place in the Government nurseries in former years was due to the seed being grown in too damp a soil, and to the plants being over-shaded and over-watered. Also the plants were put out in the beds far too close to each other; formerly the seedlings were pricked out at distances of two inches by one and-a-half; they are now pricked out at distances of 4 inches by 4. This allows all the plants to become well developed before they are transplanted into the field.

During the last and present seasons the plants have been put out on the estate very much earlier than has been customary heretofore. Last year the greater part of the planting was completed by the end of May. During the present season twenty plants were put out into the field on the last day of February as an experiment: 1·30 inches of rain had fallen the night before; the plants were lifted by means of a transplanter and wrapped in paper before being removed from the nurseries; and after it had been planted each received a little water to settle the earth about the roots, and they were then shaded by ferns in the usual way. Out of these 20 plants 13 survived, and these at the time of writing are healthy and growing plants. The next heavy rain that fell was on the last day of March; and on the following day, the 1st April, 200 were transplanted from the nursery into the field; by the end of May all these, with the exception of seven, were not only alive, but were well established, and had made a fresh pair of leaves. More rain fell about the middle of April, and the planting of the whole of the 14-acre plot, which had been uprooted, was begun on the 19th; the planting was carried on daily without any intermission and regardless of the weather, which indeed as a rule was bright and dry, and the whole of the plot was finished before the end of the first week in May. Those plants put out during bright sunshine have thriven quite as well as those put out when the weather was cloudy or wet. It is as yet too soon to say how these plants will withstand the wild weather of the monsoon, but up to the present time the mortality in the field has been very low, and the plants look hard and healthy, though the growth which they have made has been small.

The advantage of planting as early as possible in the season is obvious, as was pointed out in the last year's report:—

"By planting at this early date, owing to the warmth of the soil, the plants become well rooted before the monsoon bursts upon them, and so they get the advantage of having two growing seasons before the commencement of the dry months of winter and spring."

The pits in the field are manured with a mixture of old cattle manure, lime, and wood ashes in the proportion—

1. Cattle manure	20 parts.
2. Lime „	1 part.
3. Wood ashes	½ „

and of this mixture, a quarter of a bushel is well mixed with the earth in each pit.

19 lb. 2 oz. of cinchona seed were sold to the public during the past year, and this consisted chiefly of Cinchona officinalis and Dodabetta hybrids; the same as has been planted out so largely at Naduvatam. Eight thousand plants of Cinchona officinalis and 24,000 Dodabetta hybrids were also sold.

VII. CROP.—The crop taken during the year amounted to 53,833 lb. of bark, apportioned thus—

	LB.	LB.
Dodabetta.		
Crown bark	747	747
Naduvatam.		
Crown bark	2,140	
Red bark	37,868	
Magnifolia	142	
		40,150
Pykara.		
Crown bark	10,317	
Red bark	2,619	
		12,936
		53,833

At the close of last year there remained in stock 510,695 lb., making a total of 564,528 lb. Of this, 147,670 lb. of bark were disposed of during the year thus—

	LB.
Used in the factory for the manufacture of quinine and febrifuge...	144,500
Issued to the Madras Medical Stores Department	1,000
Do. to the Bombay Medical Stores Department	800
Sold to Messrs. Kemp and Co., Bombay	1,120
Do. to the Mysore Durbar	250
Total ...	147,670

There remained, therefore, at the close of the year 416,858 lb. in stock. The estimated output of bark for the year was 70,000 lb.—*vide* G.O., No. 1116 of 23rd November 1891, Revenue, but as there was no need to take this amount, nor indeed any, the quantity taken was governed by the needs of the plantations only, that is, bark was only taken from such trees as had passed their prime, and which it was desirable should be uprooted, and ground on which they stood replanted.

VIII. BUILDINGS.—The repairs and additions to the several buildings on the various estates were carried out at a cost of Rs. 1,835–12–8, detailed thus—

	RS.	A.	P.
Dodabetta	187	12	6
Naduvatam	1,089	13	6
Pykara	558	2	8
Total ...	1,835	12	8

IX. FACTORY.—Continuous work in the factory commenced at the end of August last and went on without any interruption till the end of March, when all the buildings were closed for a fortnight for repairs and cleaning.

During the year 4,425 lb. 14 oz. of sulphate of quinine were manufactured. At the close of the last year there were 1,572 lb. in stock, making in all 5,997 lb. 14 oz. Of this quantity 3,345 lb. 4 oz. were issued as follows:—

	LB.	OZ.
Supplied to the Madras Medical Stores	1,500	0
Do. Bombay do.	800	0
Do. Ceylon do.	1,000	0
Miscellaneous sale of quinine, &c.	18	12½
Issue of 370 paper packets of quinine	26	7½
Total ...	3,345	4

and there were thus 2,652 lb. 10 oz. left in stock at the close of the year.

Of febrifuge there was manufactured during the year 3,174 lb., and at the beginning of the year there were 1,200 lb. in stock, making in all 4,374 lb., of this quantity 3,019 lb. were issued thus:—

	LB.
Madras Medical Stores Department	1,500
Bombay do. do.	1,500
Cochin Government	16
Residency Surgeon, Bangalore, &c.	3
Total ...	3,019

and there remained, therefore, in stock at the end of the year 1,355 lb.

Taking the price of the quinine at Rs. 13–6–0 per lb. and that of the febrifuge at Rs. 10, the present value of these drugs will be Rs. 49,658–13–9 shown thus:—

	RS.	A.	P.
Value of 2,652 lb. 10 oz. quinine at Rs. 13-6-0 per lb. ...	35,478	13	9
Do. of 1,355 lb. of febrifuge at Rs. 10 per lb.	13,550	0	0
Do. of 630 packets at Re. 1 each	630	0	0
Total ...	49,658	13	9

X. MR. HOOPER'S REPORT.—It will be seen from this report that the quinine and febrifuge turned out from the factory are good; and there is no doubt that the quality and appearance of both have been considerably improved during the past year.

XI. MISCELLANEOUS—(*a*) *Supply of Sulphate of Quinine to Ceylon.*—The Government of Ceylon was supplied with quinine for the last two years by this department. Recently, however, they have discontinued getting it, finding it more convenient to procure it direct from England.

(*b*) *Issue of Quinine in paper packets.*—The sale of quinine in paper packets has increased during the year in most of the districts, but to no considerable extent. From one district the whole of the packets were returned with the remark that "next to no use is made of this medicine in this district;" also in another report it is gravely stated that the quinine causes itch.

The following extract from the *Rangoon Times* is copied from the *Chemist and Druggist* of the 28th May 1892, page 779:—

Government versus *private quinine in India.*—The *Rangoon Times* adversely criticises the refusal of the Indian Government to sell the quinine made in its factory to any persons but Government officials, and says in Burma, pre-eminently a feverish province, it would be a boon to many engaged in the country to be able to purchase quinine from Government. Many Europeans and thousands of Burmans work in the forests for private individuals and firms, large numbers are also employed in exploiting minerals and oil, and many others are engaged on railway construction and road-making for the Government. The majority of these undertakings are in the most sickly parts of the province, and much inconvenience is experienced from those engaged in them falling ill. If those engaged in private enterprise were allowed to purchase the Government quinine at the rates at which it is sold to Government officers, a great deal of sickness in Burma would be avoided and the province itself greatly benefited. It is possible that private individuals can obtain Government quinine by getting it through Government officers if they are able

to show just and sufficient cause why they should be supplied, but such a course is undesirable for many reasons. In Madras we believe planters and private individuals are at liberty to purchase quinine in certain quantities from the Naduvatam factory. The English quinine makers, however, are about, it is rumoured, to protest against a continuance of this practice."

Up to the present time the Government quinine has been sold only to planters and other persons where it has been ascertained that it was the intention of the purchaser to administer the whole of it to the coolies on his estates, and none has been sold to the public direct; but whether or not it would not be right to sell the quinine at the same rates at which it is sold to Government officials to such persons as are indicated in the above paragraph is a matter for Government alone to decide. That a sale of cheap quinine or febrifuge in Burma would tend to increase the consumption of these drugs there can be little doubt; and the officials superintending the different works now being carried on in Burma are the very persons to whom the introduction of quinine into the country could be best entrusted. In order to prevent any abuse being made of the privilege to buy the Government quinine cheap and to ensure its being all consumed by the people for whom it is intended, the quinine might be issued colored with some distinctive tint.

(*c*) *Reduction in the price of quinine in paper packets.*—In their letter, dated 3rd December 1891, No. 2486-128, the Government of India stated that they thought the price of 3 pies per powder of five grains was too much and that this price ought to be reduced. In consequence of this, Government consented to reduce the price to 2 pies and to throw in gratis one jalap powder to every ten of quinine, the packets themselves being reduced to one rupee. It is to be hoped that this reduction may have some effect; but as has been pointed out by the Surgeon-General, the sale of the powders depends quite as much, or perhaps even more, upon the interest which officials of the lower grades take in distributing the medicine than in the reduction of the price at which it is to be sold. The cost of the powders, as at present sold, is a trifle under the cost of production.

(*d*) *Removal of the Quinologist's Laboratory.*—The Quinologist's laboratory has been removed from "Oakend" to Mr. Hooper's own house "Kelso Villa."

(*e*) *Fodders.*—The question of providing good fodder for horses and cattle in large quantities on these hills has been touched upon so often in these reports that it is feared a return to the subject may be considerd tedious; nevertheless, where so many horses are kept for military purposes, for racing, for hunting and for purposes of draught, it is a subject which ought not to be lost sight of. Hitherto grass and hay have been sold by this department at cost price simply with the view of making people acquainted with the fact that grass of good quality and in great abundance may be obtained at a reasonable price if they only choose to insist upon having it; no advance, however, during the last eight years has been made in this direction; and the sale, even at cost price, has, therefore, been discontinued. In riding from Musnagudi to Sigur in the early part of January last, the horses were up to their girths for several miles in yellow waving straw. If this had been cut a month earlier it would have produced several hundreds of tons of very respectable hay; but the negligence or apathy of everybody around allowed it to be wasted. Small sympathy can be felt for people whose cattle die of starvation, when a little trouble and forethought would keep them in plenty during the dry months of the year.

(*f*) *Investigations into the nauseating properties of cinchona febrifuge.*—Investigations with the assistance of Surgeon-Major J. Maitland, M.D., are being made into the cause of the nauseating properties of cinchona febrifuge, but some months will yet be required before a conclusion can be arrived at. All that can be said at present is that certain kinds of febrifuge seem to be as non-nauseating as the sulphate of quinine itself.

(*g*) *Service books.*—All the service books of the establishment have been kept duly written up.

OOTACAMUND,
9th July 1892.

(Signed) M. A. LAWSON,
Govt. Botanist and Director.

ENCLOSURES.

No. 1.

STATEMENT showing the rainfall at the several Government Cinchona Plantations, Nilgiris, during the official year 1891-92.

Months.	Dodabetta.				Naduvatam.			
	1890-91.		1891-92.		1890-91.		1891-92.	
	Rainfall.	Number of wet days.	Rainfall.	Number of wet days.	Rainfall.	Number of wet days.	Rainfall.	Number of wet days.
1	2	3	4	5	6	7	8	9
April	6·00	13	2·47	7	8·26	12	3·92	7
May	4·77	13	4·38	13	5·34	14	5·98	16
June	4·66	24	3·77	16	14·45	23	9·26	22
July	4·35	17	6·57	24	17·06	25	46·82	30
August	8·22	24	2·98	13	9·82	23	16·93	25
September	2·67	11	1·45	9	5·84	21	3·13	14
October	9·89	16	15·94	27	5·52	16	10·64	19
November	3·57	9	5·88	7	1·49	8	2·41	3
December	1·50	3	2·73	15	0·51	3	0·55	2
January	0·25	2	0·00	..	0·10	2	0·00	..
February	1·62	4	0·12	3	1·19	4	0·00	..
March	0·63	3	0·04	1	0·00	..	1·20	1
Total	48 13	139	46·33	135	69·58	151	100·84	139

Months.	Hooker.				Wood.			
	1890-91.		1891-92.		1890-91.		1891-92.	
	Rainfall.	Number of wet days.	Rainfall.	Number of wet days.	Rainfall.	Number of wet days.	Rainfall.	Number of wet days.
	10	11	12	13	14	15	16	17
April	6·93	18	2·57	6	4·67	16	2·66	7
May	5·44	16	6·71	15	4·35	15	5·77	14
June	11·23	22	7·79	20	7·66	23	6·50	19
July	12·29	22	33·76	29	9·32	22	25·68	28
August	9·15	22	8·70	23	7·18	21	6·62	23
September	6·01	17	1·41	13	4·31	16	1·07	14
October	5·88	13	10·95	23	5·95	13	10·66	22
November	1·54	7	1·52	6	2·03	9	1·51	5
December	0·74	3	1·60	5	0·66	2	1·84	5
January	0·16	2	0·00	..	0·17	1	0·00	..
February	1·40	5	0·13	1	0·59	6	0·19	2
March	0·02	1	0·42	1	0·03	1	0·25	1
Total	60·79	148	75·56	142	46·92	145	62·75	140

No. 2.

STATEMENT showing the receipts on account of the Government Cinchona Plantations, Nilgiris, for the official year 1891-92.

Particulars.	Sanctioned budget estimate for 1891-92.	Revised budget estimate for 1891-92.	Actuals for 1891-92.
	RS.	RS.	RS. A. P.
Bark supplied to the Madras Medical Department	500	255	255 0 0
Do. to the Bombay do.	500	400	321 0 0
Do. private parties and Mysore Durbar	..	500	462 13 6
Sale of seeds and plants	200	100	258 2 0
Percentage of the fees of the Government Quinologist	100	45	17 12 9
Miscellaneous	300	500	489 3 6
Febrifuge	5,000	26,000	26,246 0 0
Quinine	53,400	47,200	49,016 10 5
Total	60,000	75,000	77,066 10 2

No. 3.

STATEMENT showing the expenditure in detail on account of the Government Cinchona Plantations, Nilgiris, for the official year 1891-92.

Name of Plantations.	SALARIES.			NURSERIES.			WORKING CHARGES.			MANURE.		
	Budget estimate.	Revised estimate.	Actuals.	Budget estimate.	Revised estimate.	Actuals.	Budget estimate.	Revised estimate.	Actuals.	Budget estimate.	Revised estimate.	Actuals.
1	2	3	4	5	6	7	8	9	10	11	12	13
	RS.	RS.	RS. A. P.	RS.	RS.	RS. A. P.	RS.	RS.	RS. A. P.	RS.	RS.	RS. A. P.
Head office and general	12,316	12,316	12,136 0 0	..	..	..	..	..	..	..	..	..
Dodabetta	3,150	3,654	3,615 10 6	400	325	263 1 0	5,900	6,485	6,423 7 11	2,220	1,986	1,985 2 1
Naduvatam	3,600	4,090	4,127 15 11	420	380	402 1 0	8,390	5,654	4,876 14 5	2,872	2,719	2,686 1 3
Pykara	3,215	3,875	3,861 0 0	500	400	400 12 6	6,394	3,859	3,486 13 0	870	675	587 1 0
Quinologist's department	6,151	7,051	7,051 8 0	..	..	..	..	..	..	..	..	..
Total ..	28,432	30,986	30,792 2 5	1,320	1,105	1,065 14 6	20,684	15,998	14,787 3 4	5,962	5,380	5,258 4 4

Name of Plantations.	CROP.			REPAIRS.			CONTINGENCIES.		
	Budget estimate.	Revised estimate.	Actuals.	Budget estimate.	Revised estimate.	Actuals.	Budget estimate.	Revised estimate.	Actuals.
	14	15	16	17	18	19	20	21	22
	RS.	RS.	RS. A. P.	RS.	RS.	RS. A. P.	RS.	RS.	RS. A. P.
Head office and general	..	..	..	300	..	..	700	700	699 14 11
Dodabetta	3,000	200	193 0 0	200	188	187 12 6	..	..	..
Naduvatam	1,450	690	751 8 8	1,100	1,100	1,089 13 6	..	..	..
Pykara	250	250	220 1 9	450	576	558 2 8	..	..	..
Quinologist's department	..	..	..	..	..	..	9,000	15,000	16,254 15 0
Total ..	4,700	1,140	1,164 10 5	2,050	1,864	1,835 12 8	9,700	15,700	16,954 13 11

No. 3.

Statement showing the expenditure in detail on account of the Government Cinchona Plantations, Nilgiris, for the official year 1891-92—*cont.*

Name of Plantation.	PRINTING CHARGES.			PEONS' CLOTHING.			TRAVELLING ALLOWANCE.		
	Budget estimate.	Revised estimate.	Actuals.	Budget estimate.	Revised estimate.	Actuals.	Budget estimate.	Revised estimate.	Actuals.
	22	23	24	25	26	27	28	29	30
	RS.	RS.	RS. A. P.	RS.	RS.	RS. A. P.	RS.	RS.	RS. A. P.
Head office and general	40	40	37 11 0	12	12	12 0 0	1,500	1,500	1,490 8 6
Dodabetta	..	..	..	..	..	..	..	..	..
Naduvatam	..	..	..	..	..	..	..	..	..
Pykara	..	..	..	..	..	..	..	..	..
Quinologist's Department	..	..	..	..	..	..	..	..	..
Total ..	40	40	37 11 0	12	12	12 0 0	1,500	1,500	1,490 8 6

Name of Plantation.	HOUSE-RENT.			FACTORY.			TOTAL.		
	Budget estimate.	Revised estimate.	Actuals.	Budget estimate.	Revised estimate.	Actuals.	Budget estimate.	Revised estimate.	Actuals.
	31	32	33	34	35	36	37	38	39
	RS.	RS.	RS. A. P.	RS.	RS.	RS. A. P.	RS.	RS.	RS. A. P.
Head office and general	..	..	..	..	..	..	14,868	14,568	14,376 2 5
Dodabetta	..	..	..	..	..	..	14,870	12,838	12,668 2 0
Naduvatam	..	..	..	1,000	1,675	1,806 0 6	18,832	16,308	15,740 7 3
Pykara	..	..	..	..	..	..	11,679	9,635	9,113 14 11
Quinologist's Department	600	600	600 0 0	..	..	..	15,751	22,651	23,906 7 0
Total ..	600	600	600 0 0	1,000	1,675	1,806 0 6	76,000	76,000	75,805 1 7

No. 4.

STATEMENT showing the Receipts and Expenditure of the Government Cinchona Plantations, Nilgiris, for the official year 1891-92.

RECEIPTS.

Classification.	Revised estimates.	Up to the end of the year.
	RS.	RS. A. P.
Sulphate of quinine	47,200	49,016 10 5
Febrifuge	26,000	26,246 0 0
Bark supplied to Madras Medical Department	255	255 0 0
Do. Bombay Medical Department	400	321 0 0
Do. Private parties and Mysore Durbar	500	462 13 6
Sale of seed and plants	100	258 2 0
Percentage of the fees of Government Quinologist	45	17 12 9
Miscellaneous	500	489 3 6
Total ..	75,000	77,066 10 2

EXPENDITURE.

Classification.	A. Conservancy.		B. Establishment.		Total.	
	Revised estimate.	Up to the end of the year.	Revised estimate.	Up to the end of the year.	Revised estimate.	Up to the end of the year.
	RS.	RS. A. P.	RS.	RS. A. P.	RS.	RS. A. P.
Head office and general ..	2,252	2,240 2 5	12,316	12,136 0 0	14,568	14,376 2 5
Quinologist's Department.	15,600	16,854 15 0	7,051	7,051 8 0	22,651	23,906 7 0
Dodabetta	9,184	9,052 7 6	3,654	3,615 10 6	12,838	12,668 2 0
Naduvatam	12,218	11,612 7 4	4,090	4,127 15 11	.. 16,308	15,740 7 3
Pykara	5,760	5,252 14 11	3,875	3,361 0 0	9,635	9,113 14 11
Total ..	45,014	45,012 15 2	30,986	30,792 2 5	76,000	75,805 1 7

No. 5.

STATEMENT showing the quantity of Cinchona seeds and the number of Cinchona plants sold to the public during the official year 1891-92.

Particulars.	Seed.	Plants.
	LB. OZ.	RS.
Cinchona Candaminea	15 12	8,000
Do. Magnifolia	.. ..	24,000
Do. Succirubra	3 6	..
Total ..	19 2	32,000

No. 6.

A.—Statement showing the total yield of the Government Cinchona Plantations, Nilgiris, for the official year 1891-92.

Name of Plantation.	Species of produce.	Bark. Stripping and mossing system. Number of plots.	Stripping and mossing system. Number of trees decorticated.	Stripping and mossing system. Outturn of green bark.	Coppicing. Number of plots.	Coppicing. Number of trees decorticated.	Coppicing. Outturn of green bark.	Scraping. Number of plots.	Scraping. Number of trees decorticated.	Scraping. Outturn of green bark.	Uprooting. Number of plots.	Uprooting. Number of trees decorticated.	Uprooting. Outturn of green bark.	Total number of trees decorticated.	Total quantity of green bark collected.	Quantity when dry.	Propagation. Seed.	Propagation. Plants.	Propagation. Seedlings.	Propagation. Rooted cuttings.
																	LB. OZ.			
Dodabetta ..	Crown bark	.. 2	1,586	2,908	.. 1	340	3,513	..	..	..	..	..	..	202	2,244	747	23 6	..	..	..
	Do.	.. 1	1,419	6,986	.. 9	12,347	105,596	..	..	2,055	..	..	..	1,926	6,421	2,140	..	..	..	..
Naduvatam ..	Red bark	.. 2	136	425	..	..	..	..	..	..	..	..	..	136	425	142	..	..	..	..
	Magnifolia	.. ..	..	..	.. 1	421	3,019	..	..	..	..	..	..	2,923	30,952	10,317	..	..	..	..
Pykara ..	Crown bark	.. ..	..	..	.. ..	..	..	..	..	..	..	..	..	175	7,358	2,619	..	..	..	..
	Red bark	.. ..	..	..	.. ..	..	..	..	..	..	..	..	..	..	..	53,833	..	..	..	..
	Add the balance on 31st March 1891.	.. ..	..	..	.. ..	..	..	..	..	..	..	..	..	..	..	510,695	..	..	..	..
	Total ..	.. ..	..	..	.. ..	..	..	..	..	..	..	..	..	..	..	564,523	..	..	..	..

