M.R.O. 14—10,000—21-4-22.

MADRAS RECORD OFFICE.

Government of Madras.

Revenue DEPARTMENT.

G.O. No. 152-53 Press ~~Mis.~~

170-174

Dated 9 - 3 - 1861.

Not to be folded or roughly handled

Proceedings of the Madras Government, Revenue Department, 9th March 1861.

Read the following papers:—

No. 170. From D. MACPHERSON, Esq., M.D., Inspector General of Hospitals, on special duty at Ootacamund, to J. D. BOURDILLON, Esq., Secretary to Government, Revenue Department, Fort Saint George, dated Ootacamund, 5th February 1861, No. 7.

SIR,

1. Having, pursuant to my instructions dated 11th January 1861, No. 85, visited the Neilgherry Hills to inspect and report on the sites selected for an experimental nursery and plantation for Cinchona plants and seeds expected from South America, I now proceed to state how far they resemble those which have proved successful in Java; and to make some general observations on the subject.

2. When *en route* to the Hills, I had the pleasure of an interview with Mr. Markham, and received from him information regarding the habitat of the plant in its native country; which, with my enquiries in Java fresh in my mind, I have found useful in arriving at the results I am now about to record.

3. Three sites have been selected on the Neilgherry Hills for the Quinquina (I use this term, as from its analogy to the active principle of the Cinchona plant, it is that adopted in Java and by many of the best writers) plantations. I minutely explored these in company with Mr. McIvor, the Superintendent of the Horticultural Gardens. The first is a scantily wooded Sholá embracing the sides of a ravine, having an eastern aspect, ascending from the Horticultural Gardens, and stated to embrace an area of 50 acres. The lowest part of this, the "Dodabet site," on which it is proposed to cultivate the plant, is 7,830 and the highest 7,950 feet above the sea. To this locality a road about six feet in width, and in length about one mile, has been partially constructed; and the underwood in the Sholá is now being cleared. The chief attractions in this position are the numerous varieties of the Cinchona family found there, and because of the altitude; for the best informed writers allow "that the bark containing the "largest amount of the alkaloid is obtained from trees growing at the greatest elevation, and "that the stunted, shrubby, varieties of the plant, the Cinchona Calisaya Josephiana for instance, "which is found at an elevation of 9,500 feet, are particularly good when their growth is owing "to the altitude of their position." But the same authorities inform us "that the best trees "inhabit dense woods, and aspire to rise above the tops of the highest trees;" and Mr. Spruce engaged in collecting plants, &c., in South America, states, "that the finest trees grow in a "stratum of yellow or reddish marl of immense thickness, and in which few or no stones were "intermixed." Now the site under review, although it possesses elevation, is wanting in luxuriance of vegetation, the forest trees are too cramped and scanty to give sufficient shade, the soil is generally a superficial superstratum of black vegetable mould on disintegrated granite, or on masses of trap protruding on the surface, and it is deficient in moisture. It bears no resemblance to those sites on which the plant flourishes in Java; and, until we are in possession of plants of the Calisaya Josephiana no further expense should, I think, be incurred on this spot.

4. As regards the important matter of the best elevation for the propagation and cultivation of the plant, I may here state that Humboldt and others give it a range in its native country of from 5,000 to 10,000 feet. Mr. Markham at paragraph 19 of his Report to the Under Secretary of State, dated 9th June 1860, states "I had but slight opportunities of observ-"ing the temperatures of the *pajonal* region about 5,000 feet above the sea, where the Cinchona "Josephiana is found;" and in paragraphs 57 and 60, "the whole of the Cinchona, with the "exception of the Josephiana variety, have been collected in the valley of Tamboopata, the height "above the level of the sea being between 3,000 and 4,000 feet." Mr. Spruce, in the appendix to his Report, speaks of "the Forest of Limon on the western slope of Chimborazo, at about "3,000 feet in altitude, and that of Tabacal near San Antonio, at an altitude of 2,600 feet;" these being the two positions wherein he made the collection shortly expected here; and finally in Java the recognised elevations, which a succession of experiments conducted with much care

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for a period of seven years have established, are, for the nurseries between 3,000 and 4,000 feet only, while the plantations range from 3,000 to 6,000 feet. Now, with these facts before us it must, I think, be admitted that we are risking our seeds and plants by attempting to propagate them in the Government Gardens at Ootacamund, the elevation of the lower green house where they are placed, being 7,478, and that of the upper 7,596 feet above the sea.

5. To conduct the experiment with any prospect of success, I would urge the Government without loss of time to adopt the system now working so successfully in Java, and direct the preparation of nurseries under efficient superintendence on the sites selected for the plantations, and at the more moderate elevations than the Government Gardens afford.

6. In the selection of the sites consideration was very properly bestowed on those adjoining the trunk roads leading to the Neilgherry plateau. The second of these is the "Avalanche site," on the highway from Calicut, and fifteen miles from Ootacamund. It commences north-east from the Travellers' Bungalow, distant about a mile, and covers an area of some 1,000 acres, nearly the whole of which might be made available for the varieties of the plant which inhabit the more elevated ranges in the Andes. The black superstratum of soil is rich and deep; generally free from stones; it is well watered; the vegetation is rich and luxuriant; the forest trees are of great size, abounding in Rhododendrons, one of which, at an elevation of 7,075 feet, in good health, I found to measure at 2 feet from the ground, 12 feet 9 inches in circumference, and more than $3\frac{1}{2}$ feet in diameter; and the following varieties of plants common to the Cinchona regions, and found also in the Forests selected for the growth of the plant in Java: Coffee, Holly, Ivy, Cinnamon, Tree ferns, Palms, Peppers, Bloberries, Leseanthus, Melestomaceœ (Osbeckia) Magnolia, Spoceneœ, and an undergrowth of ground Orchides, Ferns, Acanthus, Arodiœ, Myrtaceœ, and small bamboos, with numberless gigantic climbers. The large trees are covered with moss and orchides, indications of humidity; and there are open, well sheltered, glades, similar to the *pajonal* region where the C. Josephiana is found. The steep declivities which the plant prefers, sufficiently overshadowed by trees, are numerous, and the ravines indicate a subsoil of decaying schist much discolored with red oxide.

