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MADRAS RECORD OFFICE.

Government of Madras.

Revenue DEPARTMENT.G.O. No. 759

Press

~~Mis.~~

Dated

22. 6. 1874.Not to be folded or roughly handled

Read the following papers :—

No. 186. From J. R. COCKERELL, Esq., Commissioner of the Nilgiris, to C. G. MASTER, Esq., Acting Secretary to Government, Revenue Department, Fort St. George, dated Ootacamund, 14th March 1874, No. 22 :—

WITH reference to G. O., Revenue Department, 15th December 1873, No. 1,428 directing me to obtain any observations the Superintendent of the Cinchona Plantations may have to offer on a report of the Government Quinologist upon the changes produced by age and growth in the Cinchona trees in the Government plantations on the Nilgiri Hills, and, at the same time, to submit my own remarks, I have the honor to forward a letter from Mr. McIvor on the subject.

2. Mr. McIvor has for a long time held the opinion put forward by Mr. Broughton that after a certain age the cellular tissue in bark which contains the alkaloids gives way to liber fibre, and that the further this metamorphosis extends the greater is the deterioration in the bark. A complete substitution of liber fiber for cellular tissue is, in fact, a conversion of bark into a material worthless to the Quinine Manufacturer. Mr. McIvor concurring thus completely with the Quinologist accepts further the statement that the bark in our oldest *Succirubra* plants has entered upon the course of decline; and he suggests that the bark of these trees should be harvested. There are 6,000 of them. Mr. McIvor would advocate harvesting also the crown barks of eleven years old on the same grounds. There are 18,000 of these trees. The deterioration of bark by age was fully discussed in Mr. McIvor's letter and in mine in G. O., 5th September 1873, Revenue Department, No. 952, and the identical conclusions now stated detailed. But in that order the Government were pleased to direct one-fourth of the unmossed trees of eleven and ten years old should be preserved for coppicing until the mossaing process was demonstrated to be superior. The Government remarked that the immediate loss in bark thus entailed was not of any moment. I see no sound reason for a modification of the order at present, because circumstances have not changed since it was published, and though I agree with Mr. McIvor I cannot recommend that the older trees shall be harvested at present in greater proportion than is expressed in the order.

3. Mr. McIvor next touches upon the question of filling vacancies with *Calisaya*. He states this species is weakly, and remarks upon the fact that a plant of a weak character will not grow amongst more vigorous plants which overshadow and choke it.

4. The next point touched by Mr. McIvor is the sale of Java bark noticed by Mr. Broughton. This bark did not fetch such good prices in Amsterdam as the bark sent Home from the Nilgiris last year realized in the London market. It may be objected that the circumstances of the two sales may have been different and the higher price obtained for the Nilgiri bark not be a perfect test of its superiority. The fact, however, is that if anything, better prices are habitually obtained for bark at Amsterdam than in London. Purchasers in London must be discriminating purchasers, because bark is invariably sold on analysis. There is no guess-work in the matter.

The Government will have noticed with pleasure that even the worst barks of the 23,000 lbs. sent Home last year fetched a good price. Certain crown barks, not worth working up in Mr. Broughton's factory, realized from 2s. to 3s. 6d. a-pound Mr. Broughton anticipated this bark might sell fairly, though he was adverse to its shipment as he stated in his letter in G. O., 8th September 1873, No. 955, Revenue Department. The sales enumerated do not tend to establish a need for particular attention being bestowed on the Calisaya.

5. With regard to the views expressed by Mr. Howard upon the red barks I quoted them in a letter, dated 7th January 1874, No. 3, I addressed Government on that subject exclusively.

6. I shall forward the samples of barks required by the 2nd paragraph of the order under reply so soon as I receive them from Mr. Broughton.

ENCLOSURE No. 1.

From W. G. McIVOR, Esq., Superintendent of the Government Cinchona Plantations, to J. R. COCKERELL, Esq., Commissioner of the Nilgiris, dated Ootacamund, 14th February 1874.

I HAVE the honor to acknowledge the receipt of G. O., dated 15th December 1873, No. 1,428, with your endorsement of the 19th, calling for any observations I may wish to offer in connection with the subjects discussed in the papers recorded in the above Proceedings.

2. The report submitted by Mr. Broughton details certain changes "produced by age and growth" in the bark of several species of Cinchona, and as that gentleman's observations appear to establish and confirm the well-known and generally-accepted conclusions arrived at years ago, this part requires no remark further than bringing prominently to notice the very important fact that the "bark on our oldest trees of *C. succirubra* has passed its age of maximum yield of alkaloid;" and I submit, therefore, that this bark should be harvested as early as possible in order to prevent further deterioration.

3. I observe that, at paragraph 14 of his report, Mr. Broughton recommends the extension of our Calisaya cultivation by filling up all failures which occur among the trees of *C. succirubra* with plants of *C. Calisaya*. In my opinion there are several reasons which would render any attempt to carry out this system unprofitable and unsuccessful. In the first place, *C. Calisaya* is a species which has hitherto, in all the varieties yet imported and grown on the Nilgiris, given unmistakable indications of being unsuited to our climate. The plant is weak and of delicate growth. It is extremely liable to disease, and for these reasons I believe it to be the most unsuited to fill up failures among a strong-growing and vigorous species such as *C. succirubra*. Its delicate constitution is another serious drawback to using the species at all for filling up vacancies; it being well known to all practical planters that successfully to establish plants in the established plants in the neighbourhood grow faster than *C. Calisaya*, spreading their roots and branches further, and thus robs the weaker plant of nourishment and moisture while the branches overshade it. This even takes place when strong-growing and less-vigorous species are planted out at the same time together to such an extent that the stronger-growing invariably destroys the weaker. For the above reasons, the experienced planters would carefully avoid the selection of a slow-growing and delicate species to fill up vacancies among a strong-growing and vigorous variety.

4. In Mr. Broughton's covering letter, that gentleman further urges the adoption of this system by bringing prominently forward the fact that "certain specimens of *C. Calisaya* have sold

in Amsterdam for the extraordinary prices of 8s. to 9s. 5d. per Kilogramme, or 3s. 7½d. and 4s. 3¼d. per lb.," and concludes by giving an analysis of certain Java Calisaya bark as yielding 7.65 per cent. of total alkaloids and 6.91 of quinine, remarking: "This bark, therefore, is of better quality than any grown on our plantations, with the exception of var. *Angustifolia*." I annex to this letter the invoice and analysis in detail of these Java barks sold in Amsterdam. It will be noticed that, although four cases containing 261 kilogrammes brought the high figures quoted, the average prices realized were low.

5. I think it proper to place in juxtaposition to this list of prices obtained for Java barks the list of prices obtained for the 23,000 lbs. of bark sent Home from the Nilgiri plantations last year. Our *C. officinalis* stem-bark fetched from 4s. 6d. to 5s. 9d. per lb., and the general prices obtained were much higher than those brought by the Java barks. The price of the *C. officinalis* would indicate contrary to Mr. Broughton's impression that this is better than the Java Calisaya bark.

6. At paragraph 14 Mr. Broughton states: "It appears to me to have been unfortunate that Cinchona cultivation should have been so greatly occupied with *C. succirubra* at its commencement." This opinion is apparently founded on the statement given at paragraph 7, that "Succirubra appears the worst species for producing bark for export." Upon this point, I beg to draw your attention to a private letter I received from Mr. Howard some time ago, and the statements in which I believe you communicated to Government. The Succirubra bark in our consignment above mentioned brought us high as 3s. ½d. per lb.

7. At paragraph 20 Mr. Broughton brings to notice that the beneficial effects of mossaing become less evident with the increased age of the tree. If this means that renewed bark on the oldest trees we possess is not so rich as renewed bark on young trees, I am not prepared to follow Mr. Broughton. My experience is that renewed bark two years old is at the best state for cropping as regards the quantity of contained alkaloids, and that this bark, speaking without formal precision, is as valuable on old as on young trees.