B.—Statement showing the disposal of bark and other produce collected in the Government Cinchona Plantations, Nilgiris, for the official year 1891-92.

Name of Plantation.	Species of produce.	Bark. Used for febrifuge and quinine. Bales.	Used for febrifuge and quinine. Quantity.	Sold in the country. Bales.	Sold in the country. Quantity.	Supplied to Medical Departments. Bales.	Supplied to Medical Departments. Quantity.	Total. Bales.	Total. Quantity.	Seed. Sold to the public.	Seed. Used for nurseries.	Seed. Total.	Propagated plants and seedlings. Plants. Sold to the public.	Propagated plants and seedlings. Plants. Permanently put up in the plantation.	Propagated plants and seedlings. Seedling. Sold to the public.	Propagated plants and seedlings. Rooted cuttings. Transplanted.	Remarks.
		NO.	LB.	NO.	LB.	NO.	LB.	NO.	LB.	LB.	LB.	LB.					
Dodabetta ..	Crown bark	1,119	111,900	..	..	8	800	1,127	112,700	15¼	..	15¼	5,000	9,000	..	..	
	Magnifolia	4¾	476	..	..	..	..	4¾	476	..	1	1	..	..	..	..	
Naduvatam ..	Crown bark	..	..	..	..	..	..	..	..	..	..	..	3,000	..	..	..	
	Red bark	220	22,000	133¼	1,370	10	1,000	243¾	24,370	3¾	..	3¾	..	13,925	..	..	
	Magnifolia	101¼	10,124	..	..	..	..	101¼	10,124	..	..	..	..	11,275	..	..	
Pykara ..	Crown bark	..	..	..	..	..	..	..	..	..	..	..	24,000	..	..	..	
	Magnifolia	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
	Add the balance on 31st March 1892.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
	Total ..	..	..	..	..	..	..	..	147,670	15¾	1	16¾	5,000	9,000	..	..	
									416,853	3¾	..	3¾	3,000	13,925	..	..	
														11,275			
													24,000				
									564,523	19¾	1	20¾	32,000	34,200	..	..	

No. 7.

STATEMENT showing the approximate number of plants in permanent plantations, Nilgiris, on 31st March 1892.

Species.	DODABETTA.				NADUVATAM.				WOOD.				HOOKER.				Grand Total.
	Plants last year.	Coppiced or up-rooted.	Planted in this year.	Total.	Plants last year.	Coppiced or up-rooted.	Planted in this year.	Total.	Plants last year.	Coppiced or up-rooted.	Planted in this year.	Total.	Plants last year.	Coppiced or up-rooted.	Planted in this year.	Total.	
C. Succiruhra	..	202	9,000	693,989	48,602	12,347	..	36,255	..	..	..	..	3,063	175	..	2,888	39,143
C. Officinalis	585,191	..	..	130	97,159	340	..	96,819	..	..	..	..	371,449	2,928	13,925	382,446	1,073,254
C. Calisaya var. Ledger	130	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	130
Do. other varieties.	..	..	..	26	143	..	..	143	..	..	..	..	..	..	..	..	143
C. Micrantha	26	..	..	43	..	..	..	..	..	..	..	..	..	..	..	..	26
C. Pitayensis	43	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	43
C. Lancolata	..	..	..	18	5	..	..	5	..	..	..	..	50	..	..	50	5
C. Carthagena	18	..	..	9	716	..	..	716	..	..	..	..	..	..	..	..	829
C. Santa Fé	9	..	..	61,806	3	..	..	3	45	..	..	45	..	..	..	..	12
C. Hybrid and others ..	61,806	..	..	..	269,925	..	..	269,925	..	..	..	..	281,720	..	11,275	292,995	666,309
Total ..	647,223	202	9,000	656,021	416,553	12,687	..	403,866	45	..	..	41,583	656,282	3,103	25,200	678,379	1,779,894

No. 8.

COMPARATIVE statement showing the quantity of bark of all sorts in store at the commencement of the year 1891-92, collected and disposed of during the year and remaining in store at its close.

Description of bark.	1890-91.										
	Quantity in store at the commencement of the year.							Collected during the year.	Total.	Disposed of during the year.	
	Crop of 1883–84.	Crop of 1885–86.	Crop of 1886–87.	Crop of 1887–88.	Crop of 1888–89.	Crop of 1889–90.	Total.			Crop of 1885–86.	Crop of 1886–87.
1	2	3	4	5	6	7	8	9	10	11	12
Crown bark ..	..	..	43,676	53,813	82,233	74,058	253,780	76,038	329,818	..	43,676
Red do. ..	..	40,713	28,981	35,056	26,009	68,568	199,327	57,313	256,640	3,400	..
Magnifolia ..	900	340	..	3,877	1,920	17,600	24,637	..	24,637	..	..
Total ..	900	41,053	72,657	92,746	110,162	160,226	477,744	133,351	611,095	3,400	43,676

Description of bark.	1890-91—*cont.*									
	Disposed of during the year—*cont.*		Balance at the close of the year.							
	Crop of 1887–88.	Total.	Crop of 1883–84.	Crop of 1885–86.	Crop of 1886–87.	Crop of 1887–88.	Crop of 1888–89.	Crop of 1889–90.	Crop of 1890–91.	Total.
	13	14	15	16	17	18	19	20	21	22
Crown bark	53,324	97,000	..	..	..	489	82,233	74,058	76,038	232,818
Red do.	..	3,400	..	37,313	28,981	35,056	26,009	68,568	57,313	253,240
Magnifolia	..	..	900	340	..	3,877	1,920	17,600	..	24,637
Total ..	53,324	100,400	900	37,653	28,981	39,422	110,162	160,226	133,351	510,695

Description of bark.	1891-92.											
	Quantity in store at the commencement of the year.								Collected during the year.	Total.	Disposed of during the year.	
	Crop of 1883–84.	Crop of 1885–86.	Crop of 1886–87.	Crop of 1887–88.	Crop of 1888–89.	Crop of 1889–90.	Crop of 1890–91.	Total.			Crop of 1883–84.	Crop of 1885–86.
	23	24	25	26	27	28	29	30	31	32	33	34
Crown bark.	..	..	..	489	82,233	74,058	76,038	232,818	13,204	246,022	..	..
Red bark	..	37,313	28,981	35,056	26,009	68,568	57,313	253,240	40,487	293,727	..	24,370
Magnifolia.	900	340	..	3,877	1,920	17,600	..	24,637	142	24,779	900	340
Total ..	900	37,653	28,981	39,422	110,162	160,226	133,351	510,695	53,833	564,528	900	24,710

Comparative statement showing the quantity of bark of all sorts in store, &c.—*cont.*

Description of bark.	1891-92—*cont.*											
	Disposed of during the year—*cont.*				Balance at the close of the year.							
	Crop of 1887-88.	Crop of 1888-89.	Crop of 1889-90.	Total.	Crop of 1885-86.	Crop of 1886-87.	Crop of 1887-88.	Crop of 1888-89.	Crop of 1889-90.	Crop of 1890-91.	Crop of 1891-92.	Total.
	35	36	37	38	39	40	41	42	43	44	45	46
Crown bark.	489	82,233	29,978	112,700	..	..	..	..	44,080	76,038	13,204	133,322
Red bark	..	..	..	24,370	12,943	28,981	35,056	26,009	68,568	57,313	40,487	269,357
Magnifolia.	3,877	1,920	3,563	10,600	..	..	..	..	14,037	..	142	14,179
Total ..	4,366	84,153	33,541	147,670	12,943	28,981	35,056	26,009	126,685	133,351	53,833	416,858

No. 9.

STATEMENT showing the particulars of Cinchona bark disposed of during the year 1891-92.

Particulars.	PRODUCT OF 1883-84.		PRODUCT OF 1885-86.		PRODUCT OF 1887-88.	
	Pounds.	Value realized.	Pounds.	Value realized.	Pounds.	Value realized.
1	2	3	4	5	6	7
		RS. A. P.		RS. A. P.		RS. A. P.
Cinchona bark used for the manufacture of quinine and solid febrifuge					3,366	..
Cinchona bark supplied to Madras Medical Department	900	..	24,710	..	1,000	255 0 0
Cinchona bark supplied to Bombay Medical Department	..	..	..	..	..	..
Cinchona bark supplied to Mysore durbar and private parties	..	..	..	..	..	..
Total ..	900	..	24,710	..	4,366	255 0 0

Particulars.	PRODUCT OF 1888-89.		PRODUCT OF 1889-90.		Total.	
	Pounds.	Value realized.	Pounds.	Value realized.	Pounds.	Value realized.
	8	9	10	11	12	13.
		RS. A. P.		RS. A. P.		RS. A. P.
Cinchona bark used for the manufacture of quinine and solid febrifuge	81,983	..	33,541	..	144,500	* ..
Cinchona bark supplied to Madras Medical Department	..	..	..	..	1,000	255 0 0
Cinchona bark supplied to Bombay Medical Department	800	321 0 0	..	..	800	321 0 0
Cinchona bark supplied to Mysore durbar and private parties	1,370	349 10 10	..	..	1,370	349 10 10
Total ..	84,153	670 10 10	33,541	..	147,670	925 10 10

	RS.	A.	P.
* Value of 4,425 lb. 14 oz. of sulphate of quinine at Rs. 14-11-3 per pound ..	65,074	3	1
Do. of 3,174 lb. of febrifuge at Rs. 10 per pound	31,740	0	0
Total ..	96,814	3	1

No. 10.

STATEMENT showing the particulars of Sulphate of Quinine and Cinchona Febrifuge manufactured and disposed of during the year 1891-92.

Particulars.	Quantity in store at the commencement of the year.	Manufactured during the year.	Total.	DISPOSED OF DURING THE YEAR					Dryage.	Balance at the close of the year including paper packets.
				To Madras Medical Department.	To Bombay Medical Department.	To Colombo.	To Mysore Durbar, private parties and paper packets to Collectors.	Total.		
	LB.	LB. OZ.	LB. OZ.	LB.	LB.	LB.	LB. OZ.	LB. OZ.	LB. OZ.	LB. OZ.
Sulphate of Quinine.	1,572	4,425 14	5,997 14	1,500	800	1,000	44 10	3,344 10	0 10	2,652 10
Solid Febrifuge ..	1,200	3,174 0	4,374 0	1,500	1,500	..	17 0	3,017 0	2 0	1,355 0

OOTACAMUND,
9th July 1892.

(Signed) M. A. LAWSON,
Govt. Botanist and Director.

From D. HOOPER, Esq., Government Quinologist, to the Government Botanist and Director of the Government Cinchona Plantations, Nilgiris, dated Ootacamund, 24th June 1892.

I have the honour to make the following report on the analytical work conducted in the laboratory during the year ending 31st March 1892.

My visits to the Quinine Factory have not been so frequent as in former years, but several samples of bark have been sent in for analysis from the Dodabetta and Naduvatam plantations, and the products of manufacture have been constantly tested as to their purity. The sulphate of quinine has responded favorably to the chemical tests; it contained only a trifling amount of sulphate of cinchonidine, and its appearance and solubility were all that could be desired. The febrifuge has been made by the oil process, and has been somewhat lighter in colour than when the factory was first started.

Some interesting barks have been analysed during the year, and the results are given in the following table. The majority of the barks are from hybrid trees, a number of which are grown at Naduvatam and are gradually replacing the poorer succirubras or red bark trees. It is difficult to tell the value of hybrid trees except by analysis, as the variable habit of these trees is accompanied by a variable alkaloidal composition, and some trees having the habit of a succirubra contain a good amount of quinine in their bark, while others with the appearance of an officinalis sometimes contain a preponderance of the inferior alkaloids characteristic of the succirubra. Some of the hybrids were very rich in quinine, exceeding the amount found in the best crown barks, and knowing that these trees are faster growers and have a thicker bark, their cultivation is more profitable. Some of the better kinds of hybrids are being propagated by cuttings from analysed trees, and it will be interesting to observe the success of these experiments when the young plants are sufficiently developed. Following is a description of the different barks analysed:—

1. Hybrid bark marked "Magnifolia" from Naduvatam.
2. Bark from smooth-leaved officinalis type of hybrid.
3. Magnifolia hybrid with pubescent leaves.
4. Officinalis type of hybrid, 10 years old.
5. Officinalis type of hybrid, 9 years old.
6. Magnifolia hybrid from Dodabetta, 4 years old.
7. Officinalis hybrid from Naduvatam.
8. Natural magnifolia bark, 20 years old.
9. Mixed hybrid thinnings from Chinamen's lines.
10. Hybrid, Naduvatam.
11. Succirubra hybrid.
12. Succirubra hybrid, 9 years old.
13. Crown bark from an old tree, Dodabetta.
14. Uritusinga, variety of *C. officinalis*.

—	Quinine.	Cinchonidine.	Quinidine.	Cinchonine.	Amorphous Alkaloids.	Total.	Sulphate of Quinine.
1	5·82	1·29	..	·55	·60	8·26	7·83
2	5·18	1·18	·23	·10	·45	7·14	6·97
3	4·85	4·20	..	·42	·71	10·18	6·52
4	3·18	2·08	..	·42	·48	6·16	4·28
5	2·67	2·04	..	·56	·47	5·74	3·59
6	2·45	1·19	..	·40	·32	4·36	3·30
7	2·40	·93	·14	·29	·34	4·10	3·23
8	2·28	1·91	·09	·34	·42	5·04	3·07
9	2·28	1·98	..	1·40	·42	6·08	3·07
10	2 26	·87	..	1 34	·52	4·99	3·04
11	1·95	1·75	·04	·91	·61	5·26	2·62
12	1·40	1·95	..	·88	·41	4·64	1·88
13	5·75	1·15	·16	·27	·30	7·60	7·73
14	4·21	1·66	..	·43	·51	6·81	5·66

These are only a selection of the barks analysed during the year. It will be seen that the sulphate of quinine ranges from 7·83 per cent. in No. 1, to 1·88 per cent. in No. 12, and the last named, with respect to its alkaloids, generally yields its maximum at this age. As an instance of the variation in the value of these trees No. 6 from a 4-year old tree contains more quinine than the sample No. 8 taken from a 20-year old tree, and this shows the importance of ascertaining the quality of a bark when it is young and preventing the mistake of cumbering the land with very poor trees. The average analysis of barks from some young plots has given quinine to be over 3 per cent., but as the harvesting was made from the poorer and smaller trees, the succeeding crops will be much richer. It is satisfactory to find such old trees, as represented by No. 13, yielding such rich bark, but it is only what should be expected if the trees are treated to manure. The estates are now being subjected to a course of systematic manuring and the effect is felt in the barks affording more alkaloids. If trees are allowed to grow for many years without their roots being artificially fertilized, the quinine in the bark is sure to deteriorate and the tree itself will show signs of decay. This rule does not only apply to the slow growing species of officinalis, but also, and more emphatically, to the fast growing hybrids which are more exhausting to the soil.

Astringent Barks.—Two years ago I reported on the analysis of a large number of astringent barks from Indian trees, some of them never before analysed. Since then further opportunities have been given of examining other barks to ascertain the amount in them of tannic acid or other principle having a similar action. The bark of *Anogeissus latifolia* has hitherto been supposed to be one of the most astringent drugs, but I have recently found that a bark, much richer in tannin, is derived from the *Bridelia montana*, a tree belonging to the natural order Euphorbiaceæ. This species of Bridelia is common on the ghâts of the Nilgiris and in other parts of India. It is well known as a valuable astringent in Western India, and is used by the Goanese in certain diseases. Some years ago in Orissa a case of poisoning was traced to the employment of this bark. The tanners of this country, however, do not seek after drugs very rich in tannin, as the quality of the tannin present appears to be the criterion of the value, and the bark of the Tangedu tree (*Cassia auriculata*), which contains only 11 per cent. of tannin, is used more than any other bark in South India. Of the other barks in this table, Casuarina bark is used in Madras as a dye and tan, and *Myrica Nagi* bark is largely used by Muhammadans and Hindus in the north in medicines where astringents are required. Some of the fig barks have been chemically investigated during the year, and as some of them contain tannin, they are included in the list :—

—	Tannin.	Water extract.	Ash.	Colour with iron salts.
Bridelia montana	39·9	41·7	7·3	Blue-black.
Acacia pycnantha	33·8	46·7	3·5	Do.
Do. decurrens	33·4	44·8	3·2	Do.
Kandelia Rheedii	27·4	45·5	9·1	Do.
Acacia melanoxylon	26·8	34·2	4·1	Do.
Macaranga tomentosa	18·4	22·2	11·0	Do.
Casuarina equisetifolia	18·3	22·1	9·5	Do.
Acacia dealbata	17·8	32·1	5·3	Do.
Mangifera Indica	16·7	32·9	6·3	Do.
Ficus racemosa	14·1	20·5	12·2	Greenish.
Myrica Nagi	13·7	27·0	7·1	Blue-black.
Diospyros embryopteris	12·4	19·9	4·9	Do.
Ficus Indica	10·9	17·2	8·0	Greenish.
Fleuggea leucopyrus	10·3	20·5	3·5	Blue-black
Do. microcarpa	8·9	18·3	11·4	Do.
Ficus gibbosa	4·3	10·4	15·0	Greenish.
Curculigo orchioides (root)	4·1	19·9	8·6	Do.
Ficus religiosa	3·8	12·3	11·7	Do.
Do. hispida	2·1	11·7	13·6	Do.

Wattle Barks.—The Australian acacias or wattles introduced in the hills many years ago have firmly established themselves, but nothing seems to be done, as in Australia, in collecting the bark as a commercial article. It is true that the common forms of wattle (*A. melanoxylon* and *A dealbata*) are more plentiful on the hills than those species—*A. decurrens* and *A. pycnantha*—which yield rich tanning barks, but wherever the better species have been planted they have grown vigorously and well, and the bark is equally rich in tannin as that from trees growing in Australia. The price of good wattle bark is £10 per ton in the English market, and the market is supplied exclusively from Australia. A sample of bark from some *Acacia decurrens* grown on the Nilgiris was forwarded a few months ago to London for valuation. The reply stated that the sample of bark was in good condition and rich in tannin, but as buyers were in the habit of procuring their bark from a certain country, in regular quantities, there would be a prejudice in receiving it from a new source such as the East Indies, and there is nothing to guarantee their receiving a regular supply of the same quality. Tanners do not like changing the materials they employ, and English and Continental firms after obtaining wattle barks from the Australian Colonies for nearly a century are apt to look with suspicion upon other wattle barks. I have obtained the following results in analysing the barks of the Nilgiri grown acacias :—

A. pycnantha	33·8	per cent.	tannin.
A. decurrens	33·4	„	„
A. melanoxylon	28·6	„	„
A. dealbata	17 8	„	„

The samples of pycnantha and decurrens were from a private estate near Dodabetta. The melanoxylon was from a good sized tree after it had been cut up in logs for firewood, and represents the strength of the bark found on the majority of the fuel used in Ootacamund. The dealbata was a fresh sample from some young bushes of the very common yellow-flowering species. All these have an astringent principle of the same chemical characteristics, which I feel assured is the same as that found in the trees grown in their own native country. I have also made extracts or "tannage" from these barks, preparations which hold the virtues in a concentrated form, and much better than the crude bark for exporting. There is a good market in Europe for well prepared wattle bark extract, and the demand has been on the increase during the last few years.

Literary Work.—During the year the fourth and fifth parts of "Pharmacographia Indica" have been published, and we are now engaged with the sixth and last part, a complete index and an appendix. It is with sincere regret that Dr. Warden and I have to record the death of the Senior Editor on the 30th April last at Bombay. Dr. Dymock was the greatest authority on indigenous drugs in this country, and for many years he has encouraged original research by supplying large quantities of authentic specimens for chemical and physiological investigation. His classical knowledge and acquaintance with Sanscrit, Arabic and Persian writers, his botanical and medical experience contributed to make him particularly fitted for the work he was engaged in, and in other parts of the world besides India many will be sorry that he was not permitted to live to see the completion of the work. Last year "The Materia Medica of Madras" was published by the Government Press, and on account of the death of Dr. Mohideen Sheriff, the author, early in the year, I read through and corrected the proof-sheets. The book only deals with one-third the number of known drugs, and being incomplete and not containing the results of recent workers in the field of Materia Medica, the work is not of much value either as a text-book or book of reference. It shows what an interest in native remedies was taken by a native gentleman, and the author was an example of an industrious investigator who might well be followed by others of his colleagues in India.

Order—dated 22nd September 1892, No. 995, Revenue.

Miscellaneous.

With his letter read above Mr. Lawson submits his report on the working of the Government Cinchona Department during the year 1891–92 and Mr. Hooper's report on the analytical work conducted by him during the same period.

2. *Season.*—As compared with the previous year, the rainfall registered on all the Government estates, except Dodabetta, shows an increase, but the Director states that it was only in Naduvatam that the amount approximated to the average for the last ten years. The following statement compares the rainfall of the last two years on the several estates:—

Estates.	Rainfall in	
	1890–91.	1891–92.
Dodabetta	48·13	46·33
Naduvatam	69·58	100·84
Hooker	60·79	75·56
Wood	46·92	62·75

No unusual drought, frost or storms occurred during the year and the season was on the whole favorable to cinchona cultivation.

3. *Working.*—The total number of trees standing on the several estates at the close of the year under review according to statement No. 7 appended to the report was 1,779,894 or 18,208 more than in 1890–91. From the same statement it would appear that the number of trees planted during the year fell from 69,387 to 34,200 and that no new trees were planted on the Naduvatam and Wood estates. In section III (*b*) of the report, however, Mr. Lawson states that in the former estate 10 acres of ground were uprooted in January and February and replanted in March and April. If this statement is correct, the figures given in the appendix above referred to must be wrong and the apparent discrepancy should be explained.