7. The Avalanche Bungalow faces to the north, and the aspect of the forest is north-east and south-east. The former is unquestionably the best exposure in these latitudes, because of the passage of the sun to the south during the dry and cloudless season the rays fall direct on a north-east aspect; the very opposite state of matters have induced the Dutch in Java to select a southern exposure for their Quinquina plantations. The parched appearance of the southerly and western aspects at this the period of drought on the hills, the contracted circumference of the Sholás, and the cramped vegetation on these, compared to that seen on the other surfaces, is of itself a sufficient indication that a northern and eastern exposure is that which holds out the best chances of success in the undertaking the Government are now entering on. The elevation of the Avalanche Bungalow above sea is 6,725 feet, the thermometer in the sun at 9 A.M. stood at 53°; this may be said to be the lowest margin of the forest. The centre elevation is 6,740 feet, and the thermometer at 11 A.M. indicated in the forest shade 65°. On a grass ridge mid-summit passing over to a scrubby Sholá having a south-western aspect the elevation was found to be 7,180 feet, and the thermometer in the sun 70° at noon. The forest continues luxuriant to an elevation of 7,800 feet above the sea, when it ceases; the grass-hill ascending about 40 feet higher. Here the thermometer at 1 P.M. in the sun indicated 74° of Fahrenheit.

8. There is but one objection to this site, viewing it on the Java standard, viz., the want of a low elevation for nurseries. But otherwise, there are so many well protected favorable spots on the site for this purpose, especially with the aid of a glass house, and the position appears to be so well adapted for the more valuable species of the plant, *i. e.* the Calisaya and Ovata; the Travellers' Bungalow in its proximity, in which the Overseer in charge could reside, and the fact that a large Burgher population, available as labourers, inhabit the vicinity, are circumstances which will weigh favorably with Government in according their sanction to establishing the "Avalanche site" as one of the proposed plantations. In elevation it is nearly equal to the "Dodabett site," far surpassing it in other respects, and there is another nearly equally extensive and in every respect favorable forest descending to a lower elevation about six miles from the Bungalow.

9. I shall denominate the third situation selected for a Quinquina plantation, the "Neddivattam site," it being contiguous to the Travellers' Bungalow of the same name, 17 miles from Ootacamund, at the summit of the pass leading from that place to the Western Coast. This forest has also a north-east, and a north-west aspect, and it covers an area of about 400 acres, in an undulating descent on the flank of the mountain to the plateau land of Wainád. It shares in both monsoons, receiving a medium fall from each, a very desirable circumstance. In luxuriance of forest it is fully equal to that described under the "Avalanche site," and the Flora springing up on every side promises equally well for the future success of the Cinchona plant. Unfortunately about one half of this forest only is available: this half is strikingly illustrated by Mr. Spruce's words, "the finest trees grow in a stratum of yellow and reddish marl of immense "thickness, and in which few or no stones are intermixed." The main portion of the space is occupied by an Avalanche in which the whole of the surface soil from the high lands has been swept down and deposited a depth of from 50 to 80 feet. But no where in the better part of this space is the superficial rich, black, or coffee-colored mould under 4 to 6 feet; the substratum appears to be granite and trap in process of disintegration. A large stream passes down the centre of the space, entering from the summit, which can be conveyed in any direction for irrigation purposes. The prevailing undergrowth is that seen in the Andes, viz., the Acanthus, the Melestomaceœ, &c., and the exact same small fern which covered the plants imported by Mr. Markham. The Hymenophyllum grows on many of the forest trees. Elevated green hills protect the spot from the force of the south-west monsoon, and the trees increase in magnitude, and are overhung with rich drooping folds of moss in the more protected positions, indications of the humid character of the climate, and its germinating properties for nurseries. There is a very convenient elevated spur for Overseer's and store-house about the centre, upwards of an acre in extent, having a full command of water.

10. The following give the Barometrical and Thermometrical indications on the 22nd January 1861.

Highest locality.

Greatest elevation on the forest skirt.....	6,150 feet.
At 9 A. M. Thermometer on surface.....	67°
„ „ 18 inches beneath surface.....	66°

Spur for the House, &c.

Elevation.....	5,550 feet.
Thermometer in stream adjoining, 10 A.M.....	54°

Centre locality.

Elevation.....	5,220 feet.
Thermometer 18 inches beneath surface at noon....	65°
Do. on surface do.	68°
Do. 4 feet above surface do.	73°

Lowest North-east aspect.

Elevation.....	4,530 feet.
Thermometer 18 inches beneath surface at 2 P.M.	73°
Do. on surface do.	71°
Do. 4 feet above surface do.	$74\frac{1}{2}$°

Lowest North aspect.

Elevation.....	5,430 feet.
Thermometer 18 inches beneath surface at 3 P.M.	73°
Do. on surface do.	71°
Do. 4 feet above surface do.	76°

On the Andes in April and May, the mean of the observations given by Mr. Markham is 68°, and from July to September that by Mr. Spruce is 66°; the temperature of the earth 2 feet beneath the surface being $68\frac{1}{2}$°. The character of the soil generally on the surface is a rich black vegetable mould 18 inches in depth, beneath which is a fine red, coffee-colored, friable, porous, marl; and thus the slope descends to the Wainád plain, where the elevation varies from 3,800 feet upwards.

Superintendent

11. The chief objection to this position is its limited extent; for a large portion of it, as already stated, is too stony for planting. But contiguous to, or rather adjoining on it, westward, with a similar aspect, is another forest, equal in extent, and possessing the same character of Flora and soil. This land is Mr. Ouchterlony's property; the possession of it would very much add to the value of the proposed plantation. On my intimating this to Mr. Ouchterlony, he generously offered to hand it over to Government, stating "I regard the experiment to introduce "the cultivation of Cinchona into the country of so much vital importance, that I should be happy "to assist it in any way in my power; and as you seemed to think the forest adverted to, a desirable "locality for it, I shall be willing to transfer my title and interest in the forest for the object of "the Cinchona plantation, should the Government desire to possess it." Mr. Ouchterlony's original note is enclosed.

