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MADRAS RECORD OFFICE.

Government of Madras.

Revenue DEPARTMENT.

G.O. No. 1237 Press Mis.

Dated 20. 8. 1872.

Not to be folded or roughly handled

No. 184. Read the following letter from the Commissioner of the Nilgiris, to the Chief Secretary to Government, Ootacamund, dated Ootacamund, 12th July 1872, No. 81:—

I HAVE the honour to submit Mr. McIvor's report on the administration of the Cinchona Department during the official year 1871-72.

2. It is stated that the plantations have thriven during the year, notwithstanding drought in the months of January, February, and March last.

3. Of the new varieties of Cinchona 900 of the Pitayensis, 1,000 of the Lanceolata (*C. Angustifolia*) and 2,750 of the *C. Calisaya,* have been planted out on the Dodabetta and Hooker plantations; 12,213 of *C. Pitayensis* and 4,124 of *C. Angustifolia* have been propagated and 5,000 plants have been distributed to the public and 44 ounces of seed.

4. Mr. McIvor contemplates planting five acres of each of the new varieties during the present monsoon to complete the area intended to be appropriated to these varieties.

5. Mr. McIvor reports having furnished Mr. Broughton, the Government Quinologist, with 35,072 lbs. of bark during the year for the manufacture of Amorphous quinine. In connection with this subject he states "that large quantities of Amorphous alkaloids are available in London at 3*d.* per ounce in rolls;" and he suggests that our barks should be bartered for them. Upon this proposition Mr. Broughton, to whom I made a reference, writes: "The preparation which, in accordance with the instructions I received from the Home Government, I have recommended for adoption in this country as an effective febrifuge is amorphous in form, but as it contains the whole alkaloids in the proportion they are contained in the bark, it is nearly entirely susceptible of crystallization. The Amorphous quinine, which Mr. McIvor states can be purchased at 3*d.* per ounce in England, is the refuse of the manufacture of the crystalline salts of the alkaloids, and contains what refuse to crystallize. It, therefore, is a totally different substance to that I am manufacturing from our red barks, and is more usually called in England quinoidine."

The unsaleability and the accumulation of large stocks in the hands of manufacturers is some testimony to its comparative uselessness in medicine.

Mr. Broughton proceeds to say that he understands this substance was tried some years ago in the Madras Presidency on account of its low price before the introduction of the Cinchona plant to India, but was found ineffectual as a febrifuge, and its use was abandoned, and remarks that our barks, containing an ounce of alkaloid in the pound, sold for 2*s.* 10*d.* a lb. in the London market; and hence, that the manufacturer gave that price for an ounce of unmanufactured alkaloids, and therefore could not manufacture the real alkaloids for 3*d.* per ounce.

6. During the year under report 7,294½ lbs. of bark were shipped to England for sale, and realized excellent prices. Mr. McIvor appears not to be very sanguine as to the success of the Cinchona plantations in a commercial point of view. He

remarks that the London market for quinine is not elastic, and that the consumption averages 1,411,636 lbs. of bark per annum, while the Government and private plantations together, when at maturity, will yield yearly 3,500,000 lbs. of bark.

The actual expenditure on the Cinchona Department during the year 1870-71 was Rs. 29,490 out of a Budget grant of Rs. 45,400. The expenditure in the year under report has been Rs. 30,000 against a Budget grant of Rs. 34,337. This small excess will not, it is hoped, be viewed with dissatisfaction.

ENCLOSURE No. 1.

Report on the Progress and Condition of the Government Cinchona Plantations on the Nilgiris for the official year 1871-72.

THE early part of this year was most favourable for the growth of all varieties of Cinchona, but the drought in December, January, February, and March, has been unusually severe, and had a marked effect in retarding the growth of the younger plantations, while on the older plantations the effect was not so apparent. On the whole, the growth during the year has been satisfactory. The older trees maintained during the whole period luxuriant growth with fine leading shoots. Where the trees have completely covered the ground, excluding the light from the surface of the soil, the growth has been most rapid, as in such places a fine deposit of new soil yearly enriches the land by the fall and decay of the leaves.

2. It has been found advisable to discontinue pruning, as when branches are removed by the knife or saw they are apt to leave a scar on the stem. Our older trees have already shown that pruning is much better to be left to nature, as when the lower branches become shaded by the luxuriant lops their growth becomes weakly and ultimately die and break off from the tree without leaving any scar or injury on the stem of the plant.

3. The largest plants of *C. Succirubra* averages about 28½ feet in height, with a circumference of stem at one foot from the ground of thirty inches. The largest plants of *C. officinalis* average twenty-two feet in height, with a circumference of stem of 16½ inches at one foot from the ground.

4. Of the new varieties of *C. Pitayensis* there have been permanently planted out on the—

Dodabetta Plantation	500
Hooker ,, ...	400

of the new variety of *C. officinalis*, termed lanceolata, but now named Angustifolia, there has been permanently planted out on the—

Dodabetta Plantation	300
Hooker ,, ...	700

and of the new varieties of Calisaya on the Neddiwattam plantations 2,750.

5. The above forms the only new land planted during the year ; other operations being confined to filling up failures, keeping the plantations clean, opening drains, maintaining roads and buildings.

6. The number of new species propagated during the year are as follow :—

C. Pitayensis	12,213
C. Angustifolia (lanceolata).....	4,124

7. The number of plants distributed to the public is 5,000 and 44 ounces of seeds.

8. On the Hooker Estate a piece of fine well-sheltered land has been prepared, on which it is intended to plant five acres of each of the new varieties during this monsoon. This will complete the entire extent to be planted with the new varieties.

Proceedings of the Madras Government, Revenue Department,
20th August 1872.

9. During the year 23,494 lbs. of fresh trunk bark of the first quality and 11,578 lbs. of prunings have been supplied to Mr. Broughton, the Government Quinologist, for the manufacture of Amorphous quinine.