4. The balance of bark undisposed of at the close of the year 1890–91 (510,695 lbs.) was more than sufficient for the requirements of the year under review and the Director did not therefore take the full estimated crop of 70,000 lbs. during the year, but limited the output to the needs of the plantations, removing the bark of such of the old trees only as it was desirable to uproot and replace by new plants. The quantity so collected amounted to 53,833 lbs. which when added to the balance in stock made a total of 564,528 lbs. Of this amount 144,500 lbs. were used in the factory for the manufacture of quinine and febrifuge and 3,170 lbs. were sold or otherwise disposed of, leaving at the close of the year 416,858 lbs. in stock or 93,837 less than in the previous year. The balance is still very large, but 269,357 lbs. of it represent succirubra or red bark which, as Mr. Lawson has already reported in his letter No. 1, dated 13th January 1892, is poorer in quinine than crown bark and has to be used in large quantities in order to secure a comparatively small outturn of the drug.

5. There were at the commencement of the year 1,572 lbs. of sulphate of quinine and 1,200 lbs. of febrifuge in stock. During the year 4,425 lbs. 14 oz., and 3,174 lbs. of quinine and febrifuge, respectively, were manufactured, making a total of 5,997 lbs. 14 oz. of quinine and 4,374 lbs. of febrifuge. Of these amounts 3,345 lbs. 4 oz. and 3,019 lbs., respectively, were disposed of during the year, leaving at its close a balance of 2,652 lbs. 10 oz. of quinine and 1,355 lbs. of febrifuge. The amount of the drugs manufactured was thus considerably in excess of the demand for the same—a satisfactory result.

6. The Director reports that there was a slight increase in the sales of quinine in paper packets, but the information furnished on this subject is very meagre and the Government desires that full details as to the sale of these packets in every district should be given in future reports. In reviewing the report for 1890–91, the Government of India pointed out that the difficulty hitherto experienced in the sale of the quinine powders was probably to some extent due to their high price and suggested that the price might be reduced and that the expenditure involved in packing and conveying

them to the market might be minimised by sending the quinine in bulk to the various dispensaries, the establishments of which might be employed to weigh and pack the powders in old paper for sale to the public. In dealing with the suggestions made by the Government of India, His Excellency the Governor in Council resolved to reduce the price of the powders to the utmost limit which could be conceded without entailing serious loss, and accordingly fixed the price of a 5-grain powder at 2 pies and of a packet consisting of 100 such powders at 1 rupee. These rates are, it will be observed, considerably below the sale price of quinine in bulk to Government departments and officials. The Government was of opinion that it was inadvisable to adopt the Government of India's proposals to entrust the dispensary establishments with the making up of powders and to use old paper in packing them, and accordingly directed that the existing arrangement under which the powders are made up in new papers at the Naduvatam factory should be continued. The Supreme Government has, in a recent letter, again suggested the advisability of modifying the present system of packing and sale of powders so as to bring it into accordance with the system obtaining in Bengal; the letter in question has been referred to the Board of Revenue, to Mr. Lawson and to the Surgeon-General for remarks, and orders will be passed on receipt of their replies. In the meantime, the attention of Collectors will be drawn to the Surgeon-General's remarks quoted by Mr. Lawson in paragraph xi (*c*) of his report and they will be requested to impress upon their subordinates the necessity for making greater exertions in pushing the sale of the packets.

7. With reference to Mr. Lawson's comments at paragraph xi (*b*) on an article in the "Rangoon Times" entitled "Government *versus* Private Quinine," the Government observes that the sale of quinine to the general public has already been sanctioned on certain conditions in G.O., dated 19th November 1891, No. 1108. A considerable market for cheap quinine and febrifuge might no doubt be found in Burma, but the matter is one in which the local Administration should, the Government considers, be left to take the initiative.

8. The statements appended to the present review show the receipts and disbursements for 1891–92 and for the previous years. The receipts during the year amounted to Rs. 77,066 or Rs. 37,066 more than the budget estimate and Rs. 2,066 more than the revised estimate fixed by Government. The expenditure on the other hand was only Rs. 75,805 or Rs. 195 less than the revised and budget estimates. For the first time since 1885–86 Mr. Lawson was thus able to make the receipts exceed the expenditure, a result on which he is to be congratulated.

9. It would appear from the Director's remarks on the subject of fodder in paragraph xi (*c*) of his report that there is no demand for cut grass and hay on the Nílgiris and the reason probably is that there is abundance of good grazing ground for cattle on the plateau during the greater portion of the year and that owners of horses prefer cutting fodder for themselves free of cost to purchasing it ready cut. There is, the Government believes little, if any, mortality due to starvation among cattle on the Nílgiris, and Mr. Lawson's argument on this point is therefore hardly relevant.

10. The analytical report submitted by Mr. Hooper has been read with interest, particularly that portion which deals with the tanning properties of "wattle barks" His Excellency the Governor in Council desires that the widest possible publicity should be given to the portion of Mr. Hooper's report above mentioned, for although the Indian wattle bark will not easily be able to compete with Australian bark in the English and Continental markets, still the great advantage which India has over Australia in point of distance might with good management divert a portion of the trade to this country, and the bark ought in any case to take the place of tangedu bark in local tanneries. In order to make the tanning properties of wattle bark as widely known as possible, His Excellency in Council directs that the portion of Mr. Hooper's report relating to the same be translated into the vernaculars and published in English and in the vernaculars in the Fort St. George and all District Gazettes, and that Collectors of districts in which tanneries are situated should place themselves in

communication with tanners and explain to them the superiority of the bark for tanning purposes.

(True Extract.)

(Signed) C. A. GALTON,
Secretary to Government.

To the Government Botanist.
„ the Commissioners of Land Revenue.
„ the Commissioner of Revenue Settlement, Land Records and Agriculture.
„ the Military Department.
„ the Public Department.
„ the Financial Department.
„ the Surgeon-General with Government.
„ the Accountant-General.
„ the Resident in Travancore and Cochin, through Political Department, for information and communication to the Sirkars concerned.
Copy to the Honorary Secretary, Agri-Horticultural Society.
„ to the Chamber of Commerce.

No. 995A.

Copy to the Government of India, Revenue and Agricultural Department.

(Signed) C. A. GALTON,
Secretary to Government.

No. 995B.

Copy to the Government of Bengal.

(Signed) C. A. GALTON,
Secretary to Government.

No. 995C.

Copy to the Chief Commissioner, Burma.

(Signed) C. A. GALTON,
Secretary to Government.

Exd. A. Aubert.

200 Copies.

APPENDICES.

No. I.

STATEMENT showing the Capital and Revenue Account of the Government Cinchona Plantations, Nilgiris, from the commencement up to the official year 1891-92.

Year.	Establishment including Superintendent's salary.	Working charges. Building and plant.	Working charges. Departmental labour.	Working charges. Convict labour.	Total.	Total outlay to end of year.	Simple interest at 4½ per cent. on outlay to end of previous year *plus* half outlay during the year.	Total of columns 6 and 8.
	CHARGES.							
	1	2	3	4	5	6	7	8	9
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
1860-61	..	..	..	..	..	4,821 15 0	4,821 15 0	108 7 11	4,930 6 11
1861-62	..	..	..	..	..	22,914 15 4	27,736 14 4	732 9 2	23,647 8 6
1862-63	..	..	..	..	..	48,390 0 0	76,126 14 4	2,336 15 0	50,726 15 0
1863-64	..	..	..	..	..	65,900 7 9	1,42,027 6 1	4,908 7 7	70,808 15 4
1864-65	..	..	..	..	..	84,111 4 11	2,26,138 11 0	8,283 11 9	92,395 0 8
1865-66	12,726 14 7	3,700 0 0	48,666 10 8	..	65,093 5 2	3,14,175 14 0	17,020 12 6	1,00,194 4 4
1866-67	24,444 8 11	3,025 0 0	48,666 10 8	..	76,136 3 7	4,42,303 2 6	22,618 3 6	1,46,148 1 0
1867-68	25,449 14 0	2,600 0 0	..	..	28,049 14 0	6,62,952 14 7	27,740 7 8	1,43,267 15 7
1868-69	26,087 3 1	2,030 0 0	..	..	28,117 3 1	6,69,057 2 1	31,279 6 2	1,34,744 11 2
1869-70	25,671 7 10	6,334 5 8	..	..	32,006 13 6	7,20,237 13 1	33,039 9 8	81,550 1 2
1870-71	25,783 5 4	300 0 0	..	..	26,083 5 4	7,50,411 2 5	34,523 12 5	63,262 15 0
1871-72	23,730 5 4	3,250 0 0	..	..	26,980 5 4	7,83,978 12 6	35,947 10 2	69,091 6 6
1872-73	17,157 5 4	550 0 0	..	..	17,707 5 4	8,13,693 12 6	37,800 12 2	65,662 10 2
1873-74	12,724 0 0	2,758 0 0	..	..	15,482 0 0	8,44,117 10 6	39,784 9 2	67,724 10 2
1874-75	12,674 0 0	1,700 0 0	..	..	14,374 0 0	8,79,641 2 6	40,623 8 3	74,308 1 2
1875-76	16,406 8 0	1,550 0 0	..	..	17,956 8 0	9,25,848 2 6	43,004 13 6	86,830 8 3
1876-77	17,234 0 0	6,715 8 11	..	..	23,949 8 11	9,85,478 3 9	45,916 6 3	1,02,634 14 9
1877-78	8,064 5 4	5,468 13 8	..	..	13,533 3 0	10,55,260 1 0	49,144 1 10	1,16,688 3 6
1878-79	8,061 5 4	10,090 14 1	..	..	18,152 3 5	11,28,952 12 5	52,595 12 4	1,22,826 13 3
1879-80	9,637 2 8	6,537 4 9	..	..	16,174 7 5	12,08,657 1 5	56,551 14 11	1,22,320 1 4
1880-81	10,092 0 0	11,367 0 4	..	..	21,459 0 4	13,04,762 2 0	61,269 11 11	1,62,656 15 6
1881-82	11,879 1 0	6,278 4 9	..	..	18,157 5 9	14,18,337 7 4	56,219 0 3	1,74,845 1 3
1882-83	16,376 14 6	32,247 11 5	..	..	48,624 10 11	16,24,729 12 3	71,415 7 4	1,72,611 5 2
1883-84	15,094 14 1	35,348 14 6	..	..	50,443 12 7	16,49,290 10 7	76,171 10 0	1,85,976 6 8
1884-85	20,083 7 5	6,220 10 5	..	..	26,304 1 10	17,36,115 0 11	79,933 11 2	1,62,996 0 4
1885-86	20,413 3 4	3,513 5 8	..	..	23,926 9 0	18,16,493 11 10	83,637 5 8	1,60,312 6 1
1886-87	26,235 7 6	7,925 11 1	..	..	34,160 18 7	19,00,722 0 4	87,156 1 11	1,67,865 10 2
1887-88	27,581 14 3	2,355 9 9	..	..	29,937 7 0	19,72,883 3 5	90,343 5 8	1,59,317 5 7
1888-89	30,831 11 6	2,724 12 7	..	..	33,556 8 1	20,42,377 1 4	93,441 0 6	1,59,337 3 7
1889-90	26,686 14 3	1,614 4 11	..	..	28,301 3 2	21,10,657 9 6	96,660 10 7	1,61,621 8 8
1890-91	38,105 12 2	2,132 13 10	..	..	40,238 10 0	21,85,471 10 3	1,00,651 13 6	1,71,574 11 4
1891-92	42,061 6 6	1,835 12 8	..	..	43,897 3 2	22,61,276 10 10	16,00,968 15 8	1,75,856 15 0
	49,887 3 10		30,719 12 5	48,666 10 8	1,29,273 10 11	..	..	37,62,246 11 6
Total ..	6,24,884 13 10	1,69,174 14 11	13,21,216 15 1	1,46,000 0 0	22,61,276 11 10			

Statement showing the Capital and Revenue Account of the Government Cinchona Plantations, Nilgiris, &c.—*cont.*

Year.	Receipts. Value of bark supplied to Quinologist, or for experimental purposes and the value of quinine and febrifuge sold.	Value of bark sent to England, sold or supplied to other Governments or departments, or private parties.	Sale of plants, seeds, &c.	Total.	Surplus.	Deficit.	Net revenue (difference between columns 9 and 13).
	10	11	12	13	14	15	
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	
1860–61	..	..	..	..	..	4,930 6 11	
1861–62	..	..	..	..	..	23,647 8 6	
1862–63	..	..	..	..	..	50,726 15 0	
1863–64	..	..	..	..	..	70,808 15 4	
1864–65	..	..	2,450 0 0	2,450 0 0	..	92,395 0 8	
1865–66	..	..	..	..	..	1,00,194 4 4	
1866–67	..	..	1,680 0 0	287 8 0	..	1,42,698 1 0	
1867–68	1,512 6 4	..	..	1,680 0 0	..	1,42,980 7 7	
1868–69	4,364 14 8	..	323 14 0	1,512 6 4	..	1,33,064 11 2	
1869–70	9,642 12 8	3,479 3 6	..	4,688 12 8	..	80,047 10 10	
1870–71	16,806 15 8	4,388 2 1	227 1 4	13,022 0 2	..	58,674 2 4	
1871–72	21,136 7 0	36,417 6 3	300 0 0	21,422 3 1	..	55,069 6 4	
1872–73	8,576 0 0	..	273 4 0	57,854 6 3	..	44,240 7 1	
1873–74	..	60,404 7 11	2,000 0 0	8,849 4 0	..	9,870 3 11	
1874–75	..	1,07,878 4 0	2,579 3 10	62,404 9 11	..	65,468 13 2	
1875–76	..	3,61,746 0 6	5,469 0 2	1,10,457 7 10	7,822 9 1	24,426 0 4	
1876–77	..	3,92,217 10 1	8,136 9 2	3,67,215 0 8	2,41,626 13 2	..	
1877–78	..	4,24,323 12 8	15,462 12 4	4,00,354 3 3	2,77,627 6 0	..	
1878–79	..	3,33,295 1 3	13,175 4 8	4,39,786 9 0	3,07,466 7 8	..	
1879–80	..	5,64,236 3 11	7,653 2 9	3,46,470 5 11	1,93,813 6 5	..	
1880–81	..	6,82,003 10 1	4,345 7 10	5,71,889 6 8	3,97,044 5 5	..	
1881–82	..	80,519 10 6	4,561 2 8	6,86,349 1 11	4,13,737 12 9	..	
1882–83	933 12 0	83,351 10 0	1,643 13 6	85,080 13 2	..	1,10,895 8 6	
1883–84	1,418 0 8	1,02,101 0 0	589 10 4	85,829 3 6	..	77,166 12 11	
1884–85	2,127 1 0	63,067 4 8	1,595 4 9	1,04,108 11 0	..	56,203 11 1	
1885–86	1,203 0 0	1,976 0 0	763 1 11	71,789 10 6	..	96,075 15 9	
1886–87	2,134 0 0	420 0 0	1,047 11 10	3,941 1 11	..	1,55,376 3 1	
1887–88	4,048 10 6	792 1 9	699 12 4	3,601 11 10	..	1,66,235 7 9	
1888–89	27,635 0 10	835 13 10	504 15 1	6,440 8 7	..	1,56,181 0 1	
1889–90	75,262 10 5	1,038 13 6	765 2 3	28,875 13 9	..	1,42,698 13 7	
1890–91	..	..	..	77,066 10 2	..	98,790 4 10	
1891–92	..	..	..	..	..	..	3,09,818 3 7
Total ..	1,76,601 11 9	31,99,778 12 6	76,046 15 8	34,52,427 7 11	..	..	

No. II.

STATEMENT showing the receipts and charges on account of the Government Cinchona Plantations for the year 1891-92 prepared in accordance with the instructions issued in the Secretary of State's Despatch No. 3, dated 11th February 1886.

Disbursements, &c.	Amount.	Receipts, &c.	Amount.
	Rs. A. P.		Rs. A. P.
To value of bark in stock on 31st March 1891 (510,695 lb.) as under—		By value of bark in stock on 31st March 1892 (416,858 lb.) as under—	
900 lb. of 1883–84 at A. 8 P. 2·402 per lb.	461 4 2	12,943 lb. of 1885–86 at Rs. A. P. 0 11 4·132 per lb.	9,176 13 8
37,653 „ of 1885–86 at 11 4·132 „	26,696 12 2	28,931 „ of 1886–87 at 0 12 5·385 „	19,632 15 5
28,981 „ of 1886–87 at 12 5·385 „	19,632 15 5	35,056 „ of 1887–88 at 0 10 10·069 „	27,275 3 5
39,422 „ of 1887–88 at 10 10·069 „	30,672 2 7	26,009 „ of 1888–89 at 0 10 1·120 „	16,407 5 6
110,162 „ of 1888–89 at 10 1·120 „	69,493 13 11	126,685 „ of 1889–90 at 0 6 9·701 „	53,907 12 3
160,226 „ of 1889–90 at 6 9·701 „	68,180 8 2	133,351 „ of 1890–91 at 0 8 11·862 „	74,914 0 9
133,351 „ of 1890–91 at 8 11·862 „	74,914 0 9	53,833 „ of 1891–92 at 1 6 6·365 „	75,805 1 7
Total ..	2,90,051 9 2	Total ..	2,77,119 4 7
To establishment and working charges	75,805 1 7	By value of—	
To value of quinine and febrifuge in stock on 31st March 1891	43,026 9 0	Sulphate of quinine supplied to the Medical Stores Departments of Madras, Bombay, Ceylon, &c.	49,016 10 5
		Febrifuge sold to the Medical Stores Departments of Madras, Bombay, &c.	26,246 0 0
		Bark supplied to the Madras Medical Stores Department	255 0 0
		Bark supplied to the Bombay Medical Stores Department	321 0 0
		Bark supplied to private parties and Mysore Durbar	462 13 6
		The sale of seeds and plants	258 2 0
		Percentage of the fees of the Government Quinologist	17 12 9
		Miscellaneous	489 3 6
		Total ..	77,066 10 2
		By value of quinine and febrifuge (including 630 packets of quinine) in stock on 31st March 1892	49,658 13 9
		Grand Total of all receipts including the items in stock	4,03,844 12 6
		Net loss on operations ..	5,038 7 3
Grand Total ..	4,08,883 3 9	Grand Total ..	4,08,883 3 9

Original

Govt. of {1892} Madras.

REVENUE.

F.C. No. 9096 of 92
F.C. No. 9935 of 92
13.12.92 — 1252
F.C. No. 2308 of 93
23.3.93 — 1192

W-5-01
24-10-35-11

Issued

Recd. Encl.

G.O., 22nd September 1892,
Nos. 995, 995A, 995B, 995C.

SEPTEMBER.

Cinchona Department.

Reviewing the Administration Report of the Government — for the year 1891-92.

25

Administration Report of the Government Cinchona Department Nilgiris for the year 1891-92

Contents.

I Season and Rainfall—
- (a) Dodabetta
- (b) Naduvatam
- (c) Pykara
  - (1) Hooker Plantation
  - (2) Wood Plantation

II Financial
- (a) Receipts
- (b) Expenditure

III General Condition—
- (a) Dodabetta
- (b) Naduvatam.
- (c) Pykara
  - (1) Hooker Plantation.
  - (2) Wood Plantation.

IV Upkeep.

V Manure.

VI Nurseries.

VII Crop.

VIII Buildings.

IX Factory

X Mr. Hooper's Report.

XI Miscellaneous
- (a) Supply of Sulphate of quinine to Ceylon
- (b) Issue of quinine in paper packets.
- (c) Reduction in the price of quinine in paper packets.

Remova

(d) Removal of the Quinologist's Laboratory to Kelso Villa.

(e) Fodders

(f) Investigations into the nauseating principles of Cinchona Febrifuge.

(g) Service Books.

S.30/10 I Season and Rainfall— The rainfall on all the Estates was below the average for the last ten years, but with the exception of Dodabetta, was much greater, than that which fell during the previous year. The rainfall in October was unusually heavy all over the plateau, the amount registered being:-

Dodabetta	15.94.
Wood	10.66.
Hooker	10.95.
Aradiratam	10.64.

There was no unusual drought on any of the Estates during the year. On all the Western Estates heavy rain fell on the last day of February; good rains also occurred in March. Frost did little damage. The weather was again remarkable for its Comparative stillness, there being no excessively high winds, or violent storms. The season, taken as a whole, was a good one.

(a) Dodabetta. — On this Estate, the quantity of rain registered during the year was 46.33 inches, or 7.76 inches less than the average for the past ten years.

(b) Naduvattam. — The amount of rain registered here was 100.84 inches. July and August were the wettest months, but not abnormally so. The amount of rain, which fell, was nearly up to the average of the last ten years.

(c) Pykara. (1) Hooker. — The rain registered on this plantation was 75.56 inches or 21.02 inches less than the average for the past ten years.

(2) Wood. — 62.75 inches of rain were guaged here, and this was 17.35 inches below the average.

S. C. — II Financial (a) Receipts. — In October 1890, when framing the Budget Estimate of Receipts for 1891-92, it was

was calculated that Rs 40,000 would probably be realized during the year; but this, at the time, was more or less a guess. In G. O. No. 886 of 7th November 1890 - Revenue - Government raised this sum to Rs 60,000. The Revised Estimate for the year was fixed at Rs 60,600 this amount having been actually paid into the treasury, but in consequence of subsequent Indents for quinine, and febrifuge having been received this was raised to Rs 71,000; but in G.O. — No 1116 of 23 November 1891, when passing the Revised Estimates for the year, Government raised the Estimate again to Rs 75,000. Against this anticipated income, the actual receipts aggregated Rs 77,066-10-2

detailed

detailed thus:—

Value of quinine supplied
to the Medical Stores
Departments of Madras,
Bombay, and Ceylon &c —— Rs 49,016-10-5
Febrifuge supplied to the
Medical Stores of Madras,
Bombay, and Cochin &c —— " 26246-0-0
Bark sold to Medical
Stores Madras and Bombay —— 576-0-0
Bark sold to Mysore
Durbar &c —— " 462-13-6
Miscellaneous;
Sale of seed and plants,
percentage of fees of Govt
Quinologist &c —— " 765-2.3
" 77,066-10-2

The Actual receipts were thus
Rs 2066-10-2 above the Revised Estimate

(b) Expenditure In G.O. No. 886 of
7th November 1890- Revenue-Government
sanctioned Rs 76,000 as the Budget
Estimate for the year; and in G.O No. 1116
of 23 November 1891- Revenue-Government
accepted the same figure as the Revised
Estimate. The actual expenditure was
Rs 75,805-1-7, which was Rs 194-14-5 less
than the Budget and Revised Estimates.
This was mainly due to savings result-
ing from the Clerk at Kadiwaham
being on deputation at the Census
office, Madras. Out of the expenditure
for the year of Rs 75,805-1-7, the Quinologists
Department cost Rs 23,906-7-0, and the
maintenance of the General Establishment
and the upkeep of the Estate Rs 51,898-10-7

The financial result of the Working
of the Department for the year may be
shown as follows:—

Receipts —— Rs 77,066-10-2
Expenditure " 75,805-1-7
Balance 1261-8-7

III General Condition (a) Dodabetta —
Nearly the whole of this Estate has been
either trenched or pitted, and manured;
and

and may be said to be in very good Condition. Considerable damage was, however, done to some of the plants put out last season by grubs; and in one plot no less than two out of every three were destroyed.