12. Although the two sites just described have a striking resemblance to those which have proved successful under the Dutch Government in Java, they are wanting in the "trees with "buttressed roots of stupendous size," referred to in the 26th paragraph of Mr. Markham's report above quoted, and found throughout the Java forest plantations. Trees of this sort are common, however, on the western ghâts; in the Annamully and in the Coorg forests which I have visited, where are found also "the wild plantain, gigantic climbers, and tree ferns" found in the Cinchona forests in South America and in Java. In a letter from Mr. Markham just received from Mercara, he calls my attention to such a site "four miles down the Mangalore "ghât, where, I came to the conclusion that it would be an excellent site for nurseries, better "than any forest tract I have as yet examined to the south-east and south." When en-route to the low country I propose to visit this place; it will only take me a few miles out of my direct road to Madras; and I will then be able to speak of it from personal examination.

13. I take the liberty to submit that the period has arrived for Government to determine on the extent to which this great experiment is to be conducted. As stated in my former report, the early endeavours of the Dutch in Java ended in failure, and so it continued until science and chemical research were called in to aid. With the exception of three cuttings made from the plants introduced by Mr. Markham, viz:—

1 Cinchona Calisaya.
1 " " Josephiana.
1 " Ovata.

which, under the skilful management of Mr. McIvor, Superintendent of the Government Gardens here, may yet become robust plants, and the few left at the Royal Botanical Gardens Keir. that gentleman's importation of 456 plants are dead. The collection of plants transmitted by Mr. Pritchett from Lima were dead on arrival at Bombay; and the valuable assortment of seeds forwarded by the same gentleman, comprising the varieties denominated the red, crown, and gray, barks of commerce or the:—

Cinchona Micrantha.
" Provinciana.
" Nitida.

are stated to have suffered a delay in their transmission to this place, of six weeks at Lima and twenty seven days at Bombay, a circumstance which, of necessity, must injure their vital property. Mr. Spruce, in his letter dated 12th October 1860, to the Under Secretary of State at page 4 intimates the despatch "by the Steamer which leaves Guazaquil for Panama on the 5th "October, a packet of seeds" collected by himself with much care; and four months has now nearly elapsed without any intimation of its being received. I venture to suggest that the Government address the Home and Bombay Authorities on the necessity of expediting the despatch of plants and seeds in each case under the care of a competent gardener, whose services may be made available, if necessary, on the several sites selected for their propagation.

14. Mr. Spruce, Botanist now at Ecnador writes to Mr. Markham on 5th July 1859. "The testimony of all the bark collectors goes to prove that the bark trees are rapidly verging "to extinction. I am credibly informed that in some of the Cinchona forests in Ecnador there "does not remain a single tree large enough to produce seeds." If therefore it be established

that "the plant containing the most valuable medical substance the earth produces" will flourish on mountain ranges, at elevations from 2,600 feet upwards according to Mr. Spruce's statement, private enterprise will doubtless soon find it their interest to extend its cultivation, even although the prospect of remunerative return may embrace a term of seven years. But to establish this fact Government must, I submit, as has been done in Java, be prepared to enter on the experiment with vigour, and simultaneously, in order to secure a better chance of success, to open nurseries and plantations in different localities. The scale I suggest for our immediate wants (and not a day should be lost in preparing nurseries, the most important, and at the same time the most difficult part of the undertaking) are the two plantations indicated on the Neilgherries, the one in Coorg, and hereafter another on the less accessible Annamullys; with efficient gardeners resident at each place, and overseers under them; together with an educated and intelligent Botanist possessing a knowledge of analytical chemistry to conduct the whole. The services of John Weir who accompanied Mr. Markham, ought, I think, to be secured. He has returned to England. He might come out in charge of some of the plants left at Keir Gardens. The services of Mr. Cross, the gardener who accompanied Mr. Spruce, will also be valuable in conducting the experiment. A part from the interest which their researches may have created in them, numerous particulars regarding the growth of the plant in its natural state can be applied by them in its cultivation in this country.

15. I submit that in the new and difficult field of enquiry Government are now entering on, and the imperfect knowledge we possess of the chemical history of the Quinquina Barks, the employment of a Superintendent possessing a special knowledge of the subject is of much importance. As a guarantee against mistakes, he ought to be provided with the means, by continual analytical enquiry, to enable him to ascertain at what period the alkaloids develope themselves, and the constituents which add to, or detract from this developement. In connection with this part of the subject, I take the liberty to introduce the name of Dr. Croneman, a young Dutch gentleman in private practice at Bandong in Java, in the neighbourhood of the Quinquina plantations. This gentleman accompanied me over the plantations; and I was, much pleased with his intelligence and general knowledge of all relating to the growth and propagation of the plant, and its chemical analysis. It was evident to me that he took a warm interest in the subject from a love of natural science alone; for I knew he held no appointment under Government, nor yet could he anticipate advancement through me. Subsequent enquiry through Dr. DeViy, Dr. Younghoon's coadjutor in charge of the Quinquina plantations, satisfied me that this young man was much devoted to science; had a good knowledge of Botany and Geology; was a very fair draftsman; and through Dr. DeViy had acquired some knowledge in analytical chemistry. He possesses an imperfect knowledge of the English language so far as writing it; but can read and speak it with some freedom. Without holding out any prospect of procuring employment for him under the British Government, before leaving Bandong I ascertained from Dr. Croneman that an engagement of the sort, which would advance his interests, would be agreeable to him. He promised to continue to devote himself specially to the subject on my informing him that if an opportunity occurred I would bring his name and qualifications to the notice of the Government of Madras. I hope I may be pardoned for now doing so; and also for the length of this communication.