10. In July 1871, 3,188½ lbs., and in January 1872, 4,106 lbs. of dry bark were forwarded to England for sale. Advice has been received of the sale of the first consignment, from which we learn that "old mossed Succirubra bark" brought 2*s*. 3*d*. per lb. for pharmaceutical preparations and 2*s*. 7*d*. per lb. for the extraction of quinine ; while "small mossed bark" brought 2*s*. 6*d*., and "unmossed" 2*s*. 10*d*. per lb., both for pharmaceutical preparation. It is not stated what was realized for the bark of *C. officinalis*. This bark, however, contains by far the largest proportion of quinine, and therefore does not appear to have realized a price proportionate to its value. Another fact worthy of remark is that the mossed barks have brought the lowest price ; this is probably due to the altered appearance of the bark when subjected to the mossing process. The prices realized are, however, on the whole, most satisfactory, and leave no doubt that our Indian barks will shortly establish for themselves a position in the home market.

11. We have now taken, by the mossing process, the entire bark from the stems of 1,000 unselected *C. Succirubra* trees between eight and nine years of age, and find the yield of dry bark to be 2,988 lbs., or nearly 3 lbs. of dry bark per tree. The bark was taken at two periods ; about one-third being removed in the early part of 1871, and the second portion of about two-thirds removed in October and November of the same year. The bark was removed from the stems only from the ground to a height varying from 8 to 12 feet according to the size of the trees. Thus the produce of bark has turned out much greater than we expected, and indicates the great productive powers of our Cinchona plantations. It would thus appear that Cinchona cultivation under good management will prove a profitable investment, provided the market is not glutted by an excessive supply so as to cause the prices to fall too low to be remunerative. On the Government Cinchona plantations on the Nilgiris we may fairly estimate that we have at least one million of healthy plants which will attain maturity, and when the youngest of these plants have reached nine years' growth, we may safely calculate that the Government plantations alone will produce at least 1,500,000 lbs. of bark annually, containing on an average 6 per cent. of alkaloid, and that private plantations on the Nilgiris will produce about 2,000,000 lbs. of bark of a like quality. What effect this quantity of bark may have on the market it is impossible to conceive. At present it would appear that the quantity of bark above stated is more than sufficient to meet the demands of the whole world.

12. The exact quantities of Peruvian bark imported and exported into and from the United Kingdom is somewhat difficult to ascertain, as bark has been duty free since 1815. Table I. in the Appendix, compiled by Mr. Money from the official returns, shows the yearly imports and exports for thirty years, or from 1841 to 1871, with the official prices of bark and quinine so far as they can be ascertained ; the whole being complete from 1849 to 1871.

13. It will be observed, by a reference to this table, that the reduction in the price of quinine does not seem to have increased the consumption, and that the total quantity of bark imported will scarcely average 1,411,636 lbs. per annum, while the average consumption of the United Kingdom may be estimated at between five and six hundred thousand pounds. The stock in hand in each year seems to have materially influenced the imports of bark ; thus indicating that South America can supply any quantity of bark the market will take, provided the price is sufficiently high to be remunerative.

14. The cost of mossing, removing, and drying the bark from the 1,000 *C. Succirubra* trees abovementioned is as follows :—The first removal cost Rs. 41-2-0, and the second removal Rs. 180-11-4, or making a total of Rs. 221-13-4 ; the quantity of bark obtained being 2,988 lbs. will give the cost per lb. of dry bark Annas 1 and Pies 2, or 3½*d*. per lb., as the actual cost of labour of removing and drying the bark, exclusive of the cost of superintendence. The cost will be somewhat diminished in the succeeding harvest, as the same moss can be applied for an indefinite period of time, as the moss, when once put on, grows and increases as well as the trees.

15. A disadvantage of the mossing process, especially when viewed in connection with the manufacture of alkaloids here, is that it necessitates the bark being taken during the months of April and May, the early part of June, and in October and November only. This throws at one time upon the hands of the Government Quinologist a larger quantity of bark than he is able to manufacture.

16. Mr. Brcughton estimates that 20,000 lbs. of dry trunk bark, similar to that sold in England for 2*s.* 10*d.* per lb., will be required for the manufacture of 800 lbs. of "Amorphous quinine." In Europe the value of bark is estimated by the quantity of crystallizable alkaloid it contains, as there only crystallized alkaloids command a sale, while Amorphous alkaloids are of little value, and large stocks have accumulated in that country. In India, however, the Amorphous alkaloids are considered to be quite as effective as crystallized alkaloids. It therefore appears desirable that we should forward our barks for sale in the London market, and with the proceeds therefrom purchase what quantity of Amorphous alkaloids we may require. I learn from Messrs. Howard and Sons, Quinine Manufacturers, Stratford, London, that they can supply "Amorphous quinine" at 3*d.* per oz. in rolls. Thus 20,000 lbs. of bark at 2*s.* 6*d.* net in the London market will give a sum sufficient to purchase 12,500 lbs. of Amorphous quinine; and as 800 lbs. of Amorphous quinine can only be produced from that quantity of bark when manufactured here, it would appear to be greatly to the benefit of the plantations to dispose of the bark in the home market and to purchase there such quantities of Amorphous alkaloid as may be required for the use of the hospitals in this country.

17. Owing to the reduction of the establishment in the Cinchona Department it was found impossible to maintain a correct Meteorological Register; the usual meteorological tables, therefore, are not appended to this report.

18. The Tea Plantation has not been further extended, but a considerable nursery of Tea cuttings of the indigenous Assam, hybrid, and Chinese varieties have been formed. During the year 300 lbs. of fresh Tea leaves have been supplied to Captain Jennings.

19. A table of the expenditure incurred on the plantations from 1860 to 31st March 1872, is appended.

COIMBATORE,
24*th May* 1872.

(Signed) W. G. McIVOR,
Superintendent Government Cinchona Plantations.

Proceedings of the Madras Government, Revenue Department,
20th August 1872.

Table showing the Imports and Exports of Cinchona Bark to and from the United Kingdom from 1841 *to* 1871.