During the present season, the pits, in which the plants are to be put out, will be freely manured with quick lime; in the hope that this may kill the grubs.

(b) Nadiwatam.— The trees on that part of the Estate, which was trenched and manured two years ago, are doing well; and the amount of quinine in them has been increased. The trees about the Chinamens' lines have been thinned out, and the ground on which they stand has been trenched, and it is expected they will be fit for barking next year. Taken altogether, the Estate has much improved during the past

twelve

twelve months. Ten acres of old Succirubra were uprooted in January and February last. These trees were very old and bad, and only yielded 40,150 lbs of dry bark, and this too of a very inferior quality, from a manufacturing point of view. The ground uprooted was replanted in March and April. This is much earlier than customary; but it is in accordance with horticultural principles, and the result so far has proved satisfactory.

(c) Pykara & Hooker. Trenching and manuring have been the chief operations carried out on this plantation during the year. The trees on Hooker are like young children, whose sole duty for the next few years will be to grow.

(2) Wood.— Nothing particular has to be noticed about this plantation. The trees planted out some years ago are coming on well.

S. Parker

IV Upkeep. The usual work connected with upkeep has been properly attended to, during the year, and all

the

the buildings, roads, bridges, drains, &c, have been well maintained, and are in good order.

V Manure At Dodabetta 400 cart loads of cattle manure were made in the Estate, and 1394 Cart loads were obtained from out side. At Nadwatam 200 Cart loads were used during the year, and at Hooker 650 were put into the tranches and pits.

VI Nurseries. Particular attention has been paid during the last few years to the harvesting of Cinchona seed, and to the raising of the young plants in the nurseries. It has been often stated that the seed of Cinchona is deteriorating, and this may be true in certain cases; but experience would tend to show that, when the seed is collected from healthy trees, and taken only when quite ripe, it is perfectly sound; that it germinates freely, and produces vigorous plants. The cause of the great mortality, which used to take place in the Government nurseries in former years, was due to the seed being grown in too damp a soil, and to the plants being overshaded, and over watered. Also the plants were put out in the beds far too close to each other; formerly the seedlings were pricked out at distances of two inches by one and a half; they are now pricked out at distances of 4 inches by 4. This allows all the plants to become well developed before they are transplanted into the fields.

During the last and present seasons, the plants have been put out on the Estate very much earlier than has been customary heretofore. Last year the greater part of the planting was completed by the end of May. During the present season 20 plants were put out into the field on the last day of February as an experiment. 1·30 inches of rain had fallen the night before, the plants were lifted by means of a transplanter, and wrapped in paper before being removed from the nurseries, and after it had been planted, each

received

received a little water to settle the earth about the roots, and they were then shaded by ferns in the usual way. Out of these 20 plants, 13 survived, and these at the time of writing are healthy, and growing plants. The next heavy rain that fell was on the last day of March, and on the following day, the 1st April, 200 were transplanted from the Nursery into the field; by the end of May, all these, with the exception of seven, were not only alive, but were well established, and had made a fresh pair of leaves. More rain fell about the middle of April, and the planting of the whole of the fourteen acre plot, which had been uprooted, was begun on the 19th; the planting was carried on daily without any intermission, and regardless of the weather, which indeed as a rule was bright and dry, and the whole of the plot was finished before the end of the first week in May. Those plants put out during bright sunshine have thriven

thriven quite as well as those put out when the weather was cloudy, or wet. It is as yet too soon to say how these plants will withstand the wild weather of the Monsoon, but up to the present time, the mortality in the field has been very low, and the plants look hard and healthy, though the growth which they have made has been small.

The advantage of planting as early as possible in the season is obvious, as was pointed out in the last year's Report:—

"By planting at this early date, owing
"to the warmth of the soil, the plants
"become well rooted before the Monsoon
"bursts upon them, and so they get the
"advantage of having two growing
"seasons before the Commencement of
"the dry months of Winter and Spring."

The pits in the field are manured with a mixture of old cattle manure, lime, and wood ashes in the proportion

1	Cattle manure	20 Parts
2	Lime —"—	1 Part
3.	Wood ashes ——	½ Part

and

acid of this mixture, a quarter of a bushal is well mixed with the earth in each pit.

19 lbs. 2 ozs of Cinchona seed were sold to the public during the past year, and this consisted chiefly of Cinchona officinalis and Dodabetta Hybrids, the same as has been planted out so largely at Nadiwatam. Eight thousand plants of Cinchona Officinalis and 24,000 Dodabetta Hybrids were also sold.

VII Crop. The crop taken during the year amounted to 53,833 lbs of bark apportioned thus:—

Dodabetta		
Crown bark — 747 lbs	— 747	
Nadiwatam		
Crown bark —	2,140	
Red bark —	37,868	
Magnifolia —	142	40,150
Pykara		
Crown bark —	10,317	
Red bark —	2,619	12,936
		53,833

At the close of last year, there remained in stock 510,695 lbs making a total of 564,528 lbs. Of this, 147,670 lbs of bark were disposed of during year thus:—

Used in the Factory for the manufacture of quinine and febrifuge. —	lbs 144,500
Issued to the Madras Medical Stores Department —	1,000
Issued to the Bombay Medical Stores Department —	800
Sold to Messrs Kemp & Co. Bombay.	1,120
Sold to the Mysore Durbar. —	250
	147,670

There remained therefore, at the close of the year 416,858 lbs in stock. The estimated out put of bark for the year was 70,000 lbs. — vide G.O. No. 1116 of 23rd November 1891 - Revenue; but as there was no need to take this amount, nor indeed any, the quantity taken was governed by the needs of the Plantations only — that is, bark was only taken from such trees as had passed their prime, and which it was desirable should be uprooted, and grounds on which

thus

they stood replanted.

VIII Buildings.— The repairs and additions to the several buildings on the various Estates were carried out, at a cost of Rs 1835-12-8, detailed thus:—

Dodabetta—	R	187-12-6
Sadawaham—	"	1089-13-6
PyKara—	"	558-2-8
		1,835-12-8

IX Factory.— Continuous work in the Factory Commenced at the end of August last, and went on without any interruption till the end of March, when all the buildings were closed for a fortnight, for repairs and cleaning.

During this year 4,125 tbs-14 ozs of sulphate of quinine were manufactured. At the close of the last year there were 1572 tbs in stock, making in all 5997 tbs-14 ozs. Of this quantity, 3345 tbs-4 ozs were issued as follows:-

	lbs	oz
Supplied to the Madras Medical Stores—	1500—	
Supplied to the Bombay Medical stores—	800—	
Supplied to Ceylon Medical stores—	1000—	
Miscellaneous Sale of quinine &c.	18-12½	
Issue of 370 Paper Packets of quinine—	26-7½	
	3,345-4	

and there were thus 2,652 tbs-10 ozs left in stock at the close of the year.

Of febrifuge there was manufactured during the year 3174 tbs; and at the beginning of the year, there were 1,200 tbs in stock, making in all 4,374 tbs; of this quantity, 3,019 tbs were issued thus:—

Madras Medical Stores Department—	1500 tbs
Bombay Medical Stores Department—	1500 "
Cochin Government—	16 "
Residency Surgeon, Bangalore, &c.	3 "
	3019 "

and there remained, therefore, in stock at the end of the year 1,355 tbs

Taking

Taking the price of the quinine at Rs 13-6-0 per tb, and that of the febrifuge at Rs 10, the present value of these drugs will be Rs 49,658-13-9 shown thus:-

Value of 2652 tbs 10 oz 9 quinine. Rs	a.	p
@ Rs 13-6-0 per tb	35,478	13 9
" of 1355 tb of febrifuge		
@ Rs 10 per tb	13,550	0 0
" 630 Packets at Re 1 each	630	0 0
	49,658	13 9

XI Mr Hooper's Report. It will be seen from this report that the quinine and febrifuge turned out from the Factory are good, and there is no doubt that the quality and appearance of both have been considerably improved during the past year.

XI Miscellaneous. (a) Supply of of Sulphate of quinine to Ceylon.— The Government of Ceylon was supplied with quinine for the last two years by this Department. Recently, however, they have discontinued getting it, finding it more

more convenient to procure it direct from England.

(b) Issue of quinine in paper packets.— The sale of quinine in paper packets has increased during the year in most of the Districts, but to no considerable extent. From one District, the whole of the packets were returned with the remark that "reach to no use is made of this medicine in this District."

The following extract from the Rangoon Times is copied from the Chemist and Druggist of the 28th May 1892, page 779:-

"Government versus - Private Quinine in India".

"The Rangoon Times adversely criticises the refusal of the Indian Government to sell the quinine, made in its Factory, to any persons but Government officials, and says; In Burma, pre-eminently a feverish province, it would be a boon to many engaged in the country to be able to purchase quinine from Government. Many Europeans, and

"and thousands of Burmans work in the
"forests for private individuals and firms;"
large numbers are also employed in
"exploiting minerals and oil, and many
"others are engaged on railway Construc-
"tion and road-making for the Government."
"The majority of these undertakings are"
"in the most sickly parts of the province,"
"and much inconvenience is experienced"
"from those engaged in them falling ill."
"If those engaged in private enterprise"
"were allowed to purchase the Govern-
"ment quinine, at the rates at which it"
"is sold to Government officers, a great"
"deal of sickness in Burma would be"
"avoided, and the province itself greatly"
"benefited. It is possible that private indi-
"viduals can obtain Government quinine"
"by getting it through Government officers, if"
"they are able to show just and sufficient"
"cause why they should be supplied, but"
"such a course is undesirable for many"
"reasons." In Madras, we believe planters
"and private individuals are at liberty"

"to purchase quinine, in certain quantities"
"from the Madwabain Factory. The English"
"quinine makers, however, are about, it"
"is rumoured, to protest against a"
"Continuance of this practice".

Up to the present time, the Govern-
ment quinine has been sold only to
planters, and other persons, where it has
been ascertained that it was the intention
of the purchaser to administer the
whole of it to the Coolies on his estates,
and none has been sold to the public
direct; but whether or not it would not
be right to sell the quinine, at the same
rates at which it is sold to Government
officials, to such persons as are indi-
cated in the above paragraph, is a
matter for Government alone to decide.
That a sale of cheap quinine or febrifuge
in Burma would tend to increase the
Consumption of these drugs there can be
little doubt; and the officials superintend-
ing the different works now being carried
on in Burma, are the very persons to
whom the introduction of quinine into
the

the country could be but entrusted. In order to prevent any abuse being made of the privilege to buy the Government quinine cheap, and to ensure its being all consumed by the people for whom it is intended, the quinine might be issued colored with some distinctive tint.

(c) Reduction in the price of quinine in paper packets. In their letter dated 3rd December 1891, No. 2486/128, the Government of India stated that they thought the price of three pies per powder of five grains was too much, and that this price ought to be reduced. In consequence of this, Government consented to reduce the price to two pies; and to throw in gratis one Jalap powder to every ten of quinine, the packets themselves being reduced to one rupee. It is to be hoped that this reduction may have some effect; but, as has been pointed out by the

Surgeon General, the sale of the powders depends quite as much, or perhaps even more, upon the interest which officials of the lower grades take in distributing the medicine, than in the reduction of the price at which it is to be sold. The cost of the powders, as at present sold, is a trifle under the cost of production.

(d) Removal of the Quinologist's Laboratory. — The Quinologist's laboratory has been removed from "Oakeid" to Mr. Hooper's own house, "Kelso Villa".

(e) Fodders. The question of providing good fodder for horses and cattle in large quantities on these hills has been touched upon so often in these reports, that it is feared a return to the subject may be considered tedious; nevertheless, where so many horses are kept for military purposes, for racing, for hunting, and for purposes of draught it is a subject which ought not

not to be lost sight of. Hitherto grass and hay have been sold by this Department at cost price, simply with the view of making people acquainted with the fact that grass of good quality, and in great abundance may be obtained at a reasonable price, if they only choose to insist upon having it; no advance however, during the last eight years, has been made in this direction, and the sale, even at cost price, has therefore been discontinued. In riding from Mussaguddy to Sigur in the early part of January last, the horses were up to their girths, for several miles, in yellow waving thrash. If this had been cut a month earlier, it would have produced several hundreds of tons of very respectable hay; but the negligence or apathy of every body around allowed it to be wasted. Small sympathy can be felt for people

people whose cattle die of starvation within a little trouble and fore-thought would keep them in plenty during the dry months of the year.

(f) Investigations into the nauseating properties of Cinchona Febrifuge. — Investigations, with the assistance of Surgeon Major J. Maitland, M. D. are being made into the "Cause" of the nauseating properties of Cinchona febrifuge, but some months will yet be required before a conclusion can be arrived at. All that can be said, at present, is that certain kinds of febrifuge seem to be as now nauseating as the Sulphate of quinine itself.

(g) Service Books. — All the service books of the Establishment have been kept duly written up.

Director's office
Ootacamund
9th July 1892

N. A. Lawson
Govt. Botanist & Director

Enclosure No 1 to
Letter No 38 of 9 July 1892
From the Govt Botanist and
Director of Govt Cinchona
Plantations, Nilgiris to
the Secretary to Government
Revenue Department
Fort St George.

Administration Report
of the Govt Cinchona
Plantations for the
year 1891-92.

1/115

Statement showing the Rainfall at the several Government Cinchona Plantations, Nilgiris, during the official year 1891-92.

Months	Dodabetta				Naduvatam				Hooker				Wood			
	1890-91		1891-92		1890-91		1891-92		1890-91		1891-92		1890-91		1891-92	
	Rainfall	Number of wet days	Rainfall	Number of wet days	Rainfall	Number of wet days	Rainfall	Number of wet days	Rainfall	Number of wet days	Rainfall	Number of wet days	Rainfall	Number of wet days	Rainfall	Number of wet days
April	6.00	13	2.47	7	8.26	12	3.92	7	6.93	18	2.57	6	4.67	16	2.66	7
May	4.77	13	4.38	13	5.34	14	5.98	16	5.44	16	6.71	15	4.35	15	5.77	14
June	4.66	24	3.77	16	14.45	23	9.26	22	11.23	22	7.79	20	7.66	23	6.50	19
July	4.35	17	6.57	24	17.06	25	46.82	30	12.29	22	33.76	29	9.32	22	25.68	28
August	8.22	24	2.98	13	9.82	23	16.93	25	9.15	22	8.70	23	7.18	21	6.62	23
September	2.67	11	1.45	9	5.84	21	3.13	14	6.01	17	1.41	13	4.31	16	1.07	14
October	9.89	16	15.94	27	5.52	16	10.64	19	5.88	13	10.95	23	5.95	13	10.66	22
November	3.57	9	5.88	7	1.49	8	2.41	3	1.54	7	1.52	6	2.03	9	1.51	5
December	1.50	3	2.73	15	0.51	3	0.55	2	0.74	3	1.60	5	0.66	2	1.84	5
January	0.25	2	0.00	..	0.10	2	0.00	..	0.16	2	0.00	..	0.17	1	0.00	..
February	1.62	4	0.12	3	1.19	4	0.00	..	1.40	5	0.13	1	0.59	6	0.19	2
March	0.63	3	0.04	1	0.00	..	1.20	1	0.02	1	0.42	1	0.03	1	0.25	1
Total	48.13	139	46.33	135	69.58	151	100.84	139	60.79	148	75.56	142	46.92	145	62.75	140

Ootacamund
9 July 1892

M. A. Lawson
Govt. Botanist & Direct

5/

No. 2.

Statement showing the Receipts on account of the Government Cinchona Plantations, Nilgiris, for the official year 1891-92

Particulars	Sanctioned Budget Estimate for 1891-92	Revised Budget Estimate for 1891-92	Actuals for 1891-92		
Bark supplied to the Madras Medical Department	500	255	255	..	..
Do Do .. Bombay Do Do	500	400	321		
Do Do .. Private parties and Mysore Durbar	..	500	462	13	6
Sale of seeds and plants	200	100	258	2	.
Percentage of the fees of the Govt. Quinologist	100	45	17	12	9
Miscellaneous	300	500	489	3	6
Febrifuge	5.000	26,000	26,246		
Quinine	53,400	47,200	49.016	10	5
Total	60,000	75,000	77,066	10	2

Ootacamund
9th July 1892

M. A. Lawson
Govt. Botanist &
Director

No 3.

Statement showing the Expenditure in detail on account of the Govt. Cinchona Plantations Nilgiris for the official year 1891-92

Name of Plantations	Salaries: Budget Estimate	Salaries: Revised Estimate	Salaries: actuals	Nurseries: Budget Estimate	Nurseries: Revised Estimate	Nurseries: actuals	Working charges: Budget Estimate	Working charges: Revised Estimate	Working charges: actuals	Manure: Budget Estimate	Manure: Revised Estimate	Manure: actuals	Crop: Budget Estimate	Crop: Revised Estimate	Crop: actuals	Repairs: Budget Estimate	Repairs: Revised Estimate	Repairs: actuals
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Head office and General	12316	12316	12136	..	..	.. .. ..	..	..	.. .. ..	..	..	.. .. ..	..	..	.. .. ..	300	..	.. .. ..
Dodabetta	3150	3654	3615 10 6	400	325	263 1 ..	5900	6485	6423 7 11	2220	1986	1985 2 1	3000	200	193	200	188	187 12 6
Naduvatam	3600	4090	4127 15 11	420	380	402 1 ..	8390	5654	4876 14 5	2872	2719	2686 1 3	1450	690	751 8 8	1100	1100	1089 13 6
Pykara	3215	3875	3861	500	400	400 12 6	6394	3859	3486 13 ..	870	675	587 1 ..	250	250	220 1 9	450	576	558 2 8
Quinologist's Department	6151	7051	7051 8 ..	..	..	.. ..	..	..	.. ..	..	..	.. ..	..	..	.. ..	..	..	.. ..
Total	28432	30986	30792 2 5	1320	1105	1065 14 6	20684	15998	14781 3 4	5962	5380	5258 4 4	4700	1140	1164 10 5	2050	1864	1835 12 8
20	5	5	7	5	5	7	5	5	7	5	5	7	7	7	9	7	7	3

(Continued)

Name of Plantation	Contingencies			Printing charges			Peons clothing			Travelling allowance			House rent			Factory			Total				
	Budget Estimate	Revised Estimate	actuals	Budget Estimate	Revised Estimate	actuals	Budget Estimate	Revised Estimate	actuals	Budget Estimate	Revised Estimate	actuals	Budget Estimate	Revised Estimate	actuals	Budget Estimate	Revised Estimate	actuals	Budget Estimate	Revised Estimate	actuals		
	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39		
Head office and General	700	700	699	14	11	40	40	37	11	12	12	12	..	..	1500	1500	1490	8	6	..	..	..	..	..	..	14,868	14,568	14376	2	5
Dodabetta	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	14.870	12.838	12668	2	..
Naduvatam	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1000	1675	1806	..	6	18. 832	16.308	15.740	7	3
Pykara	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	11, 679	9.635	9113	14	11
Cinnologists Department	9000	15000	16254	15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	600	600	600	..	..	15. 751	22.651	23906	7	..
Total	9700	15700	16954	13	11	40	40	37	11	12	12	12	..	..	1500	1500	1490	8	6	600	600	600	..	..	..	76,000	76,000	75,805	1	7

20 7 7 9 7 7 9 7 7 2 7 7 9

Coimbatore
29th July 1892

M. A. Lawson
Govt. Botanist & Director

No 4

Statement showing the Receipts and Expenditure of the Government Cinchona Plantations, Nilgiris for the official year 1891-92.

Receipts

Classification	Revised Estimate	Upto the end of the year
Sulphate of Quinine	47.200	49.016 10 5
Febrifuge	26.000	26.246 .. .
Bark Supplied to Madras Medical Department	255	255 .. ..
do do Bombay Medical Deptt	400	321 .. ..
do do Private parties & Mysore Durbar	500	462 13 6
Sale of seed & plants	100	258 2 ..
Percentage of the fees of Govt. Quinologist	45	17 12 9
Miscellaneous.	500	489 3 6
Total	75.000	77.066 10 2

Expenditure

Classification	A. Conservancy		B. Establishment		Total	
	Revised Estimate	Upto the end of the year	Revised Estimate	Upto the end of the year	Revised Estimate	Upto the end of the year.
Head office & General	2252	2240 2 5	12.316	12.136 .. .	14.568	14.376 2
Quinologist Deptt	15.600	16854 15 .	7.051	7.051 8 .	22.651	23.906 7
Dodabetta	9.184	9052 7 6	3.654	3.615 10 6	12.838	12.668 2
Naduvatam	12.218	11.612 7 4	4.090	4.127 15 11	16.308	15.740 7
Pykara	5.760	5.252 14 11	3.875	3.861 .. .	9.635	9.113 14
	45014	45012 15 2	30.986	30.792 2 5	76.000	75.805 1

Ootacamund
9th July 1892

M. A. Lawson
Govt. Botanist & Director

No 5.

Statement showing the quantity of C. Seeds and the number of C. plants sold to the Public during the official year 1891-92

Particulars	Seed lb.	Seed ozp.	plants.
Cinchona Candamirea	15	12	8,000
Do. Magnifolia	"	"	24,000
Do Succirubra	3	6	"
Total	19	2	32,000
	16	5	5

Ootacamund
9th July 1892

M. A. Lawson
Govt. Botanist & Director

No 6.