8. I never for a moment contemplated bark as old as the tree on which it is grown continuing to improve. I have all along acted on the knowledge that beyond a certain age, cellular tissue, which Mr. Broughton justly states contains the alkaloids, gives way to liber fibre, which the older it is the less alkaloid it must yield.

DUTCH TRADING COMPANY.

DESCRIPTION of the Parcels of Java Barks of Crop 1872, sold by Public Auction on the 27th May 1873.

Class.	Chests.	Kilo.	Prices realized per 12 Kilo.	Percentage of Alkaloid variable.	Quinine variable.
Calisaya A	72	4,666	113c		
Do. B	23	1,525	194c	Variable.	Variable.
Do. C	3	140	116c	Do.	Do.
Do. D	5	346	158c	5 per cent.	Uncertain.
Do. E	4	261	457c	7 per cent.	¾
Haskarlana	20	1,358	141c	4 to 5 per cent.	½ to ¼
Succirubra	5	362	115c		
Officinalis	8	407	201c	4 per cent.	
Caloptera	1	62	173c	4 to 5 per cent.	½
Pahudiana	35	2,193	128c	1 to 4 per cent.	
Powder	29	3,519	16c		
Do.	3		13c		

OOTACAMUND,
14th February 1874.

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

CINCHONA Bark from the Government Plantations on the Nilgiris sold by Public Auction in
London on the 11th November 1873.

Class.	Cases.	lbs.	Price.
Crown bark	2	343	s. d. 5 9
Do.	27	6,670	4 7
Do.	2	297	4 6
Do.	1	210	4 5
Do.	3	368 $\frac{1}{2}$	4 0
Do.	2	396 $\frac{1}{2}$	3 10
Do.	5	743 $\frac{1}{2}$	3 8
Do.	1	173 $\frac{1}{2}$	3 6
Do.	2	302 $\frac{1}{2}$	3 5
Branch bark	2	466	3 6
Do. do.	9	1,341 $\frac{1}{2}$	2 6
Do. do.	2	308	2 4
Red bark	2	671	3 2
Do.	1	166 $\frac{1}{2}$	3 1
Do.	6	1,625 $\frac{1}{2}$	3 0
Do.	2	314 $\frac{1}{2}$	2 11
Do.	6	1,038	2 10
Do.	9	1,756 $\frac{1}{2}$	2 7
Do.	1	238	2 6
Do.	1	182	2 5
Do.	2	394	2 4
Do.	4	1,136	2 3
Do.	1	524 $\frac{1}{2}$	2 1
Do.	1	161 $\frac{1}{2}$	2 0
Do.	3	271	1 4
Do.	3	470	1 3
Branch bark	7	972 $\frac{1}{2}$	2 3
Do.	1	194	2 2
Do.	1	161 $\frac{1}{2}$	2 0

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

No. 186A. Minute by the Hon. J. D. SIM, C.S.I.

FROM the papers submitted it appears that we have now 6,000 trees of *C. succirubra* which have reached the age when the yield of alkaloids begins to decrease. The fact that after a certain age this result would ensue was, as the Commissioner observes, long since noticed by Mr. McIvor; and, as the analyses of Mr. Howard and Mr. Broughton confirm the conclusion, so far at least as *C. succirubra* is concerned, we may safely act on it, and proceed to harvest the bulk of the bark of these 6,000 trees before further deterioration ensues. In the order of the 5th September 1873, No. 952, Government directed that one-fourth of these trees should be "retained for coppicing" and three-fourths treated according to the mossing system. The intention of Government was, as I understood, that the trees should be *coppiced* and not merely *retained* for that purpose. I understand that 1,000 of the trees have been mossed. I would now suggest that 1,000 more be thus dealt with and 2,000 coppiced, the remaining 2,000 being retained for experimental purposes; a small number being annually mossed and coppiced in equal proportions in order to test over a long series

of years the consequences of age and the effects of each mode of harvesting on this particular species of Cinchona.

2. Besides the above 6,000 *Succirubra* trees, we have 18,000 Crown barks of eleven years age which it is proposed to harvest at once. As regards this species it does not seem to me that deterioration from age,—at least so soon,—is so clearly established that we need harvest these trees simply and solely to escape that consequence. In his letter to the Secretary of State, dated 16th January 1872, Mr. Howard says he has "no doubt that these barks will improve with age," and again that "there is no fear that these varieties of *C. officinalis* should deteriorate with age." In another part of his letter Mr. Howard speaks of this deterioration after a certain age as "the peculiar habit of the species *Succirubra*". Mr. Broughton cannot yet state the changes taking

place in the quality of Crown barks, as they advance in age, with the same precision as in the case of *C. succirubra*; but Mr. Broughton's letter to Government, 22nd August 1873, p. 10 and 11.

as yet the analyses "show that no cessation of the formation of alkaloids or any deterioration of quality is yet apparent from the increase of the age of the bark." I see no need, therefore, for harvesting these trees solely for the object of avoiding waste of alkaloids, and would leave this to be done as our requirements of bark dictate. I do not see any reason to alter the proportion of trees to be mossed and coppiced, which was prescribed in our order of the 5th September last, No. 952; but it should be explained that the trees are not to be "retained for coppicing," but that mossing and coppicing should proceed *pari passu* in the proportion fixed.

3. The other question for decision is the extension of *C. Calisaya*. This cannot be done in the manner proposed by Mr. Broughton, but there is nothing to prevent additional land being planted with this variety if Government deem it desirable. My own opinion is adverse to such a measure, because, as Mr. McIvor states, experience has shown that the climate of the Neilgherries is not suited to it, and because in *C. officinalis* we have a species nearly, if not quite, its equal which succeeds well.

Mr. Howard writes in high terms of the Crown barks (*C. officinalis*), and Mr. Broughton believes "the final success of Chinchona cultivation on the Neilgherries will result from the export of these crown barks."

NOTE.—As a disadvantage of the *C. officinalis*, Mr. Broughton mentions that the branches are nearly valueless. Mr. Howard, however, says that "the very youngest shoots that could be peeled have often been sold and even preferred by the trade."

Under these circumstances, we may, I think, rest content with the 55,000 trees we possess of the *Calisaya* variety, and rather add to our stock of *C. officinalis* the varieties especially noted for their excellence by Mr. Howard.

4. One important subject for consideration is what to do with our barks. The *C. succirubra* is declared on the best authority *not* to be the quinine-producing tree of the family; it yields the other alkaloids in greater proportion. Its bark still fetches a high price in the English market; but Mr. Broughton says emphatically, "it appears to be the worst species for the production of bark for export," and Mr. Howard especially dwells on the importance of regarding it as a "Cinchonidine-producing material." It seems to me, therefore, that our best course is to send home only so much of the *Succirubra* bark as may be needed

Letter to Government, dated 22nd August 1873, paragraph 7.

for special purposes, such as analysis, testing of market value, *etc.*, and to reserve the great bulk for conversion on Government account into sulphate of Cinchonidine for the use of our native population who cannot afford to buy quinine. I conclude Mr. Broughton will have no difficulty in using up all the bark we have of this one species and of manufacturing the product as economically as it is manufactured at home; but if he cannot do so, the surplus must, of course, be sent home for manufacture there. The Crown and other barks, on the other hand, should be chiefly sent home, as their quinine-yielding properties render them especially valuable there. Of course, this measure cannot be adopted immediately, but it should be our guiding principle.