Mr. Markham having applied to me for a copy of my former report, and also of any I may send in to Government from this place, may I beg you will obtain sanction to forward these to him to Bombay. I also solicit that a copy of this report may be sent to the head of my

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department, as I am unable to obtain a copyist here to prepare it. A small supply of seeds having been distributed by Mr. Melvor to parties at Bangalore, the Wainád, &c., I would suggest that my report on the cultivation of the Cinchona plant in Java, be placed on the Editors' table for their information.

No.. 171. From D. MACPHERSON, Esq., M. D., Inspector General of Hospitals, to J. D. BOURDILLON, Esq., Secretary to Government, Revenue Department, Fort Saint George, dated Mercara, 20th February 1861, No. 8.

SIR,

1. Adverting to my letter to you No. 7, dated 5th February from Ootacamund, I have now to bring to your notice for the information of Government, that having fully examined the site selected by Mr. Markham in this locality, I am enabled to report, that it bears even a closer resemblance to the Quinquina plantations in Java, than the two sites which I approved of on the Neilgherry Hills.

2. The forest referred to, occupies a position to, the left between the 3rd and 5th milestones down the Mangalore Ghát from this place. The trees are of great magnitude, chiefly the open and continuous buttressed species, clustered with orchideous plants and rich drooping moss. Tree ferns, small bamboos, cardamoms, and underwood, similar to that described in my former letter, give cover to a rich, deep, brown mould free from stones. The forest trees are somewhat distant one from the other, and the foliage above is very lofty so that when the entire underwood is removed there will be a free circulation, with abundance of light and shade. The ground undulates from ridges down into ravines with running streams. These ridges average in elevation from 3,400 feet above the sea, the ravines gradually descending 100 to 150 feet. The temperature of the atmosphere at 8 A. M. in the sun indicated 85° of Fahrenheit. In the shade four feet above the surface 69°, in the surface 67½° and 18 Inches beneath 61½°. Its aspect being N. E. and N. W.

3. Unfortunately the extent of this forest is circumscribed, barely I should say 100 acres. But from its open character, it will receive a larger number of trees than a similar space on the localities examined on the Neilgherries, and its elevation, equable temperature, and genial climate, make it a valuable locality for a nursery, and one of the earliest experimental plantations. Distant about three miles from this site, on the same side of the ghát, immediately above a Coffee clearing by Mr. Bain, is a forest ascending up to 4,000 feet, and well adapted for a Quinquina plantation, into which, as the space in that first refered to became occupied, trees could be introduced, with the same good prospect of success.

4. I beg to suggest that application be made to the Commissioner of Mysore, to reserve the above two sites for Government purposes, as otherwise they may pass into the hands of Coffee Planters who by felling the forest would render it useless for the introduction of the Cinchona tree.

No. 172. Telegram from J. McIVOR, Esq., Superintendent Government Gardens, Ootacamund, to J. D. BOURDILLON, Esq., Secretary to Government, Madras, dated Ootacamund, 22nd February 1861.

Two Cinchona cuttings retain life but I fear, they will not grow.

No. 173. ORDER THEREON, 9th March 1861, No. 552.

1. On the 19th December last, Dr. Macpherson communicated to the Government some interesting and valuable information which he had acquired during a recent visit to Java, as to the mode of culture and propagation of the Cinchona tree, which has been successfully introduced into that island from South America. The great expense that has been incurred by the Home Government in the experiment of introducing the same plant into this Presidency, and the failure of the plants hitherto received, induced the Government to depute Dr. Macpherson to inspect and report on the sites selected on the Neilgherries for the Cinchona plantations, with reference to what he had observed in Java. In the first of the two letters above recorded, Dr. Macpherson records the results of his examination. He minutely describes the three sites that have been selected and which he calls, from their respective localities, the Dodabett, the Avalanche, and the Neddivattam sites. In the second letter Dr. Macpherson describes another site which he inspected in Coorg.

2. He highly approves the 2nd and 3rd of the Neilgherry sites. In one (the "Avalanche site") the forest trees are of great size and amongst them are several varieties common to the Cinchona regions and found also in the tracts where the plant is now grown in Java. In the other (the "Neddivattam site") "the prevailing undergrowth is "that seen in the Andes; * * * and the exact same small fern "which covered the plants imported by Mr. Markham, * * * "grows on many of the trees." The soil of both is most favorable; the aspect of both is excellent being northerly, so as to be turned away from the sun during the dry and cloudless season of the year, and in every respect the sites seem peculiarly suited to the object.

Paragraph 6, &c.

Paragraph 9, &c.

3. The remaining site, "Dodabett," is unobjectionable as regards altitude, for certain hardy species of the plant, but is not otherwise suitable, and Dr. Macpherson advises its abandonment, for the present at least. The Governor in Council concurs with him in this opinion and directs that no further expense shall be incurred in connection with it. The two approved sites will be reserved for the Government Quinquina plantations.

Paragraph 3, &c.

4. The site in Coorg is a tract of forest about a hundred acres in extent, situated between the third and fifth mile stone from Mercara on the Mangalore road, and having a N. E. and N. W. aspect. It is reported to bear even a closer resemblance to the site of the plantations in Java than the Neilgherry sites. It contains large trees of the buttressed species, clustered with orchideous plants and rich drooping moss, as well as tree ferns, small bamboos and cardamons; and the underwood is similar to that found on the Neilgherry sites. The soil is of a rich deep brown mould, free from stones. In Dr. Macpherson's opinion the elevation, equable temperature and general climate of this forest make it a valuable locality for a nursery and one of the earliest experimental plantations.

5. The attention of the Acting Conservator of Forests will be drawn to Dr. Macpherson's remarks in paragraphs 4 and 5 of his first letter. Captain Morgan will put a stop to any further attempt to propagate seeds or raise plants in the Government Gardens at Ootacamund, and will adopt immediate measures for the preparation of nurseries at the Neddivattam site to be ready for the plants and seeds expected shortly from England; and on their arrival, endeavours will be made to obtain the services of Mr. Cross, the Gardener who accompanies them, to have charge of this nursery and plantation. The immediate charge of the preparation should be entrusted to Mr. McIvor, and some notes for his guidance drawn up by Dr. Macpherson will be sent to him.