Years.	Price of Quinine.	Value of Bark imported per lb.	Value of Bark exported per lb.	Calculated Stock beginning of each year starting at 2 years Average Exports.	Quantity of Imports.	Quantity of Exports.	Excess Imports.	Excess Exports.	Imports above Average by.	Imports below Average by.	Five years Averages of yearly Imports and Exports and Home Consumption.	
1	2	3	4	5	6	7	8	9	10	11	12	
1841	0 16 0	0 0 0	0 0 0	715,724	210,112	229,152	.....	19,040	.....	80,000	Imports	290,931
1842	0 16 0	0 0 0	0 0 0	640,471	124,000	406,560	.....	280,560	.....	164,000	Exports	357,863
1843	0 16 0	0 0 0	0 0 0	303,698	312,928	450,688	.....	137,760	23,000	.....	Home consumption per annum.	50,213
1844	0 16 0	0 0 0	0 0 0	109,725	236,880	255,024	.....	18,144	.....	54,000		
1845	0 12 6	0 0 0	0 0 0	35,388	585,736	447,888	120,848	.....	278,000	.....	Imports	740,409
1846	0 12 6	0 0 0	0 0 0	100,000	739,312	433,888	305,424	.....	.....	1,000	Exports	491,919
1847	0 12 6	0 0 0	0 0 0	296,964	768,544	781,088	.....	12,544	28,000	.....	Home consumption per annum.	108,460
1848	0 13 9	0 0 0	0 0 0	175,960	276,416	288,064	.....	11,648	.....	464,000		
1849	0 16 0	0 0 0	0 0 0	55,852	737,744	407,568	330,176	.....	.....	3,000	Imports	1,903,328
1850	0 15 0	0 2 6	0 3 0	277,568	1,180,032	549,136	630,896	.....	440,000	.....	Exports	1,305,741
1851	0 13 0	0 2 6	0 3 0	800,000	1,237,936	429,184	808,752	.....	.....	666,000	Home consumption per annum.	457,587
1852	0 9 3	0 2 6	0 3 0	1,151,165	2,039,072	1,130,304	908,768	.....	136,000	.....		
1853	0 8 0	0 2 6	0 3 0	1,602,346	1,542,464	1,526,672	15,792	.....	.....	36,000	Imports	1,512,493
1854	0 9 0	0 2 6	0 2 6	1,160,551	2,163,952	1,584,552	579,600	.....	260,000	.....	Exports	1,231,440
1855	0 8 3	0 2 6	0 2 4½	1,282,564	2,533,216	1,858,192	675,024	.....	620,000	.....	Home consumption per annum.	500,982
1856	0 7 2	0 2 0	0 2 0	1,500,000	3,090,976	1,097,152	1,993,824	.....	1,178,000	.....		
1857	0 6 2	0 1 10½	0 1 10½	2,992,842	2,380,112	1,078,000	1,302,112	.....	468,000	.....	Imports	2,011,341
1858	0 5 10	0 2 2½	0 2 2½	3,798,972	2,003,120	1,299,760	703,360	.....	91,000	.....	Exports	1,283,699
1859	0 5 10	0 2 3½	0 2 3½	3,996,350	1,067,136	1,324,176	.....	257,040	.....	845,000	Home consumption per annum.	527,642
1860	0 8 0	0 3 1	0 3 1	3,236,938	1,020,768	1,358,112	.....	337,344	.....	892,000		
1861	0 6 6	0 2 8	0 2 8	2,400,000	1,397,424	1,056,384	341,040	.....	.....	614,000	Imports	1,611,389
1862	0 7 0	0 1 6	0 1 6	2,213,399	1,097,296	1,174,320	822,976	.....	.....	14,000	Exports	1,660,670
1863	0 6 4	0 1 0	0 1 0	2,508,734	2,641,968	1,264,704	1,377,264	.....	640,000	.....	Home consumption per annum.	545,718
1864	0 5 9	0 1 1½	0 1 1½	3,358,357	2,282,896	1,279,488	1,003,408	.....	271,000	.....		
1865	0 5 2	0 1 2½	0 1 2½	3,834,124	1,737,120	1,643,600	93,520	.....	.....	274,000		
1866	0 5 0	0 1 5	0 1 5	3,400,000	1,545,264	1,274,672	270,592	.....	.....	66,000		
1867	0 4 9	0 1 5⅝	0 1 5⅝	3,124,874	1,005,760	1,490,270	.....	484,512	.....	606,000		
1868	0 4 3	0 1 9	0 1 9	2,094,644	1,712,368	1,874,432	.....	162,064	101,000	.....		
1869	0 5 9	0 1 8½	0 1 8½	1,386,562	1,257,984	1,757,056	.....	490,072	.....	854,000		
1870	0 6 3	0 1 8⅝	0 1 8⅝	342,072	2,535,568	1,431,920	1,103,648	.....	924,000	.....		
1871	0 3 0	0 2 2½	0 2 2½	900,000	2,547,776	2,026,192	521,584	.....	.....	.....		

(Signed) W. G. McIVOR,
Superintendent Government Cinchona Plantations.

COIMBATORE,
24th May 1872.

No. 185. ORDER THEREON, 20th August 1872, No. 1,237.

Miscellaneous.

THE above papers relate to the working of the Cinchona Department during the official year 1871-72. The unusual drought during December and three following months had the effect of retarding the growth of the young plants, but the older trees were not seriously affected, and, on the whole, the progress may be regarded as satisfactory.

2. Operations were restricted, in a great measure, to conservancy; it having been decided that attention should be directed to the propagation of new varieties exclusively, the extensions were necessarily limited. Of the new varieties of *C. Pitayensis* 900 seedlings were planted out and 12,213 propagated. Of *C. Angustifolia* (lanceolata) the number planted amounted to 1,000 and the number propagated to 4,124, whilst 2,750 plants of *C. Calisaya* have been added to the Neddiwattam plantation. During the present season the area allotted to each of the above three new species, namely, 5 acres, will be completely planted up, 15 acres of land on the Hooker Estate having been prepared for the purpose.

The number of plants distributed to the public was 5,000 against 602 in the previous year. The effect of discontinuing pruning should be carefully noted.

3. The total expenditure was slightly in excess of that for the previous year, namely, Rs. 30,000 against Rs. 29,490; but the cessation of operations on the Mailkoondah Estate having led to a reduction of expenditure on that estate to one-fifth of the sum laid out in the previous year, the working expenses of the other estates were really considerably heavier than in the preceding year. The excess appears to have been in the item Weeding and Clearing on the Dodabetta and Pykara Estates. This point should have been noticed in the report. As the census of the trees will, it is presumed, be completed shortly, the Superintendent will no doubt be in a position soon to submit his proposals regarding the allotment of a fixed sum per acre for working charges, as directed in paragraph 4, G. O., 8th June 1871, No. 1,011. The total expenditure on the Government Cinchona Plantations from the commencement in 1860 up to the end of March last is stated to have amounted to Rs. 6,17,194.