5. The paper which accompanies Mr. McIvor's letter to the Commissioner gives the prices which our bark has realized in England in comparison with the prices realized by the Java barks. Mr. Broughton laid especial stress on the high price realized by some Java Calisaya bark; but our own Crown barks fetched even higher prices, and the general average of our bark is, as Mr. McIvor points out, considerably higher than that of the Java bark. It will be observed that some branch Crown bark sent home, Mr. Broughton stated contrary to his advice, and the Commissioner adds rejected by him as unfit for the use of the factory at Neddivuttum, realized from 2s. 0d. to 3s. 6d. per pound. If this be the case, the result naturally suggests a doubt as to whether there is not some defect in his process of manufacture which fails to extract all the alkaloids in the bark. In this bark which he rejected there must, I should suppose from the price realized, have been some 2 per cent. of quinine. Mr. Broughton has described his method of manufacture very fully in his letter of the 1st December 1873. It is evident, from the prices realized in the English market for bark rejected here, that there must be a great loss between the laboratory and the manufactory results. This is a very important subject and merits our serious consideration; for on it turns the question whether we should continue to manufacture here, or leave this to be done in England. One object of the manufactory here was to utilize bark which it would not be worthwhile to send to England. I would suggest that the amorphous quinine which has been issued for experimental use in our Hospitals should be submitted to the analysis and valuation of Mr. Howard and Dr. DeVriy.

27th April 1874.

(Signed) J. D. SIM.

No. 186B. Minute by the Hon. W. ROBINSON, C.S.I.

I AGREE with Mr. Sim on the whole. But unless medical science establishes the efficacy of alkaloids other than quinine, and thus raises the value of *C. succirubra*, the further use of this species—even for filling vacancies—should be given up entirely; not that the matter of filling vacancies is pressing as regards the plantations at Neddivuttum, for thinning must be the order of the day for long there. On this point, therefore, a decision is needed. One of the other two species, *C. officinalis* or *C. Calisaya*, must be used.

2. Mr. Sim advocates the former, and I agree with him for the reasons he gives, wherever the *C. Calisaya* does not thrive; wherever it does thrive fairly, the *C. Calisaya* should be preferred.

3. I think that the doubt raised as to the efficiency of the Factory should be inquired into and set at rest at once; and I am inclined, on further consideration, to think that Mr. Sim's proposal to have the analysis conducted at home the best plan.

30th April 1874.

(Signed) W. ROBINSON.

No. 186C. Minute by His Excellency the Commander-in-Chief.

I FULLY concur with the Hon. J. D. Sim, especially as regards the method by which he would test the value of Mr. Broughton's operations at Neddivuttum. We have no knowledge of Dr. Bidie's qualifications as a Chemist; whereas in a matter of such vast importance we should take care to obtain the opinion of the most eminent available. We could hardly ascribe much value to that of any other.

2. We should not be in too great a hurry to condemn *C. succirubra*; for I observe that whilst Mr. Howard speaks most disparagingly of that bark from coppice, he speaks highly of the bark renewed under the mossing process (*vide* "Gardener's Chronicle," March 28th, 1874, page 408).

23rd May 1874.

(Signed) F. P. HAINES.

No. 186D. Minute by His Excellency the Governor.

I THINK that sufficient reason is shown for the action which is proposed by the Hon. Mr. Sim respecting the *C. Succirubra* trees. As regards the choice between *C. Officinalis* and *C. Calisaya*, Mr. McIvor says that the latter will not grow well on the Nilgiris, and this seems to be sufficient reason for preferring the former. I think that the subject noticed by Mr. Sim in the last paragraph of his Minute, respecting the process of manufacture in the Factory and the real value of its results, is one requiring serious consideration; and I would select, as suggested by the Hon. Mr. Robinson, some person or persons to inquire into and report upon it, with a view to a satisfactory solution of the question whether our manufacture should be continued.

6th June 1874.

(Signed) HOBART.

No. 187. ORDER THEREON, 22nd June 1874, No. 759.

Miscellaneous.

IN August last Mr. Broughton forwarded an account of the results obtained by him in the analysis of specimens of different species of Cinchona, "in order to trace the changes produced by age and growth on the several kinds."

This report was sent to Mr. McIvor for his remarks, which have now been received.

2. Mr. Broughton first pointed out that the analysis of bark from the oldest trees of *C. succirubra* show that this bark "has passed its age of maximum yield of alkaloids," and "appears to be even deteriorating in total yield of alkaloids." This is in accordance with the known "peculiar habit of the species," to use the words of Mr. Howard, who in 1872 remarked that "the bark does not really improve by age, but the contrary."

3. Mr. McIvor, who predicted the probability of this result in his report for 1864-65, concurs and proposes to harvest the whole of the older trees, whose number, the Commissioner states, is 6,000.

4. Mr. McIvor would appear to contest Mr. Broughton's low estimate of the value of *C. succirubra* for export purposes, probably on the ground that *Succirubra* is still worth exporting, as it fetches 3s. 6d. per lb. (not that it is better than *Calisaya* and *Officinalis*). Mr. Howard, however, has already remarked that "it cannot be looked upon as the quinine tree of the future;" and on Mr. McIvor's own showing, the highest price obtained at the recent sales for stem bark of this species was less than the lowest obtained for stem bark of *C. officinalis*.

5. From *C. succirubra* Mr. Broughton turns to *C. officinalis*, but none of his remarks on this species are noticed by Mr. McIvor.

The Commissioner, indeed, states that Mr. McIvor would harvest the older barks of this species also, on the ground apparently that they will deteriorate; but Mr. Broughton notices no deterioration, nor any cessation of the formation of alkaloids, and Mr. Howard has stated of the good varieties of this species that "there is no fear" of the bark deteriorating with age.

6. As to the species of *C. Calisaya*, Mr. Broughton remarks that its bark "notwithstanding its youth is fully equal to good South American *Calisaya* in yield of quinine." He anticipates much success from the export of this species when of fit age, and points out that the Netherlands Government are cultivating it largely, that it has the greatest reputation of any of the *Cinchona* in the European market, and that its branch bark is better than that of *C. officinalis*. On these grounds he would recommend casualties among the *C. succirubra* being re-placed by plants of *C. Calisaya*.

7. Mr. McIvor contests this recommendation on the following grounds:—1st, that the plant is, on the Nilgiris, a delicate one, and, therefore, will not grow well among the more robust *Succirubra*; and, 2ndly, that, as tested by recent sales, *C. officinalis*, which grows well here, brings higher prices.

8. In regard to *C. succirubra* it is plainly shown that the 6,000 trees referred to have reached the age when the yield of alkaloids begins to decrease, and the bulk of the bark should, therefore, be harvested. The Government understand that 1,000 of these trees have already been mossed. A similar number should be treated in the same way, and 2,000* should be coppiced, that is cut down and allowed to come up again, the remaining 2,000 being retained for experimental purposes. This so far

*NOTE.—This number will form one-third of those to be coppiced under G. O., 11th April 1874, No. 434, paragraph 4.

modifies the order, dated 5th September 1873, No. 952, which contemplated the harvesting of all these trees.

9. Of the 2,000 trees reserved by the preceding paragraph, a small number should be annually mossed and coppiced in equal proportions, in order to test, over a long series of years, the consequences of age and the effects of each method of harvesting on this particular species of *Cinchona*.

10. In regard to the 18,000 crown barks (*C. officinalis*), it does not appear that deterioration from age need be alleged as a reason for harvesting these trees. On the contrary, in his letter to the Secretary of State, dated 16th January 1872, Mr. Howard

states that he has "no doubt that these barks will improve with age," and again that "there is no fear that these varieties of *C. officinalis* should deteriorate with age."