A. Statement showing the total yield of the Government Cinchona Plantations, Nilgiris, for the official year 1891-92

Name of Plantation	Species of Produce	Bark: Under stripping & moss-rig system: Number of plots	Under stripping & moss-rig system: Number of trees decorticated	Under stripping & moss-rig system: Out-turn of green bark	Uprooting: Number of plots	Uprooting: Number of trees decorticated	Uprooting: Out-turn of green bark	Coppicing: Number of Plots	Coppicing: Number of trees decorticated	Coppicing: Out-turn of green bark	Scraping: Number of Plots	Scraping: Number of trees decorticated	Scraping: Out-turn of green bark	Total number of trees decorticated	Total quantity of green bark collected	Quantity when dry	Seed	Propagation: Plants	Propagation: Seedlings	Propagation: Rooted cuttings
																lbs.				
Doddabetta	brown bark	..	..	..	..	..	..	12	202	2244	..	..	..	202	2244	747	23-6	..	..	..
Nadwatam	brown bark	2	1586	2908	1	340	3513	..	..	..	..	..	..	1926	6421	2140	..	..	..	..
	Red bark	1	1419	5956	9	12347	105596	..	..	..	..	..	2055	13766	113607	37868	..	..	..	..
	Magnifolia	2	136	425	..	..	..	..	..	..	..	..	..	136	425	142	..	..	..	..
Pykara	brown bark	..	..	..	1	421	3019	5	2507	27933	..	..	..	2928	30952	10317	..	..	..	..
	Red bark	..	..	..	..	..	..	1	175	7858	..	..	..	175	7858	2619	..	..	..	..
	Add the Balance on 31 March 1891															53833				
																510695				
	Total															564528				

Ootacamund
9th July 1892

M. A. Lawson
Govt. Botanist & Director

B. Statement showing the disposal of bark and other produce collected in the Government Cinchona Plantations Nilgiris, for the official year 1891-92

Name of Plantation	Species of produce	Bark: Used for Febrifuge + quinine — Bales	Bark: Used for Febrifuge + quinine — quantity	Bark: Sold in the country — Bales	Bark: Sold in the country — quantity	Bark: Supplied to Medical Departments — Bales	Bark: Supplied to Medical Departments — quantity	Bark: Total — Bales	Bark: Total — quantity	Seed: Sold to the Public	Seed: Used for nurseries	Seed: Total	Propagated plants + seedlings: Plants — Sold to the Public	Plants — Presented gratuitously to Public Institutions	Seedlings — Sold to the Public	Rooted cuttings — Transplanted	Remarks
		No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.	lbs.	lbs.	lbs.					
Dodabetta	Crown bark	1119	111900	..	..	8	800	1127	112700	15 3/4	..	15 3/4	5000	9000	..	..	..
	Magnifolia	4 3/4	476	..	..	..	..	4 3/4	476	..	..	..	..	..	..	..	..
Naduvatam	Crown bark	..	..	..	..	..	..	..	..	..	1	1	3000	..	..	..	..
	Red bark	220	22000	13 3/4	1370	10	1000	243 3/4	24370	3 3/8	..	3 3/8	..	..	..	..	..
	Magnifolia	101 1/4	10124	..	..	..	..	101 1/4	10124	..	..	..	..	..	..	..	..
Pykara	Crown bark	..	..	..	..	..	..	..	..	..	..	..	..	13925	..	..	..
	Magnifolia	..	..	..	..	..	..	..	..	..	..	..	24000	11275	..	..	..
									147670								
	add the balance on 31 March 1892								416858								
	Total								564528								

Dated the 9th July 1892

W. A. Lawson

Govt. Botanist + Director

No. 7

Statement showing the approximate number of plants in permanent plantations, Nilgiris, on 31 March 1892

Species	Dodabetta				Naduvattam				Hooker				Wood				Grand Total
	Plants last year	Coppices or uprooted	Planted in this year	Total	Plants in last year	Coppices or uprooted	Planted in this year	Total	Plants in last year	Coppices or uprooted	Planted in this year	Total	Plants last year	Coppices or uprooted	Planted in this year	Total	
C. Succirubra	..	..	..	..	48.602	12.347	..	36.255	3063	175	..	2888	..	..	..	..	39,143
C. Officinalis	585.191	202	9.000	593989	97.159	340	..	96.819	371.119	2928	13.925	382.446	..	..	..	..	1.073,254
C. Calisaya var Ledger	130	..	..	130	..	..	..	..	..	..	..	..	..	..	..	..	130
C. Calisaya other varieties	..	..	..	..	143	..	..	143	..	..	..	..	..	..	..	..	143
C. Micrantha	26	..	..	26	..	..	..	..	..	..	..	..	..	..	..	..	26
C. Pitayensis	43	..	..	43	..	..	..	..	..	..	..	..	..	..	..	..	43
C. Lanceolata	..	..	..	..	5	..	..	5	..	..	..	..	..	..	..	..	5
C. Carthagena	18	..	..	18	716	..	..	716	50	..	..	50	45	..	..	45	829
C. Santa Fé	9	..	..	9	3	..	..	3	..	..	..	..	..	..	..	..	12
C. Hybrid & others	61.806	..	..	61.806	269925	..	..	269925	281720	..	11275	292995	41.583	..	..	41.583	666,309
Total	647223	202	9000	656021	416553	12687	..	403866	656282	3103	25200	678379	41.628	..	..	41.628	1.779,894

Ootacamund
9th July 1892

N. L. Law
Asst. Botanist & Director

24

No 8

Comparative Statement showing the quantity of bark of all sorts in store at the commencement of the year 1891-92, collected and disposed of during the year, and remaining in store at its close.

1890-91

Description of bark	Quantity in store at the commencement of the year							Collected during the year	Total	Disposed of during the year			
	Crop of 1883-84	Crop of 1885-86	Crop of 1886-87	Crop of 1887-88	Crop of 1888-89	Crop of 1889-90	Total			Crop of 1885-86	Crop of 1886-87	Crop of 1887-88	Total
1	2	3	4	5	6	7	8	9	10	11	12	13	14
		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Crown bark	..	..	43.676	53.813	82.233	74.058	253.780	76038	329.818	..	43.676	53.324	97.000
Red bark	.	40.713	28.981	35056	26.009	68.568	199.327	57.313	256.640	3.400	..	..	3.400
Magnifolia	900	340	..	3.877	1920	17.600	24.637	..	24.637	..	..	..	..
Total	900	41053	72657	92.746	110.162	160.226	477744	133351	611.096	3.400	43.676	53.324	100.400

25

Description of bark.	1890-91 Balance at the close of the year								1891-92 Quantity in store at the commencement of the year								Collected during the year	Total
	crop of 1883-84	crop of 1885-86	crop of 1886-87	crop of 1887-88	crop of 1888-89	crop of 1889-90	crop of 1890-91	Total	crop of 1883-84	crop of 1885-86	crop of 1886-87	crop of 1887-88	crop of 1888-89	crop of 1889-90	crop of 1890-91	Total		
	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Brown bark	-	..	..	489	82.233	74.058	76038	232.818	..	..	..	489	82.233	74.058	76038	232.818	13.204	246.022
Red bark	-	37.313	28981	35056	26.009	68.568	57.313	253.240	..	37.313	28.981	35056	26.009	68.568	57.313	253.240	40.487	293.727
Magnifolia	900	340	..	3877	1.920	17.600	..	24.637	900	340	..	3.877	1920	17.600	..	24.637	14.2	24.779
Total	900	37.653	28981	39422	110.162	160.226	133351	510.695	900	37.653	28.981	39.422	110.162	160.226	133.351	510.695	53.833	564.528

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Description of bark	1891-92 Disposed of during the year						Balance at the close of the year							
	crop of 1883-84	crop of 1885-86	crop of 1887-88	crop of 1888-89	crop of 1889-90	Total	crop of 1885-86	crop of 1886-87	crop of 1887-88	crop of 1888-89	crop of 1889-90	crop of 1890-91	crop of 1891-92	Total
	33	34	35	36	37	38	39	40	41	42	43	44	45	46
Brown bark	..	..	489	82.233	29.978	112.700	..	..	..	..	44080	76038	13.204	133.322
Red bark	..	24.370	..	..	..	24.370	12.943	28.981	35056	26009	68.568	57.313	40.487	269.357
Magnifolia	900	340	3877	1920	3563	10.600	..	..	..	..	14.037	..	142	14.179
Total	900	24.710	4366	84.153	33.541	147.670	12.943	28.981	35056	26009	126685	133351	53833	416.858

Ootacamund
9th July 1892

M. A. Lawson
Govt. Botanist & Director

№ 9.

Statement showing the particulars of cinchona bark disposed of during the year 1891-92

Particulars	Product of 1883-84		Product of 1885-86		Product of 1887-88		Product of 1888-89		Product of 1889-90		Total	
	Pound.	Value realized	Pound.	Value realized	Pound.	Value realized	Pound.	Value realized	Pound.	Value realized	Pound.	Value realized
cinchona bark used for the manufacture of quinine and Solid febrifuge	900	.. .. ..	24.710	.. .. ..	3366	.. .. ..	81,983	.. .. ..	33,541	.. .. ..	144,500	.*
cinchona bark supplied to Madras Medical Department	..	.. .. ..	..	.. .. ..	1000	255	..	.. .. ..	..	.. .. ..	1000	255 .. ..
cinchona Bark supplied to Bombay Medical Department	..	.. .. ..	..	.. .. ..	..	.. .. ..	800	321	..	.. .. ..	800	321 .. ..
cinchona bark supplied to Mysore Durbar & private parties	..	.. .. ..	..	.. .. ..	..	.. .. ..	1370	349 10 10	..	.. .. ..	1370	349 10 10
Total	900	.. .. ..	24.710	.. .. ..	4366	255	84153	670 10 10	33541	.. .. ..	147670	925 10 10

.* Value of 4425 lbs 14 ozs of S. quinine @ Rs 14-11-3 per pound = Rs 65,074-3-1

Do of 3174 lbs of Febrifuge @ Rs 10 per pound = 31,740-0-0

96,814-3-1

Ootacamund
9th July 1892

M. A. Lawson

Govt. Botanist & Director

№ 10.

28

Statement showing the particulars of Sulphate of quinine and Cinchona febrifuge manufactured and disposed of during the year 1891-92

Particulars	Quantity in store at the commencement of the year	Manufactured during the year	Total	Disposed of during the year					Drygage	Balance at the close of the year including paper packets
				To Madras Medical Department	To Bombay Medical Department	To Colombo	To Ingeore Durbar Private persons & paper packets to Collectors	Total		
	lbs.	lb. oz.	lb. oz.	lb. oz.	lb. oz.	lb. oz.	lb. oz.	lb. oz.	lb. oz.	lb. oz.
Sulphate of Quinine	1572	4425- 14	5997- 14	1500- -	800- -	1000- -	44- 10	3344- 10	- 10	2652- - 10
Solid Febrifuge	1200	3174- -	4374- -	1500 -	1500- -	- -	17- -	3017- -	2 -	1355- -

16-2 Cinchona 5- 5- 2 4 21 4 4 2 4 4

Ootacamund
2nd July 1892

M. A. Lawson
Govt: Botanist & Director

Ootacamund
24th June 1892.

From

D Hooper Esqr
Govt Quinologist

To

M. A. Lawson Esqr
Govt Botanist and Director of the
Govt Cinchona Plantations
Nilgiris

Sir,

I have the honor to make the following report on the analytical work conducted in the laboratory during the year ending 31st March 1892.

My visits to the Quinine Factory have not been so frequent as in former years, but several samples of bark have been sent in for analysis from the Dodabetta and Naduvatam Plantations, and the products of manufacture have been constantly tested as to their purity. The Sulphate of quinine has responded favorably to the chemical tests, it contained only a trifling amount of sulphate of Cinchonidine, and its appearance and solubility were all that could be desired. The febrifuge has

Statement No 1 to letter
No 38 of 9 July 1892 from
the Government Botanist
and Director of Govt
Cinchona Plantations
Nilgiris, to the Secre-
tary to Government
Revenue Department
Fort St George.

Statement showing the Administration
Report of the Government
Cinchona Plantations, Nilgiris,
for the years 1891-92.

has been made by the oil process, and has been somewhat lighter in colour than when the factory was first started.

Some interesting barks have been analysed during the year, and the results are given in the following table. The majority of the barks are from hybrid trees, a number of which are grown at Nadiwatam and are gradually replacing the poorer Succirubras or red bark trees. It is difficult to tell the value of hybrid trees except by analysis, as the variable habit of these trees is accompanied by a variable alkaloidal Composition, and some trees having the habit of a Succirubra contain a good amount of quinine in their bark, while others with the appearance of an officinalis sometimes contain a preponderance of the inferior alkaloids characteristic of the Succirubra. Some of the hybrids were very rich in quinine, exceeding the amount found in the best Crown

Crown barks, and knowing that these trees are faster growers, and have a thicker bark, their cultivation is more profitable. Some of the better kinds of hybrids are being propagated by cuttings from analysed trees, and it will be interesting to observe the success of these experiments when the young plants are sufficiently developed. Following is a description of the different barks analysed:-

1 Hybrid bark marked "Magnifolia" from Nadiwatam

2 Bark from smooth-leaved officinalis type of hybrid.

3 Magnifolia hybrid with pubescent leaves.

4 Officinalis type of hybrid, 10 years old.

5 Officinalis type of hybrid 9 years old,

6 Magnifolia hybrid from Dodabetta, 4 years old.

7 Officinalis hybrid from Nadiwatam.

8 Natural Magnifolia bark, 20 years old.

9 Mixed Hybrid thinnings from Chinamreslina

10 Hybrid Nadiwatam.

11 Succirubra hybrid.

12 Succirubra hybrid 9 years old.

13 Crown bark from an old tree Dodabetta.

14 Ledgeriana variety of C. officinalis.

	Quinine	Cinchonidine	Quinidine	Cinchonine	Amorphous Alkaloid	Total	Sulphate of Quinine
1	5.82	1.29	—	.55	.60	8.26	7.83
2	5.18	1.18	.23	.10	.45	7.14	6.97
3	4.85	4.20	—	.42	.71	10.18	6.52
4	3.18	2.08	—	.42	.48	6.16	4.28
5	2.69	2.07	—	.56	.47	5.74	3.59
6	2.45	1.19	—	.40	.32	4.36	3.30
7	2.40	.93	.14	.29	.34	4.10	3.23
8	2.28	1.91	.09	.34	.42	5.04	3.07
9	2.28	1.98	—	1.40	.42	6.08	3.07
10	2.26	.87	—	1.34	.52	4.99	3.04
11	1.95	1.75	.04	.91	.61	5.26	2.62
12	1.40	1.95	—	.88	.41	4.64	1.88
13	5.75	1.15	.16	.27	.30	7.60	7.73
14	4.21	1.66	—	.43	.51	6.81	5.66

17= 5- 5- 5- 5- 6 5- 5-

These are only a selection of the barks analysed during the year. It will be seen that the Sulphate of quinine ranges from 7.83 per cent in No. 1 to 1.88 per cent in No. 12, and the last named, with respect to

to its alkaloids, generally yields its maximum at this age. As an instance of the variation in the value of these trees No. 6 from a 4 year old tree contains more quinine than the sample No. 8 taken from a 20 year old tree, and this shows the importance of ascertaining the quality of a bark when it is young and preventing the mistake of Cumbering the land with very poor trees. The average analysis of barks from some young plots has given quinine to be over 3 per cent, but as the harvesting was made from the poorer and smaller trees, the succeeding Crops will be much richer. It is satisfactory to find such old trees, as represented by No. 13, yielding such rich bark, but it is only what should be expected if the trees are treated to manure. The estates are now being subjected to a course of systematic manuring and the effect is felt in the barks affording more alkaloids. If trees are allowed to grow for many years

without their roots being artificially fertilized, the quinine in the bark is sure to deteriorate and the tree itself will show signs of decay. This rule does not only apply to the slow growing species of officinalis, but also, and more emphatically to the fast growing hybrids which are more exhausting to the soil.

Astringent barks. Two years ago I reported on the analysis of a large number of astringent barks from Indian trees, some of them never before analysed. Since then further opportunities have been given of examining other barks, to ascertain the amount in them of tannic acid or other principle having a similar action. The bark of Anogeissus latifolia has hitherto been supposed to be one of the most astringent drugs, but I have recently found that a bark much stronger in tannin is derived from the Bridelia montana a tree belonging to the

the natural order Euphorbiaceæ. This species of Bridelia is common on the ghauts of the Nilgiris and in other parts of India. It is well known as a valuable astringent in Western India, and is used by the Goanese in certain diseases. Some years ago in Orissa a case of poisoning was traced to the employment of this bark. The tanners of this country, however, do not seek after drugs very rich in tannin as the quality of the tannin present appears to be the criterion of the value, and the bark of the Tangeon tree (Cassia auriculata) which contains only 11 per cent of tannin, is used more than any other bark in South India, of the other barks in this table, Casuarina bark is used in Madras as a dye and tan, and Myrica nagi bark is largely used by Mahomedans and Hindus in the north in medicines where astringents are required. Some of the

the fig barks have been chemically investigated during the year and as some of them contain tannin, they are included in the list

	Tannin	Water Extract	Ash	Colour with Iron Salts
Bridelia montana	39.9	41.7	7.3	blue black
Acacia pycnantha	33.8	46.7	3.5	" "
" decurrens	33.4	44.8	3.2	" "
Randelia Rheedii	27.4	45.5	9.1	" "
Acacia melanoxylon	26.8	34.2	4.1	" "
Macaranga tomentosa	18.4	22.2	11.0	" "
Casuarina equisetifolia	18.3	22.1	9.5	" "
Acacia dealbata	17.8	32.1	5.3	" "
Mangifera indica	16.7	32.9	6.3	" "
Ficus racemosa	14.1	20.5	12.2	greenish
Myrica Nagi	13.7	27.0	7.1	blue black
Diospyros embryopteris	12.4	19.9	4.9	" "
Ficus Medica	10.9	17.2	8.0	greenish
Bleeggea leucopyrus	10.3	20.5	3.5	blue black
" microcarpa	8.9	18.3	11.4	"
Ficus gibbosa	4.3	10.4	15.0	greenish
Curculigo orchioides (root)	4.1	19.9	8.6	"
Ficus religiosa	3.8	12.3	11.7	"
Ficus hispida	2.1	11.7	13.6	"

Wattle barks — The Australian acacias or wattles introduced in the Hills many years ago have firmly established

established themselves, but nothing seems to be done, as in Australia, in collecting the bark as a Commercial article. It is true that the Common forms of Wattle (A. melanoxylon and A. dealbata) are more plentiful on the Hills than those species A. decurrens and A. pycnantha which yield rich tanning barks, but wherever the better species have been planted they have grown vigourously and well, and the bark is equally rich in tannin as that from trees growing in Australia. The price of good Wattle bark is £10 per ton in the English market, and the market is supplied exclusively from Australia. A sample of bark from some acacia decurrens grown on the Nilgiris was forwarded a few months ago to London for valuation. The reply stated that the sample of bark was in good Condition and rich in tannin, but as buyers were in the habit of procuring their bark from a certain country, in regular quantities, there would be a

a prejudice in receiving it from a new source such as the East Indies, & there is nothing to guarantee their receiving a regular supply of the same quality. Tanners do not like changing the materials they employ, and English and Continental firms after obtaining Wattle barks from the Australian Colonies for nearly a century are apt to look with suspecion upon other Wattle barks. I have obtained the following results in analysing the barks of the Nilgiri grown acacias:-

A. pycnantha	33.8 per cent tannin
A. decurrens	33.4 " "
A. melanoxylon	28.6 " "
A. dealbata	17.8 " "

The Samples of pycnantha and decurrens were from a private estate near Dodabetta. The melanoxylon was from a good sized tree after it had been cut up in logs for firewood, and represents the strength of the bark found on the majority of the

final

fuel used in Ootacamund. The dealbata was a fresh sample from some young bushes of the very common yellow-flowering species. All these have an astringent principle of the same chemical characteristics, which I feel assured is the same as that found in the trees grown in their own native Country. I have also made extracts or "tannage" from these barks, preparations which hold the virtues in a Concentrated form, and much better than the crude bark for exporting. There is a good market in Europe for well prepared Wattle bark extract, and the demand has been on the increase during the last few years.

Literary Work. During the year the 4th and 5th parts of "Pharmacographia Indica" have been published, and we are now engaged with the 6th and last part, a complete index and an appendix. It is with sincere regret that Mr. Warden and I have to record the death of the senior editor on the 30 April last at

at Bombay - Dr. Dymock was the greatest authority on indigenous drugs in this Country and for many years he has encouraged original research by supplying large quantities of authentic specimens for chemical and physiological investigation. His classical knowledge, and acquaintance with Sanskrit, Arabic, and Persian writers, his botanical and medical experience contributed to make him particularly fitted for the work he was engaged in, and in other parts of the world besides India many will be sorry that he was not permitted to live to see the completion of the work. Last year "The Materia Medica of Madras" was published by the Government Press and on account of the death of Dr. Mohideen Sheriff the author early in the year I read through and corrected the proof sheets. The book only deals with one-third the number of known drugs, and being incomplete and not containing the results of recent workers in the field of Materia Medica, the

work

work is not of much value either as a text-book or book of reference. It shows what an interest in native remedies was taken by a native gentleman, and the author was an example of an industrious investigator who might well be followed by others of his colleagues in India.

I have the honor to be
Sir
Your Most obedient Servant
D. Hooper.
Government Quinologist

Enclosure No. III
to letter No. 38 of 9 July 1892
from the Govt. Botanist and
Director of Govt. Cinchona
Plantations Nilgiris to
the Secretary to Government
Revenue Department
Fort St George.

Quinologist's Report
for the Year ending
31st March 1892.

Rec'd 13 July 1892.

No. 38 1791

DIRECTOR'S OFFICE,
OOTACAMUND, 9th July 1892.

From

M. A. LAWSON, Esq.,

GOVERNMENT BOTANIST AND DIRECTOR OF
GOVERNMENT CINCHONA PLANTATIONS, &c.,

Nilgiris.

To The Secretary to Government
Revenue Department
Fort St George

Sir,

I have the honor to submit the Annual Report on the Government Cinchona Plantations, Nilgiris, for the year ending 31st March 1892.

I have the honor to be
Sir
Your Most obedient Servant
M. A. Lawson
Govt. Botanist & Director

995 Dept

REVENUE 1892, ~~CINCHONA~~.

Current Number 6156.