4. The value of the bark supplied to the Government Quinologist and shipped to England for sale during the year under report is estimated at a little over Rs. 16,000, or rather more than half the year's outlay.

5. A first consignment of 7,294½ lbs. of dry bark was despatched to England for sale, and realized satisfactory prices, varying from 2*s.* 3*d.* per lb. to 2*s.* 10*d.* per lb.; it is noteworthy, however, that the "unmossed" bark, contrary to Mr. McIvor's expectations, fetched a higher price than the "mossed"—a result which is attributed by him to the altered appearance of the bark owing to its having been subjected to the mossing process; it would, of course, be premature to pass any judgment until the qualities of each description of bark have been thoroughly tested by further experiments. The comparative advantages of the coppicing and mossing methods have still to be ascertained.

6. The Government Quinologist was supplied with 2,349 lbs. of fresh trunk bark of the first quality and 11,578 lbs. of prunings for the manufacture of Amorphous quinine. From paragraph 5 of the Commissioner's letter it appears that

Mr. McIvor is altogether mistaken in supposing that the so-called Amorphous quinine procurable in the home market at 3*d.* per oz. in rolls is identical with the substance which is now being manufactured by Mr. Broughton under that name, and which, as Mr. Broughton explains, is amorphous in form only, but contains the whole alkaloids in the proportion in which they exist in the bark, whilst the article to which Mr. McIvor refers is the refuse of the manufacture of the crystalline salts.

7. It is satisfactory to learn that the yield of dry bark obtained from the mossed Succirubra trees averaged about 3 lbs. per tree, or ½ lb. in excess of Mr. McIvor's estimate (*vide* paragraph 8 of the Report for 1870-71, wherein a special report on the subject is promised). The effects of the mossing process on the proportion of alkaloids as well as on the weight of bark yielded will be ascertained by experiments.

8. The rest of the report is devoted to an examination of the effect which will be produced upon the home market by the influx of the bark produced on the Nilgiri plantations (Government and private combined), which Mr. McIvor estimates to be capable of producing 3,500,000 lbs. of bark annually. The result at which Mr. McIvor arrives, on a consideration of the data afforded by a table, showing the imports and exports of Peruvian bark to and from the United Kingdom for a period of thirty years from 1841 to 1871, is that South America is equal to any demand that is likely to arise, provided the price is sufficiently high to be remunerative. The success of Cinchona cultivation, as a commercial speculation, is, however, not a question which can influence the Government action, as their avowed object is to provide an abundant supply of the febrifuge at a rate so cheap as to be within the means of the population at large, and not to enter into competition with private growers.

9. Before sanctioning the discontinuance of the meteorological observations (which appear to have been made hitherto at Neddiwattam and the Botanical Gardens), the Government desire to be informed in greater detail how the reduction of the establishment in the Cinchona Department renders it impossible to maintain a correct register. The rainfall should at least be registered.

10. The price at which the produce of the Government Tea Plantation is handed over to Captain Jennings does not appear to have been communicated to Government.

(True Extract.)

(Signed) W. HUDLESTON,
Secretary to Government.

To the Commissioner of the Nilgiris.
,, the Government Quinologist.
,, the Board of Revenue.
,, the Accountant-General.

Exd. F. R. Bantleman.

Nilgiris C. No 923 of 1872.

Govt. of [1872] Madras

REVENUE.

To

THE COMMISSIONER OF THE NILGIRIS,

&c., &c., &c.

Dated August 20th.

Read.

Encl.

G. O., 20th August 1872, No. 1,237.

AUGUST.

Nos. 184-185.

Cinchona Cultivation.—Letter from the Commissioner of the Nilgiris submitting the report in connection with it for the official year 1871-72 reviewed.

Report on the Progress and Condition of the Government Chinchona Plantations on the Nedleshries for the official year 1871-72.

The early part of this year was most favorable for the growth of all varieties of Chinchona, but the drought in December, January, February and March has been unusually severe, and had a marked effect in retarding the growth of the younger Plantations, while on the older plantations the effect was not so apparent. On the whole the growth during the year has been satisfactory. The older trees maintained during the whole period luxuriant growth with five leading shoots. Where the trees have completely covered the ground, excluding the light from the surface of the soil, the growth has been most rapid; as in such places a fine deposit of new soil yearly enriches the land by the fall and decay of the leaves.

2 It has been found advisable to discontinue pruning, as when branches are removed by the knife or saw they are apt to leave a scar on the stem. Our older trees have already shewn that pruning

is much better to be left to nature, as when the lower branches become shaded by the incumbant tops their growth becomes weakly and ultimately die and break off from the tree, without leaving any scar or injury on the stem of the plant.

3. The largest plants of C. succirubra averages about 28½ feet in height, with a circumference of stem at one foot from the ground of 30 inches. The largest plants of C. Officinalis average 22 feet in height with a circumference of stem of 16½ inches at one foot from the ground.

4. Of the new varieties of C. Pitayensis there have been permanently planted out on the

Dodabetta Plantation 500

Hooker Do 400

of the new variety of C. officinalis termed Lancolata but now named angustifolia there has been permanently planted out on the

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and of the new varieties of Calisaya on the Nedivattum Plantations 2750.

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keeping the plantations clean, opening drains, maintaining roads and buildings

6 The number of new species propagated during the year are as follows

C. Pitayensis 12213

C. Angustifolia (lancolata) 4124

7. The number of plants distributed to the public is 5000 and 44 oz of seeds.

8 On the Hooker Estate a piece of fine well sheltered land has been prepared on which it is intended to plant five acres of each of the new varieties during this monsoon This will complete the entire extent to be planted with the new varieties.

9 During the year 23494 lbs of fresh trunk bark of the first quality and 11578 lbs of prunings have been supplied to Mr Broughton the Government Quinologist for the manufacture of amorphous Quinine.

10 In July 1871, 3188½ lbs and in January 1872, 4106 lbs of dry bark were forwarded to England for sale. advice has been received of the sale of the first Consignment from which we

we learn that "old mossed succirubra bark" brought 2/3½ per lbs for pharmaceutical preparations and 2/7½ per lbs for the extraction of quinine, while "small mossed bark" brought 2/6 and "unmossed" 2/10 per lbs both for pharmaceutical preparations. It is not stated what was realized for the bark of C. Officinalis. This bark however contained by far the largest proportion of quinine and therefore does not appears to have realized a price proportionate to its value. Another fact worthy of remark is that the mossed barks have brought the lowest prices; this is probably due to the altered appearance of the bark when subjected to the mossing process. The prices realized are however on the whole most satisfactory and leave no doubt that our Sudean barks will shortly establish for themselves a position in the home markets.