Mr. Broughton cannot (*vide* paragraphs 10 and 11 of his letter, dated 22nd August 1873) yet state the changes taking place in the quality of crown barks as they advance in age with the same precision as in the case of *C. succirubra*; but so far, "the analyses show that no cessation of the formation of alkaloids or any deterioration of quality is yet apparent from the increase of the age of the bark." These trees need not, therefore, be harvested solely with the object of avoiding waste of alkaloids, but may be dealt with as the requirements for bark dictate; the instructions in G. O., 5th September 1873, No. 952, being observed as to the proportions to be mossed and coppiced. It should be understood that the expression in that order "retained for coppicing" is meant to imply that mossing and coppicing should proceed *pari passu* in the proportion fixed.

11. With reference to the opinion expressed by Mr. McIvor about *C. Calisaya*, it is not advisable to extend its cultivation in the manner proposed by Mr. Broughton. The Superintendent, Government *Cinchona* Plantations, will be requested to advise as to the best mode of filling up the vacancies among the *C. succirubra*. It is observed that Mr. Howard writes in high terms of *C. officinalis*, and Mr. Broughton believes "the final success of *Cinchona* cultivation on the Nilgiris will result from the export of these crown barks." Rather than add to the stock of *C. Calisaya*, it seems preferable to increase the cultivation of *C. officinalis* by growing the varieties especially noted for their excellence by Mr. Howard.

12. It is important to consider the best mode of disposing of the different kinds of bark when harvested. *C. succirubra* has been declared on the best authority not to be the quinine-producing tree of the family, but it yields the other alkaloids in greater proportion. Its bark still fetches a high price in the English market; but Mr. Broughton says emphatically: "It appears to be the worst species for the production of bark for export;" and Mr. Howard dwells on the importance of regarding it as a "Cinchonidine-producing material." The Government, therefore, consider that only so much of this bark should be sent to England as may be needed for special purposes, *e.g.*, analysis, testing of market value, and so forth; the bulk being retained here for conversion into sulphate of Cinchonidine for the use of the native population, who cannot afford to buy quinine. His Excellency in Council concludes that Mr. Broughton will have no difficulty in using up all available bark of this one species, but he will report on this point. If he cannot do so, the surplus must be sent Home. The crown and other barks, on the other hand, should be chiefly shipped to England, as their quinine-yielding properties render them especially valuable there. Of course, the shipments of *Succirubra* bark cannot be immediately stopped, but the course above indicated should be the guiding principle, *viz.*, that the red barks should be regarded as the source of supply of cheap febrifuge for India, while the crown and other quinine-yielding barks should be reserved for the Home market.

13. The enclosure to Mr. McIvor's letter to the Commissioner gives the prices which the Nilgiri bark has realized in England compared with those obtained for Java bark at Amsterdam. Mr. Broughton laid special stress on the enhanced price fetched by some Java *Calisaya* bark; but it is observed that the Indian crown barks

*Proceedings of the Madras Government, Revenue Department,
22nd June 1874.*

were sold at even a higher figure, and the general average of the Nilgiri is, as Mr. McIvor points out, considerably greater than that of the Java bark.

14. It is also noticed that some branch crown bark sent, as stated by Mr. Broughton, contrary to his advice, and (the Commissioner adds) rejected by him as unfit for the use of the factory at Neddivattum, realized from 2s. 0d. to 3s. 6d. per lb. This result naturally suggests a doubt as to whether there is not some defect in the process of manufacture now in operation, owing to which all the alkaloids are not extracted from the bark. In the sample thus rejected there must, judging from the price realized, have been two per cent. of quinine. The subject is very important, and merits serious consideration; for on it turns the question whether the manufacture should be carried on here or in England. It was stated as one reason for working up the material on the spot that bark would be utilized which it would not be worth while to export, but the instance noted does not bear this out.

15. His Excellency the Governor in Council resolves to depute Mr. Cornish and the Commissioner of the Nilgiris to inquire and report on the subject so soon as Mr. Broughton returns from leave, in order that the efficiency of the factory may be determined and a satisfactory solution be arrived at upon the question whether the existing arrangements should be continued. The points for special inquiry are (1) the cost and (2) the medicinal value of the product. In regard to the former, it should be considered how much of Mr. Broughton's salary should be debited to the factory.

16. The Surgeon-General, Indian Medical Department, will be desired to forward some of the Amorphous quinine already issued for experimental trial, in order that it may be submitted for analysis and valuation to Mr. Howard and Mr. DeVriz.

17. The samples of barks called for in G. O., 15th December 1873, No. 1,428, have, it is observed, not yet been forwarded.

18. The Government will be obliged to the Commissioner for a full report on the subject of the plantations, *etc.*, up to date.

(Signed) C. G. MASTER,
Acting Secretary to Government.

To the Commissioner of the Nilgiris.

„ the Sanitary Commissioner.

„ the Government Quinologist.

„ the Surgeon-General, Indian Medical Department.

REVENUE DEPARTMENT.

MINUTE BY THE HON. J. D. SIM, C.S.I.

From the papers submitted it appears that we have now 6,000 trees of *C. succirubra* which have reached the age when the yield of alkaloids begins to decrease. The fact that after a certain age this result would ensue was, as the Commissioner observes, long since noticed by Mr. McIvor; and, as the analyses of Mr. Howard and Mr. Broughton confirm the conclusion, so far at least as *C. succirubra* is concerned, we may safely act on it, and proceed to harvest the bulk of the bark of these 6,000 trees before further deterioration ensues. In the order of the 5th September 1873, No. 952, Government directed that one-fourth of these trees should be "retained for coppicing" and three-fourths treated according to the mossaing system. The intention of Government was, as I understood, that the trees should be *coppiced* and not merely *retained* for that purpose. I understand that 1,000 of the trees have been mossaed. I would now suggest that 1,000 more be thus dealt with and 2,000 coppiced, the remaining 2,000 being retained for experimental purposes; a small number being annually mossaed and coppiced in equal proportions in order to test over a long series of years the consequences of age and the effects of each mode of harvesting on this particular species of Cinchona.

2. Besides the above 6,000 Succirubra trees, we have 18,000 Crown barks of eleven years age which it is proposed to harvest at once. As regards this species it does not seem to me that deterioration from age,—at least so soon,—is so clearly established that we need harvest these trees simply and solely to escape that consequence. In his letter to the Secretary of State, dated 16th January 1872, Mr. Howard says he has "no doubt that these barks will improve with age," and again that "there is no fear that these varieties of *C. officinalis* should deteriorate with age." In another part of his letter Mr. Howard speaks of this deterioration after a certain age as "the peculiar habit of the species Succirubra". Mr. Broughton cannot yet state the changes taking

place in the quality of Crown barks, as they advance in age, with the same precision as in the case of *C. succirubra*; but as yet the analyses "show that no cessation of the formation of alkaloids or any deterioration of quality is yet apparent from the increase of the age of the bark." I see no need, therefore, for harvesting these trees solely for the object of avoiding waste of alkaloids, and would leave this to be done as our requirements of bark dictate. I do not see any reason to alter the proportion of trees to be mossaed and coppiced, which was prescribed in our order of the 5th September last, No. 952; but it should be explained that the trees are not to be "retained for coppicing," but that mossaing and coppicing should proceed *pari passu* in the proportion fixed.

3. The other question for decision is the extension of *C. Calisaya*. This cannot be done in the manner proposed by Mr. Broughton, but there is nothing to prevent additional land being planted with this variety if Government deem it desirable. My own opinion is adverse to such a measure, because, as Mr. McIvor states, experience has shown that the climate of the Neilgherries is not suited to it, and because in *C. officinalis* we have a species nearly, if not quite, its equal which succeeds well.

Boht. of 1874

REVENUE.

To

THE COMMISSIONER OF THE NILGIRIS,

&c., &c., &c.

Dated June 22nd.

Recd.

Encl.