From

M. A. LAWSON, ESQ.,

GOVERNMENT BOTANIST AND DIRECTOR OF

GOVERNMENT CINCHONA PLANTATIONS;

Nilgiris.

To The Secretary to Government
Revenue Department
Fort St George

No. 38

Dated 9/7
Despd. 9/7
Recd. 11/7

July 1892

GOVERNMENT OF MADRAS
REVENUE DEPARTMENT
11 1892

ENCLOSURES — 3

SUBJECT.

Annual Administration Report on the Government Cinchona Plantations, Nilgiris
Submitting the
for the year ending 31st March 1892.

(Mail) 11/7
not seen by me.
ttk 22/11/92

95

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

READ—the following letter from M. A. LAWSON, Esq., Government Botanist and Director of Government Cinchona Plantations, &c., Nilgiris, to the Secretary to Government, Revenue Department, dated Ootacamund, 9th July 1892, No. 38:—

I have the honour to submit the Annual Report on the Government Cinchona Plantations, Nilgiris, for the year ending 31st March 1892.

Minute
Committee for
Mr Lawson
Ah.

ADMINISTRATION REPORT OF THE GOVERNMENT CINCHONA DEPARTMENT, NILGIRIS, FOR THE YEAR 1891-92.

CONTENTS.

I. Season and Rainfall—
(a) Dodabetta.
(b) Naduvatam.
(c) Pykara—
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(2) Wood Plantation.
II. Financial—
(a) Receipts.
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III. General condition—
(a) Dodabetta.
(b) Naduvatam.
(c) Pykara—
(1) Hooker Plantation.
(2) Wood Plantation.
IV. Upkeep.
V. Manure.
VI. Nurseries.
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X. Mr. Hooper's report.
XI. Miscellaneous—
(a) Supply of sulphate of quinine to Ceylon.
(b) Issue of quinine in paper packets.
(c) Reduction in the price of quinine in paper packets.
(d) Removal of the Quinologist's Laboratory to Kelso Villa.
(e) Fodders.
(f) Investigations into the nauseating principles of cinchona febrifuge.
(g) Service books.

I. SEASON AND RAINFALL.—The rainfall on all the estates was below the average for the last ten years, but, with the exception of Dodabetta, was much greater than that which fell during the previous year. The rainfall in October was unusually heavy all over the plateau, the amount registered being—

	INCHES.
Dodabetta	15·94
Wood	10·66
Hooker	10·95
Naduvatam	10·64

There was no unusual drought on any of the estates during the year. On all the western estates heavy rain fell on the last day of February; good rains also occurred in March. Frost did little damage. The weather was again remarkable for its comparative stillness, there being no excessively high winds, or violent storms. The season, taken as a whole, was a good one.

(a) *Dodabetta.*—On this estate the quantity of rain registered during the year was 46·33 inches, or 7·76 inches less than the average for the past ten years.

(*b*) *Naduvatam.*—The amount of rain registered here was 100·84 inches. July and August were the wettest months, but not abnormally so. The amount of rain which fell was nearly up to the average of the last ten years.

(*c*) *Pykara*—(1) *Hooker.*—The rain registered on this plantation was 75·56 inches, or 21·02 inches less than the average for the past ten years.

(2) *Wood.*—62|75 inches of rain were gauged here, and this was 17·35 inches below the average.

II. FINANCIAL—(*a*) *Receipts*—In October 1890, when framing the budget estimate of receipts for 1891–92, it was calculated that Rs. 40,000 would probably be realized during the year; but this, at the time, was more or less a guess. In G.O., No. 886 of 7th November 1890, Revenue, Government raised this sum to Rs. 60,000. The revised estimate for the year was fixed at Rs. 60,600, this amount having been actually paid into the treasury, but in consequence of subsequent indents for quinine and febrifuge having been received, this was raised to Rs. 71,000; but in G.O., No. 1116 of 23rd November 1891, when passing the revised estimates for the year, Government raised the estimate again to Rs. 75,000. Against this anticipated income the actual receipts aggregated Rs. 77,066–10–2, detailed thus:—

	RS.	A.	P.
Value of quinine supplied to the Medical Stores Departments of Madras, Bombay and Ceylon, &c.	49,016	10	5
Febrifuge supplied to the Medical Stores of Madras, Bombay and Cochin, &c.	26,216	0	0
Bark sold to Medical Stores, Madras and Bombay	576	0	0
Bark sold to Mysore Durbar, &c	462	13	6
Miscellaneous sale of seed and plants, percentage of fees of Government Quinologist, &c.	765	2	3
Total ...	77,066	10	2

The actual receipts were thus Rs. 2,066–10–2 above the revised estimate.

(*b*) *Expenditure.*—In G.O., No. 886 of 7th November 1890, Revenue, Government sanctioned Rs. 76,000 as the budget estimate for the year; and in G.O., No. 1116 of 23rd November 1891, Revenue, Government accepted the same figure as the revised estimate. The actual expenditure was Rs. 75,805–1–7, which was Rs. 194–14–5 less than the budget and revised estimates. This was mainly due to savings, resulting from the clerk at Naduvatam being on deputation at the Census office, Madras. Out of the expenditure for the year of Rs. 75,805–1–7, the Quinologist's Department cost Rs. 23,906–7–0, and the maintenance of the general establishment and the upkeep of the estates Rs. 51,898–10–7.

The financial result of the working of the department for the year may be shown as follows:—

	RS.	A.	P.
Receipts	77,066	10	2
Expenditure	75,805	1	7
Balance ...	1,261	8	7

III. GENERAL CONDITION (*a*) *Dodabetta.*—Nearly the whole of this estate has been either trenched or pitted, and manured; and may be said to be in very good condition. Considerable damage was, however, done to some of the plants put out last season by grub; and in one plot no less than two out of every three were destroyed.

During the present season the pits in which the plants are to be put out will be freely manured with quick-lime, in the hope that this may kill the grubs.

(*b*) *Naduvatam.*—The trees on that part of the estate which was trenched and manured two years ago are doing well, and the amount of quinine in them has been increased. The trees about the Chinamen's lines have been thinned out, and the ground on which they stand has been trenched, and it is expected they will be fit for

barking next year. Taken altogether, the estate has much improved during the past twelve months. Ten acres of old succirubras were uprooted in January and February last. These trees were very old and bad, and only yielded 40,150 lb. of dry bark, and this too of a very inferior quality, from a manufacturing point of view. The ground uprooted was replanted in March and April. This is much earlier than customary; but it is in accordance with horticultural principles, and the result so far has proved satisfactory.

(*c*) *Pykara* (1) *Hooker.*—Trenching and manuring have been the chief operations carried out on this plantation during the year. The trees on Hooker are like young children, whose sole duty for the next few years will be to grow.

(2) *Wood.*—Nothing particular has to be noticed about this plantation. The trees planted out some years ago are coming on well.

IV. UPKEEP.—The usual work connected with upkeep has been properly attended to during the year, and all the buildings, roads, bridges, drains, &c., have been well maintained, and are in good order.

V. MANURE.—At Dodabetta 400 cart-loads of cattle manure were made in the estate, and 1,394 cart-loads were obtained from outside. At Naduvatam 200 cart-loads were used during the year, and at Hooker 650 were put into the trenches and pits.

VI. NURSERIES.—Particular attention has been paid during the last few years to the harvesting of cinchona seed, and to the raising of the young plants in the nurseries. It has been often stated that the seed of cinchona is deteriorating, and this may be true in certain cases; but experience would tend to show that when the seed is collected from healthy trees, and taken only when quite ripe, it is perfectly sound; that it germinates freely, and produces vigorous plants. The cause of the great mortality which used to take place in the Government nurseries in former years was due to the seed being grown in too damp a soil, and to the plants being over-shaded and over-watered. Also the plants were put out in the beds far too close to each other; formerly the seedlings were pricked out at distances of two inches by one and-a-half; they are now pricked out at distances of 4 inches by 4. This allows all the plants to become well developed before they are transplanted into the field.

During the last and present seasons the plants have been put out on the estate very much earlier than has been customary heretofore. Last year the greater part of the planting was completed by the end of May. During the present season twenty plants were put out into the field on the last day of February as an experiment: 1·30 inches of rain had fallen the night before; the plants were lifted by means of a trans-planter and wrapped in paper before being removed from the nurseries; and after it had been planted each received a little water to settle the earth about the roots, and they were then shaded by ferns in the usual way. Out of these 20 plants 13 survived, and these at the time of writing are healthy and growing plants. The next heavy rain that fell was on the last day of March; and on the following day, the 1st April, 200 were transplanted from the nursery into the field; by the end of May all these, with the exception of seven, were not only alive, but were well established, and had made a fresh pair of leaves. More rain fell about the middle of April, and the planting of the whole of the 14-acre plot, which had been uprooted, was begun on the 19th; the planting was carried on daily without any intermission and regardless of the weather, which indeed as a rule was bright and dry, and the whole of the plot was finished before the end of the first week in May. Those plants put out during bright sunshine have thriven quite as well as those put out when the weather was cloudy or wet. It is as yet too soon to say how these plants will withstand the wild weather of the monsoon, but up to the present time the mortality in the field has been very low, and the plants look hard and healthy, though the growth which they have made has been small.

The advantage of planting as early as possible in the season is obvious, as was pointed out in the last year's report.

> "By planting at this early date, owing to the warmth of the soil, the plants become well rooted before the monsoon bursts upon them, and so they get the advantage of having two growing seasons before the commencement of the dry months of winter and spring."

The pits in the field are manured with a mixture of old cattle manure, lime, and wood ashes in the proportion—

1. Cattle manure	20 parts.
2. Lime „	1 part.
3. Wood ashes ~~manure~~	½ „

and of this mixture, a quarter of a bushel is well mixed with the earth in each pit.

19 lb. 2 oz. of cinchona seed were sold to the public during the past year, and this consisted chiefly of Cinchona officinalis and Dodabetta hybrids; the same as has been planted out so largely at Naduvatam. Eight thousand plants of Cinchona officinalis and 24,000 Dodabetta hybrids were also sold.

VII. Crop.—The crop taken during the year amounted to 53,833 lb. of bark, apportioned thus—

	LB.	LB.
Dodabetta.		
Crown bark	747	747
Naduvatam.		
Crown bark	2,140	
Red bark	37,868	
Magnifolia	142	
		40,150
Pykara.		
Crown bark	10,317	
Red bark	2,619	
		12,936
		53,833

At the close of last year there remained in stock 510,695 lb., making a total of 564,528 lb. Of this, 147,670 lb. of bark were disposed of during the year thus—

	LB.
Used in the factory for the manufacture of quinine and febrifuge...	144,500
Issued to the Madras Medical Stores Department	1,000
Do. to the Bombay Medical Stores Department	800
Sold to Messrs. Kemp and Co., Bombay	1,120
Do. to the Mysore Durbar	250
Total ...	147,670

There remained, therefore, at the close of the year 416,858 lb. in stock. The estimated output of bark for the year was 70,000 lb.—*vide* G.O., No. 1116 of 23rd November 1891, Revenue, but as there was no need to take this amount, nor indeed any, the quantity taken was governed by the needs of the plantations only, that is, bark was only taken from such trees as had passed their prime, and which it was desirable should be uprooted, and ground on which they stood replanted.

VIII. Buildings.—The repairs and additions to the several buildings on the various estates were carried out at a cost of Rs. 1,835-12-8, detailed thus—

	RS.	A.	P.
Dodabetta	187	12	6
Naduvatam	1,089	13	6
Pykara	558	2	8
Total ...	1,835	12	8

IX. Factory.—Continuous work in the factory commenced at the end of August last and went on without any interruption till the end of March, when all the buildings were closed for a fortnight for repairs and cleaning.

During the year 4,425 lb. 14 oz. of sulphate of quinine were manufactured. At the close of the last year there were 1,572 lb. in stock, making in all 5,997 lb. 14 oz. Of this quantity 3,345 lb. 4 oz. were issued as follows:—

	LB.	OZ.
Supplied to the Madras Medical Stores	1,500	0
Do. Bombay do	800	0
Do. Ceylon do.	1,000	0
Miscellaneous sale of quinine, &c.	18	12½
Issue of 370 paper packets of quinine	26	7½
Total ...	3,345	4

and there were thus 2,652 lb. 10 oz. left in stock at the close of the year.

Of febrifuge there was manufactured during the year 3,174 lb., and at the beginning of the year there were 1,200 lb. in stock, making in all 4,374 lb., of this quantity 3,019 lb. were issued thus:—

	LB.
Madras Medical Stores Department	1,500
Bombay do. do.	1,500
Cochin Government	16
Residency Surgeon, Bangalore, &c.	3
Total ...	3,019

and there remained, therefore, in stock at the end of the year 1,355 lb.

Taking the price of the quinine at Rs. 13-6-0 per lb. and that of the febrifuge at Rs. 10, the present value of these drugs will be Rs. 49,658-13-9 shown thus:—

	RS.	A.	P.
Value of 2,652 lb. 10 oz. quinine at Rs. 13-6-0 per lb. ...	35,478	13	9
Do. of 1,355 lb. of febrifuge at Rs. 10 per lb.	13,550	0	0
Do. of 630 packets at Re. 1 each	630	0	0
Total ...	49,658	13	9

X. Mr. Hooper's Report.—It will be seen from this report that the quinine and febrifuge turned out from the factory are good; and there is no doubt that the quality and appearance of both have been considerably improved during the past year.

XI. Miscellaneous—(*a*) *Supply of Sulphate of Quinine to Ceylon.*—The Government of Ceylon was supplied with quinine for the last two years by this department. Recently, however, they have discontinued getting it, finding it more convenient to procure it direct from England.

(*b*) *Issue of Quinine in paper packets.*—The sale of quinine in paper packets has increased during the year in most of the districts, but to no considerable extent. From one district the whole of the packets were returned with the remark that "next to no use is made of this medicine in this district."

The following extract from the *Rangoon Times* is copied from the *Chemist and Druggist* of the 28th May 1892, page 779:—

Government versus *private quinine in India.*—The *Rangoon Times* adversely criticises the refusal of the Indian Government to sell the quinine made in its factory to any persons but Government officials, and says in Burma, pre-eminently a feverish province, it would be a boon to many engaged in the country to be able to purchase quinine from Government. Many Europeans and thousands of Burmans work in the forests for private individuals and firms, large numbers are also employed in exploiting minerals and oil, and many others are engaged on railway construction and road-making for the Government. The majority of these undertakings are in the most sickly parts of the province, and much inconvenience is experienced from those engaged in them falling ill. If those engaged in private enterprise were allowed to purchase the Government quinine at the rates at which it is sold to Government officers, a great deal of sickness in Burma would be avoided and the province itself greatly benefited. It is possible that private individuals can obtain Government quinine by getting it through Government officers if they are able

to show just and sufficient cause why they should be supplied, but such a course is undesirable for many reasons. In Madras we believe planters and private individuals are at liberty to purchase quinine in certain quantities from the Naduvatam factory. The English quinine makers, however, are about, it is rumoured, to protest against a continuance of this practice.".

Up to the present time the Government quinine has been sold only to planters and other persons where it has been ascertained that it was the intention of the purchaser to administer the whole of it to the coolies on his estates, and none has been sold to the public direct; but whether or not it would not be right to sell the quinine at the same rates at which it is sold to Government officials to such persons as are indicated in the above paragraph is a matter for Government alone to decide. That a sale of cheap quinine or febrifuge in Burma would tend to increase the consumption of these drugs there can be little doubt; and the officials superintending the different works now being carried on in Burma are the very persons to whom the introduction of quinine into the country could be best entrusted. In order to prevent any abuse being made of the privilege to buy the Government quinine cheap and to ensure its being all consumed by the people for whom it is intended, the quinine might be issued colored with some distinctive tint.

(*c*) *Reduction in the price of quinine in paper packets.*—In their letter, dated 3rd December 1891, No. 2486-128, the Government of India stated that they thought the price of 3 pies per powder of five grains was too much and that this price ought to be reduced. In consequence of this Government consented to reduce the price to 2 pies and to throw in gratis one jalap powder to every ten of quinine, the packets themselves being reduced to one rupee. It is to be hoped that this reduction may have some effect; but as has been pointed out by the Surgeon-General, the sale of the powders depends quite as much, or perhaps even more, upon the interest which officials of the lower grades take in distributing the medicine than in the reduction of the price at which it is to be sold. The cost of the powders, as at present sold, is a trifle under the cost of production.

(*d*) *Removal of the Quinologist's Laboratory.*—The Quinologist's laboratory has been removed from "Oakend" to Mr. Hooper's own house "Kelso Villa."

(*e*) *Fodders.*—The question of providing good fodder for horses and cattle in large quantities on these hills has been touched upon so often in these reports that it is feared a return to the subject may be considerd tedious; nevertheless, where so many horses are kept for military purposes, for racing, for hunting and for purposes of draught, it is a subject which ought not to be lost sight of. Hitherto grass and hay have been sold by this department at cost price simply with the view of making people acquainted with the fact that grass of good quality and in great abundance may be obtained at a reasonable price if they only choose to insist upon having it; no advance, however, during the last eight years has been made in this direction; and the sale, even at cost price, has, therefore, been discontinued. In riding from Musnagoody to Sigur in the early part of January last the horses were up to their girths for several miles in yellow waving straw. If this had been cut a month earlier it would have produced several hundreds of tons of very respectable hay; but the negligence or apathy of everybody around allowed it to be wasted. Small sympathy can be felt for people whose cattle die of starvation when a little trouble and forethought would keep them in plenty during the dry months of the year.

(*f*) *Investigations into the nauseating properties of cinchona febrifuge.*—Investigations with the assistance of Surgeon-Major J. Maitland, M.D., are being made into the cause of the nauseating properties of cinchona febrifuge, but some months will yet be required before a conclusion can be arrived at. All that can be said at present is that certain kinds of febrifuge seem to be as non-nauseating as the sulphate of quinine itself.

(*g*) *Service books.*—All the service books of the establishment have been kept duly written up.

OOTACAMUND,
9th July 1892.

(Signed) M. A. LAWSON,
Govt. Botanist and Director.

ENCLOSURES.

No. 1.

STATEMENT showing the rainfall at the several Government Cinchona Plantations, Nilgiris, during the official year 1891-92.

Months.	Dodabetta.				Naduvatam.			
	1890-91.		1891-92.		1890-91.		1891-92.	
	Rainfall.	Number of wet days.	Rainfall.	Number of wet days.	Rainfall.	Number of wet days.	Rainfall.	Number of wet days.
1	2	3	4	5	6	7	8	9
April	6·00	13	2·47	7	8·26	12	3·92	7
May	4·77	13	4·38	13	5·34	14	5·98	16
June	4·66	24	3·77	16	14·45	23	9·26	22
July	4·35	17	6·57	24	17·06	25	46·82	30
August	8·22	24	2·98	13	9·82	23	16·93	25
September	2·67	11	1·45	9	5·84	21	3·13	14
October	9·89	16	15·94	27	5·52	16	10·64	19
November	3·57	9	5·88	7	1·49	8	2·41	3
December	1·50	3	2·73	15	0·51	3	0·55	2
January	0·25	2	0·00	..	0·10	2	0·00	..
February	1·62	4	0·12	3	1·19	4	0·00	..
March	0·63	3	0·04	1	0·00	..	1·20	1
Total ..	48 13	139	46·33	135	69·58	151	100·84	139

Months.	Hooker.				Wood.			
	1890-91.		1891-92.		1890-91.		1891-92.	
	Rainfall.	Number of wet days.	Rainfall.	Number of wet days.	Rainfall.	Number of wet days.	Rainfall.	Number of wet days.
	10	11	12	13	14	15	16	17
April	6·93	18	2·57	6	4·67	16	2·66	7
May	5·44	16	6·71	15	4·35	15	5·77	14
June	11·23	22	7·79	20	7·66	23	6·50	19
July	12·29	22	33·76	29	9·32	22	25·68	28
August	9·15	22	8·70	23	7·18	21	6·62	23
September	6·01	17	1·41	13	4·31	16	1·07	14
October	5·88	13	10·95	23	5·95	13	19·66	22
November	1·54	7	1·52	6	2·03	9	1·51	5
December	0·74	3	1·60	5	0·66	2	1·84	5
January	0·16	2	0·00	..	0·17	1	0·00	..
February	1·40	5	0·13	1	0·59	6	0·19	2
March	0 02	1	0·42	1	0·03	1	0·25	1
Total ..	60·79	148	75·56	142	46·92	145	62·75	140

No. 2.

STATEMENT showing the receipts on account of the Government Cinchona Plantations, Nilgiris, for the official year 1891-92.

Particulars.	Sanctioned budget estimate for 1891-92.	Revised budget estimate for 1891-92.	Actuals for 1891-92.
	Rs.	Rs.	Rs. A. P.
Bark supplied to the Madras Medical Department	500	255	255 0 0
Do. to the Bombay do.	500	400	321 0 0
Do. private parties and Mysore Durbar	..	500	462 13 6
Sale of seeds and plants	200	100	258 2 0
Percentage of the fees of the Government Quinologist	100	45	17 12 9
Miscellaneous	300	500	489 3 6
Febrifuge	5,000	26,000	26,246 0 0
Quinine	53,400	47,200	49,016 10 5
Total ..	60,000	75,000	77,066 10 2

No. 3.

Statement showing the expenditure in detail on account of the Government Cinchona Plantations, Nilgiris, for the official year 1891-92.

