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G.O. No.	469-70	Press Mis.
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5TH APRIL 1884, No. 469, REVENUE.

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

READ—again G.O., dated 23rd January 1884, Mis. No. 341, Revenue:—

Read—the following letter from A. MACKENZIE, Esq., Secretary to the Government of India, Home Department (Medical), to the Chief Secretary to the Government of Madras, dated Calcutta, the 5th January 1884, No. 12.:—

I am directed to forward herewith copy of a despatch from Her Majesty's Secretary of State, No. 68 (Revenue), dated 18th October 1883, with enclosures.

2. It will be observed that the Secretary of State has determined to revert, pending final decision of the question of local manufacture in lieu of home manufacture, to the former system of sale by auction of the barks consigned to the India Office. He also proposes to send to India the stock of quinine and febrifuge which has accumulated in London and which, for the reasons stated, is unsaleable in England.

3. I am to request that the Government of India may be favored with the opinion of His Excellency the Governor in Council on the proposals made in paragraphs 3 and 6 of the Secretary of State's despatch as to the sale by auction of the barks from Madras and also as to the disposal of the febrifuge at a low price in those districts which suffer most from malarious fever.

ENCLOSURES.

Letter from Her Majesty's Secretary of State for India, to His Excellency the Most Honorable the Governor-General of India in Council, dated India Office, London, the 18th October 1883, No. 68 (Revenue).

I have had under my consideration in Council the questions whether it is desirable to place upon a permanent footing the existing system of manufacturing in London, on account of the Secretary of State in Council, into either febrifuge or into quinine and other alkaloids, the cinchona bark annually sent home from the Madras Presidency; and what should now be done with the large stock of these products which has accumulated in store, not having been indented for by the Indian Governments.

2. The question of the local manufacture of Sikkim febrifuge has lately been referred, with the assent of Your Excellency, to Professor Armstrong for report, and I understand that the Madras Government will take up the question of the best way of utilising the barks grown in that Presidency as soon as Professor Lawson, who has lately gone out to take charge of the cinchona plantations, is in a position to advise that Government upon it.

3. In these circumstances, and while it is still doubtful whether it will not eventually be decided to manufacture locally, either into quinine or into febrifuge, both the Madras and the Sikkim barks, it is evidently undesirable to place the home manufacture upon a permanent footing. And as it appears that the result of the home manufacture during the last three years has been to accumulate a stock both of quinine and other alkaloids, and of febrifuge, for which there is no immediate demand in India, I have determined, unless your Lordship sees any objection to that course, to revert, pending final decision of the question of local manufacture, to the former system of sale by auction of the barks consigned to this Office from either Sikkim or Madras.

4. Your Excellency will see from the statement at the end of the accompanying memorandum by Mr. F. C. Danvers of this Office what is the stock of the alkaloids at present on hand, which will be increased when the consignments of barks now in process of manufacture are ready. As the quinine is colored with carmine and is, therefore, unsaleable, it must now be sent to India, and you will probably think it desirable also to send to India the febrifuge, for which there is no great demand in this country. The other products, unless you desire that any shall be sent to India, will be sold in this country.

5. I request that Your Excellency will inform me, at your early convenience, when and in what quantities the quinine and febrifuge shall be consigned.

6. The quinine now to be sent will probably render it unnecessary for you to indent on this country for quinine for some years to come. The febrifuge, added to the annual produce of the Sikkim works, will apparently exceed the quantity for which there is at present an effective demand from your Medical Department or from the public, and I would suggest, for your consideration, whether it would not be advisable to distribute the extra quantity freely at a low price in those districts of India which suffer most from malarious fever. This course will probably make the beneficial effect of the febrifuge widely known among the people, and will increase the future demand for it.

7. I address Your Excellency separately in the Financial Department upon a question raised by the Government of Madras, that of the proper method of bringing to account, under the provincial system, the value of the Madras bark which has been sent to England for manufacture.

CINCHONA.

Several circumstances have recently arisen which render it desirable that the present policy of the home manufacture of alkaloids from the cinchona bark received from the Madras Government plantations should be considered. The first is, as pointed out by the Madras Government, that under the present system provincial revenues fail to receive any credit for receipts on account of the products of the cinchona plantations, which, under the new decentralization scheme, should be credited to them; secondly, that, under the present system of home manufacture, the supplies of sulphate of quinine and other alkaloid products from Government bark are being delivered from the manufacturers greatly in excess of the amounts demanded for use in India, and they are consequently accumulating in large quantities in the Store Depot; and, thirdly, Messrs. Howard and Sons have expressed their inability to guarantee the speedy delivery of alkaloids manufactured on account of this Office, unless arrangements can be made for continuing the manufacture on Government account for some definite period, in which case they would increase their plant accordingly.

Before considering what steps should be taken in these matters, it may be as well to review briefly the present position of affairs, and to show what circumstances have led to the adoption of the course now followed.

For these purposes it seems unnecessary to go into much detail relative to the earlier years of Government cinchona cultivation, but it will be necessary to refer to them briefly. It will be remembered that the introduction of the cinchona plant into India was undertaken for the express purpose of providing a cheap febrifuge for the use of the people of India. Government have established two plantations within their territories, one near Ootacamund, in the Madras Presidency, and the other near Darjeeling, in Bengal. Owing to climatic causes, it has been found most desirable to cultivate different kinds of bark in these two plantations respectively, it having been found that the *succirubra*, or red bark, comparatively poor in the high-priced sulphate of quinine, but rich in the other less valuable alkaloids generally found in cinchona bark, flourishes most at Sikkim, whereas in Madras, the crown and other species, rich in quinine, but relatively poor in the other alkaloids, have grown best and been principally cultivated.

This difference in the products of the two plantations has led to the adoption of various methods of disposing of the bark from them, and for this reason it will perhaps be best to deal with the two plantations separately, commencing with the Madras plantations, as it is with reference to them that an immediate decision is the more pressing.

Madras Plantations.—The Nilgiri (Ootacamund) plantation dates from the introduction of the plant from South America, by Mr. C. R. Markham, in 1860. The first operations were confined to the propagation of the plant in as great numbers as possible, and so successful was the first Superintendent (Mr. McIvor) in this, that by October 1862 he was enabled to submit proposals for greatly extending operations, and by the early part of 1863 there were already 135,739 plants in existence. Private enterprise was not slow to follow the lead taken by Government in this industry, and in 1863 applications were received from twelve different parties for 34,000 cinchona plants, 1,339 having been already previously distributed among nine private individuals.

In a despatch of January 1863, the Secretary of State approved of a proposal to plant 150 acres annually for at least 10 years; and remarked that the two great objects of the experiment were, "the provision of an abundant and certain supply of bark for the use of hospitals and troops, and the spread of the cultivation throughout the hill districts, in order to bring the remedy within the reach of frequenters of jungles and of the Native population generally." The Secretary of State went on to remark, "your Government has very justly observed that 'the experiment cannot be regarded as a mere money speculation,' nor are the commercial advantages that may be derived from it to be considered as other than a secondary consideration; though of course a return for the outlay and the spread of cinchona cultivation by private enterprise are very desirable in themselves."

The first samples of immature bark sent home in 1863 were found, on analysis, to produce a fair yield of quinine, and in August of that year the Madras Government proposed the establishment at Ootacamund, as soon as the supply of bark should be sufficient, of a Government manufactory, to which private individuals might also send their bark for the manufacture of quinine.

12th August 1863.

Samples of bark were, from time to time, sent home for analysis by Mr. E. Howard, who recommended that the bark should be sent home in its natural state for sale on the London market.

15th June 1864.

It had been suggested that a rough extract might be made in India, which, while efficacious as a febrifuge, might also be imported into Europe for the manufacture of quinine, instead of sending home many times the bulk and weight of bark. Mr. Howard, however, stated "that experience has hitherto shown, by the failure of the very numerous attempts in this direction,"

15th June 1864.

that the collectors and importers reap in the end more profit from sending in to the European market the raw material than the half-manufactured product. The latter would command no price worth mentioning as a febrifuge *per se*. It would simply come into competition with the quinoidine and refuse product of the bark operation. As to the reasons why it is not profitable to bring the product into a smaller bulk for facility of transport, they depend in part on the complexity of the organic constituents of the barks, leading (specially under the influence of lime or alkalis) to deteriorating changes in the alkaloids, and partly also to the tendency of the heat to which the product must be subjected operating in the same direction."

In 1865, the Secretary of State decided that a certain proportion of the bark harvest should be sent home for sale on the London market, and about this time a question having arisen as to the relative therapeutic value of the several alkaloids other than quinine contained in the bark, he directed that a commission should be appointed in each Presidency to report on the subject. Commissions were accordingly appointed, with the result that most of the other alkaloids were considered valuable as therapeutic agents.

30th September 1865.

Despatch, 24th May 1867.
Despatch, 23rd August 1867.

In January 1866, Mr. Markham suggested the appointment of a quinologist at Ootacamund, to investigate on the spot the various questions connected with the elaboration of alkaloids, the harvesting of the bark, and the manufacture of a rough and cheap febrifuge therefrom.

17th October 1866.

This was approved by the Secretary of State, and in October 1866 Mr. John Broughton was sent out as Quinologist to the Madras Government.

In a despatch of 16th June 1866, a hope was expressed "that private enterprise may hereafter render the continuance of operations by Government on an extended scale unnecessary,"

but that "in order to carry out as fully as possible the great object contemplated by Her Majesty's Government in introducing the cinchona into India, viz., that of making its produce accessible to the greatest possible number of the poorer inhabitants of the country, every effort should be made to promote the cultivation of the tree by private persons wherever the cultivation is likely to be successful."

In 1867, the first consignment from the Government plantations, consisting of three cases, each containing about 100 lb. of bark, was sent home for sale by public auction, and

Despatch, 23rd August 1867.

etched very satisfactory prices. In the same year also, the first sample of sulphate of quinine manufactured by Mr. Broughton was received from India. Mr. Broughton reported that the cinchona barks of the Government plantations on the Nilgiris contained, in at least an equal amount, all the active medicinal principles of the American barks, and, in considering the best manner of treating the Government barks *in situ*, he recommended for consideration the preparation of sulphates of the mixed alkaloids, and the precipitation of the alkaloids from solution in the amorphous state. In a subsequent communication, he stated that, with the exception of sulphuric acid, the whole of the materials required for the manufacture were obtainable in the surrounding districts. A year or so later, Mr. Broughton had commenced the manufacture of

"amorphous quinine," at an estimated cost of one rupee per ounce, which was reported to be "highly efficacious."

Shortly after this, the Government of Madras discussed the position of the State with regard to the supply of quinine, and they then stated that a choice lay between the following courses of action, or an intermediate policy:—

Letter, 7th February 1871.