G. O., 22nd June 1874, No. 759.

JUNE.

No. 186-187.

Cinchona Trees.—Reviews letters from Commissioner of Nilgiris and Mr. McIvor, remarking on Mr. Broughton's report as to the changes produced by the age and growth of —; directs certain Succirubra trees to be harvested; indicates the principle on which shipments of bark should be made; deposes Dr. Cornish and Commissioner of Nilgiris to report on the efficiency of the Factory at Neddivatam; requests Dr. Balfour to forward some Amorphous quinine for transmission to Messrs. Howard and DeVitz; and directs Commissioner to submit a full report on the Plantations, &c.

9-5-95 ✓
21-10-09 ✓
28-7-11 ✓

NOTE.—As a disadvantage of the *C. officinalis*, Mr. Broughton mentions that the branches are nearly valueless. Mr. Howard, however, says that "the very youngest shoots that could be peeled have often been sold and even preferred by the trade."

Mr. Howard writes in high terms of the Crown barks (*C. officinalis*), and Mr. Broughton believes "the final success of Chinchona cultivation on the Neilgherries will result from the export of these crown barks."

Under these circumstances, we may, I think, rest content with the 55,000 trees we possess of the Calisaya variety, and rather add to our stock of *C. officinalis* the varieties especially noted for their excellence by Mr. Howard.

4. One important subject for consideration is what to do with our barks. The *C. succirubra* is declared on the best authority not to be the quinine-producing tree of the family; it yields the other alkaloids in greater proportion. Its bark still fetches a high price in the English market; but Mr. Broughton says emphatically, "it appears to be the worst species for the production of bark for export," and Mr. Howard especially dwells on the importance of regarding it as a "Cinchonidine-producing material." It seems to me, therefore, that our best course is to send home only so much of the *Succirubra* bark as may be needed for special purposes, such as analysis, testing of market value, etc., and to reserve the great bulk for conversion on Government account into sulphate of Cinchonidine for the use of our native population who cannot afford to buy quinine. I conclude Mr. Broughton will have no difficulty in using up all the bark we have of this one species and of manufacturing the product as economically as it is manufactured at home; but if he cannot do so, the surplus must, of course, be sent home for manufacture there. The Crown and other barks, on the other hand, should be chiefly sent home, as their quinine-yielding properties render them especially valuable there. Of course, this measure cannot be adopted immediately, but it should be our guiding principle.

5. The paper which accompanies Mr. McIvor's letter to the Commissioner gives the prices which our bark has realized in England in comparison with the prices realized by the Java barks. Mr. Broughton laid especial stress on the high price realized by some Java Calisaya bark; but our own Crown barks fetched even higher prices, and the general average of our bark is, as Mr. McIvor points out, considerably higher than that of the Java bark. It will be observed that some branch Crown bark sent home, Mr. Broughton stated contrary to his advice, and the Commissioner adds rejected by him as unfit for the use of the factory at Neddivuttum, realized from 2s. 0d. to 3s. 6d. per pound. If this be the case, the result naturally suggests a doubt as to whether there is not some defect in his process of manufacture which fails to extract all the alkaloids in the bark. In this bark which he rejected there must, I should suppose from the price realized, have been some 2 per cent. of quinine. Mr. Broughton has described his method of manufacture very fully in his letter of the 1st December 1873. It is evident, from the prices realized in the English market for bark rejected here, that there must be a great loss between the laboratory and the manufactory results. This is a very important subject and merits our serious consideration; for on it turns the question whether we should continue to manufacture here, or leave this to be done in England. One object of the manufactory here was to utilize bark which it would not be worthwhile to send to England. I would suggest that the amorphous quinine which has been issued for experimental use in our Hospitals should be submitted to the analysis and valuation of Mr. Howard and Dr. DeVriy.

27th April 1874.

(Signed) J. D. SIM.

MINUTE BY THE HON. J. D. SIM, C.S.I.

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place in the quality of crown barks, as they advance in age, with the same precision as in the case of *C. succirubra*; but

as yet the analyses "show that no cessation of the formation of alkaloids or any deterioration of quality is yet apparent from the increase of the age of the bark," I see no need, therefore, for harvesting these trees solely for the object of avoiding waste of alkaloids, and would leave this to be done as our requirements of bark dictate. I do not see any reason to alter the proportion of trees to be mossed and coppiced, which was prescribed in our order of the 5th September last, No. 952; but it should be explained that the trees are not to be "retained for coppicing," but that mossing and coppicing should proceed *pari passu* in the proportion fixed.

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C
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C
Measure
C
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27th April 1874.

(Signed) J. D. SIM.

Cal use in
our Hospitals

4 19

Minute

From Cont. of
Keilyberries.

14 March 74

From the papers
submitted it ap-
pears that we
have now 1000 lbs
of C. Succine wa-
which have reached
the age when the
yield of alcohol
begins to decrease.
The fact that
after a certain
age this result
would be reached
as the Com. shows

the same process

long since noticed
by Mr. McLeod -
and as the analysis
of Mr. Howard &
Mr. Broughton con-
firm the conclu-
sion - so far as
least as C. succi-
ferum is concerned
we may safely
act on it & pro-
ceed to harvest
the ~~whole~~ bulk of
the bark of these

(47)
10
6000 Trees - be free
^{further}
other deterioration
ensues. In the
order of the 5 Sept
73 No 952 - put
directed that $\frac{1}{4}$
of these trees should
be "retained" for
"cupping" - and
 $\frac{3}{4}$ "treated" as
according to the
existing system
The intention of
putting on an

the same process

understand - that
the trees should
be copied - &
not merely retained
for their bird hole -
I understand and
that 1000 of the
trees have been
knocked - I would
now suggest that
1000 more be then
cut in the,
and 2000 copied
the remaining 2000

on this particular
species of Chinaberry.

47
being retained
for experimental
purposes - a small
number being an-
nually needed &
copied ^{in equal proportions} in order
to test over a long
series of years the
consequences of age
& the effects of each
mode of harvesting.

Besides the
above 46000 trees.
Cinnabar trees, we
have 18000 Crown
and the last of his
the main property

of 11 yrs ago
Mar 18th in his de,
it is proposed to
harvest at once.
As reports then
specifies it does
not seem to me
that the termination
from eye - at least
to some - is so
clearly established
that we need
harvest these trees
simply & solely
because that

47
11
Consequence - In
his letter to the
Secy of State
of 16 Jan 72 Mr
Howard says he
has "no doubt
that these bushes
will improve
with age" and
again that "there
is no fear ^{that} of these
varieties of *C. officinalis*
should be terminated
with age." See
another part of his
memorandum.

of 11 yrs. ago

letter Mrs. Howard
Speaker of the
determination after
a certain age
as "the peculiar
habit of the spe-
cies" *Succirubra*.
Mrs. Broughton com-
municated to state the
changes taking
place in the growth
of Crown Bark as
they advance in
age in the tree

3/

Mrs. Broughton letter
Sept. 22 Aug. 5/73
p. 10-11

+ but ^{the} analyses
"show that no cer-
-tification of the forma-
-tion of alkaloids
or any deterioration
of quality is yet
apparent from the
increase of the age
of the bark."

47
Same specimen
as in the case
of *C. Succirubra*.
I see no need
therefore for bar-
-resting these trees
shady for the object
of avoiding waste of
~~alkaloids~~
alkaloids.
and I would
leave them to be
done as our la-
-bourers want of
dictate.
bark ~~the~~
I do not see any
reason for doing

be asked to alter
the position of
trees to be moved
& explain what
was prescribed
in our order & of
the 5 Sept last
no. 952. but it
should be explained
that the trees are
not to be "retained
for copying" -
but that the crossing
& copying shall
be the same

(47)
Proceed with
in the position.
fixed.