Superintendent

The clearing will for the present be limited to a few acres, sufficient for planting out the plants expected, and for a fair trial whether the seed will germinate—should this be found to be the case, the Government will at once sanction more extensive preparations for planting out the seedling plants.

6. Dr. Macpherson will be requested to state whether he can suggest any means for preparing ground on the Coorg site, in order that the plants and seeds may be divided between these two localities.

Paragraph 11. 7. Adjoining the Neddivattam site is a piece of forest land belonging to Mr. Ouchterlony admirably suited to a Cinchona plantation, and which that gentleman has expressed his willingness to transfer to Government for that purpose. The Government fully appreciate the public spirit which prompts this liberal offer; and the site being so extremely favorable, as reported by Dr. Macpherson, they resolve to take advantage of it and accept the land for the purpose stated.

8. In accordance with the suggestion at the end of paragraph 13, the necessity of expediting the despatch of plants and seeds so as to avoid all needless risks of deterioration will be urged on the Secretary of State and the Government of Bombay. The Government will move the Secretary of State to send a competent Gardener in charge of every supply, and application will be made at the same time for the services of Mr. Weir referred to in paragraph 14 to have charge of one of the plantations.

9. From specimens of the plants brought out by Mr. Markham, which have been laid before Government by Dr. Macpherson, and which he says are fair samples of the whole, it appears that they were not seedling plants but root-shoots, *i. e.*, they were off-shoots from the roots of trees. They were dug up with a small adjoining part of the root whence they sprung; but they had no root of their own, and it is no wonder that they died. It will be pointed out, therefore, to the Secretary of State that the failure of these plants is not to be regarded as conclusive, that in fact this batch of plants was not a fair trial of the experiment.

10. A copy of Dr. Macpherson's report of the 19th December has already been furnished to Mr. Markham. The present one will also be communicated to him and to the Principal Inspector General, Medical Department, as requested in the last paragraph, and both reports will be laid on the Editor's table.

11. The Governor in Council approves Dr. Macpherson having visited Coorg to inspect the land referred to above in paragraph 4.

(Signed) J. D. BOURDILLON,

Secretary to Government.

———

Ordered that the following letter be despatched.

No. 174. From J. D. BOURDILLON, Esq., Secretary to the Government of Fort Saint George, to the Secretary to the Government of Bombay, dated 9th March 1861, No. 553.

SIR,

1. I am directed to forward for the information of the Government of Bombay a copy of a report by Dr. Macpherson on the introduction of the Cinchona tree into this Presidency, and with reference to paragraph 13 thereof, to request that you will move His Excellency in Council to urge upon all departments concerned, the necessity of expediting the despatch of all supplies of plants and seeds which may arrive at Bombay on the way to places in this Presidency.

2. I am directed to request that on the arrival of the plants and seeds now expected, you will cause the fact to be notified to me by telegraph, and also to the Superintendent of the Government Gardens at Ootacamund, who has been directed to prepare ground for the reception of these plants and seeds.

No 7

Ootacamund 5th February 1861

From

D. Macpherson Esquire M.D.
Inspector General of Hospitals
On special duty at
Ootacamund.

To

J. D. Bourdillon Esquire
Secretary to Government
in the Revenue Department
Fort Saint George.

Sir,

Having, pursuant to my instructions dated 11th January 1861 No. 85, visited the Neilgherry Hills to inspect and report on the sites selected for an experimental Nursery and Plantation for Cinchona plants and seeds expected from South America, I now proceed to state how far they resemble those which have proved successful in Java, and to make some general observations on the subject.

2 When on route to the Hills I had the pleasure of an interview with Mr. Markham, and received from him information regarding the habitat of the plant in its native country, which, with my enquiries in Java fresh in my mind, I have found useful in arriving at the results I am now about to record.

3 Three sites have been selected on the Neilgherry Hills for the Quinquina (I use this term, as from its analogy to the active principle of the Cinchona plant, it is that adopted in Java and by many of the best writers) plantations. I minutely explored these in company with Mr. M. Ivor, the

Superintendent

Superintendent of the Horticultural Gardens. ~~[illegible]~~ letter for the Under Secretary dated 9th June 1860 [illegible]

The first is a scantily wooded shola embracing the sides of a ravine having an eastern aspect ascending from the Horticultural Gardens, and stated to embrace an area of 50 acres. The lowest part of this, the "Dodabet side," on which it is proposed to cultivate the plant, is 7830 feet above the sea. To this locality a road about six feet in width, and in length about one mile, has been partially constructed; and the undergrowth in the shola is now being cleared. The chief attractions in this position are the numerous varieties of the Cinchona family found there and because of the altitude; for the best informed writers allow "that the Bark containing the largest amount of the alkaloid is obtained from trees growing at the greatest elevations, and that the stunted, shrubby varieties of the plant the Cinchona Calisaya Josephiana for instance, which is found at an elevation of 9500 feet, are particularly good when their growth is owing to the altitude of their position". But the same authorities inform us "that the best trees inhabit dense woods, and aspire to rise above the tops of the highest trees"; and Mr. Spruce engaged in collecting plants &c. in South America, states "that the finest trees grow in a stratum of yellow or reddish marl of immense thickness, and in which few or no stones were intermixed". Now the site under review, although it possesses elevation, is wanting in luxuriance of vegetation - the forest trees are too cramped and scanty to give sufficient shade, the soil is generally a superficial superstratum of black vegetable mould on disintegrated granite, or on masses of trap protruding on the surface, and it is deficient in moisture. It bears no resemblance to those sites on which the plant flourishes in Java; and, until we are in possession of plants of the Calisaya Josephiana no further

expense

expense should, I think, be incurred on this spot.