1. The retention and maintenance by the State of the cinchona plantations, and the institution of a regular system of quinine manufacture by the State for Indian requirements.
2. The abandonment by the State of both branches of industry in favor of private enterprise.
3. The retention of the plantations by the State with a view to the manufacture of quinine from the bark in England.
4. The sale of the plantations, but the retention by the State of the process of quinine manufacture for Indian requirements at Ootacamund.

Upon the first point, Government considered that certain of the plantations at least should be retained; that, although State supervision cannot ordinarily compete with ably directed private enterprise, it does not follow that a project should be relinquished when the cost of it is rapidly decreasing, while the profits are only beginning to be realised; and, further, the cinchona planting in India, although a proved success, had not yet altogether lost the character of an experiment, which it would be unsafe to entrust to private hands. With reference to the question whether the bark should be utilised entirely at Ootacamund, or whether a portion of it should be sent to the London market, it was considered that as the amorphous quinine prepared by Mr. Broughton was found highly efficacious, there could be no doubt as to the expediency of continuing its preparation in India. As, however, it was evident that, unless the local demand for quinine increased considerably, the supply of bark from the Government plantation would soon exceed the demand, it was considered highly advisable that samples of the Nilgiri bark should be sent to the home market. The Madras Government accordingly expressed their determination to export so much as might not be required for use in India, and they stated that orders had accordingly been given for the shipment to London of 4,000 lb. of bark.

Reviewing a report by Mr. Broughton on an examination of cinchona barks, the Secretary of State came to the conclusion (11th January 1872) that it would "be found advisable to use one set of barks for general consumption among the natives of India, and to cultivate another, having a larger yield of crystallisable sulphate of quinine for sale in the London market." And in a subsequent despatch (8th February 1872), the extension of the cultivation of a variety of crown bark was urged, on the ground that the importation of the once famous crown barks from South America had practically ceased, "so that the world is now dependent on India for a supply of this valuable product."

It was further stated "Mr. Howard is also of opinion that the grey barks should not be neglected, as the demand for cinchonidine, which they yield so abundantly, is increasing." In a subsequent despatch (8th August 1872), it was further stated—"The chief object of your Government in forwarding bark for sale in the London market should be to make its great superiority over all other barks well known throughout the world, and care should therefore be taken that it is equal to any bark that is grown, under the same conditions, on private plantation."

From the foregoing extracts it appears that the growth of cinchona expressly for sale in London was at this time part of the deliberate policy of Government, and from this date annually increasing supplies were sent home from Madras for this purpose.

After repeated requests by the Secretary of State to be furnished with a report on the results of the alkaloid manufactory, the Madras Government wrote (9th March 1875), that having reason to entertain doubts as to the working of the factory, they deputed the Commissioner of the Nilgiris and the Sanitary Commissioner to inquire and report on the cost and medicinal value of the product. These gentlemen "satisfactorily demonstrated that, while the present prices of cinchona bark obtain, the local product is being manufactured at a considerable loss, and that its commercial value is less than one-half the value of the raw material and manufacturing charges, the value being less than 1,500l., and the cost rather above 3,000l. They state that its efficacy as a febrifuge is undoubted, and this is supported by the record of cases treated with it, submitted by the Surgeon-General; but they also show that, as at present prepared from different barks, it is 'always varying in composition,' and the process of manufacture does not extract from the bark a yield at all approximating to the estimated amount, as calculated by analysis of samples of the bark used." "As, therefore," the Madras Government proceed to state, "it appears to be conclusively shown that the manufacture is being carried on at a very serious loss to the public revenue, we have directed it to be, for the present, wholly discontinued." Consequently, upon this Mr. Broughton resigned his appointment, and it has not since been filled up; the local manufacture of "febrifuge" then ceased, and the entire crop of bark from the Madras Government plantations has since (with very trifling exceptions) been sent home.

On the 28th June 1875, Mr. J. W. B. Money, a large private cinchona grower on the Nilgiri hills, wrote to the Secretary of State for India, complaining that by the competition of Government cinchona bark with his in the London market he had sustained substantial injury, and that upon the arrival of a consignment of Government bark in 1875, which was superior to his own bark, and by which the wants of the trade were fully supplied, he had been obliged to sacrifice a portion of the latter at half the rates previously obtained to avoid having to keep it, at heavy expense, till the following winter. He complained that he had been induced to buy large tracts of land for cinchona cultivation from the Madras Government, by their express public assurance that the Government cinchona gardens on the Nilgiri hills would never be allowed to compete with private growers in the European market; and he alleged that, in order to attract private enterprise, the Government of Madras had intimated that, if the cultivation proved successful, they would withdraw from the cultivation in favour of the private growers, as they did with the Government Assam tea cultivation, so far as this could be done without detriment to India, and with as little loss as possible to the public purse. Mr. Money argued that had Government succeeded in making their gardens supply India with a cheap febrifuge, this would have justified their retention of their plantations; but as this had failed, all politic reasons were against the Madras Government any longer retaining these gardens as mere trading adventurers, and to the injury of the private growers, and he accordingly offered to take over the existing Government gardens on the Nilgiris at the amount of the unrecovered Government outlay thereon.

In forwarding this letter to the Government of India, the Secretary of State remarked, with regard to the manufacture of alkaloids fit for medical purposes, "it seems at least

26th August 1875.

possible that it will be found to be the most economical system to send the bark to England, and to have the manufacture conducted there." "But," it was added, "whatsoever the conclusions eventually come to as to the proper course to follow in dealing with the manufacture of alkaloids, it is a further question whether the knowledge of the conditions of climate, exposure, and culture, which are best adapted to develop the production of the alkaloids in the bark of growing plants, has been carried to such a point that it would be desirable to withdraw the plantations from the supervision of a chemist capable of ascertaining the results of varying methods of cultivation, &c., and to offer them for sale to private persons." Inquiry was made how far the free action of Government was restricted by any promise, express or implied, that it would not compete with private growers, in the European market, in the absence of which the Secretary of State entertained no ground for concluding that the time had yet come for selling the Government plantations, and, in deciding upon these points, Government was requested to take into account the provisions of the Charter Act of 1833, so far as they related to transactions that might come within the designation of commercial business.

Subsequently an offer was made by the Nilgiri Tea and Cinchona Company to purchase the Government cinchona plantations on the Nilgiris.

In reply to the allegations by Mr. Money, the Government of India stated they had no cognizance of any assurance having been given that Government would abstain from interfering with private growers of bark in the European market, and the Madras Government

22nd July 1878.

also were not aware of any such pledge having been given. With regard to the general question whether the cultivation of cinchona might not be left to private enterprise, the Government of India expressed an opinion that until it had been proved that a cheap and efficient febrifuge could not be manufactured in Madras, they entertained no doubt that it would be advisable the Nilgiri plantations should be retained in the hands of Government, and that they should not be parted with; also that, "for the present the Government of Madras should continue to direct their efforts chiefly to the establishment of such a manufactory, and should restrict their despatches of bark to Europe to small parcels, intended to gauge practically the prices ruling in the home market, and not as a commercial speculation."

The recommendations contained in this letter were approved by the Secretary of State, who concurred "in the opinion that the plantations should, for the present at least, remain in the hands of Government, and efforts be directed chiefly to the establishment of a manufactory of a cheap and efficient febrifuge." It was, however, held that the plantations should be self-supporting, and for this purpose there could be no objection to the disposal on the spot, if possible, at a fair price, of the surplus bark of each season's crop; but the shipment to this country for sale on Government account should, as suggested, be limited to small parcels for the purpose of practically gauging the prices ruling in the home market.

The death of Mr. McIvor in 1876 left the Government Cinchona Gardens without any qualified Superintendent, and in January 1878 the Secretary of State urged upon the Madras

17th January 1878.

Government the advisability, not only of appointing a successor to Mr. McIvor, but of appointing also a quinologist in the place of Mr. Broughton, and of re-establishing a manufactory for alkaloids. In this despatch the practice of sending home bark for sale on the London market

was referred to, and it was remarked: "This was, no doubt, an advisable course to pursue at one time, as it afforded some criterion of the relative value of the different kinds of bark beyond what could be obtained by chemical analysis; but to continue this practice merely for commercial purposes, and so compete with the established trade, is to go altogether beyond the purposes for which the Government plantations were established, or ought to be maintained." In this despatch, as well as on subsequent occasions, the Madras Government were urged to place the plantations under the charge of an officer of the Forest Department.

The points herein raised were referred by the Madras Government to a Committee, whose report, together with one by Captain C. Walker on the Nilgiri cinchona plantations generally, was sent home by the Madras Government in their letter, No. 4, of 14th March 1879. With regard to the sale in London of the Government bark, the committee considered (p. 56) "this plan of procedure not only free from objection itself, but as having contributed more than any other circumstance to the embarkation of private enterprise and capital in the cultivation of cinchona in India and Ceylon. . . . The result of the Government sending its best barks into the open market has been to encourage private enterprise on a scale so vast, that in a few years cinchona production will be one of the chief industries of the hilly country of South India and Ceylon."

This view was endorsed by the Madras Government, who gave expression to it in similar terms in their covering letter. They admitted that several questions yet remained for solution, such as the cultivation in other districts of varieties of cinchona which do not thrive in the Nilgiri plantations; the best method of harvesting the bark, and others of a kind too costly and protracted to be undertaken by private persons, and as their aim was to provide "the people of India with a febrifuge bark of the highest quality, and one that could be abundantly grown by them, they were a fit object for Government experiment." At the same time, without a considerable annual harvest of bark, it would not be possible, they said, to meet the requisite expenditure, or to defray the interest of the money already sunk and reproduce the capital. With reference to the utilization of the bark, the Madras Government observed: "The information now available has forced us to the conclusion that the only course at present advisable is to send the bulk of the bark for sale in the home market," a course which the Government are satisfied "in no way injures the Indian planters." The objection pointed out to the re-establishment of a local febrifuge factory was, that "if the bark is to be worked up in India, it is in the first place necessary to cheapen its production, and next to discover a method of manufacture that shall, at a reasonably moderate outlay, extract a due proportion of the alkaloids, no such method having hitherto been discovered."

On this point the "cinchona committee" considered that a local manufacture from the Nilgiri barks could not at present be adopted without sacrifice of valuable produce and income; mensurate results in outturn, and that the manufacturing operations for the production of crystalline salts could be conducted cheaper and more satisfactorily in England than in India. . . . The Nilgiri barks, they added, "are of high value, and remunerative to exporters, and their realized value in the home market would permit Government to purchase largely and economically the febrifuge alkaloids of European manufacture required for use in India."

Upon these grounds the Madras Government did not recommend the resumption of the local manufacture of a febrifuge, and stated that they would not therefore require the services of a quinologist, but they asked that a successor to Mr. Melvor might be appointed.