(98)
The other question
for decision is
the retention
of C. Calibaya.
This cannot be
done in the man-
ner proposed by
Mr. Bradley.
but there is nothing
to prevent ad-
ditional land
being obtained with
the same facility

this variety, if it
deem ~~that~~ it de-
-sirable. My own
opinion is adverse
to such a measure.
He can do as they
think proper. It is
stated that the
elimination of the
Healy carrier
is not tantamount
to it - and because
in the C. & N. W.
we have a space
nearly if not quite

4/

Note. As an advantage
of the C. & N. W. we
Broughton mentions that
the branches are nearly
valueless. Mr. Howard
however says that "the
long form is not short but
could be fitted here often
been sold & even preferred by the public"

(4)
its equal. which
succeeds well.
Mr. Howard writes
in high terms of
the Crown Books
(C. & N. W. Books)
Mr. Boring also has
been "the principal
success of Chicago
and the town on the
Healy carrier will
be sold from the
Export of these
Crown Books."

no more for sale

Broughton says "suc-
 phatically," it ap-
 -pears to be the
 most species for
 the production of
 bark for export"
 and Mr Howard
 especially well
 on the importance
 of regarding it as
 a "cinchona-like"
 -producing material.
 It seems to me therefore
 that our best course
 is to send home

Letter to Mr G
 22 Aug. 73. box 7.

5/

I have also some of Chile.
 It is very like our own
 but it is more of a
 in it can be made at home

for the use of our
 native population
 who cannot afford
 to buy Quinine

only so much
 of the succinate
 bark as may be
 needed for special
 purposes - such
 as analysis -
 testing of market-
 -value - and to
 reserve the best
 bulk ~~held~~ for
 on full account
 conversion into
 sulphate of Chin-
 chona line. I can-
 -do do but Broughton
 in many cases

will have no
difficulty in
using up all
the bark we have

of this one species - and of manufacturing
the product as economi-
cally as it is manufactured
at home -

that if we can
do so, the surplus
bark it if we can
be sent home - for manufacture there -

The Crown & other
bark on the
other hand should
be chiefly sent
home - as there
is a great demand

if we could this could
cannot be ~~done~~ ^{adapted}
immediately - but
it should be not
proving profitable -

properties under
them especially
valuable there -

The paper which
has been carried here
the Lord's letter
to the Com^{rs} - gives
the prices which
our bark has re-
alized in England
in comparison
with the prices
realized by the
Java Bark & the
Banyan bark
as main property

especial stress
 on the high level
 realised by some
 Java Calistegia
 Bark - but our
 own Crown Bark
 fetched even higher
 prices - and the
 general average of
 our Bark is as
 the Mc Low points
 out considerably
 higher than that
 of the Java Bark.
 It is to be observed

18 (39)
That some Branch
crown bar. sent
home, ~~the~~ his brought
stated, contrary
to his advice, &
~~the~~ the Com^r adds
rejected by him
as unfit for the
use of the factory
at Redditch. ¹⁰
Realised from 2-0
to 3-6 ¹² per pound.
If this be the
case, the result
naturally
& the man. factory

naturally my
-test to ^a ~~the~~ ~~good~~
Drill as to whether
there is not some
defect in his
~~method~~ process
of manufacturing
which fails to
extract all the
alkaloids in
the bark. In the
bark which he
rejected there must
I should suppose

Mrs Broughton has
described his method
of manufacturing very
fully in his letter of
the 1st Dec. 73. It
is evident - from the
prices realized in
the English market for
bark rejected here

(47)
19
~~has been~~ from
the prices realized
have been some
2% of Linnine.
~~the~~
~~the~~
assessing
important
as ~~was~~ ~~the~~ ~~case~~ ~~of~~ ~~the~~ ~~case~~
It is there ^{must be}
a great ~~loss~~
~~account~~ ~~the~~
loss - ~~when~~ he
between the Laboratory
& the manufactory

results. This is
 a very important
 subject & merits
 our serious con-
 sideration. For on
 its terms the question
 whether we should
 continue to manu-
 facture here or
 leave this to be
 done in England.
 I would suggest
 that the Committee
 consider which
 has been issued

One must have
 means for the
 to utilize the
 it would not be
 worth while to send
 to England.

7/

20
 For Experiments
 should be sub-
 mitted to the
 & valuations
 analysis of the
 Howard & ~~the~~
 De Vries.

J. D. S. Linn

27. 4. 74.

No 2098.
Prosmue 1874 Sept
Minute by the
Hon. J. D. Sim C.S.I.

Dated 27 April 1874
Refd 27 June.

Analysis of different
species of *Pinchona*
bark.

GO-22 June/74 No 759

186 A

REVENUE DEPARTMENT.

MINUTE BY THE HON. W. ROBINSON, C.S.I.

I AGREE with Mr. Sim on the whole. But unless medical science establishes the efficacy of alkaloids other than quinine, and thus raises the value of *C. succirubra*, the further use of this species—even for filling vacancies—should be given up entirely; not that the matter of filling vacancies is pressing as regards the plantations at Neddivuttum, for thinning must be the order of the day for long there. On this point, therefore, a decision is needed. One of the other two species, *C. officinalis* or *C. Calisaya*, must be used.

2. Mr. Sim advocates the former, and I agree with him for the reasons he gives, wherever the *C. Calisaya* does not thrive; wherever it does thrive fairly, the *C. Calisaya* should be preferred.

3. I think that the doubt raised as to the efficiency of the Factory should be inquired into and set at rest at once; and I am inclined, on further consideration, to think that Mr. Sim's proposal to have the analysis conducted at home the best plan.

30th April 1874.

(Signed) W. ROBINSON.

Proof for approval

Corrected 49
21/7

MINUTE BY THE HON. W. ROBINSON, C.S.I.

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30th April 1874.

(Signed) W. ROBINSON.

Thompson & H. Bell. N^o 10

Amundson

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other than Quinine and
thus raises the value
of C. Succirubra, the
further use of this species
- even for filling vacancies
should be given up ^{entirely}
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of filling vacancies
is pressing as regards
the plantations at Hadam
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does not thrive; wherever
it does thrive, ^{fairly} the
C. Calisaya should
be preferred.

I think that the
doubt raised as to the
efficiency of the Factory
should be inquired
into and set at
rest at once. I would
recommend that
~~Dr. Linn~~ with some
~~other~~ competent persons
be deputed to inquire
and report.

30th November

And I am inclined, on
further consideration, to
think that Dr. Linn's proposal
than the analysis conducted
at home the best plan
W. L.

186/13

Shulgi of Shulgi
pieces of Luchona
bank.
Qd 22 June 1874 12759

Dated 30 June 1874
Regd 27 June 1874

Minute by the
Hon. W. Robinson C.S.R.

No. 2097.
Bosnia 1874 Regd

REVENUE DEPARTMENT.

MINUTE BY HIS EXCELLENCY THE COMMANDER-IN-CHIEF.

I FULLY concur with the Hon. J. D. Sim, especially as regards the method by which he would test the value of Mr. Broughton's operations at Neddivuttum. We have no knowledge of Dr. Bidie's qualifications as a Chemist; whereas in a matter of such vast importance we should take care to obtain the opinion of the most eminent available. We could hardly ascribe much value to that of any other.

2. We should not be in too great a hurry to condemn *C. succirubra*; for I observe that whilst Mr. Howard speaks most disparagingly of that bark from coppice, he speaks highly of the bark renewed under the mossaing process (*vide* "Gardener's Chronicle," March 28th, 1874, page 408).

23rd May 1874.

(Signed) F. P. HAINES.

57
Proof for approval

[Signature]

MINUTE BY HIS EXCELLENCY THE COMMANDER-IN-CHIEF.

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23rd May 1874.