4 As regards the important matter of the best elevation for the propagation and cultivation of the plant, I may here state that Humboldt and others give it a range in its native country of from 5,000 to 10,000 feet. Mr. Markham at Para 19 of his Report to the Under Secretary of State dated 9th June 1860 states "I had but slight opportunities of observing the temperatures of the pajonal region about 5000 feet above the sea, where the Cinchona Josephiana is found;" and in Paras 57 and 60 "the whole of the Cinchona, with the exception of the Josephiana variety, have been collected in the valley of Tamboopata, the height above the level of the sea being between 3000 and 4000 feet." Mr. Spruce, in the appendix to his Report, speaks of "the Forest of Limon on the western slope of Chimborazo, at about 3000 feet in altitude, and that of Tabacal near San Antonio, at an altitude of 2600 feet"; these being the two positions wherein he made the collection shortly expected here; and finally in Java the recognised elevations, which a succession of experiments conducted with much care for a period of seven years have established, are, for the Nurseries between 3000 and 4000 feet only, while the plantations range from 3000 to 6000. Now, with these facts before us it must, I think, be admitted that we are risking our seeds and plants by attempting to propagate them in the Government Gardens at Ootacamund, the elevation of the lower green house where they are placed, being 7478, and that of the upper 7596 feet above the sea.

5 To conduct the experiment with any prospect of success, I would urge the Government without loss of time to adopt the system now working so successfully in Java, and direct the preparation of nurseries under efficient superintendence on the sites selected for the plantations, and at the more moderate elevations than the Government Gardens afford.

6 In the selection of the sites consi-

deration

duration was very properly bestowed on those adjoining the trunk
roads leading to the Nilgherry plateau. The second of these
is the "Avalanche site," on the highway from Calicut, and 15
miles from Ootacammundy. It commences North East from
the Travellers' Bungalow, distant about a mile, and covers an
area of some 1000 acres, nearly the whole of which might be
made available for the varieties of the plant which inhabit
the more elevated ranges in the Andes. The black super-
stratum of soil is rich and deep; generally free from stones;
it is well watered; the vegetation is rich and luxuriant; the
Forest trees are of great size, abounding in Rhododendrons,
one of which, at an elevation of 7075 feet, in good health,
I found to measure at 2 feet from the ground, 12 feet of
inches in circumference, and more than 3½ feet in dia-
meter; and the following varieties of plants, common to
the Cinchona regions, and found also in the Forests select-
ed for the growth of the plant in Java: Coffee, Holly, Ivy,
Cinnamon, Tree ferns, Palms, Peppers, Barberries, Leseanthus,
Melestomaceæ (Osbeckia), Magnolia, Spurceæ, and an
undergrowth of ground Orchides, ferns, acanthus, aroidæ,
myrtaceæ, and small Bamboos, with numberless gigantic
climbers. The large trees are covered with mosses and orchidæ,
indications of humidity; and there are open well sheltered
glades similar to the pajonal region where the C. Josephi-
ana is found. The steep declivities which the plant prefers,
sufficiently overshadowed by trees, are numerous, and the
ravines indicate a subsoil of decaying schist much dis-
colored with red oxide.

7

The Avalanche Bungalow faces
to the North, and the aspect of the Forest is North East and
South East. The former is unquestionably the best expos-
ure in these latitudes, because of the passage of the sun

to

to the South during the dry, and cloudless season the rays fall
direct on a North East aspect; the very opposite state of matters
have induced the Dutch in Java to select a Southern exposure
for their Quinquina plantations. The parched appearance of
the Southerly and Western aspects at this the period of drought
in the hills, the contracted circumference of the Sholas, and
the cramped vegetation on these, compared to that seen on the
other surfaces, is of itself a sufficient indication that a north-
ern and eastern exposure is that which holds out the best
chances of success in the undertaking the Government are now
entering on. The elevation of the Avalanche Bungalow above
the Sea is 6725 feet - the thermometer in the Sun at 9 A.M. stood
at 53°; this may be said to be the lowest margin of the Forest.
The centre elevation is 6740 feet, and the thermometer at 11 A.M.
indicated in the forest shade 65°. On a grass ridge mid sum-
mit passing over to a scrubby shola having a South Western
aspect the elevation was found to be 7180 feet, and the thermometer
in the Sun 70° at noon. The Forest continues luxuriant to an ele-
vation of 7800 feet above the sea, when it ceases, the grass hill
ascending about 40 feet higher. Here the thermometer at 1 P.M.
in the Sun indicated 74° of Fahrenheit.

There is but one objection to this site, view-
8 ing it in the Java standard, viz: the want of a low elevation for
nurseries. But otherwise, there are so many well protected fa-
vorable spots in the site for this purpose, especially with the
aid of a glass house, and the position appears to be so well
adapted for the more valuable species of the plant, i.e. the
Calisaya and Ovata; the Travellers' Bungalow in its proxi-
mity, in which the Overseer in charge could reside, and the
fact that a large Burgher population, available as labourers,
inhabit the vicinity, are circumstances which will weigh fa-
vorably with Government in according their sanction to esta-
blishing the "Avalanche site" as one of the proposed plantations.
In elevation it is nearly equal to the "Dodabet site;" far

Surpassing

surpassing it in other respects; and there is another nearly equally extensive and in every respect favorable Forest descending to a lower elevation about six miles from the Bungalow

9. I shall denominate the third situation selected for a Cinchona plantation, the "Neddiwatum Site"; it being contiguous to the Travellers' Bungalow of the same name; 17 miles from Ootacamund; at the summit of the pass leading from that place to the Western Coast. This Forest has also a North East, and a North West aspect; and it covers an area of about 400 acres, in an undulating descent on the flank of the mountain to the plateau land of Wynaad. It shares in both Monsoons, receiving a medium fall from each, a very desirable circumstance. In luxuriance of Forest it is fully equal to that described under the "Avalanche Site", and the Flora springing up on every side, promises equally well for the future success of the Cinchona plant. Unfortunately about one half of this Forest only is available; this half is strikingly illustrated by Mr Spruce's words "the finest trees grow in a stratum of yellow and reddish marl of immense thickness, and in which few or no stones are intermixed". The main portion of the space is occupied by an avalanche in which the whole of the surface soil from the high lands has been swept down and deposited a depth of from 50 to 80 feet. But no where in the better part of this space is the superficial rich, black or coffee colored mould under 4 to 6 feet; the substratum appears to be granite and trap in process of disintegration. A large stream passes down the centre of the space, entering from the summit, which can be conveyed in any direction for irrigation purposes. The prevailing under growth is that seen in the Andes, viz- the Acanthus, the Melastoma-ceæ &c., and the exact same small fern which covered the plants imported by Mr Markham; the Hymenophyllum grows on many of the Forest trees. Elevated grass hills protect the spot from the force of the South West Monsoon, and the trees increase in magnitude, and are overhung with rich drooping folds of moss in the more protected positions, indications of the humid character of the climate, and its germinating properties for nurseries. There is a very convenient elevated Spur for Overseer's and Store house about the centre, upwards of an acre in extent, having a full command of water.