A suggestion had been made by the Government of India that the bark should be sent to Calcutta to be converted into a febrifuge or quinine by the local quinologist, but the Madras Government observed that, apart from the fact that a satisfactory method of manufacture had still to be found, there were obvious objections to the adoption of such a course, such as the cost of transport, &c.

In acknowledging this letter the Secretary of State admitted that much remained to be done before the cultivation of cinchona in Madras could well be left to private enterprise, and that for some time to come the Nilgiri plantations must remain in the hands of Government. In consideration of the then existing state of the finances of India the Secretary of State declined to send out a Superintendent for the plantations from this country, and directed that they should be placed in charge of an officer of the Forest Department.

In a departmental minute, reviewing the reports sent home with the last quoted letter from Madras, it was remarked, with reference to the considerable extension of private cinchona plantations in recent years, under the stimulus of high prices, that with a considerable fall in prices it might become a question with private growers whether some other crop might not be grown on their land with greater certainty of profit, and that, therefore, upon public grounds, Government should retain their plantations. Reference was made to recent experiments in Java for the manufacture of febrifuge at the cinchona plantations there under which "the loss

of alkaloids did not amount to more than 15 per cent. of the analytical result, instead of 50 per cent. loss, as in Bengal," and it was added, "after long discussion with Dr. de Vrij, I see no reason whatever why the results should not be as successful in India as in Java. Dr. de Vrij considers that the loss hitherto sustained in India must be attributed to defective apparatus."

As another alternative to local manufacture in India, besides the sale of the harvested bark in the London market, it was suggested that arrangements might be "made with a quinologist here to enter into a contract to manufacture quinine from the bark on Government account. The bark on arrival would, in this case, be analysed, in order to determine the amount of quinine and other alkaloids which it should yield, and must therefore be delivered to Government by the contractor in exchange for the bark, he receiving a specified sum per pound for the cost of manufacture, &c."

The last alternative having been approved, the two quinine manufacturers in this country were communicated with on the subject, and arrangements were subsequently made for handing over 106 bales for experimental manufacture to one of them. This experiment proved successful from a financial point of view, and it was accordingly determined to repeat it again upon a larger scale, and 250 bales of bark were handed over to the manufacturers for this purpose.

During these experiments, the remainder of the bark received from Madras* was sold on the London market in the usual manner.

On the 8th April 1881, Captain Price, M.P., asked the Secretary of State for India, in Parliament, whether it was a fact that the Indian Government were exporting large quantities of cinchona bark for sale in London, and whether, in introducing the cinchona plant into India, the Government did so with the object of encouraging private enterprise, or of competing in the market with private trade.

In reply, Lord Hartington stated, as reported in the *Times*, "the object of the Government in introducing the cinchona plant into India was to provide an abundant supply of a cheap febrifuge for that country. Almost all the bark produced in the Bengal plantations is manufactured in India for use there. Difficulty has been found in treating the produce of the Madras plantation in the same way, and hence most of it has been sent to England. It is believed that the sale of this bark has established the reputation of Indian-grown bark, to the advantage of private growers; but an experiment is now being made on a large scale with the view to the manufacture of this bark in England on Government account, and, if this prove successful, it is likely that sales will be discontinued."

Shortly after this the sale of bark on the London market was discontinued, and all the bark received from India has been handed over to manufacturers for the extraction of the quinine and other alkaloids on Government account.

In 1880, applications were made by firms in India to be permitted to purchase bark direct from Government. One small quantity was sold by private arrangement, but Government refused to make further sales in the same manner. In January 1882, however, 100 bales were put up to auction, and realized fair prices, and it was decided to hold a few more similar sales, with the object of developing a local demand, which private growers might ultimately supply. The Acting Commissioner of the Nilgiris, however, pointed out that nothing was gained by selling the bark locally, as English prices only were charged, and the alkaloids were not abstracted locally. Some, at least, of the bark thus sold found its way subsequently to the London market. So far as is known in this office, these local sales have not been continued.

The foregoing is a *résumé* of the proceedings of Government hitherto with regard to the disposal of the bark from the Nilgiri cinchona plantations. It is now proposed to consider in detail the several questions in connection therewith that press for early solution.

Accounts.—In a Departmental Minute of the 27th December 1881 it was pointed out, with reference to the system of home manufacture of alkaloids from the Government cinchona bark, and with a view to their value being brought to account in the accounts of the Nilgiri plantations, that the produce from the bark of these plantations alone would probably exceed the requirements for the public service, and that it was, therefore, desirable some alteration should be made in the manner in which it was indented for and supplied. Three alternative plans were suggested, and draft despatches were submitted for approval, after consultation with the Financial Secretary, the Accountant-General, and the Director-General of Stores, in which it was proposed to inform the Government of Madras as follows: "The products obtained from

* From the following statement it will be seen how great an annual increase there has been in the amount of bark sent from Madras:—

		LB.			LB.
1871-72		7,294½	1877-78		132,951½
74		23,648	1878-79		103,444
		28,659	1879-80		173,539
		63,600	1880-81		224,736
		88,380	1881-83		232,467

consignments of bark from your Presidency will, for the present, be sent to the Medical Store-keeper at Madras, and all particulars of expenses incurred in this country for freight, manufacture, or other charges on account of each consignment, will be sent to your Government in order that they may be brought to account in the administrative accounts of the Nilgiri cinchona plantations." It was also proposed to instruct the other Governments to indent for future supplies upon the Madras instead of the Home Government.

This arrangement was not, however, approved, but an alternative, suggested at the same time, was adopted that all the products so manufactured "be placed in store with the Director-General of Stores, who would draw therefrom in order to comply with indents from India, instead of purchasing, as at present, leaving any balance in stock until required," and it was proposed that, so long as the existing system be continued, the Government of India be advised periodically of the quantities of different kinds of alkaloids in stock in this country, and that they be asked to state how they would desire that they should be distributed to the different Presidencies in India.

These papers were held back for some time and subsequently withdrawn, and the Government of India have not yet been communicated with on the subject of alkaloids in stock here.* This should now be done, unless it be considered a preferable course to send all the alkaloids in store here to the Government of India for distribution in such manner as they may think best.

In a despatch of 14th September last, instructions were given as to the manner in which the products from cinchona bark manufactured in this country should be brought to credit in the accounts and budget estimates of the Nilgiri plantations. In reply, the Madras Government inquire whether the "fact that, under the new decentralization scheme which came into force on the 1st April 1882, cinchona receipts fall wholly to be credited to provincial revenues, was considered when the despatch under reference was penned." These papers were referred to the Financial Secretary, who replies—"I think the Madras Government should be informed that the despatch, No. 31 of 1882, dealt only with the administrative accounts, and that a reference will be made to the Government of India as to the effect on the provincial revenues of the system adopted in the Finance and Revenue Accounts." It is submitted that this course be now adopted.

Disposal of products.—It next has to be considered how the bark from the Nilgiri plantations shall henceforth be disposed of. There are now in the Store Depot very large quantities of quinine and other alkaloids, which have been delivered from the manufacturers at a rate greatly in excess of the demands from India. The following table has been compiled from the annexed statements, and shows to what extent these alkaloids have been manufactured in excess of current requirements :—

	Amount manufactured on account of Government.		Amount issued.		Amount in store.		Average annual supply to India over 51 years, 1877-78 to 29th September 1882.
	LB.	OZ.	LB.	OZ.	LB.	OZ.	LB.
Quinine sulphas	6,168	2	2,573	0	3,595	2	1,482
Quinine do	92	13	27	9	65	4	137
Liquor of amorphous quinine .	870	0	226	0	644	0	84
Cinchonidine sulphas... ..	1,608	12	1,508	4	100	8	383
Cinchonine do	403	9½	363	14½	39	11	578
Do. alkaloid	423	4	172	4	251	0	32
Cinchona febrifuge	7,999	8	423	0	7,576	8	...
Mixed tartrates	280	4	62	0	218	4	11

Up to 1880-81 all the alkaloids of cinchona sent out were purchased. Since July in that year the demands have been met from products manufactured, on account of this office, from Indian Government bark, so far as that has been possible.

From these figures it appears that of the principal alkaloid sent from this country to India, viz., sulphate of quinine, there is enough in store for over two years' requirements, whilst some of the other alkaloids are also in excess of the average demands for them. At the same time the manufacture is proceeding, and, at the present rate of production, the quantities in store in excess of requirements must increase rapidly. It therefore becomes an important question

* These stocks have, however, been drawn from in order to comply with indents from India for quinine, &c.

whether the excess supply shall be sent to India where there must be ample scope for their employment, or whether the supply shall be reduced so as to meet the probable demand from India.

Under these circumstances, unless it be decided to send all the present stock to India, it may perhaps be considered advisable, as an exceptional case, to hand over some of the excess stock to Messrs. Jenkin and Phillips for sale on account of the Secretary of State.

This would reduce the present stock on hand; but the question has further to be considered how the production can be limited for the future. This is on the assumption that it will not be considered advisable to depart from the present system of home manufacture pending the receipt of a report from Professor Lawson on the general questions of the Nilgiri plantations and the ultimate disposal of their products, together with the views of the Madras Government thereon.

This, I think, may be done in two or three ways. In the first place Messrs. Howard and Sons might be asked to take payment for their manufacturing charges entirely in bark instead of money. I have already spoken to Mr. David Howard on the subject, and he has agreed to accept payment on the basis of Dr. Paul's test, and the prices obtained in the last three public sales. This latter may be ascertained from Messrs. Jenkin and Phillips, the brokers. Mr. Howard further offers to take the consignment of *officinalis* bark ex *Khedive* on these terms, "or so much as would be required to pay for the work now before them."

Vide annexed letter, 14th June 1883.

By referring to the terms of Lord Hartington's reply to Captain Price (see page 8), it will be seen that he gave no *distinct pledge* that sales of Indian Government bark on the London market would be *absolutely discontinued*, and it is submitted that it would not be against either the letter or spirit of that reply if occasional consignments were sold. This would further reduce the quantities to be employed for the manufacture of alkaloids on Government account.

Again, there seems no reason why occasional sales should not annually be held in Madras, with the view, as originally contemplated by the Madras Government, of developing a local demand, which private growers might ultimately supply. In talking on this subject with Mr. Howard, he expressed an opinion that Government cinchona bark would find a ready market wherever it was sold; that in India probably the "crown," and "grey," barks would find a better market than the "succirubra." He further stated that in the event of sales being held in Madras he should instruct his agents there to buy, but that he should except to get a merchant's profit on the transaction, and that, therefore, he did not think sales in India would, as a rule, fetch such high prices as in England.

A combination of all the above plans would be possible, and in this case the amount of bark to be handed over for the manufacture of alkaloids on Government account might be regulated approximately, so as to meet the probable annual demands from India.