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and find the yield of dry bark to be 3 lbs 8 ozs or nearly 3 lbs of dry bark per tree. The bark was taken at two periods, about one third being removed in the early part of 1871 and the second portion of about two thirds removed in October and November of the same year. The bark was removed from the stems only, from the ground, to a height varying from 8 to 12 feet according to the size of the trees. Thus the produce of bark has turned out much greater than we expected, and indicates great productive powers of our Cinchona Plantations. It would thus appear that Cinchona cultivation under good management will prove a profitable investment provided the market is not glutted by an excessive supply so as to cause the prices to fall too low to be remunerative. On the Government Cinchona Plantations on the Neilgherries we may fairly estimate that we have at least one million of healthy plants which will attain maturity and when the youngest of these plants have reached nine years growth we

we may safely calculate that the Government Plantations alone will produce at least 1,500,000 lbs of bark annually containing on an average 6 p% of alkaloid, and that Private Plantations on the Neilgherries will produce about 2,000,000 lbs of bark of a like quality. What effect this quantity of bark may have on the market it is impossible to conceive. At present it would appear that the quantity of bark above stated, is more than sufficient to meet the demands of the whole world.

12. The exact quantities of Peruvian bark imported and exported into and from the united kingdoms is somewhat difficult to ascertain, as bark has been duty free since 1845. Table I in the Appendix compiled by Mr Money from the official returns shows the yearly imports and exports for 31 years, or from 1841 to 1871, with the official prices of bark

so far as they can be ascertained. the whole being Complete from 1849 to 1871.

13. It will be observed by a reference to this table that the reduction in the price of quinine does not seem to have increased the consumption, and that the total quantity of bark imported will scarcely average 1,411,636 lbs per annum, while the average consumption of the united kingdom may be estimated at between 5 and 6 hundred thousand lbs. The stock in hand in each year seems to have materially influenced the imports of bark, thus indicating that South america can supply any quantity of bark the market will take provided the price is sufficiently high to be remunerative.

14. The cost of bruising, removing and drying the bark from the 1000 C. Succirubra trees above mentioned is as follows. The first removal Cost Rs 41..2..0 and the second removal Rs 180..11..4 or making a total of Rs

Rupees 221.13.4, the quantity of bark obtained being 2988 lbs, will give the cost per lbs of dry Bark Annas 1 2 Pice 2 or 1 3/2 per lbs as the actual cost of labor of removing and drying the bark exclusive of the cost of superintendence. The Cost will be somewhat diminished in the succeeding harvest as the same trees can be applied for an indefinite period of time as the trees when once put on grows and increases as well as the trees.

The disadvantage of the mossing process especially when viewed in connection with the manufacture of alkaloids here is that it necessitates the bark being taken during the months of April and May, the early part of June, and in October and November only. This throws at one time upon the hands of the Government Quinologist a larger quantity of bark than he is able to manufacture.

Mr. Broughton estimates that

that 20,000 lbs of dry Trunk bark similar to that sold in England for 2/10 per lbs will be required for the manufacture of 200 lbs of "Amorphous Quinine". In Europe the value of bark is estimated by the quantity of crystallizable alkaloid it contains, as there only crystallized alkaloids command a sale, while amorphous alkaloids are of little value, and large stocks have accumulated in that Country. In India however the Amorphous alkaloids are considered to be quite as effective as Crystallized alkaloids. It therefore appears desirable that we should forward our barks for sale in the London market, and with the proceeds thereof purchase what quantity of Amorphous alkaloids we may require. I learn from Messrs Howard and Sons Quinine manufacturers Stratford London that they can supply "Amorphous Quinine" at 1/6 per oz in rolls. Thus 20000 lbs of bark at 2/6 nett in the London market will

will give a sum sufficient to purchase 12,500 lbs of Amorphous Quinine, and as 800 lb. of Amorphous Quinine can only be produced from that quantity of bark when manufactured here it would appear to be greatly to the benefit of the Plantations to dispose of the bark in the home market and to purchase there such quantities of Amorphous alkaloid as may be required for the use of the Hospitals in this Country.

17. Owing to the inaction of the Establishment in the Chinchona department, it was found impossible to maintain a correct meteorological register; the usual meteorological tables therefore are not appended to this report.

18. The Tea Plantation has not been further extended, but a considerable nursery of tea cuttings of the indigenous Assam, Hybrid, and Chinese varieties have been formed.

During the year 300 lbs of fresh tea leaves have been supplied to Captain Jennings.

19. A table of the Expenditure incurred on the Plantations from 1860 to 31st March 1872 is appended.

W. G. M. Iver

Supt. Govt. Chinchona Plantns

Coimbatore
24th May 1872

Table shewing the Imports and Exports of Chinchona Bark to and from the United Kingdom from 1841 to 1871