10. The following give the Barometrical and Thermometrical indications on the 22nd January 1861.

Highest locality	
Greatest elevation on the Forest skirt	6150 ft.
At 9 A.M. Thermometer on surface	67°
" " 18 inches beneath surface	66°
Spur for the House &c.	
Elevation	5550 ft.
Thermometer in stream adjoining, 10 A.M.	54°
Centre locality	
Elevation	5220 ft.
Thermometer 18 inches beneath surface at noon	65°
Do on surface do	68°
Do 4 feet above surface do	73°
Lowest North East aspect	
Elevation	4530 ft.
Thermometer 18 inches beneath surface at 2 P.M.	73°
Do on surface do	71°
Do 4 feet above surface do	74½°
Lowest North aspect	
Elevation	5130 ft.
Thermometer 18 inches beneath surface at 3 P.M.	73°
Do on surface do	71°
Do 4 feet above surface do	76°

On the Andes in April & May the mean of the observations given by Mr Markham is 68°, and from July to September that by Mr

M.r Spruce is 66°, the temperature of the earth 2 feet beneath the surface being 68½°. The character of the soil generally on the surface is a rich black vegetable mould 18 inches in depth, beneath which is a fine red, coffee colored, friable, porous, marl; and thro' the slope descends to the Wynaad plains, where the elevation varies from 3800 feet upwards.

11. The chief objection to this position is its limited extent; for a large portion of it, as already stated, is too stony for planting. But contiguous to, or rather adjoining on it, westward, with a similar aspect, is another Forest equal in extent, and possessing the same character of Flora and Soil. This land is M.r Ouchterlony's property: the possession of it would very much add to the value of the proposed plantation. On my intimating this to M.r Ouchterlony he generously offered to hand it over to Government, stating "I regard the experiment to introduce the cultivation of Cinchona into the Country of so much vital importance, that I should be happy to assist it in any way in my power; and as you seemed to think the Forest adverted to a desirable locality for it, I shall be willing to transfer my title and interest in the forest for the object of the Cinchona plantation, should the Government desire to possess it." M.r Ouchterlony's original note is enclosed.

12. Although the two sites just described have a striking resemblance to those which have proved successful under the Dutch Government in Java they are wanting in the "trees with buttressed roots of stupendous size" referred to in the 26th Para of M.r Markham's Report above quoted, and found throughout the Java Forest plantations. Trees of this sort are common, however, on the Western ghats; in the Annamully and in the Coorg Forests which I have visited, where are found also "the wild Plantain gigantic climbers, and tree ferns" found on the Cinchona

Forests

Forests in South America and in Java. In a letter from M.r Markham just received from Mercara, he calls my attention to such a site "four miles down the Mungalore ghat, where I came to the conclusion that it would be an excellent site for nurseries, better than any Forest tract I have as yet examined to the South East and South." When en route to the low country I propose to visit this place; it will only take me a few miles out of my direct road to Madras; and I will then be able to speak of it from personal examination.

13. I take the liberty to submit that the period has arrived for Government to determine on the extent to which this great experiment is to be conducted. As stated in my former Report, the early endeavours of the Dutch in Java ended in failure, and so it continued until Science and chemical research were called in to aid. With the exception of three cuttings made from the plants introduced by M.r Markham viz.t

1 Cinchona Calisaya
1 " " Josephiana
1 " Ovata

which, under the skilful management of M.r M.c Ivor Superintendent of the Government Gardens here, may yet become robust plants, and the few left at the Royal Botanical Gardens Kew, that gentleman's importation of 456 plants are dead. The collection of plants transmitted by M.r Pritchett from Lima were dead on arrival at Bombay; and the valuable assortment of seed forwarded by the same gentleman, comprising the varieties denominated the red, crown, and gray, barks of commerce or the

Cinchona micrantha.
" Provinciana.
" nitida.

are stated to have suffered a delay in their transmission to this

place

place, of six weeks at Lima and twenty seven days at Bombay, a circumstance which, of necessity, must injure their vital property. Mr. Spruce, in his letter dated 12th October 1860 to the Under Secretary of State at Page 4 intimates the despatch "by the Steamer which leaves Guayaquil for Panama on the 14th October, a packet of seeds" collected by himself with much care; and four months have now nearly elapsed without any intimation of them being received. I venture to suggest that the Government address the Home and Bombay authorities on the necessity of expediting the despatch of plants and seeds in each case under the care of a competent gardener, whose services may be made available, if necessary, on the several sites selected for their propagation.

14. * — If therefore it be established that "the plant containing the most valuable medicals substance the earth produces" will flourish in mountain ranges, at elevations from 2600 feet upwards according to Mr. Spruce's statement, private enterprise will doubtless soon find it their interest to extend its cultivation, even although the prospect of remunerative return may embrace a term of seven years. But to establish this fact Government must, I submit, as has been done in Java, be prepared to enter on the experiment with vigour, and simultaneously, in order to secure a better chance of success, to open nurseries and plantations in different localities. The scale I suggest for our immediate wants (and not a day should be lost in preparing nurseries, the most important, and at the same time the most difficult part of the undertaking) are the two plantations indicated on the Nulgherries, the one in Coorg, and hereafter another on the less accesible Annamullys; with efficient gardeners resident at each place, and overseers under them; together with an educated and intelligent botanist

x Weddell

possessing a knowledge of analytical chemistry, to conduct the whole. The services of John Weir who accompanied Mr. Markham, might, I think, to be secured. He has returned to England. He might, come out in charge of some of the plants left at Kew Gardens. The services of Mr. Crofs, the gardener who accompanied Mr. Spruce, will also be valuable in conducting the experiment. Apart from the interest which their researches may have created in them, numerous particulars regarding the growth of the plant in its natural state can be applied by them in its cultivation in this Country.