But in connection with this subject, the question raised by the Secretary of State in Despatch of 26th August 1875 must be considered as to whether the free action of Government in this respect is in any way restricted by the provisions of 3 and 4 Will. IV., Cap. 85 (the Company's Charter Act of 1883), so far as they related to transactions coming within the designation of commercial business. On this subject the legal adviser states, "It seems to me that the provisions of the Charter Act of 1833 have nothing to do with the matter, the East India Company as the governing authority being defunct." He adds, I can see no reason in complaint against the growth and sale of cinchona by Government. It is a question of policy and not of law, and stands on the same footing as the sale of Government forest timber, and other products of Government lands."

The adoption of the above suggestions would render it unnecessary to enter into any contract with Messrs. Howard to continue the home manufacture for a definite period, which they would require if it were desired to ensure prompt and regular working of large quantities of bark. By always keeping in store a fair margin of alkaloids to meet probable early requirements from India, Messrs. Howard might be permitted to make delivery at their own convenience.

Amorphous mixed alkaloids, or febrifuge.—As will be seen from the statement on page 9, large quantities of amorphous mixed alkaloids (cinchona febrifuge) have been manufactured in this country for use in India. In October last Dr. Macnamara drew attention to a great difference* (as shown by analyses by Mr. Bell) existing between samples of febrifuge lately sent into store by Messrs. Whiffen and Messrs. Howard and Sons, which had been manufactured by them, on account of the Secretary of State, from Indian Government bark. This, he pointed out, showed an important difference in their value as therapeutical agents, and he referred to the serious consequences likely to result in India from the use of a drug possessing no fixed standard.

* This difference in the percentages of the various alkaloids in the Sikkim febrifuge was noticed in India as early as 1876. See page 14.

Samples of amorphous alkaloids manufactured by Mr. Whiffen and Messrs. Howard and Sons, together with a sample of Indian-made febrifuge, were sent to Dr. Paul for analysis, with the following results:—

	Howard's.	Whiffen's.	Indian.
Quinine	11.40	19.00	10.50
Quinidine	0.30	0.44	1.25
Cinchonidine	32.00	43.80	9.50
Cinchonine	27.00	22.40	49.50
Amorphous	8.22	4.16	10.83
Colouring matter and resin	7.72	5.66	9.38
Ash	5.30	0.30	1.70
Water	8.06	4.24	7.34
Total alkaloids ...	100.00	100.00	100.00
	78.92	89.80	81.58

The subject was next referred to Sir Joseph Fayrer, who remarked, "The analyses submitted are most unsatisfactory, and point either to different barks having been dealt with, or to varying methods of analysis." He remarked that a "great and most valuable industry—searching inquiry." He also added, "I am convinced India can produce the bark, and manufacture the alkaloids in India; and obviously, if such be the case, measures should be taken for doing so properly."

Hitherto, the amorphous mixed alkaloids manufactured in this country have been extracted from consignments of barks as they have arrived, and no attempt has been made to select the bales according to the alkaloids contained in the bark, as shown by Dr. Paul's analyses, with a view to obtaining products of an uniform standard; but Mr. Howard informs me there would be no difficulty in doing this so as to obtain fairly uniform results: and, in order that the exact constituents of each delivery of febrifuge may be known, Mr. Howard suggests that a sample be sent to Dr. Paul for analysis and the results thereof printed on labels, to be affixed to each tin or parcel.

Mr. Wood, late Quinologist in Bengal, in a letter to Dr. Macnamara remarks that in his opinion, "Rungbee febrifuge cannot be made in this country, it must be made by the same process to have the same characters and properties." He further states, "I believe only a crystalline preparation can be economically and advantageously made in this country."

As the Nilgiri cinchona plantations have recently been placed under the charge of a scientific Superintendent, it may perhaps be considered advisable to request the Government of Madras to consult with Professor Lawson as to the advisability of establishing a factory in connection with these plantations for the manufacture of febrifuge, and possibly also for the extraction of quinine and the other separate alkaloids, before making any permanent arrangements for the disposal in this country of the bark from those plantations.

Bengal Cinchona plantations.—A collection of cinchona plants from Java and Ootacamund having been sent to the Calcutta Botanic Gardens, these, together with some which had been raised from seed there, amounting to 211 plants in all, were forwarded to Darjeeling on the 24th March 1862, where a nursery for them was established. By the 1st April 1863 the number of plants had increased to 2,811. In June 1864 a commencement was made of open-air cultivation of cinchona at Rungbee, on a piece of Government reserved land, and this plantation was placed under the charge of Mr. Gustav Mann, an experienced botanist.

Third Annual Report, 20th April 1863.

About the same time the cultivation of cinchona was also successfully commenced by two private individuals near Darjeeling, and Government was enjoined by the Secretary of State not only to "take every suitable opportunity of fostering the plantations undertaken by your Government," but also "of encouraging the efforts of private enterprise to introduce the cultivation of these valuable plants into districts where it is likely to be attended with success."

Report, July 1864.

Despatch, 24th February 1864.

In January 1867 the Government of India sent home the first samples from these plantations of *succirubra* bark for analysis. The results were considered satisfactory, but Mr. Howard expressed an opinion that the varieties of *C. officinalis* held out the best prospects of successful and profitable cultivation in the climate of Darjeeling. Commenting upon the results

Despatch, 25th April 1867.

of subsequent analyses of samples from Darjeeling, Mr. Howard stated "there is no reason to think the Darjeeling barks at all inferior to those grown at Ootacamund." In the following year further samples were sent home for the purpose of being analysed and of their market value being ascertained. The report on this latter point was not satisfactory, two samples being considered quite unsaleable.

2nd October 1867.

Despatch, 9th July 1868.

On receipt of reports from the Commissions appointed to examine the therapeutic value of the alkaloids, other than quinine, contained in cinchona bark, the Secretary of State remarked, "The cinchona febrifuge alkaloids should now be made available in India to a much larger extent than has hitherto been practicable, and thus save, to a considerable extent, the expense of quinine."

Despatch, 4th March 1869.

The Government of Bengal having sanctioned a limited expenditure for the experimental manufacture of quinine on the Rungbee plantations, Mr. C. B. Clarke, the Superintendent in charge, after visiting Ootacamund to examine into Mr. Broughton's process there, expressed an opinion that the manufacture of amorphous cinchona alkaloid could be as successfully carried out at Rungbee as at Ootacamund, and he accordingly commenced to make experiments, and succeeded in producing "a very fine alkaloid."

24th October 1870.

On receipt of his report thereon the Governor-General, in February 1871, appointed a Commission to inquire into and report on the best manner of utilizing the rapidly increasing supply of bark from the Government plantations. The question referred to the Commission was as to which of the following courses it would be best, on general as well as economical grounds, to adopt:—

- (1) To send home the whole of the bark which bears a marketable value; or,
- (2) To extract by a single process all soluble matter from the bark, and send home the gross proceeds of the first precipitation; or,
- (3) To proceed further with the manufacture in India, and, if so, how much further; whether (a) only so far as is necessary to separate the several alkaloids from the resin, colouring matter, and other foreign elements, which the first precipitate will contain; or (b) as far as the manufacture of the pure sulphate of quinine?

Should the Commission recommend the second or third alternative, they were called on to consider what process would be most likely to prove appropriate; and as a certain portion of the bark would, owing to its extreme poverty in alkaloids, always be unfit for the home market, they were called on to decide how it might be most profitably dealt with locally.

Samples of the first made preparation from cinchona bark at Sikkim having been sent home for analysis, was found to contain a "very large percentage of copper," and it was consequently quite inadmissible as a medicine.

Despatch, 27th April 1871.

The Commission above referred to reported, on the 30th March 1871, that *cinchona officinalis* was largely dying out in Bengal, that several years must elapse before any considerable supply of *C. calisaya* would be given by the Government plantations, and that consequently they refer in their report to *C. succirubra* alone.

In the absence of information as to the cost at which a manufacturing process in India could be carried out on a large scale, the Commission felt themselves unable to report on the relative advantages of local manufacture and sale of the bark in London; they recommended that the bulk of the stem bark be sent to London for sale next cold season, but that an experiment on a considerable scale be made in manufacturing some of this bark at Rungbee, and that an accurate record of the attendant outlay be henceforth kept; also, that the inferior bark be worked up at Rungbee. They expressed a strong opinion that the manufacture, whatever process be adopted, ought not to be entrusted to other than a qualified person.

The recommendations of the Commission were approved by Government, and the Secretary of State, in endorsing this approval, remarked,—"it is impossible to overrate the importance of entrusting such delicate and difficult work to a competent person."

Despatch, 14th September 1871.

At the request of the Government of India, the Secretary of State appointed Mr. C. H. Wood as Quinologist to Government for service on the Sikkim plantations. About the same time, a communication was made from this office to Mr. E. Howard on the subject of the best means of providing a cheap febrifuge for the people of India. In reply, he pointed out that the demand for cinchonidine had largely increased in all quarters of the world, as well as at home, in our large hospitals, that its therapeutic action was in some instances preferable to quinine, and that this was the alkaloid most largely predominant in the Bengal barks. He consequently recommended the use of cinchonidine as a cheap febrifuge for India. The Secre-

Letter, 5th August 1872.

Despatch, 4th June 1873.

21st October 1873.

tary of State then pressed upon the Government of India an extended use of cinchonidine, and with the same Despatch he sent out examples of febrifuge alkaloids, obtained by Dr. de Vrij from the refuse of the quinine manufactory, for trial in India.

Despatch, 4th June 1874.

In his first report, Mr. Wood, the Quinologist, referred to the difficulty of maintaining anything like uniformity of composition in the alkaloid in its precipitated form. In a second report he entered very fully into the relative values of bark and alkaloids, and recommended an extended trial of two processes of extraction, which may be briefly described as the "lime and spirit" and the "acid and alkali" methods, the latter being Dr. de Vrij's process. In a subsequent report Mr. Wood stated that he had abandoned the spirit process on account of the

5th August 1874.

large capital that would be necessary for plant, &c., and had turned his attention to improving the acid and alkali process.

24th May 1875.

The report on the Cinchona Plantations for 1874-75 mentioned that Mr. Wood had succeeded in manufacturing cinchona febrifuge in the form of amorphous powder, which had been highly reported on for its therapeutic properties.

Referring to the question as to the establishment of a factory on a large scale, Mr. Wood recommended that it should be at Calcutta rather than at Rungbee, as it would cost less to bring the bark to Calcutta than to take all the chemicals for working it to Rungbee. The Government determined, for the present at any rate, to allow manufacture to continue in Sikkim, but the Lieutenant-Governor of Bengal thought that it could be best conducted at Calcutta.

Letter, 2nd November 1876.