Year	Price of Quinine	Value of Bark imported per lb	Value of Bark exported per lb	Calculated stock beginning of each year starting at 2 years average of Imports	Quantity of Imports	Quantity of Exports	Excess Imports	Excess Exports	Imports above average by	Imports below average by	5 years average of yearly Imports and Exports & Home consumption
1	2	3	4	5	6	7	8	9	10	11	12
1841	" 16 "	" " "	" " "	715,724	210,112	229,152	"	19,040	"	80,000	Impts 290,931 Expts 357,862 H. Con. 56,213 per Annum
1842	" 16 "	" " "	" " "	640,471	126,000	406,560	"	280,560	"	164,000	
1843	" 16 "	" " "	" " "	303,698	312,928	450,688	"	137,760	22,000	"	
1844	" 16 "	" " "	" " "	109,725	236,880	255,024	"	18,144	"	54,000	
1845	" 12 6	" " "	" " "	35,368	568,736	447,888	120,848	"	278,000	"	
1846	" 12 6	" " "	" " "	100,000	739,312	433,888	305,424	"	"	1,000	Impts 740,409 Expts 491,949 H. Con. 108,460 per Annum
1847	" 12 6	" " "	" " "	296,964	768,544	781,088	"	12,544	28,000	"	
1848	" 13 9	" " "	" " "	175,960	276,416	288,064	"	11,648	"	464,000	
1849	" 16 "	" " "	" " "	55,852	737,744	407,568	330,176	"	"	3,000	
1850	" 15 "	" 2 6	" 3 "	277,568	1,180,032	549,136	630,896	"	440,000	"	
1851	" 13 "	" 2 6	" 3 "	800,000	1,237,936	429,184	808,752	"	"	666,000	Impts 1,703,328 Expts 1,305,741 H. Con. 457,587 per Annum
1852	" 9 3	" 2 6	" 3 "	1,151,165	2,039,072	1,130,904	908,168	"	136,000	"	
1853	" 8 "	" 2 6	" 3 "	1,602,346	1,542,464	1,526,672	15,792	"	"	361,000	
1854	" 9 "	" 2 6	" 2 6	1,160,551	2,163,952	1,584,552	579,600	"	260,000	"	
1855	" 8 3	" 2 6½	" 2 1½	1,282,561	2,53[illegible]	1,558,192	645,021	"	130,000		
1856	" 7 2	" 2 "	" 2 "	1,500,000	3,090,976	1,097,152	1,993,824	"	1,178,000	"	Impts 1,912,422 Expts 1,231,440 H. Con. 500,982 per Annum
1857	" 6 2	" 1 10¼	" 1 10¼	2,992,842	2,380,112	1,078,000	1,302,112	"	468,000	"	
1858	" 5 10	" 2 2¾	" 2 2¾	3,793,972	2,003,120	1,299,760	703,360	"	91,000	"	
1859	" 5 10	" 2 3½	" 2 3½	3,996,350	1,067,136	1,324,176	"	257,040	"	845,000	
1860	" 8 "	" 3 1	" 3 1	3,238,328	1,020,768	1,358,112	"	337,344	"	892,000	
1861	" 6 6	" 2 8	" 2 8	2,400,000	1,397,424	1,056,384	341,040	"	"	614,000	Impts 2,011,341 Expts 1,283,699 H. Con. 527,641 per Annum
1862	" 7 "	" 1 6	" 1 6	2,213,399	1,997,296	1,174,320	822,976	"	"	14,000	
1863	" 6 4	" 1 "	" 1 "	2,508,784	2,641,968	1,264,704	1,377,264	"	640,000	"	
1864	" 5 9	" 1 1¼	" 1 1¼	3,358,357	2,282,896	1,279,488	1,003,408	"	271,000	"	
1865	" 5 2	" 1 2¼	" 1 2¼	3,834,124	1,737,120	1,643,600	93,520	"	"	274,000	
1866	" 5 "	" 1 5	" 1 5	3,400,000	1,545,264	1,274,672	270,592	"	"	66,000	Impts 1,611,389 Expts 1,555,670 H. Con. 545,718 per annum
1867	" 4 9	" 1 5¾	" 1 5¾	3,124,874	1,005,760	1,490,270	"	484,572	"	606,000	
1868	" 4 3	" 1 9	" 1 9	2,094,644	1,712,368	1,874,432	"	162,064	101,000		
1869	" 5 9	" 1 8¾	" 1 8¾	1,386,862	1,257,984	1,757,056	"	499,072	"	354,000	
1870	" 6 3	" 1 8¾	" 1 8¾	342,072	2,535,568	1,431,920	1,103,648	"	924,000	"	
1871	" 8 "	" 2 2½	" 2 2½	900,000	2,547,776	2,026,192	521,584	"	"	"	

Coimbatore
24th May 1872

W. G. McIvor
Supt. Govt. Chinchona Plantations

...nctioned Estimate, results of expenditure and Out turn of the Government Chinchona Plantations for the year 1871-72

Particulars	Superintendent & Office Establishment Estimate	Superintendent & Office Establishment Expenditure	Propagation & Nursery Dept. Estimate	Propagation & Nursery Dept. Expenditure	Dodabet Plantation Estimate	Dodabet Plantation Expenditure	Neddivuttum Plantation Estimate	Neddivuttum Plantation Expenditure	Pykara Plantation Estimate	Pykara Plantation Expenditure	Malakoondah Plantation Estimate	Malakoondah Plantation Expenditure	Total Estimate	Total Expenditure
...blishment including Salaries	8,012	8,023	1982	2,135	1860	[illegible]1	2,882	2,729	1020	937	156	120	15,912	15,835
...ldings	"	"	250	125	300	[illegible]	350	150	100	125	"	"	1000	500
... and Store rooms	"	"	"	"	15	[illegible]5	25	24	15	8	"	"	55	47
...ies Quarters	"	"	"	"			125	121	50	13	"	"	175	134
...ing	"	"	"	"			50	"	50	40	"	"	100	40
...ring and Weeding	"	"	40	"	4,000	3,[illegible]61	4,000	3,099	2000	2190	147	147	10,187	8,897
...ting	"	"	"	"	500	[illegible]60	500	370	300	175	"	"	1,300	905
...riage of Plants	"	"	"	"	50	[illegible]5	50	30	25	10	"	"	125	75
...ntking and Shading	"	"	"	"	200	[illegible]80	200	174	75	65	"	"	475	419
...ad Making	"	"	"	"	50	[illegible]20	50	"	50	"	"	"	150	20
...ols	"	"	"	72	100	[illegible]	200	125	100	50	"	"	400	347
...ntingencies	200	100	200	10	200	[illegible]6	200	61	200	40	163	"	1,163	397
...thing	30	20	20	13	20	"	20	20	10	"	"	"	100	53
...rians	"	"	25	"	500	[illegible]10	500	430	300	200	"	"	1325	940
...llection of Bark	"	"	"	"	500	57	1000	1,220	"	20	"	"	1500	1,297
...rriage of do	"	"	"	"	"	"	150	94	"	"	"	"	150	94
...nuping trees	"	"	"	"	"	"	2,540	"	"	"	"	"	2,540	"
	8,242	8,143	2,517	2,355	8,295	[illegible]15	12,842	8,647	4,295	3,873	456	267	38,757	30,000

...stimated
...t turn
...of
1.72.