Name of Plantations.	Salaries.			Nurseries.			Working charges.			Manure.		
	Budget estimate.	Revised estimate.	Actuals.	Budget estimate.	Revised estimate.	Actuals.	Budget estimate.	Revised estimate.	Actuals.	Budget estimate.	Revised estimate.	Actuals.
1	2	3	4	5	6	7	8	9	10	11	12	13
	Rs.	Rs.	Rs. A. P.	Rs.	Rs.	Rs. A. P.	Rs.	Rs.	Rs. A. P.	Rs.	Rs.	Rs. A. P.
Head office and general	12,316	12,316	12,136 0 0	..	..	..	..	..	..	..	..	..
Dodabetta	3,150	3,654	3,615 10 6	400	325	263 1 0	5,900	6,485	6,423 7 11	2,220	1,986	1,985 2 1
Naduvatam	3,600	4,090	4,127 15 11	420	380	402 1 0	8,390	5,654	4,876 14 5	2,872	2,719	2,686 1 3
Pykara	3,215	3,875	3,861 0 0	500	400	400 12 6	6,394	3,859	3,486 13 0	870	675	687 1 0
Quinologist's department	6,151	7,051	7,051 8 0	..	..	..	..	..	..	..	..	..
Total ..	28,432	30,986	30,792 2 5	1,320	1,105	1,065 14 6	20,684	15,998	14,787 3 4	5,962	5,380	5,258 4 4

Name of Plantations.	Crop.			Repairs.			Contingencies.		
	Budget estimate.	Revised estimate.	Actuals.	Budget estimate.	Revised estimate.	Actuals.	Budget estimate.	Revised estimate.	Actuals.
	14	15	16	17	18	19	20	21	22
	Rs.	Rs.	Rs. A. P.	Rs.	Rs.	Rs. A. P.	Rs.	Rs.	Rs. A. P.
Head office and general	..	..	..	300	..	..	700	700	699 14 11
Dodabetta	3,000	200	193 0 0	200	188	187 12 6	..	..	..
Naduvatam	1,450	690	751 8 8	1,100	1,100	1,089 13 6	..	..	..
Pykara	250	250	220 1 9	450	576	558 2 8	..	..	..
Quinologist's department	..	..	..	..	..	..	9,000	15,000	16,254 15 0
Total ..	4,700	1,140	1,164 10 5	2,050	1,864	1,835 12 8	9,700	15,700	16,954 13 11

No. 3.

Statement showing the expenditure in detail on account of the Government Cinchona Plantations, Nilgiris, for the official year 1891-92—*cont.*

Name of Plantation.	Printing charges.			Peons' clothing.			Travelling allowance.		
	Budget estimate.	Revised estimate.	Actuals.	Budget estimate.	Revised estimate.	Actuals.	Budget estimate.	Revised estimate.	Actuals.
	22	23	24	25	26	27	28	29	30
	Rs.	Rs.	Rs. A. P.	Rs.	Rs.	Rs. A. P.	Rs.	Rs.	Rs. A. P.
Head office and general	40	40	37 11 0	12	12	12 0 0	1,500	1,500	1,490 8 6
Dodabetta	..	..	..	..	..	..	..	..	..
Naduvatam	..	..	..	..	..	..	..	..	..
Pykara	..	..	..	..	..	..	..	..	..
Quinologist's Department	..	..	..	..	..	..	..	..	..
Total ..	40	40	37 11 0	12	12	12 0 0	1,500	1,500	1,490 8 6

Name of Plantation.	House-rent.			Factory.			Total.		
	Budget estimate.	Revised estimate.	Actuals.	Budget estimate.	Revised estimate.	Actuals.	Budget estimate.	Revised estimate.	Actuals.
	31	32	33	34	35	36	37	38	39
	Rs.	Rs.	Rs. A. P.	Rs.	Rs.	Rs. A. P.	Rs.	Rs.	Rs. A. P.
Head office and general	..	..	..	..	..	..	14,868	14,568	14,376 2 5
Dodabetta	..	..	..	..	..	..	14,870	12,838	12,668 2 0
Naduvatam	..	..	..	1,000	1,675	1,806 0 6	18,832	16,308	15,740 7 3
Pykara	..	..	..	..	..	..	11,679	9,635	9,113 14 11
Quinologist's Department	600	600	600 0 0	..	..	..	15,751	22,651	23,906 7 0
Total ..	600	600	600 0 0	1,000	1,675	1,806 0 6	76,000	76,000	75,805 1 7

No. 7.

STATEMENT showing the approximate number of plants in permanent plantations, Nilgiris, on 31st March 1892.

Species.	Dodabetta.				Naduvatam.				Wood.				Hooker.				Grand Total.
	Plants last year.	Coppiced or uprooted.	Planted in this year.	Total.	Plants last year.	Coppiced or uprooted.	Planted in this year.	Total.	Plants last year.	Coppiced or uprooted.	Planted in this year.	Total.	Plants last year.	Coppiced or uprooted	Planted in this year.	Total.	
C. Succirubra	..	..	..	..	48,602	12,347	..	36,255	..	..	..	..	3,063	175	13,925	2,888	39,143
C. Officinalis	685,191	202	9,000	693,989	97,159	340	..	96,819	..	..	..	..	371,449	2,928	..	382,446	1,073,254
C. Calisaya var. Ledger ..	130	..	..	130	..	..	..	..	143	..	..	143	..	..	..	..	130
Do. other varieties.	..	..	..	..	143	..	..	143	..	..	..	..	..	..	..	..	143
C. Micrantha	..	26	..	26	..	..	..	..	..	..	..	..	..	..	..	..	26
C. Pitayensis	43	..	..	43	..	..	..	..	..	..	..	..	..	..	..	..	43
C. Lancoolata	..	..	..	..	5	..	..	5	..	..	..	..	..	..	..	..	5
C. Carthagena	..	18	..	18	716	..	..	716	..	..	..	..	50	..	..	50	829
C. Santa Fé	9	..	..	9	3	..	..	3	..	..	..	..	..	..	..	..	12
C. Hybrid and others ..	61,803	..	..	61,806	269,925	..	..	269,925	..	..	..	..	281,720	..	11,275	292,995	666,309
Total ..	647,223	202	9,000	656,021	416,553	12,687	..	463,865	..	..	..	..	656,282	3,103	25,200	678,379	1,779,594

No. 8.

COMPARATIVE statement showing the quantity of bark of all sorts in store at the commencement of the year 1891-92, collected and disposed of during the year and remaining in store at its close.

Description of bark.	1890-91.										
	Quantity in store at the commencement of the year.							Collected during the year.	Total.	Disposed of during the year.	
	Crop of 1883-84.	Crop of 1885-86.	Crop of 1886-87.	Crop of 1887-88.	Crop of 1888-89.	Crop of 1889-90.	Total.			Crop of 1885-86.	Crop of 1886-87.
1	2	3	4	5	6	7	8	9	10	11	12
Crown bark ..	..	..	43,676	53,813	82,233	74,058	253,780	76,038	329,818	..	43,676
Red do. ..	..	40,713	28,981	35,056	26,009	68,568	199,327	57,313	256,640	3,400	..
Magnifolia ..	900	340	..	3,877	1,920	17,600	24,637	..	24,637	..	..
Total ..	900	41,053	72,657	92,746	110,162	160,226	477,744	133,351	611,095	3,400	43,676

Description of bark.	1890-91—*cont.*								
	Disposed of during the year—*cont.*		Balance at the close of the year.						
	Crop of 1887-88.	Total.	Crop of 1883-84.	Crop of 1885-86.	Crop of 1886-87.	Crop of 1887-88.	Crop of 1888-89.	Crop of 1889-90.	Crop of 1890-91.	Total.
	13	14	15	16	17	18	19	20	21	22
Crown bark	53,324	97,000	..	..	..	489	82,233	74,058	76,038	232,818
Red do.	..	3,400	..	37,313	28,981	35,056	26,009	68,568	57,313	253,240
Magnifolia	..	..	900	340	..	3,877	1,920	17,600	..	24,637
Total ..	53,324	100,400	900	37,653	28,981	39,422	110,162	160,226	133,351	510,695

Description of bark.	1891-92.											
	Quantity in store at the commencement of the year.								Collected during the year.	Total.	Disposed of during the year.	
	Crop of 1883-84.	Crop of 1885-86.	Crop of 1886-87.	Crop of 1887-88.	Crop of 1888-89.	Crop of 1889-90.	Crop of 1890-91.	Total.			Crop of 1883-84.	Crop of 1885-86.
	23	24	25	26	27	28	29	30	31	32	33	34
Crown bark.	..	..	..	489	82,233	74,058	76,038	232,818	13,204	246,022	..	..
Red bark	..	37,313	28,981	35,056	26,009	68,568	57,313	253,240	40,487	293,727	..	24,370
Magnifolia.	900	340	..	3,877	1,920	17,600	..	24,637	142	24,779	900	340
Total ..	900	37,653	28,981	39,422	110,162	160,226	133,351	510,695	53,833	564,528	900	24,710

Comparative statement showing the quantity of bark of all sorts in store, &c.—*cont.*

Description of bark.	1891-92—*cont.*											
	Disposed of during the year—*cont.*				Balance at the close of the year.							
	Crop of 1887-88.	Crop of 1888-89.	Crop of 1889-90.	Total.	Crop of 1885-86.	Crop of 1886-87.	Crop of 1887-88.	Crop of 1888-89.	Crop of 1889-90.	Crop of 1890-91.	Crop of 1891-92.	Total.
	35	36	37	38	39	40	41	42	43	44	45	46
Crown bark.	489	82,233	29,978	112,700	..	..	..	..	44,080	76,038	13,204	133,322
Red bark	..	..	..	24,370	12,943	28,981	35,056	26,009	68,568	57,313	40,487	269,357
Magnifolia.	3,877	1,920	3,563	10,600	..	..	..	..	14,037	..	142	14,179
Total ..	4,366	84,153	33,541	147,670	12,943	28,981	35,056	26,009	126,685	133,351	53,833	416,858

No. 9.

STATEMENT showing the particulars of Cinchona bark disposed of during the year 1891-92.

Particulars.	PRODUCT OF 1883-84.		PRODUCT OF 1885-86.		PRODUCT OF 1887-88.	
	Pounds.	Value realized.	Pounds.	Value realized.	Pounds.	Value realized.
1	2	3	4	5	6	7
		RS. A. P.		RS. A. P.		RS. A. P.
Cinchona bark used for the manufacture of quinine and solid febrifuge	900	..	24,710	..	3,366	..
Cinchona bark supplied to Madras Medical Department	..	..	..	..	1,000	255 0 0
Cinchona bark supplied to Bombay Medical Department	..	..	..	..	..	..
Cinchona bark supplied to Mysore durbar and private parties	..	..	..	..	..	..
Total ..	900	..	24,710	..	4,366	255 0 0

Particulars.	PRODUCT OF 1888-89.		PRODUCT OF 1889-90.		Total.	
	Pounds.	Value realized.	Pounds.	Value realized.	Pounds.	Value realized.
	8	9	10	11	12	13
		RS. A. P.		RS. A. P.		RS. A. P.
Cinchona bark used for the manufacture of quinine and solid febrifuge	81,983	..	33,541	..	144,500	* ..
Cinchona bark supplied to Madras Medical Department	..	..	..	..	1,000	255 0 0
Cinchona bark supplied to Bombay Medical Department	800	321 0 0	..	..	800	321 0 0
Cinchona bark supplied to Mysore durbar and private parties	1,370	349 10 10	..	..	1,370	349 10 10
Total ..	84,153	670 10 10	33,541	..	147,670	925 10 10

* Value of 4,425 lb. 14 oz. of sulphate of quinine at Rs. 14-11-3 per pound .. RS. A. P. 65,074 3 1
Do. of 3,174 lb. of febrifuge at Rs. 10 per pound 31,740 0 0
Total .. 96,814 3 1

No. 10.

STATEMENT showing the particulars of Sulphate of Quinine and Cinchona Febrifuge manufactured and disposed of during the year 1891-92.

Particulars.	Quantity in store at the commencement of the year.	Manufactured during the year.	Total.	DISPOSED OF DURING THE YEAR					Dryage.	Balance at the close of the year including paper packets.
				To Madras Medical Department.	To Bombay Medical Department.	To Colombo.	To Mysore Durbar, private parties and paper packets to Collectors.	Total.		
	LB.	LB. OZ.	LB. OZ.	LB.	LB.	LB.	LB. OZ.	LB. OZ.	LB. OZ.	LB. OZ.
Sulphate of Quinine.	1,572	4,425 14	5,997 14	1,500	800	1,000	44 10	3,344 10	0 10	2,652 10
Solid Febrifuge ..	1,200	3,174 0	4,374 0	1,500	1,500	..	17 0	3,017 0	2 0	1,355 0

OOTACAMUND,
9th July 1892.

(Signed) M. A. LAWSON,
Govt. Botanist and Director.

From D. HOOPER, Esq., Government Quinologist, to the Government Botanist and Director of the Government Cinchona Plantations, Nilgiris, dated Ootacamund, 24th June 1892.

I have the honour to make the following report on the analytical work conducted in the laboratory during the year ending 31st March 1892.

My visits to the Quinine Factory have not been so frequent as in former years, but several samples of bark have been sent in for analysis from the Dodabetta and Naduvatam plantations, and the products of manufacture have been constantly tested as to their purity. The sulphate of quinine has responded favorably to the chemical tests; it contained only a trifling amount of sulphate of cinchonidine, and its appearance and solubility were all that could be desired. The febrifuge has been made by the oil process, and has been somewhat lighter in colour than when the factory was first started.

Some interesting barks have been analysed during the year, and the results are given in the following table. The majority of the barks are from hybrid trees, a number of which are grown at Naduvatam and are gradually replacing the poorer succirubras or red bark trees. It is difficult to tell the value of hybrid trees except by analysis, as the variable habit of these trees is accompanied by a variable alkaloidal composition, and some trees having the habit of a succirubra contain a good amount of quinine in their bark, while others with the appearance of an officinalis sometimes contain a preponderance of the inferior alkaloids characteristic of the succirubra. Some of the hybrids were very rich in quinine, exceeding the amount found in the best crown barks, and knowing that these trees are faster growers and have a thicker bark their cultivation is more profitable. Some of the better kinds of hybrids are being propagated by cuttings from analysed trees, and it will be interesting to observe the success of these experiments when the young plants are sufficiently developed. Following is a description of the different barks analysed:—

1. Hybrid bark marked "Magnifolia" from Naduvatam.
2. Bark from smooth-leaved officinalis type of hybrid.
3. Magnifolia hybrid with pubescent leaves.
4. Officinalis type of hybrid, 10 years old.
5. Officinalis type of hybrid, 9 years old.
6. Magnifolia hybrid from Dodabetta, 4 years old.
7. Officinalis hybrid from Naduvatam.
8. Natural magnifolia bark, 20 years old.
9. Mixed hybrid thinnings from Chinaneres lines.
10. Hybrid, Naduvatam.
11. Succirubra hybrid.
12. Succirubra hybrid, 9 years old.
13. Crown bark from an old tree, Dodabetta.
14. Uritusinga, variety of *C. officinalis*.

—	Quinine.	Cinchonidine.	Quinidine.	Cinchonine.	Amorphous Alkaloids.	Total.	Sulphate of Quinine.
1	5·82	1·29	..	·55	·60	8·26	7·83
2	5 18	1·18	·23	·10	·45	7·14	6·97
3	4·85	4·20	..	·42	·71	10·18	6·52
4	3·18	2·08	..	·42	·48	6·16	4·28
5	2·67	2·04	..	·56	·47	5·74	3·59
6	2·45	1·19	..	·40	·32	4·36	3·30
7	2·40	·93	·14	·29	·34	4·10	3·23
8	2·28	1·91	·09	·34	·42	5·04	3·07
9	2·28	1·98	..	1·40	·42	6·08	3·07
10	2 26	·87	..	1 34	·52	4·99	3·04
11	1·95	1·75	·04	·91	·61	5·26	2·62
12	1 40	1·95	..	·88	·41	4·64	1·88
13	5·75	1·15	·16	·27	·30	7·60	7·73
14	4·21	1·66	..	·43	·51	6·81	5·66

These are only a selection of the barks analysed during the year. It will be seen that the sulphate of quinine ranges from 7·83 per cent. in No. 1 to 1·88 per cent. in No. 12, and the last named, with respect to its alkaloids, generally yields its maximum at this age. As an instance of the variation in the value of these trees No. 6 from a 4-year old tree contains more quinine than the sample No. 8 taken from a 20-year old tree, and this shows the importance of ascertaining the quality of a bark when it is young and preventing the mistake of cumbering the land with very poor trees. The average analysis of barks from some young plots has given quinine to be over 3 per cent., but as the harvesting was made from the poorer and smaller trees, the succeeding crops will be much richer. It is satisfactory to find such old trees, as represented by No. 13, yielding such rich bark, but it is only what should be expected if the trees are treated to manure. The estates are now being subjected to a course of systematic manuring and the effect is felt in the barks affording more alkaloids. If trees are allowed to grow for many years without their roots being artificially fertilized, the quinine in the bark is sure to deteriorate and the tree itself will show signs of decay. This rule does not only apply to the slow growing species of officinalis, but also, and more emphatically, to the fast growing hybrids which are more exhausting to the soil.

Astringent Barks.—Two years ago I reported on the analysis of a large number of astringent barks from Indian trees, some of them never before analysed. Since then further opportunities have been given of examining other barks to ascertain the amount in them of tannic acid or other principle having a similar action. The bark of *Anogeissus latifolia* has hitherto been supposed to be one of the most astringent drugs, but I have recently found that a bark, much ~~stronger~~ in tannin, is derived from the *Bridelia montana*, a tree belonging to the natural order Euphorbiaceæ. This species of Bridelia is common on the ghâts of the Nílgiris and in other parts of India. It is well known as a valuable astringent in Western India, and is used by the Goanese in certain diseases. Some years ago in Orissa a case of poisoning was traced to the employment of this bark. The tanners of this country, however, do not seek after drugs very rich in tannin, as the quality of the tannin present appears to be the criterion of the value, and the bark of the Tangedu tree (*Cassia auriculata*), which contains only 11 per cent. of tannin, is used more than any other bark in South India. Of the other barks in this table, Casuarina bark is used in Madras as a dye and tan, and *Myrica Nagi* bark is largely used by Muhammadans and Hindus in the north in medicines where astringents are required. Some of the fig barks have been chemically investigated during the year, and as some of them contain tannin, they are included in the list:—

—	Tannin.	Water extract.	Ash.	Colour with iron salts.
Bridelia montana	39·9	41·7	7·3	Blue-black.
Acacia pycnantha	33·8	46·7	3·5	Do.
Do. decurrens	33·4	44·8	3·2	Do.
Kandelia Rheedii	27·4	45·5	9·1	Do.
Acacia melanoxylon	26·8	34·2	4·1	Do.
Macaranga tomentosa	18·4	22·2	11·0	Do.
Casuarina equisetifolia	18·3	22·1	9·5	Do.
Acacia dealbata	17·8	32·1	5·3	Do.
Mangifera Indica	16·7	32·9	6·3	Do.
Ficus racemosa	14·1	20·5	12·2	Greenish.
Myrica Nagi	13·7	27·0	7·1	Blue-black.
Diospyros embryopteris	12·4	19·9	4·9	Do.
Ficus Indica	10·9	17·2	8·0	Greenish.
Flenggea leucopyrus	10·3	20·5	3·5	Blue-black.
Do. microcarpa	8·9	18·3	11·4	Do.
Ficus gibbosa	4·3	10·4	15·0	Greenish.
Curculigo orchioides (root)	4·1	19·9	8·6	Do.
Ficus religiosa	3·8	12·3	11·7	Do.
Do. hispida	2·1	11·7	13·6	Do.

Wattle Barks.—The Australian acacias or wattles introduced in the hills many years ago have firmly established themselves, but nothing seems to be done, as in Australia, in collecting the bark as a commercial article. It is true that the common forms of wattle (*A. melanoxylon* and *A dealbata*) are more plentiful on the hills than those species—*A. decurrens* and *A. pycnantha*—which yield rich tanning barks, but wherever the better species have been planted they have grown vigorously and well, and the bark is equally rich in tannin as that from trees growing in Australia. The price of good wattle bark is £10 per ton in the English market, and the market is supplied exclusively from Australia. A sample of bark from some *Acacia decurrens* grown on the Nílgiris was forwarded a few months ago to London for valuation. The reply stated that the sample of bark was in good condition and rich in tannin, but as buyers were in the habit of procuring their bark from a certain country, in regular quantities, there would be a prejudice in receiving it from a new source such as the East Indies, and there is nothing to guarantee their receiving a regular supply of the same quality. Tanners do not like changing the materials they employ, and English and Continental firms after obtaining wattle barks from the Australian Colonies for nearly a century are apt to look with suspicion upon other wattle barks. I have obtained the following results in analysing the barks of the Nílgiri grown acacias:—

A. pycnantha	33·8 per cent. tannin.
A. decurrens	33·4 „ „
A. melanoxylon	28·6 „ „
A. dealbata	17 8 „ „

The samples of pycnantha and decurrens were from a private estate near Dodabetta. The melanoxylon was from a good sized tree after it had been cut up in logs for firewood, and represents the strength of the bark found on the majority of the fuel used in Ootacamund. The dealbata was a fresh sample from some young bushes of the very common yellow-flowering species. All these have an astringent principle of the same chemical characteristics, which I feel assured is the same as that found in the trees grown in their own native country. I have also made extracts or "tannage" from these barks, preparations which hold the virtues in a concentrated form, and much better than the crude bark for exporting. There is a good market in Europe for well prepared wattle bark extract, and the demand has been on the increase during the last few years.

Literary Work.—During the year the fourth and fifth parts of "Pharmacographia Indica" have been published, and we are now engaged with the sixth and last part, a complete index and an appendix. It is with sincere regret that Dr. Warden and I have to record the death of the Senior Editor on the 30th April last at Bombay. Dr. Dymock was the greatest authority on indigenous drugs in this country, and for many years he has encouraged original research by supplying large quantities of authentic specimens for chemical and physiological investigation. His classical knowledge and acquaintance with Sanscrit, Arabic and Persian writers, his botanical and medical experience contributed to make him particularly fitted for the work he was engaged in, and in other parts of the world besides India many will be sorry that he was not permitted to live to see the completion of the work. Last year "The Materia Medica of Madras" was published by the Government Press, and on account of the death of Dr. Mohideen Sheriff, the author, early in the year, I read through and corrected the proof-sheets. The book only deals with one-third the number of known drugs, and being incomplete and not containing the results of recent workers in the field of Materia Medica, the work is not of much value either as a text-book or book of reference. It shows what an interest in native remedies was taken by a native gentleman, and the author was an example of an industrious investigator who might well be followed by others of his colleagues in India.

APPENDICES.

No. I.