Commenting on the nature of Mr. Wood's febrifuge, the Government of India observed that, whilst opinions would differ as to the exact proportion by which its effects fall short of those of the crystallized sulphate, it was believed that the mixed alkaloids would be generally admitted to be more effective than any of the cheap substitutes for quinine at present in use. With regard to its uniformity they remarked, "although in the opinion of many medical men the exact percentages in which quinine, cinchonine, and cinchonidine respectively exist in the preparation is a matter of little moment, and they are content if a tolerable uniformity of constitution is maintained, still it seems desirable, in view to rendering the Sikkim alkaloids as generally acceptable as possible to the whole profession, to take some trouble to render this uniformity as close as possible."

Letter, 2nd November 1876.

The Resolution of the Bengal Government on the report on the Cinchona Plantations for 1876-77 stated that the question of the best mode of dealing with the bark in order to secure the general question whether local manufacture was preferable to disposal of the crop at home, were under reference to a Committee,* and that no steps would be taken to extend or alter the mode of manufacture until their report should be received.

Letter, 7th December 1877.

This Committee recommended that the local manufacture should be carried on on the existing scale; they did not recommend that the manufacture should be extended so as to use all the bark, but that, until the composition of an improved febrifuge had been settled, all the surplus bark of good quality should be sent to England for sale.

* Dr. G. King.
Mr. C. H. Wood.
Dr. D. O'Connell Raye.
Dr. J. F. P. O'Connell.

The Sikkim febrifuge was also reported on by the Committee* appointed to consider questions relative to the Madras cinchona plantations, one of which was the possibility of locally manufacturing a drug that should be commercially and chemically an economical production, while of such medicinal value as to justify its cost.

* Dr. R. W. Barlow.
Dr. W. R. Cornish.
Dr. G. Bidie.
Mr. L. A. Campell.

Their report bears date the 31st August 1878. In comparing the results of the local manufactures at the Nilgiris and at Sikkim, the Committee remarked that the nature of the product was, in both cases, essentially the same, though somewhat different processes were adopted. In Mr. Broughton's process he failed to recover, on a manufacturing scale, more than 64 per cent. of the total alkaloids, while Mr. Wood only obtained about 50 per cent. of the alkaloids, by his process. The Bengal experience, the Committee remarked, had entirely confirmed their previously conceived opinion as to the unprofitable character of alkaloid manufacture by crude processes and appliances; and they expressed a strong opinion that a full commercial outturn of alkaloid was impracticable without a regular factory establishment.

With their letter of the 17th June 1878 the Government of India sent home a collection of papers containing reports on experiments made with the "cinchona febrifuge" manufactured at Rungbee, and the "quinetum alkaloid" and "quinetum sulphate" sent out from England. The first of those drugs had been very favourably reported on by the numerous medical officers who had made experiments therewith in Native hospitals, but the results from its employment

with Europeans had not been satisfactory. Its most marked defect, it was stated, as compared with quinine, seemed to be a somewhat greater liability to produce gastric irritation; but it was considered probable that, with greater care in preparation, this defect might be remedied.

In consequence of this favourable report, orders were issued that the febrifuge should be substituted for quinine in all Native civil hospitals and dispensaries to the extent of 75 per cent. of their entire expenditure. It was further decided that all the bark produced on the Rungbee plantations should henceforth be maintained for manufacture locally into febrifuge, instead of being sent to England for sale.

Letter, 19th August 1878.

After this, the factory at Mungpoo was considerably extended, and the entire crop of bark was made over to the Quinologist.

16th October 1879.

Mr. Wood resigned his appointment as Quinologist in October 1879. With the letter from the Government of India, asking for the appointment of a successor, was enclosed the second report of the Cinchona Committee, in which it was stated that the mixture of the three sulphates of quinine, cinchonidine, and cinchonine had been found to be quite as efficacious as the cinchona febrifuge, while, in the opinion of most of the medical officers consulted, it was free from the objections which attached to latter preparation, and was regarded by some as fully equal to quinine as an antiperiodic. The Government of India also stated that it had been determined to establish a small factory for the preparation of the pure alkaloids from the *succirubra* bark.

The request that a successor to Mr. Wood might be appointed was subsequently revoked.

Letter, 21st January 1880.

The factory was placed under the charge of Mr. Gammie, resident manager of the plantations, who, it is stated in the report for 1878-80, "very intelligently carried out, with great success, experiments for preparing sulphate of quinine and an improved and purer febrifuge." During this time it appears that the red bark only was used for the manufacture of febrifuge, whilst the *calisaya* bark was allowed to accumulate, and, in March and May 1881, the Government of India sent home nearly 70,000 lbs. of that bark for sale in London.

Letter, 17th August 1880.

Letter, 14th March 1881.

Letter, 23rd May 1881.

In 1881, as the number of *succirubra* trees, from which the cinchona febrifuge is manufactured, was sufficient to provide red bark for a much larger consumption of the febrifuge than there was any reason immediately to anticipate, endeavours were confined to increasing the stock of quinine-producing trees to meet the demand for sulphate of quinine in the hospitals and different departments of the Government service. This course appears to have been adopted upon the strength of an alleged discovery by Mr. Gammie of processes for manufacturing quinine and other preparations from the cinchona bark at a comparatively small cost. These, however, did not prove successful.

Letter, 20th August 1881.

There can be no question as to the value of the Sikkim febrifuge as a therapeutic agent. The increasing demand for it is proved by the following figures, which show how each year's supplies have been principally distributed:—

	MEDICAL STORE DEPARTMENT.			Sold to the public.	Samples, &c.
	Calcutta.	Madras.	Bombay.		
	LBS.	LBS.	LBS.	LBS.	LBS.
1875-76	1,607	...	...	...	...
1876-77	1,942	...	...	45	31
1877-78	3,011	...	400	2,038	28
1878-79	4,000	300	1,200	2,431	23
1879-80	3,500	300	1,600	2,757	6
1880-81	3,000	500	2,000	3,150	3
1881-82	3,386	800	1,000	4,680	2

The febrifuge is issued to Government officers, hospitals, and charitable institutions at Rs. 16-8 per 1 lb. tin, and to the general public at Rs. 20 per lb. The Sikkim factory is thus fulfilling the object for which the cinchona plant was introduced into India, viz., the supply of a cheap febrifuge to the people of India.

There is, however, another side to the question, which must not be overlooked. It is claimed in the Administration Report for 1881-82 that the net result for that year's working

showed a profit equal to 13 per cent. on the capital expenditure on the plantations. It is, however, a fact, which was pointed out by the Cinchona Commission in 1878, by the Secretary of State in 1882, and is now admitted by the Government of Bengal, that under the present process of manufacture at Sikkim there is a loss of about 50 per cent. of the alkaloids contained in the bark, whereas, by manufacture in this country, 100 per cent. and sometimes slightly over 100 per cent. of the alkaloids shown by analysis to exist in the bark, is recovered in the shape of amorphous mixed alkaloids, similar to the product manufactured in India. In a note by Dr. King on the Secretary of State's Despatch No. 13 of 30th March 1882, and its enclosures, it is remarked (page 3), "the factory process, condemned by the Secretary of State as inefficient, has all along been known to be so, and it was never intended to be other than a temporary makeshift." The value of the product obtained is also (viewing the matter from a purely financial point) far below the price that could have been obtained in the London market for the bark from which it was made, and to this extent, therefore, the manufacture is at present carried on at a very serious loss to the State.

On former occasions I have shown that *financially* it has proved more advantageous to manufacture alkaloids from the bark sent home from Madras than to sell the bark in London, and in a memorandum of the 18th October 1881, I suggested that it might be a question for consideration whether it would not be *cheaper* to send the Bengal bark to England for manufacture, instead of permitting the *present* system of local manufacture to continue by which half the alkaloids were lost.

Dr. King in his "Note" uses figures taken from one of my former memoranda in order to show that in the above suggestion I am quite wrong. After carefully examining Dr. King's calculations, I must confess that I am in no way shaken in my previously expressed opinion. Of course if it were a *fact* that febrifuge which was in a single year manufactured in Bengal at an average cost of 15s. 9½d. would have cost 12. 12s. 7d. if manufactured in this country, which seems to be the idea intended to be conveyed in this "Note," there would remain nothing more to be said on the other side.

The comparison is, however, of no value at all, as in the one case bark from the Madras plantations, costing on an average 9 annas 6·3 pies per lb., was used, and in the other, Sikkim bark averaging 2 annas 7·3 pies per lb., and again the cost of manufacture is set down at 10s. 9½d. per lb. in the former case, when Mr. Whiffen's charge was only 10s. per lb. Making the necessary corrections on these accounts, the cost of manufacture, according to the method of calculation adopted by Dr. King, of which I in no way approve, would be as follows:—

	£
Cost of growing, &c., 354,480 lbs. Sikkim bark	4,845
Freight, charges, agency, &c., at 16s. per 100 lbs. Packing and re-	3,132
turn freight at 4d. per lb.	8,862
Manufacture at 10s. per lb. of 17,724 lbs. of febrifuge	
Total	16,838

or at an average rate of 19s. per lb.

It cannot, of course, be denied that even at this price the home manufacture compares unfavorably as to cost with that of local manufacture, but I venture to submit that the method of calculation by which this result is attained is erroneous. Dr. King observes that in both my reports the "matter is looked at from a manufacturer's point of view" (paragraph 6 of note); I freely admit that it is so, and further, I maintain that in order to arrive at the true financial results of the alternative methods of manufacture, it is impossible to look at it from any other point of view.

Dr. King also remarks (paragraph 10 of note) that the plan of selling all the bark on the London market, "as much as that of manufacturing in London on Government account, would (unless the benevolent intentions of Government be abandoned) necessitate the sale in India below their market value of the ordinary commercial alkaloids." The following figures will, I think, clearly show that the Sikkim febrifuge is, even now, being sold in India at less than half its commercial value, and that the loss to Government would, under existing circumstances, be reduced per pound of febrifuge produced by about one-half if the manufacture were carried on as at present in England instead of in India.

Now, the market value of the alkaloids produced, whether in India or in England, is represented by the market value of the raw material (the bark), plus working expenses, plus trade profit, in which the first and third items are liable to fluctuation, being influenced by the relative conditions of supply and demand. Mr. Phillips, the drug broker, informs me that at present (the bark market being lower than it has been for some time past) Sikkim bark—stem branch, and root—may fairly be set down as worth, on an average all round, 2s. per lb. Assuming, then, that it contains on an average 5 per cent. of alkaloids, the latter would be worth,

in their *unmanufactured* state 40s. per lb., one-sixth more than is charged for them to the public in their manufactured state from the Bengal factory.

	£
At 2s. per lb. the gross value of the 354,480 lbs. of bark used at the Bengal factory in 1880-81 would be	35,448
Deduct freight, &c., at 16s. per 100 lbs., and 5 per cent. on value	4,607
Net value of bark	30,841
We thus find that the net value of the bark employed at the Bengal factory in 1880-81 was	30,841
Add manufacturing charges in Bengal, as per report, Rs. 27,784, or	2,315
Thus making the total cost to the state of the febrifuge manufactured in Bengal	33,156
For this sum 9,296 lbs. of febrifuge were manufactured, equal to 2·6 per cent. of the weight of bark used, which, at an average selling price of, say, Rs. 18 per lb., would realize	13,944
Thus showing a loss by local manufacture and sale below market value (exclusive of profit) of	19,212

being at the rate of 2l. 1s. 4d. loss upon each pound of febrifuge sold.