(Signed) F. P. HAINES.

Minute on
Chinichina -

I fully concur with
the Noble / J. Linn -
especially as regards
the method by which
he would test the value
of Dr. Wright's Opera-
tions at Reddick's written
We have no knowledge
of Dr. Bidie's Qualifications
as a Chemist, whereas
in a matter of such vast
importance we should
take care to obtain the
opinion of the most Sci-
entist available - We could
hardly ascribe much
value to that of any other
Noble, Linn

2. We should not be in
too great a hurry to condemn
Chinichina for I believe
that whilst Dr. Howard speaks
most disparagingly of that bark
from Coppice, he speaks highly
of the bark removed under the
mopping process I believe
Chinichina March 26-1874 Rev 408.
Ottawa
23-5-74.

N. 2100

Revenue 1874 Sept

Minute by M. E. the
Commander-in-Chief

Dated 23 May
Ref. 27 June 1874

Analysis of different
species of Cinchona bark

QO 22 June 74 No 759

186 C.

REVENUE DEPARTMENT.

MINUTE BY HIS EXCELLENCY THE GOVERNOR.

I THINK that sufficient reason is shown for the action which is proposed by the Hon. Mr. Sim respecting the *C. Succirubra* trees. As regards the choice between *C. Officinalis* and *C. Calisaya*, Mr. McIvor says that the latter will not grow well on the Nilgiris, and this seems to be sufficient reason for preferring the former. I think that the subject noticed by Mr. Sim in the last paragraph of his Minute, respecting the process of manufacture in the Factory and the real value of its results, is one requiring serious consideration; and I would select, as suggested by the Hon. Mr. Robinson, some person or persons to inquire into and report upon it, with a view to a satisfactory solution of the question whether our manufacture should be continued.

6th June 1874.

(Signed) HOBART.

Prop for approval
com. w. 7/11

65

MINUTE BY HIS EXCELLENCY THE GOVERNOR.

S/O
4

I THINK that sufficient reason is shown for the action which is proposed by the Hon. Mr. Sim respecting the *C. succirubra* trees. As regards the choice between *C. officinalis* and *C. Calisaya*, Mr. McIvor says that the latter will not grow well on the Nilgiris, and this seems to be sufficient reason for preferring the former. I think that the subject noticed by Mr. Sim in the last paragraph of his Minute, respecting the process of manufacture in the Factory, and the real value of its results, is one for serious consideration; and I would select, as suggested by the Hon. Mr. Robinson, some person or persons to inquire into and report upon it, with a view to a satisfactory solution of the question whether our manufacture should be continued.

6th June 1874.

(Signed) HOBART.

I think that sufficient reason is
 shown for ^{the} action ~~which~~ ^{that} is
 suggested by the W. ^{to} be true respecting
 the *C. succinea* tree.

As regards the choice between
C. opacoides & *C. californica*,
 Mr. Henslow says that the
 latter will not grow well on
 the Mendocino; and this seems
 to be sufficient reason for
 preferring the former.

I think that the subject noticed
 by you in the last paragraph
 of his Memoir - respecting the

Knowledge of manufacture in the
factory, and the real value of
its results, — is an ~~pr~~ ^{one}
serious consideration; and
I would select (as suggested ^{by} Mr. Robinson)
some person or persons to represent
I expect upon this — with a
view to a ^{satisfactory} final solution of the question
whether our manufacture should be
continued.

W. B. W.

Aug 6/74

No. 2101
Revenue 1874 Sept.

Minute by H. E. the
Governor.

Dated 6 June 1874.
Regol. 27

Analysis of different
species of *Pinchona* bark.

GA 22 June 1874 No 759

186 D.

Dutch Trading Company
Description of the parcels of Java Bark of Crop
1872, sold by Public Auction on the 27th May 1873.

Class	Chests	Kilo.	Prices realized per 12 Kilo.	Percentage of alkaloid Variable	Quinine Variable
Calisaya	a	72	4666	113 c	
	b	23	1525	194 c Variable	Variable
	c	3	140	116 c	do
	d	5	346	158 c	5 % Uncertain
	e	4	261	457 c	7 % 3/4
Tacharctiana		20	1358	141 c	4 to 5 % 1/3 to 1/4
Succinbra		5	362	115 c	
Officinalis		8	407	201 c	4 % 1/2
Caloptera		1	62	173 c	4 to 5 %
Pahudiana		35	2193	128 c	1 to 4 %
Powder		29	3519	16 c	
"		3	"	13 c	

W. S. M. Esq.
Supdt. Govt. Chin. Plantns.

Potac amund
Government Gardens.
14th February 1874.

73
Chinchona Bark from the Government
Plantations on the Molgherries sold by Public Auction
in London on the 11th November 1873.

Class	Cases	No.	Price
Crown bark	2	343	5. 9
do	27	6670	4. 7
do	2	297	4. 6
do	1	210	4. 5
do	3	368 1/2	4. "
do	2	396 1/2	3. 10
do	5	463 1/2	3. 8
do	1	173 1/2	3. 6
do	2	302 1/2	3. 5
Branch do	2	466	3. 6
do	9	1341 1/2	2. 6
do	2	308	2. 4
Red Bark	2	671	3. 2
do	1	166 1/2	3. 1
do	6	1625 1/2	3. "
do	2	314 1/2	2. 11
do	6	1038	2. 10
do	9	1756 1/2	2. 7
do	1	238	2. 6
do	1	182	2. 5
do	2	394	2. 4
do	4	1126 1/2	2. 3
do	1	161 1/2	2. "
do	3	271	1. 4
do	3	470	1. 3
Branch Bark	7	972 1/2	2. 3
do	1	194	2. 2
do	1	161 1/2	2. "

W. S. M. Esq.
Supdt. Govt. Chin. Plantns.

90-22 Jan 174 1873



Government Gardens
Cotacamund 14 February 1873

No. 16274
From

W. G. M. Esq.
Supdt. Govt. Chin. Plantation
J. R. Escherell Esq.
Commissioner of the Nilgiris
Cotacamund

Sir,

I have the honor to acknowledge the receipt of G. O. dated 15th December 1873 No 1428 with your endorsement of the 19th calling for any observations I may wish to offer in connection with the subjects discussed in the Papers recorded in the above Proceedings.

The report submitted by Mr. Broussais details certain changes "produced by age and growth" in the bark of several species of *Cinchona*, and as that gentleman's observations appear to establish and confirm the well known and generally accepted conclusions arrived at years ago, this part requires no remark further than bringing prominently

prominently to notice the very important fact that the "bark on our oldest trees of *C. Succirubra* has passed its age of maximum yield of alkaloid," and I submit therefore that this bark should be harvested as early as possible in order to prevent further deterioration.

I observe that at Para 14 of his report Mr. Broughton recommends the extension of our *Calisaya* cultivation by filling up all failures which occur among the trees of *C. Succirubra* with Plants of *C. Calisaya*. In my opinion there are several reasons which would render any attempt to carry out this system unprofitable & unsuccessful. In the first place *C. Calisaya* is a species which has hitherto in all the varieties yet imported, and grown on the *Estigies*, given unmistakable indications of being unsuited to our climate. The Plant is weak and of delicate growth. It is extremely liable to disease, and for these reasons I believe it to be the most unprofitable species to cultivate on the *Estigies*. Moreover its weak habit of growth renders it quite unsuited

4
to fill up failures among a strong growing and vigorous species such as *C. Succirubra*. Its delicate constitution is another serious draw back to using the species at all for filling up vacancies, it being well known to all practical Planters that successfully to Establish plants in vacancies requires a more vigorous plant than that originally planted. The reason of this is plain. the Established Plants in the neighbourhood grow faster than *C. Calisaya* spreading their roots & branches further and thus rob the weaker plant of nourishment & moisture while the branches over shade it. This even takes place when strong growing & less vigorous species are planted out at the same time together to such an extent that the stronger growing invariably destroys the weaker. For the above reasons the experienced planters would carefully avoid the selection of a slow growing and delicate species to fill up vacancies among a strong growing and vigorous variety.