STATEMENT showing the Capital and Revenue Account of the Government Cinchona Plantations, Nilgiris, from the commencement up to the official year ~~1890-91.~~ 1891-92

Year.	Charges.				Total.	Total outlay to end of year.	Simple interest at 4½ per cent. on outlay to end of previous year *plus* half outlay during the year.	Total of columns 6 and 8.
	Establishment including Superintendent's salary.	Building and plant.	Working charges.					
			Departmental labour.	Convict labour.				
1	2	3	4	5	6	7	8	9
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
1860-61	..	..	4,821 15 0	..	4,821 15 0	4,821 15 0	108 7 11	4,930 6 11
1861-62	..	..	22,914 15 4	..	22,914 15 4	27,736 14 4	732 9 2	23,647 8 6
1862-63	..	..	48,390 0 0	..	48,390 0 0	76,126 14 4	2,336 15 0	50,726 15 0
1863-64	12,726 14 7	..	53,173 9 2	..	65,900 7 9	1,42,027 6 1	4,908 7 7	70,808 15 4
1864-65	24,444 8 11	..	59,666 12 0	..	84,111 4 11	2,26,138 11 0	8,283 11 9	92,395 0 8
1865-66	25,449 14 0	3,700 0 0	58,887 5 0	..	88,037 3 0	3,14,175 14 0	12,157 1 4	1,00,194 4 4
1866-67	23,803 9 10	3,025 0 0	52,632 0 0	48,666 10 8	1,28,127 4 6	4,42,303 2 6	17,020 12 6	1,45,148 1 0
1867-68	26,087 3 1	2,600 0 0	43,295 14 4	48,666 10 4	1,20,649 12 1	5,62,952 14 7	22,618 3 6	1,43,267 15 7
1868-69	25,671 7 10	2,030 0 0	30,636 1 0	48,666 10 4	1,07,004 3 6	6,69,957 2 1	27,740 7 8	1,34,744 11 2
1869-70	25,783 5 4	5,334 5 8	19,163 0 0	..	50,280 11 0	7,20,237 13 1	31,279 6 2	81,560 1 2
1870-71	23,730 5 4	300 0 0	6,143 0 0	..	30,173 5 4	7,50,411 2 5	33,089 9 8	63,262 15 0
1871-72	17,157 5 4	3,250 0 0	13,160 4 9	..	33,567 10 1	7,83,978 12 6	34,523 12 5	68,091 6 6
1872-73	12,724 0 0	550 0 0	16,441 0 0	..	29,715 0 0	8,13,693 12 6	35,947 10 2	65,662 10 2
1873-74	12,574 0 0	2,758 0 0	15,091 14 0	..	30,423 14 0	8,44,117 10 6	37,300 12 2	67,724 10 2
1874-75	16,406 8 0	1,700 0 0	17,417 0 0	..	35,523 8 0	8,79,641 2 6	38,784 9 2	74,308 1 2
1875-76	17,234 0 0	1,550 0 0	27,423 0 0	..	46,207 0 0	9,25,848 2 6	40,623 8 3	86,830 8 3
1876-77	8,064 5 4	6,715 8 11	44,850 3 0	..	59,630 1 3	9,85,478 3 9	43,004 13 6	1,02,634 14 9
1877-78	8,061 5 4	5,468 13 8	56,241 10 3	..	69,771 13 3	10,55,250 1 0	45,916 6 3	1,15,688 3 6
1878-79	9,637 2 8	10,090 14 1	53,954 10 8	..	73,682 11 5	11,28,932 12 5	49,144 1 10	1,22,826 13 3
1879-80	10,092 0 0	6,537 4 9	63,095 0 3	..	79,724 5 0	12,08,657 1 5	52,595 12 4	1,32,320 1 4
1880-81	11,879 1 0	11,367 0 4	72,858 15 3	..	96,105 0 7	13,04,762 2 0	56,551 14 11	1,52,656 15 6
1881-82	16,375 14 6	6,278 4 9	90,921 2 1	..	1,13,575 5 4	14,18,337 7 4	61,269 11 11	1,74,845 1 3
1882-83	15,094 14 1	32,247 11 5	50,049 11 5	..	1,06,392 4 11	15,24,729 12 3	56,219 0 3	1,72,611 5 2
1883-84	20,083 7 5	35,348 14 5	69,128 8 6	..	1,24,560 14 4	16,49,290 10 7	71,415 7 4	1,95,976 5 8
1884-85	20,413 3 4	6,220 10 5	60,190 8 7	..	86,824 6 4	17,36,115 0 11	76,171 10 0	1,62,996 0 4
1885-86	26,235 7 5	3,513 5 8	50,629 13 10	..	80,378 10 11	18,16,493 11 10	79,933 11 2	1,60,312 6 1
1886-87	27,581 14 3	7,925 11 1	48,720 11 2	..	84,228 4 6	19,00,722 0 4	83,637 5 8	1,67,865 10 2
1887-88	30,831 11 6	2,355 9 9	38,973 13 10	..	72,161 3 1	19,72,883 3 5	87,156 1 11	1,59,317 5 0
1888-89	26,686 14 3	2,724 12 7	40,082 3 1	..	69,493 13 11	20,42,377 1 4	90,343 5 8	1,59,837 3 7
1889-90	38,105 12 2	1,614 4 11	28,460 7 1	..	68,180 8 2	21,10,557 9 6	93,441 0 6	1,61,621 8 8
1890-91	42,061 6 6	2,132 13 10	30,719 12 5	..	74,914 0 9	21,85,471 10 3	96,660 10 7	1,71,574 11 4
1891-92 Total ..	~~5,74,997-10-0~~ × 4988-3-10	~~1,07,339-2-3~~ × 1035-12-8	~~12,07,184-14-0~~ 24,082-1-1	~~1,46,000-0-0~~ ..	~~21,85,471-10-3~~ 75805-1-7	22,61,276-11-10	14,00,917-2-3 1,00,051-13-5	~~35,86,388-12-6~~ 1,75,956-15-0
Total	6,24,884-13-10	1,69,174-14-11	13,21,216-15-1	1,46,000-0-0	2261,276-11-10		15,00,968-15-8	37,62,245-11-6

Statement showing the Capital and Revenue Account of the Government Cinchona Plantations, Nilgiris, &c.—*cont.*

Year.	Receipts.				Net revenue (difference between columns 9 and 13).	
	Value of bark supplied to Quinologist, or for experimental purposes and the value of quinine and febrifuge sold.	Value of bark sent to England, sold or supplied to other Governments or departments, *private parties*	Sale of plants, seeds, &c.	Total.	Surplus.	Deficit.
	10	11	12	13	14	15
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
1860-61	..	..	..	..	..	4,930 6 11
1861-62	..	..	..	..	..	23,647 8 6
1862-63	..	..	..	..	..	50,726 15 0
1863-64	..	..	..	..	..	70,808 15 4
1864-65	..	..	..	..	..	92,395 0 8
1865-66	..	..	2,450 0 0	2,450 0 0	..	1,00,194 4 4
1866-67	..	287 8 0	..	287 8 0	..	1,42,698 1 0
1867-68	..	..	1,680 0 0	1,680 0 0	..	1,42,980 7 7
1868-69	..	..	..	1,512 6 4	..	1,33,064 11 2
1869-70	1,512 6 4	..	323 14 0	4,688 12 8	..	80,047 10 10
1870-71	4,364 14 8	3,479 3 6	..	13,022 0 2	..	58,574 2 4
1871-72	9,542 12 8	4,388 2 1	227 1 4	21,422 3 1	..	55,069 6 4
1872-73	16,806 15 8	36,417 6 3	300 9 0	57,854 6 3	..	44,240 7 1
1873-74	21,136 7 0	..	273 4 0	8,849 4 0	..	9,870 3 11
1874-75	8,576 0 0	..	2,300 0 0	62,404 9 11	..	65,458 13 2
1875-76	..	60,404 7 11	2,579 3 10	1,10,457 7 10	7,822 9 1	24,426 0 4
1876-77	..	1,07,878 4 0	5,469 0 2	3,57,215 0 8	2,41,526 13 2	..
1877-78	..	3,51,746 0 6	8,136 9 2	4,00,354 3 3	2,77,527 6 0	..
1878-79	..	3,92,217 10 1	15,462 12 4	4,39,786 9 0	3,07,466 7 8	..
1879-80	..	4,24,323 12 8	13,175 4 8	3,46,470 5 11	1,93,813 6 5	..
1880-81	..	3,33,295 1 3	7,653 2 9	5,71,889 6 8	3,97,014 5 5	..
1881-82	..	5,64,236 3 11	4,345 7 10	5,86,349 1 11	4,13,737 12 9	..
1882-83	..	5,82,003 10 1	4,561 2 8	85,080 13 2	..	1,10,895 8 6
1883-84	..	80,519 10 6	1,543 13 5	85,829 3 5	..	77,166 12 11
1884-85	933 12 0	83,351 10 0	589 10 4	1,04,108 11 0	..	56,203 11 1
1885-86	1,418 0 8	1,02,101 0 0	1,595 4 9	71,789 10 5	..	96,075 15 9
1886-87	2,127 1 0	68,067 4 8	763 1 11	3,941 1 11	..	1,55,376 3 1
1887-88	1,203 0 0	1,975 0 0	1,047 11 10	3,601 11 10	..	1,56,235 7 9
1888-89	2,134 0 0	420 0 0	599 12 4	5,440 8 7	..	1,56,181 0 1
1889-90	4,048 10 6	792 1 9	504 15 1	28,875 13 9	..	1,42,698 13 7
1890-91	27,535 0 10	835 13 10				
1891-92	~~1,01,220 1 4~~ 75,262-10-5	~~21,08,739 15 9~~ 1,038-13-6	~~75,191 18 5~~ 765-2-3	~~38,75,860 13 9~~ 77,066-10-2	..	2,11,027-14-9 98,790-4-10
Total	1,76,601-11-9	31,99,778-12-6	76,946-15-8	34,52,427-7-11	..	3,09,818-3-7

No. II

Statement showing the receipt and charges on account of the Govt. Cinchona Plantations for the year 1891-92 prepared in accordance with the instructions issued in the Secy of State's Despatch No 3 dy 11th Feb'86

Disbursements &c	Amount			Receipts &c.	Amount		
To By value of Bk bark in Stock on 31st March 1891 (510,695 lbs) as under:-	Rs	as	p	By value of bark in stock on 31st March 1892 (416,858 lbs) as under—	Rs	as	p
900 lbs of 1883-84 @ as 8 — p 2·402 per lb	461	4	2	12,943 lbs of 1885-86 @ as 11 — p 4·132 per lb	9,176	13	8
37653 " of 1885-86 @ 11 — 4·132 "	26,696	12	2	28,981 " of 1886-87 @ 10 — 10·069 "	19,632	15	5
28981 " of 1886-87 @ 10 — 10·069 "	19,632	15	5	35,056 " of 1887-88 @ 12 — 5·385 "	27,275	3	5
39422 " of 1887-88 @ 12 — 5·385 "	30,672	2	7	26,009 " of 1888-89 @ 10 — 1·120 "	16,407	5	6
110,162 " of 1888-89 @ 10 — 1·120 "	69,493	13	11	126,685 " of 1889-90 @ 6 — 9·701 "	53,907	12	3
160,226 " of 1889-90 @ 6 — 9·701 "	68,180	8	2	133,351 " of 1890-91 @ 8 — 11·862 "	74,914	0	9
133,351 " of 1890-91 @ 8 — 11·862 "	74,914	0	9	53,833 " of 1891-92 @ Rs 1—6—6·365 "	75,805	1	7
Total	290,051	9	2	Total	277,119	4	7
To establishment & working charges	75,805	1	7	By value of —			
To By value of Quinine and febrifuge in Stock on 31st March 1891	43,026	9	0	- Sulphate of quinine supplied to the Medical Stores Depts. of Madras, Bombay, Ceylon &c.	49,016	10	5
				- Febrifuge sold to the Medical Stores Depts of Madras, Bombay &	26,246	0	0
To Net Profit on Cultivation &c	40,883	3	9	- Bark supplied to the Medical Depts of Madras	255	0	0
	408883			do Bombay do	321	0	0
				do Private parties and Mysore Durbar	462	13	6
				- The Sale of seeds and plants	258	2	0
				- Percentage of the fees of the Govt Analyst	17	12	9
				- Miscellaneous	489	3	6
				Total	77,066	10	2
				By value of Quinine & febrifuge (including 630 packets of quinine) in Stock on 31st Mar 92	49,658	13	9
Grand Total	40883	3	9	Grand Total of all receipts including the items then in stock.	4,03,824	12	6
				Net loss on operations	5,038	7	3
				Grand Total	40883	3	9

NOTE FOR THE Secretary

(The Board's letter & enclosures on the Rubber Seed are / the Chemist should place himself in communication with the Planters & explain to them the experiments the Board wish to be carried out here.

CA
1/9

Paragraph Press.

Please fair copy and a Separate Sheet for Press as required & submit for Circ & H.E.

Submitted DM 11-9-92 RM 21 T. 92

11.9

Read C. No 6155 of 92.

Fair copy of rough draft with Order of 22nd Sept: 1892, no: 995.

With his letter read above, Mr Lawson submits his report on the working of the Govt. Cinchona Dept. during the year 1891-92 and Mr Hooper's report on the analytical work conducted by him during the same period.

2. Season - As compared with the previous year, the rainfall registered on all the Govt. estates, except Dodabetta, shows an increase, but the Director states that it was only in Nadwatam that the amount approximated to the average for the last ten years. The following statement compares the rainfall of the last two years on the several estates.

Estates	Rainfall in	
	1890-91	1891-92
Dodabetta	48.13	46.33
Nadwatam ..	69.68	100.84
Hooker	60.79	75.56
Wood	46.92	62.75

No.

Mr. Hooper's report on the tanning qualities of the Australian wattles should be made widely known. The bark will evidently not easily be able to compete with Australian bark - though the great advantage this country has in point of distance might let gardeners derive the trade here - but for local tanners the great percentage of tannin in the wattle compared to tanjedu, ought to be a matter of great importance."

J H L 11/9/92

H.S. 12 Sep

W 15 Sep.

no unusual drought frost or storms occurred during the year and the season was on the whole favorable to Cinchona cultivation.

3. Working — The total number of trees standing on the several estates at the close of the year under review, according to the Statement no 7 appended to the report was 1,779,894 or 18208 more than in 1890-91. From the same statement it would appear that the number of trees planted during the year fell from 69,387 to 34,200 and that no new trees were planted on the Naduvatam and Lord Ducies. In Sec III (b) of the report, however, Mr Lawson states that in the former estate 10 acres of ground were uprooted in January and February and replanted in March and April. If this statement is correct, the figures given in the appendix above referred to must be wrong and the apparent discrepancy should be explained.

4. The balance of bark undisposed of at the close of the year 1890-91 (510,695 lbs) was more than sufficient for the requirements of the year under review and the Director did not therefore take the full estimated crop of 70,000 lbs during the year but limited the output to the needs of the plantations, removing the bark of such of the old trees only as opportunities it was desirable to uproot and replace by new plants. The quantity so collected amounts to 53,833 lbs which when added to the balance in stock made a total of 564,528 lbs. Of this amount 144,500 lbs were used in the factory for the manufacture of quinine and febrifuge and 3,170 lbs were sold or otherwise disposed of, leaving at the close of the year 416,858 lbs in stock or 93,837 less than in the previous year. The balance is still very large, but 269,357 lbs of it represent Succirubra or red bark, which as Mr Lawson has already reported in his letter no 1 of 13th Jan 1892, (written in reply to certain

certain remarks passed by the Govt of India on last year's report) is poorer in quinine than Crownbark and has to be used in large quantities in order to secure a comparatively small outturn of the drug.

5. There were at the commencement of the year 1572 lbs of sulphate of quinine and 1200 lbs of febrifuge in stock. During the year 4426 lbs 14 oz, and 3174 lbs of quinine and febrifuge respectively were manufactured making a total of 5997 lbs - 14 oz of quinine and 4374 lbs of febrifuge. Of these amounts 3345 lbs 4 oz and 3019 lbs respectively were disposed of during the year, leaving at its close a balance of 2652 lbs 10 oz of quinine and 1355 lbs of febrifuge. The amount of the drugs manufactured was thus considerably in excess of the ~~same~~ demand for the ~~year~~ — a ~~considerably~~ satisfactory result.

6. The Director reports that there was a slight increase in the sales of quinine in paper packets, but the information

should perhaps be better to omit the portion bracketed

Rec Ct 4/5

furnished on this subject is very meagre and the Govt. desires that full details as to the sale of these packets in every district should be given in future reports. In reviewing the report for 1890-91, the Govt. of India pointed out that the difficulty hitherto experienced in the sale of the quinine powders was probably to some extent due to their high price and suggested that ~~the Cotton price~~ ~~their price~~ might be reduced and that the expenditure involved in packing and conveying them to the market might be minimised by sending the quinine in bulk to the ^various dispensaries ~~in the various districts~~, the establishments of which might be employed to weigh and pack the powders in old paper for ~~sale~~ dealing with to the public. In ~~considering~~ the suggestions made by the Govt of India, H.E. the Governor in Council resolved to reduce the price of the powders to the utmost ~~possible~~ limit which could be conceded without entailing serious loss and accordingly fixed the price of a five grain powder at

at two pies and of a packet consisting of 100 such powders at A 1. These rates are, it will be observed considerably below the sale price of quinine in bulk to Govt Depts and officials. The Govt was of opinion that it was inadvisable to adopt the Govt of India's proposals to entrust the Dispensary establishments with the making up of powders and to use old paper in packing them, and accordingly directed that the existing arrangement under which the powders are made up in new papers at the Madura factory should be continued. The Supreme Govt has in a recent letter again suggested the advisability of modifying the present system of packing so as to bring it into accordance with the system obtaining in Bengal; the Govt of India's letter on the subject has been referred to the Board of Revenue, to mr Lawson and to the Surgeon General for remarks, and orders will be passed on receipt of their replies. In the meantime

meantime, the attention of the Collectors will be drawn to the Surgeon-General's remarks quoted by mr Lawson in para XI (c) of his report and they will be requested to impress upon their subordinates the necessity for making greater exertions in pushing the sale of the packets.

7. With reference to mr Lawson's comments at para XI (b) on an article in the "Rangoon Times" entitled "Govt versus Private Quinine", the Govt observes that the sale of quinine to the general public has already been sanctioned on certain conditions in G.O. 1108 dy 19th Nov 1891. A considerable market for cheap quinine and febrifuge might no doubt be found in Burma, but the matter is one in which the Local Admn should, the Govt considers, be left to take the initiative.

8. The Statements appended to the present review show the receipts and disbursements

To

for 1891-92. and for the previous year. The receipts during the year amounted to Rs 77,066 or Rs 37,066 more than the budget estimate and Rs 2,066 more than the revised estimate fixed by Govt. The expenditure on the other hand was only Rs 75,895 or Rs 195 less than the revised and budget estimates. For the first time since 1885-86, Mr Lawson was thus able to make the receipts exceed the expenditure, a result on which he is to be congratulated

9. It would appear from the Director's remarks on the subject of fodder in para XIIth of his report that there is no demand for entgrass and hay on the Nilgiris and the reason probably is that there is abundance of good grazing ground for cattle on the plateau during the greater portion of the year and that owners of horses prefer cutting fodder for themselves free of cost to purchasing it ready cut. There is the Govt believe little

little, if any, mortality due to starvation among cattle on the Nilgiris and Mr Lawson's argument on this point is hardly relevant

10. The Analytical report submitted by Mr Hooper has been read with interest.

Rel

3. 9. 92

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particularly the portion which deals with the Tanning properties of "Wattle barks". HE the Govr in Council desires that the widest possible publicity should be given to that portion of Mr Indian Hooper's report for although the Wattle bark will not easily be able to compete with Australian bark still the great advantage which India has over Australia in point of distance might with good management divert a portion of the trade & Madras Country and the bark might in any case take the place of Sanjeda bark in local tanneries. & Wattle bark as widely known as possible

H.E. the G in C desires that the portion of W. Hooper's report relating to Tanning properties be translated into the vernaculars & published in English & in the vernaculars in the Fort St George all District Gazettes & that Collectors of Districts in which tanneries are situated should place themselves in communication with tanners & explain to them the properties of Wattle bark for tanning purposes.

Rel

25. 9. 92

All the addresses given in fo. 851 9-5-91

" Resident in Travancore & Cochin thro' the Pol. Dept for information & communication to the Sirkars concerned

Endt no: 995A.
Copies to the Govt of India Rev & Agri Dept

Endt no: 995B.
copy to the Govt of Bengal "

Endt no: 995C.
Copy to the Chief Commr Burma. "

To the Govt: Botanist.
" Comptr of A/C
" Comptr of Nilgiris & Wynaad
" Military Dept
" Public Dept
" Financial Dept
" Surgeon General with the Govt
" Accts General
" Resident in Travancore & Cochin thro' Pol Dept for information & Commn to the Sirkars concerned

BRM 3.9.92 copy to the Hon: Secy: agri-Horticultural Society " " Chamber of Commerce

200/13

Draft Review

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Cinchona Report for
1891-92.

H.M.S
&
H.E. the Governor

Para 10. The Econ-
lytical report submitted by
Mr Hooper has been read with
interest, particularly that portion
which deals with the tanning
properties of "wattle barks".
H.E. the Governor in Council
desires that the widest possible
publicity should be given to
that portion of Mr Hooper's re-
port, for although the Indian
abnormal
wattle bark will not be able
easily
to compete with Australian
bark, still the great advantage
which India has over Austra-
lia in point of distance might
with good management divert
a portion of the trade to this
country, and the bark ought
in any case to take the place
of Tanjore bark in local tan-
neries. In order to make the
wattle bark
tanning properties as widely known as possible H.E.
in Council directs that the portion
of Mr Hooper's report relating to
the same be translated into the
Vernaculars and published in
English and in the Vernaculars in
the

For St George and all District Gazettes, and that Collectors of districts in which tanneries are situated should place themselves in communication with tanners and explain to them the superiority of ~~bark~~ the bark for tanning purposes

21. 9 92

22/9

(Print statements as appended to letter)

Para 10 of Mr Cochrane's Review noted in accordance with His Excellency's remarks & to be submitted for approval.

G. Cecil 22 Sept: 1892 no: 995

Seen

Print
Sharp
2/95

Note for Mr Sharp

Please send copy of first page of this article to Mr Price

SK 4/9