Applying a similar calculation to the alternative method of manufacture of febrifuge in London, it appears that at present prices charged for febrifuge in India there would still be a loss to the State, though less in amount, and less *pro rata*, accompanied by a much larger production of febrifuge.

	£
Thus, taking the net value of the bark as before	30,841
Add manufacturing charges at 10s. per lb. of febrifuge made (see my first report)	8,862
Cost of packing, and return freight, at 4d. per lb.	296
	9,158
Total cost in India to the State of febrifuge manufactured in England	39,999
For this sum 17,724 lbs. of febrifuge might be manufactured in England, equal to 5 per cent. of the weight of bark used, and delivered in India; which, at the average selling price of, say, Rs. 18 per lb., would realize	26,586
Thus showing a loss by manufacture in England, and sale below market value (exclusive of profit), of	13,413

Being at the rate of 15s. 1d. loss per lb. of febrifuge; 17. 6s. 3d. less loss per lb. than the locally manufactured febrifuge; and 5,799l. less loss in the aggregate. It being, of course, understood that the loss is, in each case, consequent upon the commercial value of the bark having been taken as the basis of calculation, and not its bare cost of production.

In the foregoing figures I have adopted the prices charged by Mr. Whiffen, as they are referred to in Dr. King's "Note;" but it is only fair to state that Messrs. Howard's prices are slightly higher, and the saving by manufacture in England is, therefore, now less; but there is still a saving, and, at the present prices, it might be shown that the loss by manufacture in England, as compared with selling prices in India, amounts to about 16s. per lb. as against 2l. 1s. 4d. in the case of the locally manufactured febrifuge.

The cost of home manufacture might, however, be somewhat reduced, if Government were to adopt the practice of many private growers of sending bark home in compressed bales. This, Mr. Phillips informs me, does not in any way injure the bark or reduce its value for sale, whilst at the same time it effects a saving of something like two-thirds in the cost for freight.

It was for precisely similar causes to those shown now to exist in connection with the Bengal Factory, that the Madras febrifuge manufactory was put a stop to. There are, however, political reasons, with which I entirely concur, why it is not desirable similarly to put a stop to the factory at Rungbee. My object in bringing to notice the foregoing facts is to show at what indirect cost to the State the manufacture is now being carried on, and to prove the necessity that exists for putting the factory on a better footing. I am informed by Messrs. Howard and others that there should be no more difficulty in properly and fully extracting the amorphous mixed alkaloids from the cinchona bark in India than in England, although, probably, any attempt to manufacture the separate alkaloids as sulphates would not prove so successful in

India. It is therefore, it is submitted, very desirable that early steps be taken to put the Bengal Factory on an efficient footing, and, this being done, it may be confidently anticipated that the local manufacture will be able to compete successfully, as regards cost of production, with English manufacture of febrifuge.

I may, perhaps, here add that I have recently been informed that a new and very efficacious process of extracting alkaloids has recently been invented, by which, it is claimed, the present cost of manufacture will be considerably reduced. This will shortly become the subject of a patent, and, when the proper time for giving it publicity shall have arrived, it may be advantageous for this office to enter into correspondence with the inventors, whose names are, I understand, for the present kept secret.

In consequence of the present unsatisfactory position of affairs, papers relating to the Bengal cinchona plantations were referred, in May 1880, to Sir Joseph Hooker, who in reply recommended the adoption of certain experiments with Sikkim febrifuge and with the barks from which it was made, and he suggested that the conduct of these experiments should be entrusted to Professor Armstrong. This was approved by the Secretary of State, and orders were accordingly given for the necessary samples of the bark and its products to be sent home from India.

These have now arrived, and with the letter advising their despatch the Government of India approve of the further proposal that Professor Armstrong should superintend their

extraction by some competent chemical expert, and that the reporting chemist should afterwards proceed to India and examine into the process of manufacture on the spot, making thereafter such recommendations as may appear necessary.

30th June 1883.

(Signed) F. C. DANVERS.

Statement of the Quantity of Bark received from Madras in the years 1871 to July 1883 inclusive, and Particulars as to its Sale, Manufacture, and the Disposal of the Product.

Madras Letter advising Shipment.	Reply from Secretary of State.	Name of Vessel.	No. of Bales received.	No. of Bales sold.	Gross Receipts.	Freight and other Charges.	Net Receipts.	No. of Bales Manu- factured.	Freight and other Charges including Analysis.	Cost of manu- facture in- cluding Jars, Bottles, &c.	Quinine Sulphas.	Quinine Sulphas.	Liquor of Amorphous Quinine Sulphate.	Cinchonidine Sulphas.	Cinchonine Sulphas.	Cinchonine Alkaloid.	Cinchona Folilage.	Mixed Tartarates.	Date of issue.	To whom issued.	Quinine Sulphas.	Quinine Sulphas.	Amorphous Quinine Sulphate.	Cinchonidine Sulphas.	Cinchonine Sulphas.	Cinchonine Alkaloid.	Cinchona Folilage.	Mixed Tartarates.	
					£ s. d.	£ s. d.	£ s. d.		£ s. d.	£ s. d.	LBS. OZ.	LBS. OZ.	LBS. OZ.	LBS. OZ.	LBS. OZ.	LBS. OZ.	LBS. OZ.	LBS. OZ.	LBS. OZ.			LBS. OZ.	LBS. OZ.	RS. OZ.	LBS. OZ.	LBS. OZ.	LBS. OZ.	LBS. OZ.	LBS. OZ.
21st August 1871 ..	11th January 1872 ..		21 cases, 3,188½ lbs.	3,188½ lbs.			333 8 6	..			..	..	..	..	..	..	..	..	..	July 1880	Shipped to India per <i>Kashgar</i> ..	250 0	..	..	..	..	..	..	..
7th March 1872 ..	8th August " ..	<i>Excelsior</i> ..	12 cases, 4,106 lbs.	4,106 "	433 17 10	4 4 5	429 13 5	..			..	..	..	..	..	..	..	..	..	Dec. " "	" " <i>Manora</i> ..	..	10 8	226 0	88 8	..	30 0	179 0	62 0
12th September 1873 ..	16th December 1873.	<i>Othello</i> ..	139 cases, 23,646 lbs.	23,646 "	3,490 0 0	345 3 4	3,144 16 8	..			..	..	..	..	..	..	..	..	..	July 1881	" " <i>Mongolia</i> ..	1,000 0	..	..	..	..	..	..	..
24th March 1875 ..		<i>Cathay</i> ..	172 bales.	172 bales.	2,994 4 0	196 3 2	2,798 0 10	..			..	..	..	..	..	..	..	..	..	Nov. " "	Per <i>Flamingo</i> to Madras ..	171 0	..	..	..	..	142 4	..	..
" " " "		<i>Malwa</i> ..	106 "	106 "	1,860 1 5	116 12 0	1,743 9 5	..			..	..	..	..	..	..	..	..	..	April 1882	Per <i>Clan Maclean</i> to Bombay ..	56 0	..	..	..	..	..	..	..
21st March 1876 ..	22nd January 1876 ..	<i>Australia</i> ..	456 packets.	456 packets.	10,392 10 8	788 12 4	9,603 18 4	..			..	..	..	..	..	..	..	..	..	May " "	Per <i>Lady Dalhousie</i> to Bombay ..	574 0	..	..	..	..	..	..	..
" " " "	" " " "	<i>Indus</i> ..	180 "	180 "	10,700 7 4	426 11 11	10,273 15 5	..			..	..	..	..	..	..	..	..	..	Sept. " "	Sold per Jenkin and Phillips ..	..	..	..	732 0	..	..	..	..
24th February 1877 ..	21st June 1877 ..	<i>Bokhara</i> ..	261 bales.	261 bales.	19,399 0 6	309 17 2	19,089 3 4	..			..	..	..	..	..	..	..	..	..	Oct. " "	Taken by Messrs. Howard in part payment of manufacturing charges.	..	..	..	..	..	..	..	..
6th March " "	" " " "	<i>Hydaspes</i> ..	623 "	623 "	1,108 1 3	36 8 0	1,071 13 3	..			..	..	..	..	..	..	..	..	..	" " "	Sold to Crown Agents for Colonies.	..	..	..	..	..	..	..	..
19th June " "	27th December 1877.	<i>Bokhara</i> ..	135 "	135 "	20,319 3 3	353 13 3	19,965 10 0	..			..	..	..	..	..	..	..	..	..	Nov. " "	" " " "	..	..	..	31 0	..	..	..	..
22nd January 1878 ..	18th April 1878 ..	<i>Malwa</i> ..	577 "	577 "	5,678 4 0	223 2 4	5,355 1 8	..			..	..	..	..	..	..	..	..	..	" " "	Sold per Jenkin and Phillips ..	522 0	..	..	..	150 0	..	200 0	..
21st February " "	30th May " "	<i>Khedive</i> ..	165 "	165 "	8,027 2 0	164 0 10	7,863 1 2	..			..	..	..	..	..	..	..	..	..	March 1883	Shipped per <i>Rohilla</i> to Bombay ..	..	..	..	..	213 14½	..	..	..
19th March " "	" " " "	<i>Hydaspes</i> ..	556 "	556 "	11,302 16 6	640 13 2	10,662 3 4	..			..	..	..	..	..	..	..	..	..	July "	" " " " to Bengal ..	..	17 1	..	106 8	..	..	..	..
28th December " "	20th March 1879 ..	<i>Australia</i> ..	304 "	304 "	7,147 12 6	269 11 11	6,878 0 7	..			..	..	..	..	..	..	..	..	..		Taken by Messrs. Howard in part payment of charges.	..	..	..	..	..	..	..	..
16th January 1879 ..	8th May " "	<i>Zambezi</i> ..	215 "	215 "	9,090 16 10	471 10 7	8,619 6 3	..			..	..	..	..	..	..	..	..	..		Total issued ..	2,573 0	27 9	226 0	1,508 4	363 14½	172 4	423 0	62 0
1st March " "	5th June " "	<i>Hindustan</i> ..	486 "	486 "	7,925 3 4	384 8 8	7,540 14 8	..			..	..	..	..	..	..	..	..	..		Balance ..	3,595 2	65 4	644 0	100 8	39 11	251 0	7,576 8	218 4
19th September " "	15th January 1880	<i>Pekin</i> ..	440 "	440 "	15,042 11 8	744 2 1	14,298 9 7	106	92 15 5	476 6 6	294 0	10 8	226 0	88 8	..	32 0	179 0	62 0	..										
19th January 1880 ..	{ 29th April 16th September " }	<i>Hydaspes</i> ..	728 "	622 "	10,493 16 11	790 14 11	9,703 2 0	..			..	..	..	..	..	..	..	..	..										
11th March " "	17th June 1880 ..	<i>Mirzapore</i> ..	536 "	536 "	170 9 3	12 19 11	157 9 4	..			..	..	..	..	..	..	..	..	..										
7th April " "	8th July " "	<i>Pekin</i> ..	16 "	16 "	23,204 1 11	1,043 19 7	22,160 2 4	250	153 18 11	1,368 13 0	1,127 0	25 0	644 0	292 8	..	142 4	..	..	..										
26th January 1881 ..	{ 19th May 1881 .. 30th May 1882 .. }	<i>Eldorado</i> ..	1,465 "	1,215 "	8,405 13 1	313 13 10	8,091 19 3	..			..	..	..	..	..	..	..	..	..										
14th March " "	16th June 1881 ..	<i>Manora</i> ..	305 "	305 "	6,812 19 0	592 18 1	6,220 0 11	..			..	..	..	..	..	..	..	..	..										
18th May " "	11th August " "	<i>Ancona</i> ..	488 "	488 "	..	..	..	56	59 10 3	178 2 7	55 8	..	..	..	..	..	..	..	..										
15th July " "	2nd February 1882 ..	<i>Indus</i> ..	56 "	..	..	..	..	413	422 11	1,508 19 10	742 0	23 0	..	94 8	..	41 0	..	..	..										
8th November " "	21st September " "	<i>Booldana</i> ..	413 "	..	..	..	..	317	324 18 4	1,268 2 7	725 0	17 0	..	120 0	..	43 0	1,433 0	..	..										
22nd " " "	" " " "	<i>Navarino</i> ..	317 "	..	..	..	..	230	211 10 9	..	1,023 5	..	..	225 0	..	165 0	803 3	..	..										
20th December " "	" " " "	<i>Eldorado</i> ..	230 "	..	..	..	..	138	199 5 1	..	528 10	0 4	..	157 10	31 13	..	..	71 12	..										
17th January 1882 ..	" " " "	<i>Teheran</i> ..	138 "	..	..	..	..	155	151 10	3,651 15 4	501 13	..	..	113 2	0 14½	..	..	..	..										
6th February " "	" " " "	<i>Manora</i> ..	155 "	..	..	..	..	200	184 6	..	85 8½	..	..	214 7	94 8	..	..	..	..										
21st " " "	" " " "	<i>Merkara</i> ..	200 "	..	..	..	..	360	343 16 1	1,195 18 6	43 7	..	..	64 13	77 2	..	816 0	146 8	..										
8th March " "		<i>Nepaul</i> ..	360 "	..	..	..	..	383	275 9	1,469 0 10	177 12	..	..	31 0	32 4	..	2,026 0	..	..										
1st May " "		<i>India</i> ..	383 "	..	..	..	..	52	65 1 1	..	172 9 2	..	..	77 0	97 8	..	2,102 0	..	..										
15th June " "		<i>Carthage and Nepaul.</i>	52 "	..	..	..	..	85	91 5 2	..	..	..	..	23 12	30 2	..	178 0	..	..										
11th October " "		<i>Thames</i> ..	85 "	..	..	..	..	6	24 8 2	..	..	..	..	..	..	..	437 0	..	..										
" " " "		<i>Navarino</i> ..	6 "	..	..	..	..	131	158 10 3	..	3 12	0 1	..	1 0	0 8	..	25 8	..	..										
20th December " "		<i>Khedive</i> ..	131 "	..	..	..	..	91	..	..	..	..	..	105 8	39 0	..	..	..	..										
20th February 1883 ..		<i>Teheran</i> ..	91 "	..	..	..	..	160	..	..	..	..	..	..	..	..	..	..	..										
12th April " "		<i>Peshawar</i> ..	160 "	..	..	..	..	69	..	..	..	..	..	..	..	..	..	..	..										
22nd May " "		<i>Ravenna</i> ..	69 "	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..										
Total ..			Equivalent to 11,357 Bales.	Equivalent to 8,165 Bales.	183,898 13 3	8,229 1 6	176,003 0 3	3,192	2,748 11	11,289 8 4	6,168 2	92 13	870 0	1,608 12	403 9½	423 4	7,999 8	280 4				6,168 2	92 13	870 0	1,608 12	403 9½	423 4	7,999 8	280 4