In Mr. Broughton's covering letter, that gentleman further urges the adoption of this system by bringing prominently forward the fact that "Certain Specimens of *C. Calisaya* have sold in Amsterdam for the extraordinary prices of 8 to 9 ^s 5 ^d per Kilogramme or $3\frac{1}{2}$ ^s $4\frac{1}{3}$ ^d per lb." and

concludes by giving an analysis of Certain Java Calisaya Bark as yielding 7.65% of total alkaloids & 6.9% of quinine, remarking "This Bark therefore is of better quality" than any grown on our Plantations with the exception of var. *Augustifolia*. I annex to this letter the Invoice & analysis in detail of three Java Barks sold in Amsterdam.

It will be noticed that although 4 Cases containing 261 Kilogrammes brought the high figures quoted, the average prices realized were low.

I think it proper to place in juxtaposition to this list of prices obtained for Java barks, the list of prices obtained for the 23,000 lbs of bark sent home from the Milgiri plantations last year. Our *C. Officinalis*

Officinalis stem bark fetched from $4\frac{1}{2}$ ^s $6\frac{1}{2}$ ^d to $5\frac{1}{2}$ ^s $9\frac{1}{2}$ ^d per lb, and the general prices obtained were much higher than those brought by the Java barks. The price of the *C. Officinalis* would indicate contrary to Mr. Broughton's impression that this is better than the Java Calisaya bark.

At para 14 Mr. Broughton states "It appears to me to have been unfortunate that *Chinchona* cultivation should have been so greatly occupied with *C. Succirubra* at its commencement." This opinion is apparently founded on the statement given at para 7 that "*Succirubra* appears the worst species for producing bark for export." Upon this point I beg to draw your attention to a private letter I received from Mr. Howard some time ago, and the statements which I believe you communicated to Government. The *Succirubra* bark in our consignments above mentioned brought as high as $3\frac{1}{2}$ ^s per lb.

At para 20 Mr. Broughton brings

Mr. Howard wrote in 72 "I cannot be asked upon as the *Succirubra* bark of the future"

Yes but the lowest price fetched by *C. succirubra* in 1873 was 3.5.

to notice that the beneficial effects of mopping
become less evident with the increased
age of the tree. If this means that renewed
bark on the oldest trees we possess is not so
rich as renewed bark on young trees, I am
not prepared to follow Mr. Broughton. My
experience is that renewed bark 2 years
old is at the best state for cropping as
regards the quantity of contained alkaloids,
and that this bark, speaking without
formal precision, is as valuable on old as
on young trees.

I never for a moment con-
templated bark as old as the tree on
which it is grown continuing to
improve. I have all along acted on
the knowledge that beyond a certain
age, cellular tissue which Mr. Broughton
justly states, contains the alkaloids,
gives way to liber fibre which the
older it is the less alkaloid it must
yield.

I

I have the honor to be

Sir.

Your most. Obedt. Servant.

J. S. M. J. M.

Supt. Govt. Chin. Plantations

From J. A. Cockrell Esq
Commissioner - Freetown

To The Secretary of Government
Revenue Department
Fort Saint George

Sir,
With reference to Government Order, Revenue Department, 15th December 1873 No 1428 directing me to obtain any observations the Superintendent of the Cinchona Plantations may have to offer on a report of the Government Quinologist upon the changes produced by age and growth in the Cinchona trees in the Government Plantations on the Freetown Hills and at the same time to submit my own remarks I have the honor to forward a letter from Dr. J. S. on the subject.

2. Dr. J. S. has for a long time held the opinion put forward by Mr. Broughton that after a certain age the cellular tissue in bark, which contains the alkaloids gives way to liber fibre and that the further this metamorphosis extends the greater is the deterioration in the bark. A complete substitution of liber fibre for cellular tissue is in fact a conversion of bark into a material worthless to the Quinine manufacturers. Dr. J. S. concurring thus completely with the Quinologist accepts as further the statement that the bark in our oldest *Succirubra* plants has entered upon the course of decline.

The former two out
Gent: En: Plantation
Colonial Office

Dated 14th } February
Recd 15. } 1874.

Rev: 863/74

26. 7 22 June 1874

26. 13 16. 1874

on points noticed by
Mr Broughton with
reference to the Cinchona
Plantations on the Freetown
Hills in G. O. No 1428
dated 15 December 1873

skins and he suggests that the bark of these
trees should be harvested. There are 6000 of them.
Mr. In: I would advocate harvesting also the Crown
barks of 11 years old on the same grounds. There
are 18000 of these trees. The deterioration of bark
by age was fully discussed in Mr. In: I's letter
and in mine in Government order 5th September
1843, Revenue Department No 952 and the identical
conclusions now stated detailed. But in that order
the Government were pleased to direct $\frac{1}{4}$ of the
unmossed trees of 11 and 10 years old should be
preserved for coppicing until the mossing process
was demonstrated to be superior. The Government
remarked that the immediate loss in bark thus
entailed was not of any moment. I see no sound
reason for a modification of the order at present
because circumstances have not changed since it
was published and though I agree with Mr. In: I
I cannot recommend that the older trees shall
be harvested at present in greater proportion
than is expressed in the order.

3. Mr. In: I now next touches upon the question
of filling vacancies with Calisaya. He states
this species is weakly and remarks upon the fact
that a plant of a weak character will not
grow amongst more vigorous plants which over
shadow and choke it.

4. The next point touched by Mr. In: I
is the sale of Java bark noticed by Mr. Broughton.
This

This bark did not fetch such good prices in
Amsterdam as the bark sent home from the
last year realized in the London market. It may
be objected that the circumstances of the two sales
may have been different and the higher price obtained
for the Nilgiri bark not be a perfect test of its
superiority. The fact however is, that if anything
better prices are habitually obtained for bark
at Amsterdam than in London. Purchasers in
London must be discriminating purchasers or
because bark is invariably sold on analysis. There
is no guess work in the matter. The Government
will have noticed with pleasure that even the
worst barks of the 23000 lbs sent home last
year fetched a good price. Certain Crown barks
not worth working up in Mr. Broughton's factory
realized from 2 shillings to 3-6 a lb. Mr. Broughton
anticipated this bark might sell fairly, though
he was adverse to its shipment as he stated in
his letter in Government order, 8th September 1843
No 955 Revenue Department. The sales enumerated
do not tend to establish a need for particular
attention being bestowed on the Calisaya.

5. With regard to the views expressed by Mr.
Howard upon the Red barks I quoted them in
a letter dated 7th January 1844 No 3, I addressed
Government on that subject exclusively.

6. I shall forward the samples of barks
required by the 3rd para of the order under
reply.

15 Dec 1873 No. 207-208
 5 Sept 1874 - 39-40
 11 March 1874 - 168 Nov

Shave the honor to be
 your most obedt servt
 E. C. Coker
 Commissioner.

to be so soon as receive them from Mr. Bronghton.

186.
 RC 12/14/74 R 29
 10/14/74 R 614

No. 208
 Date - 14 Dec 1874
 Recd 16, - - -

Commissioner's Office,
 Olatumunul.

To
 the Secretary of the
 Revenue Dept
 16
 at Olatumunul

Enclosures
 1
 Enclosure

SUBJECT

Transmitting Mr. Bronghton's
 letter admitting his name
 on Mr. Bronghton's report
 regarding the change from
 by a set growth in the time
 from the first evidence
 plantation on the village
 SD-22 Jan 14/75