35,072 lbs	Chinchona fresh Bark supplied to Government Quinologist	@ 4 As. p lb	8.768 - " - "
7,294 lbs	Do dry do shipped for sale in England	@ 1 Rupee do	7,294 - 8 - "
44 lbs	Do Seeds distributed gratuitously	@ 4 As. p lb	11 - " - "
5000	Do Plants	@ 2 Pie each	52 - 1 - 4
	Sale of Tools		70 " "
		Total Rs.	16.195 - 9 - 4

Government Gardens
Ootacamund 31st March 1872

[illegible]
Sub Govt. Chinchona Plantns
[illegible] Chinchona Plantns

Statement of Expenditure 1871-72 of the Govt. Chinchona Plantations in the Nilgiris

Particulars	Supt's Office Estt.		Propagation & Nursery Depts.		Bodasatta Plantation		Naduvattum Plantation		Paycara Plantation		Mallondad Plantation		Total
	1860 & 1870	1871/72	1861 to 1870/71	1871/72	1860 to 1870/71	1871/72	1861 to 1870/71	1871/72	1862 1870-71	1871/72	1863 to 1870-71	1871/72	
Establishment. Salaries &c	73177	8023	38262	2135	40825	1891	81946	2729	12559	937	9485	120	272059
Buildings	"	"	14093	125	20521	100	22865	150	3458	125	3138	"	64575
Tool and Store rooms	"	"	"	"	660	15	1594	24	885	8	320	"	3506
Coolies quarters	"	"	"	"	159	"	4119	121	2220	13	545	"	8611
Felling	"	"	"	"	456	"	9227	"	7536	40	4952	"	26323
Clearing and weeding	"	"	1000	"	16132	3461	27302	3099	17247	2190	11044	147	81628
Pitting	"	"	"	"	9296	360	15215	370	6452	175	4623	"	36485
Carriage of plants	"	"	"	"	3380	35	4974	30	1689	10	786	"	10904
Planting and Shading	"	"	"	"	6714	180	7175	174	2015	65	1117	"	17440
Trenching	"	"	"	"	3759	"	6642	"	2065	"	575	"	13041
Enclosing	"	"	548	"	5331	"	4552	"	1845	"	1080	"	13362
Road making	"	"	"	"	7124	20	5757	"	3441	"	2371	"	18718
Tools	"	"	494	72	4991	100	5827	125	3800	50	1981	"	17440
Contingencies	731	100	2413	10	5711	186	7768	61	1833	40	1104	"	19957
Excavating	"	"	172	"	1092	"	1195	"	"	"	"	"	2289
Clothing	149	20	352	13	250	"	361	20	158	"	85	"	1228
Various	"	"	"	"	226	310	2662	430	460	200	303	"	6977
Collection of Bark	"	"	"	"	"	57	616	1220	"	20	"	"	1913
Carriage of Do	"	"	"	"	"	"	614	94	"	"	"	"	708
Total	74057	8143	57334	2355	136226	6715	210411	8647	67663	3873	43509	267	617194

Government Gardens —
Ootacamund 1st April 1872

Supt Govt. Chinchona Plantns

No 81. 31

Commissioner's Office
Ootacamund 12th July 1872

From
J. R. Cockerell Esquire
Commissioner
Neilgherries

To
The Chief Secretary to Government
Ootacamund

Sir
I have the honor to submit Mr. McIvor's Report on the Administration of the Cinchona Department during the Official Year 1871-72.

2. It is stated that the Plantations have thriven during the year notwithstanding drought in the months of January, February and March last.

3. Of the new varieties of Cinchona 900 of the Pitayensis 1000 of the Lancerolata, C. Angustifolia and 2750 of the C. Calisaya have been planted out on the Dodabetta, and Hooker Plantations, 12213 C. Pitayensis, and 4124 of C. Angustifolia have been propagated, 15000 plants have been distributed to the Public and 44 oz. of seed.

4. Mr. McIvor contemplates planting five acres of each of the new varieties, during the present monsoon

Recd 24th May 1872
Ans 15th July/72

Report on the Progress and Condition of the Government Cinchona Plantations on the Neilgherries for the Year 1871-72

monsoon, to complete the area intended
to be appropriated to these barracties
5. Mr McIvor reports having
purchased Mr Broughton the
Government Quinologist with
3507½ lbs of bark during the year
for the Manufacture of Amorphous
Quinine. In connection with this
subject he states "that large quantities
"of Amorphous Alkaloids are available
"in London at 3 d. per oz in rolls,"
and he suggests that our barks should
be bartered for these, Upon this
proposition Mr Broughton to whom
I made a reference writes, "The prepara-
"tion which in accordance with the
"instructions I received from the Home
"Government, I have recommended
"for adoption in this Country, as
"an effective febrifuge, is Amorphous
"in form, but as it contains the whole
"Alkaloids in the proportions they are
"contained in the bark it is nearly
"entirely susceptible of crystallization.
"The Amorphous Quinine which
Mr McIvor states can be purchased
at 3 d per oz in England is the
base of the Manufacture of the
crystalline salts of the Alkaloids
& contains what refuse to
salify. It therefore is a totally
different substance to that Manu-
factured from our Red barks

and is more correctly called in
"England Quinoidine" "

The unsaleability and the
Accumulation of large stocks in the
hands of Manufacturers is some
testimony to its comparative useless-
-ness in Medicine.-

Mr Broughton proceeds to say
that he understands this substance
was tried some years ago in the
Madras Presidency on account of
its low price, before the introduction
of the Cinchona plant to India, but
was found ineffectual as a febrifuge,
and its use was abandoned, and
remarks that our barks containing
an oz of Alkaloid in the pound sell
for 2.10 d. a lb in the London
market, and hence, that the Manu-
-facturer gave that price for an
oz of unmanufactured alkaloids
and therefore could not manufacture
the real alkaloids for 3 d per oz.

6. During the year under report
7294½ lbs of bark were shipped to
England for sale, and realized
excellent prices, Mr McIvor
appears not to be very sanguine
as to the success of the Cinchona Plan-
-tations in a Commercial point
of view. He remarks that the
London Market for Quinine
is not elastic, and that the

Consumption

Consumption averages 1411636 lbs of bark
per annum while the Government
and private plantations together
when at maturity will yield an
annual 3500000 lbs of bark.