Reg: 11/1
Govt. of 1884 Madras.
REVENUE.

Issued

Recd.

Encl.

G.O., 5th April 1884, No. 469.

APRIL.

Cinchona products at the
India Office.

Letter expressing opinion on the Secretary of
State's proposals relative to the disposal of —,
ordered to be forwarded to the Government of
India.

5TH APRIL 1884, No. 470, REVENUE.

REVENUE DEPARTMENT.

LETTER from—

THE SECRETARY TO THE GOVERNMENT OF
FORT ST. GEORGE,

To

THE SECRETARY TO THE GOVERNMENT OF INDIA,
HOME DEPARTMENT.

SIR,

With reference to your letter dated 5th January 1884, No. 12, I am directed
to state that His Excellency the Governor in Council sees no objection to the
proposal to revert, pending the final
decision of the question of local manufac-

Miscellaneous.

ture, to the former system of sale by auction of the bark consigned from Madras to the India Office. I am to observe, however, that His Excellency in Council is strongly in favor of the establishment by private agency of a local factory at the earliest possible date, and that, pending the attainment of this end, it is desirable in His Excellency's opinion to continue the holding of local sales in order to stimulate the local demand for bark. I am to add that the proposal to distribute the surplus quantity of febrifuge at a low price in those districts which suffer most from malarious fever has His Excellency's entire concurrence, and that such a measure would seem well calculated to promote the object in view, viz., the creation of a more extended market for the sale of cinchona products.

I have the honor to be,

Sir,

Your most obedient servant,

(Signed) H. E. STOKES,
Secretary to Government.

FORT ST. GEORGE,
5th April 1884.

Exd. A. Aubert.

25 Copies.

Original

1884.

HOME DEPARTMENT.

*From the Government of
Fort St. George.*

Issued

Recd.

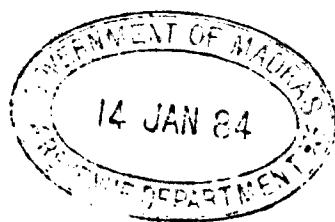
Encl.

Letter, 5th April 1884, No. 470.

APRIL.

Expressing concurrence with the Secretary
of State's proposals relative to the disposal of
the cinchona products at the India Office.





No. 12.

FROM

A. Mackenzie Esquire,

Secretary to the Govt. of India,

TO

The Chief Secretary to the
Government of Madras

Calcutta, the 5 January 1884.

Home Department.

Medical.

SIR,

I am directed to forward herewith copy of a Despatch from Her Majesty's Secretary of State 1268 (Revenue) dated 15th October 1883, with enclosures

2. It will be observed that the Secretary of State has determined to revert, pending final decision of the question of local manufacture in lieu of home manufacture, to the former system of sale by auction of the barks consigned to the India Office. He also proposes to send to India the stock of quinine and febrifuge which has accumulated in London and which for the reasons stated is unsaleable in England.

3. I am to request that the Government of India may be favored with the opinion of His Excellency the Governor in Council on the proposals made in paragraphs.

of the Secretary of States Dispatch as to the sale
by auction of the barks from Madras and also
as to the disposal of the febrifuge at a low price
in those Districts which suffer most from
malarious fever.

I have the honor to be

Sir

Your most obedt. Servant

A. Munro

Secretary to the Govt. of India
ms

REVENUE (1884) DEPARTMENT.

No. 196.

From The Govt. of India
Home Dept.

Dated 5th }
Recd. 11th } January 1884.

No. 12

Enc: 1.

SUBJECT.

Forwarding copy of a
Despatch from the Secy of
State and requesting to be
favored with the opinion
of the Madras Govt. on the
proposals made in paras 3
and 6 thereof as to the sale
by auction of the Cinchona
bark from Madras.

Dec 1883/Jan

N: 11

Director's Office
(Madras)
15th March 1884.

From The Director
Govt. Cinchona Plantations &
Nilgiris

To

The Secretary to Government
Revenue Department
Fort St. George

Sir,

I have the honor to acknowledge
the receipt of a copy of a despatch from
Her Majesty's Secretary of State N: 68 Revenue
18th October 1883 together with the S. O. N: 341
23rd January 1884, in which I am desired
to report to Government my opinion on
the subject matter contained in paras 3
and 6 of the despatch.

2. Before entering upon the questions
raised in the above quoted paragraphs, I
should like to make a few observations on
the existing state of the cinchona industry
in Southern India and on its prospects.

for

Mis: Exp. No: 341.

Referred to the Director of
Government Cinchona
Plantations for report.
(By order)

H. Wilson

Secy to Govt.

At K. George
1883/Jan

for the future.

3. Owing to the high prices realised by the sale of bark in past years a great many persons have been induced to take up the cultivation of cinchona, and large tracts of land have been opened out for this purpose.

4. The natural consequence of this activity in the industry has already been to pour into the market a very much larger amount of bark than has ever happened before, and, if no adverse circumstances occur, it may be confidently predicted that the output of bark will be still greater when the many young estates of the present day shall have reached their maturity.

5. There are, however, reasons which lead me to believe that in a few years time there may be not only no increase in the production of bark, but even a considerable decrease. The reasons are these:-

1st although a very large amount of land has been opened out for the cultivation of cinchona, much of this seems

to me to have been badly selected and to be such as will not suit the ripper and more profitable ages of the trees; and I think it only too likely that considerable portions of this land may go out of cultivation altogether, or be utilized for the production of other commodities.

2^d The great fall, which has lately taken place in the price of bark will, if it continues, not only deter persons from opening out new plantations, but will tempt many who already possess estates to turn their cultivation to the cultivation of more paying products.

6. Now that which would tend to prevent a decrease in the production of bark is of course greatly to be desired, and as the only way to accomplish this end, is to make it apparent to the growers that they may expect a profitable return for their invested capital, I believe that the action, which it is proposed to take by the Secretary of State will be of

the greatest advantage.

7 In the first place, with respect to the suggestions made in para 3 of the despatch I believe that the establishment of a manufactory for the extraction of the cinchona alkaloids must benefit the industry in this country; as in whatever form the manufactory may be started, it will enable the planters to secure a higher price for their bark than they do at present. The cost of freight and other charges, attendant upon transport, would, at any rate, be considerably reduced, let alone the actual gain, which would be effected by their being able to dispose at a profit of those poorer kinds of bark, which do not pay to ship to Europe.

8 The best form which the manufactory may take is a matter which will require much careful consideration. I will enumerate the different ways as they have occurred to me.

1st The planters might combine together
and

35
and get up a factory of their own. This I believe would be the very best form that could be set on foot; as there would then be no tapping of profits by middle men. In the present depressed state of affairs this is not practicable, and need not therefore be considered further.

2nd A company might be started, deriving the whole of the necessary funds from people in England. This form of manufactory would have the advantage of being in strict accordance with the rules laid down by political economists; but it is evident that such a company's sole object would be to make money for themselves, and that they would buy bark as cheaply as they could, and sell their drugs as dear as they could, having no more consideration for the planters or consumers than suited their gainful purposes. And it is quite possible that such a company might think it their interest to endeavour to limit the supply of bark with a view to keeping up the price.

price of their drugs, in which case
neither the planters nor the consumers
would be benefitted at all.

3rd The Government might start
a factory of their own. And they might
say to the planter if you like to send
your bark to us we will give you such a
price for it as will make it worth your
while to continue growing cinchona, or
even to increase the area which you have
of it under cultivation; and to the consumer
we will sell you our drugs at such a
price as will cover the cost of manufacturing
them.

4th The Government, instead of being
the sole proprietors of the manufactory
might assist by money or other grants, a
company to start one; and in consideration
of their aid, reserve to themselves the right
to declare that the shareholders of the
company should not divide more than
a certain percentage upon their outlay, just
as, I believe, the Government do in the

Case

156
Case of water or gas companies in our
large towns in England.

9 In the second place with respect
to the suggestion made in para 6 of
the despatch I am sure that nothing
would be more calculated to increase
the demand for the cinchona products, than
the distribution of the surplus febrifuge
at a low price among the natives who
reside in the more malarious stricken
parts of the country.

10 To create a cheaper method of
obtaining the cinchona drugs, than at
present exists; and to open out a more
extended market for the drugs seem to
me to be the only ways in which we can
hope to look for a satisfactory future
of the cinchona industry in this country. And
I believe that the reestablishment of a
manufactory for the cinchona alkaloids on
the Nilgiri plateau, and the sale of
febrifuge to the natives at a low rate
would bring about this desirable

end.

and more certainly and more quickly
than would be done by any other
method.

I have the honor to be

Sir

Your most Obedt servant

M. A. Lawson.

Director, Fort. Cuatrecasas
Plantation, Brit. Ind. West.

1871

Revenue (1884) Dep^y
 W^h 18/3
 Scientific & other
 Service Departments
 (1884)

600. L 469
 Must that the
 Govt. of India be
 addressed.
 5-4-84.

From
 The Director
 Govt. of India
 to
 The Secretary to Government
 Revenue Department
 Fort St. George

Dated 15th Dec 1884
 Recd 15th Dec 1884
 C to 11

Encl.
 Subject
 Offering remarks as to the
 proposals contained in paras
 3 and 6 of the Despatch from
 the Secy of State dt. 18th 1884
 October 1883 to manufacture
 locally Cinchona bark into
 Febrifuge or into Quinine

to the Director, Govt. of India
 Calcutta, 15th Dec 1884
 35

C. 21-3-84
 R. 26-3-84 R. 31-3-84

India Office,
 London, 14th February 1884.

Revenue,
 No. 10

To His Excellency The Right Honourable The Governor
 in Council, Fort St. George.

SIR,

Para. 1. I have considered in Council the
 letter of your Excellency's Government in this
 Department, No. 19 (Confidential), dated 3rd
 October last.

* Secretary of State to Governor of Madras,
 dated 14th December 1883.
 "Your Revenue, 19. Do you wish to
 appoint Quinologist in India, or shall selection
 be made here? Telegraph reply.
 Governor of Madras to Secretary of State,
 dated 15th December 1883.
 "Please select and appoint the Quinologists
 in England.

2. With reference to the appointment of a
 Quinologist, I took steps, on receipt of your telegram
 marginally transcribed,* to procure the services of
 a competent person, and will address your Excel-
 lency again when the applications received have
 been considered.

3. I approve the proposal contained in your
 second paragraph that local sales of Government
 bark shall for the present be continued, the surplus
 not disposed of in this way being sent home for dis-
 posal as heretofore, either by sale or by manu-
 facture on account of Government as may be found
 most suitable.

4. With regard to the establishment of a local
 factory, I consider that this question cannot be
 finally settled till I have learned the result of the
 inquiries which are at present being carried on in
 communication with the authorities at Kew.
 Meanwhile, however, I forward, for your consider-
 ation copy of a letter which has been received from
 Messrs. Hinde and others, dated 21st January last,
 setting forth the terms on which they would be
 prepared to form a Company for the purpose of
 manufacturing quinine in the Nilgiris.

I have the honour to be,
 Sir,
 Your most obedient humble Servant,
 (Signed) KIMBERLEY.

ENCLOSURE.

9, Mincing Lane, London,
21st January 1884.

Sir,

We have the honour to lay before you a proposed scheme for the establishment of a Company for the manufacture of quinine on the Neilgherry Hills, Madras Presidency, a copy of which we shall feel obliged by your forwarding to the Madras Government.

The reasons.—The reasons that have led to the proposed formation of a Company for extracting the alkaloids from Cinchona bark may be briefly enumerated as follows:—

- A. 1. That, although the price of bark has fallen, there has been no corresponding diminution in the price of quinine.
2. That, owing to the larger production of the more valuable barks, low class bark and twigs are now practically valueless, and do not pay import charges.
3. These causes, reacting on the cultivator, tend to restrict if not destroy the cultivation of this valuable product, and that for the exclusive benefit of the manufacturers.

The object.—The object of this Company is to counteract this state of affairs, and this can only be done by treating bark for the exclusive benefit of the cultivator, at a fixed rate per ounce, to allow of a reasonable amount of profit on the capital employed. Upon any other basis this object would be defeated, for were the Company to buy bark on their own account, they would be brought into direct competition with manufacturers in general, and like them, therefore, would be obliged to discard the very class of bark they seek to turn to profitable account, and, likewise, they would require to buy in the cheapest and sell in the dearest market.

The scheme.—The scheme, therefore, is to enable planters to have their own bark converted into quinine, and the special advantages that they would derive would be that their at present valueless bark would be rendered profitable. The alkaloids so extracted would pay for export should the local demand be insufficient.

It must be obvious, therefore, that the interests of the Government, as extensive growers of Cinchona, are identical with those of all other cultivators, and what is asked of Government is practically identical with what will be asked of all others. But as the Government are the largest planters in the district, as per statement attached, it is essentially necessary that their support should be in the first instance secured.

Support.—That support may be roughly stated as follows:—

- B. 1. The free use of any plant, for experimental purposes, that they may now have on the Hills.
2. A limited quantity of bark, such as may be required for this purpose, free of charge, proceeds and residue to be returned to Government.

This has reference to the preliminary stage only, the object to determine,—

- C. 1. Whether the manufacture of quinine can be successfully carried on at Ootacamund, or adjacent thereto.

2. If the cost of preparing it is such as to warrant the establishment of a manufactory.
3. And to determine what percentage must be added thereto to give the Company a fair and reasonable return on their money, having due consideration to the risk incurred in their preliminary operations.

It is obvious that if the anticipations of those interested are not borne out by results, the scheme will end here, with a loss to those interested; but should it be clearly demonstrated that the manufacture of quinine can be successfully carried out at Ootacamund, or adjacent thereto, then Government are asked to give the following guarantees:—

- D. 1. That they will, for a period of not less than 10 years, give to the Company not less than 50 per cent. of the bark produced on their estates in Southern India, to be manufactured into alkaloids by the Company, according to its percentage of quinine, as per analysis, on an equitable price, to be determined upon as provided for in Clause C. 3.
2. That the Government guarantee to give all their bark grown in Southern India, and not exported, to this Company for preparation.

This latter clause is added to prevent competition, for a limited number of years, in the manufacture of quinine on the Neilgherry Hills by Government or any other Company that might be established or sought to be established.

We have, &c.,
 (Signed) H. STANBROUGH,
 A. R. HINDE,
 9, Mincing Lane.
 J. W. MINCHIN,
 Of Ootacamund.
 SAML. JENNING,
 35, Queen Victoria Street.

The Under Secretary of State
 for India.

~~No. 11~~
~~C. 1040~~
Revenue
14th Feb 1844.

Copy
Letter to Govt S. George
No. 10. enclosure.

Letter to Govt S. George

Received 15 March 1844

The views of this Govt
were clearly expressed
in letter to India. on
20. 8. 14. 3. 78 &
25. 8. 24. 6. 78. but
having having addressed
the Secy of State
Direct & not this Govt
Govt must have re-
ceived a reply. This
must have been from
the India office.

S. M.

in those cases which

NOTE FOR THE SECRETARY.

It is not clear what
H.C. alludes to. There is
no communication from
or about Mr. Money
remaining unanswered
by G.H.

But the allusion
is intended to the
correspondence summa-
rized by Mr. Danvers
at the end of the current
page. Mr. Money
advised a protest
to the Secretary of State
which was referred to
Messrs. the Govt
of India and both India
Secretaries. That the
income cultivation in
state for some time past
the agricultural stage,
and that therefore the
Govt plantations, which
Mr. Money offered to
buy at the amount of
the unrecouped Govt. outgo
should be retained.

Revenue Secretary.

I think the reply to Mr.
Money had better be put
forward now

W.S.
March 28/84

lin

M.S. Dec. 9-11-84
S.P. Dec. 29-11-84

Revenue Department.

No 470 of S. L. 84. 51

The Secretary to the Govt. of India. Home Department.

Sir,

With reference to your letter of 5th January 1884. No 12. I am directed to state that H.E. the Govt. in C. sees no objection to the proposal to revert, pending the final decision of the question of local manufacture, to the former system of sale by auction of the bark consigned from Madras to the India Office. I am to observe, however, that His Excy. in C. is strongly in favour of the establishment of private agency of a local factory at the earliest possible date, and that, pending the attainment of this end, it is desirable in His Excy.'s opinion to continue the holding of occasional local sales, as recommended by Mr. Lawton, in order to stimulate the local demand for bark. I am to add that the proposal to distribute the surplus quantity of febrifuge at a low price in those districts which

Dark in all cases

MR

? omit occasional
? I do not find any reference has in the Revenue
letter. It is necessary to insert
The recommendation is contained in his letter of 26 Sept 83 no 1189. see concluding para. 4 para 5 of the Govt. The mention of his authority is not absolutely necessary here, but might be so in other cases.

Suffer most from
malarious fever has
His Excy's entire con-
currence, and that
such a measure would
seem well calculated
to promote the object
in view viz. the crea-
tion of a more extended
market for the sale
of cinchona products

G.M.

21-13-84.

WY

$\frac{25}{2}$

Report of the
plus Cinchona
products of the
India Office

Print
Despatch No. 10 India
5/6/84

HC. the Commr.

M