The Actual Expenditure on the
Cinchona Department during
the year 1870-71 was Rs 29490
out of a Budget Grant of Rs 45400.
The Expenditure in the year under
Report has been Rs 30000 against
a Budget Grant of Rs 34334.
This small Excess will not it is
hoped be viewed with dissatis-
-faction, -

I have the honor to be
Sir
Your most obed Servt

H. Cockburn
Commissioner

No. 1237 Revenue Department
20 Augt/72

Proceedings of the Madras Government

Read the following letter from the Commissioner of the Nilgiris.

Submitting with remarks Cinchona Report for the Official year 1871/72. } (H.E. 12th July 1872 No. 81)

The above papers relate to the working of the Cinchona Dept during the Official year 1871/72.

The unusual drought during December and three following months had the effect of retarding the growth of the young plants but the older trees were not seriously affected and on the whole the progress may be regarded as satisfactory.

2 Operations were restricted

A. J. A.

J. D. S.

[docket, written sideways]

Rev: No. 81 1872. No. 1233 Dept

Date— 12th July 1872

Recd 15th

Commissioner's Office, Ootacamund.

To The Chief Secretary to Government of Madras

Enclosures 1. Cinchona Report

SUBJECT. Submitting for the official year 1871-72

No. 184 O. 31st July/72 R. 14th Augt

G.O. No. 1237 - 20th Augt/72

restricted in a great measure to Conservancy; it having been decided that attention should be directed to the propagation of new varieties exclusively, the extensions were necessarily limited. Of the new varieties of C. Peltayensis 900 ~~lastings~~ were planted out and 1221 3 propagated. of C. Augustifolia (lanceolata) the number planted amounted to 1000 and the number propagated to 4524, whilst 2750 plants of C. Calisaya have been added to the ~~Peradeniya~~ Plantation. During the present season the area allotted to each of the above three new species viz 5 acres, will be completely planted up, 15 acres of land on the Booker estate having been prepared for the purpose.

The

The number of plants distributed to the public was 5000 against 602 in the previous year. The effect of discontinuing pruning should be carefully noted.

3. The total expenditure was slightly in excess of that for the previous year, viz Rs 30,000 against Rs 29,490; but the cessation of operations on the Mailkonda estate having led to a reduction of expenditure on that estate to one-fifth of the sum laid out in the previous year, the working expenses of the other estates were really considerably heavier than

than in the preced-
ing year. The excess
appears to have
been in the item
Weeding and Clearing
on the Dodabettah
and Pykara estates.
This print should
have been noticed
in the report. As
the Census of the
trees will, it is presumed
be completed shortly,
the Superintendent
will no doubt be
in a position
soon to submit
his proposals re-
garding the
allotment of a
fixed sum per
Acre — for
working charges.
as directed in para 4. S.O. 8th June 71 to 1911

The

The Total expenditure
on the Government Cinchona
from the commencement in 1860
Plantations up to the end
of March last is stated
to have amounted to Rupees
6,17,194.

4. The value of the
bark supplied to the
Government Quinologist
and shipped to England
for sale during the
year under report is
estimated at a little over
Rs 16,000 or rather more
than half the year's
outlay

outlay.

5. A first consignment of 7294½ lbs of dry bark was despatched ~~was shipped~~ to England for sale and realized satisfactory prices varying from 2/3D per lb to 2/10 per lb.; it is noteworthy however, that the "un mossed" bark contrary to Mr McIvor's expectations fetched a higher price than the "mossed", a result which is attributed by him to the altered appearance of the bark owing to its having been subjected to the mossing

process, it would of course be premature to pass any judgment until the qualities of each description of bark have been thoroughly tested by further experiments. The comparative advantages of the ~~opposing~~ opposing and mossing methods have still to be ascertained.

The first Quinologist was supplied with

6. 2349 lbs of fresh bunk bark of the first quality and 11,578 lbs of prunings were supplied to the ~~permanent quinologist~~ for the manufacture

F

of Amorphous Quinine.

From para 5 of the Commissioners letter it appears that Mr Mc Ivor is ~~quite~~ altogether mistaken in supposing that the so called Amorphous Quinine procurable in the Home market at 3d per oz is identical with the substance which is now being manufactured by Mr Broughton under that name, and which, as Mr Broughton explains, is Amorphous in form only but contains the whole alkaloids in the proportion in which they exist in the bark, whilst the ~~crude~~ to which Mr Mc Ivor refers is the refuse of the manufacture of the Crystallized Salts. It

7. It is satisfactory to learn that the yield of dry bark obtained from the mossed Succirubra trees averaged about 3 lbs per tree or ½ lb in excess of Mr Mc Ivor's estimate (Vide para 8 of the Report for 1870-71 wherein a special report on the subject is promised.) The effects of the ~~mossing~~ process on the proportion of alkaloids as well as ~~its effects~~ on the weight of bark yielded should be ascertained by experiment.

8. The rest of the Report is devoted to an examination of the effect which will be produced upon the Home market by the influx of the

the bark produced on the Neilgherry plantations (Govt and private combined) which Mr Mc Ivor estimates to be capable of producing 3,500,000 lbs of bark annually. The result at which Mr Mc Ivor arrives on a consideration of the data afforded by a Table, showing the imports and exports of Peruvian Bark to and from the United Kingdom for a period of 20 years from 1841 to 1871, is that South America is equal to any demand that is likely to arise provided the price is sufficiently high to be remunerative. The success of Cinchona cultivation

cultivation as a commercial speculation is, however not a question which ~~concerns~~ can interest the Govt. as their ~~object~~ object is to provide an abundant supply of the febrifuge at a rate so cheap as to be within the means of the population at large, and not to enter into competition with private growers

9. Before sanctioning the discontinuance of the Meteorological observations (which appear to have been made hitherto at Reddiyarattam and the Botanical gardens) the Govt. desire to be informed in greater detail how the reduction of the establishment in the Cinchona Department renders

renders it impossible
to maintain a correct
Register. The rainfall
should at least be registered
10. The ~~arrangements~~ price at
which the produce of the
Govt. tea Plantation
is handed over to
Captain Jennings does
not, appear ~~to have~~ to have been
communicated to Govt.

3 To the Commr of the Nilgiris Dec 26 August/72
1 " Government Quinologist — " "
14 " Board of Revenue — " "
6 " Accountant General — " "

No. 184–185

Qt.

Chaukhena Reports

for 1871-72

Dispatch