15. I submit that in the new and difficult field of enquiry Government are now entering on, and the imperfect knowledge we possess of the chemical history of the Quinquina Barks, the employment of a Superintendent possessing a special knowledge of the subject is of much importance. As a guarantee against mistakes, he ought to be provided with the means, by continual analytical enquiry, to enable him to ascertain at what period the alkaloids develope themselves, and the constituents which add to, or detract from, this development. In connection with this part of the subject I take the liberty to introduce the name of Dr. Cronenman, a young Dutch gentleman in private practice at Bandoeng in Java, in the neighbourhood of the Quinquina plantations. This gentleman accompanied me over the plantations, and I was much pleased with his intelligence and general knowledge of all relating to the growth and propagation of the plant, and its chemical analysis. It was evident to me that he took a warm interest in the subject from a love of natural Science alone, for I knew he held no appointment under Government, nor yet could he anticipate advancement through me. Subsequent enquiry through Dr. DeVry, Dr. Youngkoon coadjutor in charge of the Quinquina plantations, satisfied me that this young man was much devoted to Science, had a good knowledge of Botany and Geology,

was

* Mr. Spruce Botanist now at Ecuador writes to Mr. Markham on 5 July 1859 "The testimony of all the Bark collectors goes to prove that the Bark trees are rapidly verging to extinction. I am credibly informed that in some of the Cinchona Forests in Ecuador there does not remain a single tree large enough to produce seed."

was a very fair draftsman, and though Dr. De Vry had acquired some knowledge in analytical chemistry. He possesses an imperfect knowledge of the English language so far as writing it; but can read and speak it with some freedom. Without holding out any prospect of procuring employment for him under the British Government, before leaving Bandoeng I ascertained from Dr. Vreneman that an engagement of the sort, which would advance his interests, would be agreeable to him. He promised to continue to devote himself specially to the subject on my informing him that if an opportunity occurred I would bring his name and qualifications to the notice of the Government of Madras. I hope I may be pardoned for now doing so; and also for the length of this communication.

Mr. Markham having applied to me for a copy of my former Report, and also of any I may send in to Government from this place, may I beg you will obtain sanction to forward these to him to Bombay. I also solicit that a copy of this Report may be sent to the head of my department, as I am unable to obtain a copyist here to prepare it. A small supply of Seeds having been distributed by Mr. McIvor to parties at Bangalore, the Wynaad &c., I would suggest that my Report on the cultivation of the Cinchona plant in Java, be placed on the Editors' table for their information.

I have the honor to be
Sir
Your most Obedient Servant
Alexander Kilgour
Inspector General of Hospitals

Mad Dept

51

No. 552.

Proceedings of the Madras Government
Under date the 9th March 1861

Read the following Papers—

From the Inspector Genl of Hospitals.
Reports on the introduction of the Cinchona tree on the Neilgherries.

From — Do — Do —

Reports upon the selection of Coorg selected by Mr Markham for a Cinchona Plantation.

Telegraph Message from Mr I. McIvor Supt Govt Gardens Ootacamund.
Stating that the Cinchona cuttings retain life, but that he fears they will not grow.

(Here enter 7th Feby 1861 No 7)

(Here enter 20 Feby 1861 No 8)

(Here enter 22nd " ")

On the 19th December last, Dr. Macpherson communicated to the Govt some interesting and valuable information which he had acquired during a recent visit to Java, as to the mode of culture and propagation of the Cinchona tree, which has been successfully introduced into that island from South America.

The

The great expence that has been incurred by the Home Govt in the experiment of introducing the same plants into this Presidency, and the failure of the plants hitherto received, induced the Govt to depute Dr Macpherson to inspect and report on the sites selected on the Neilgherries for the Cinchona plantations, with reference to what he had observed in Java. In the first of the two letters above recorded Dr Macpherson records the results of his examination. He minutely describes the three sites that have been selected and which he calls, from their respective localities, the Dodabett, the Avalanche, and

Para 6 &c.

Para 9 &c.

and the Neddiwattam sites. In the second letter Dr M'Pherson describes another site which he inspected in proference to the 2d and 3d of the Neilgherry sites. In one (the "Avalanche site") the forest trees are of great size and amongst them are several varieties common to the Cinchona regions and found also in the tracts where the plant is now grown in Java. In the other (the "Neddiwattam site") "the prevailing undergrowth is that peculiar to the cinchonas and the exact same small ferns which covered the plants imported by Mr Markham, and grows on many of the trees." The soil of both is most favourable, the aspect of both is excellent being Northerly,

62 b

Northerly aspect to be
turned away from the
sun during the dry and
cloudless season of
the year and in every
respect the sites seem
peculiarly suited to the
object.

3 The remaining
site, Nedubetta is unob-
jectionable as regards
altitude, for certain hardy species of the plants
but is not other-
wise suitable. and Dr
Macpherson advises its
abandonment for the pre-
sent at least. The Governor
in Council concurs with
him in this opinion and
directs that no further
expense shall be incurred
in connection with it.

The two approved sites
will be reserved for the
Govt

Para 3 &c.

Government Cinchona
Plantations.

4 The site in Coorg
is a tract of forest about a hun-
dred acres in extent, si-
tuated between the third
and fifth mile stone from
Mercara on the Mangalore
road, and having an E &
and N W aspect. It is
reported to bear some re-
semblance to the
site of the
plantations in Java than
It contains
the Neilgherry sites - large
trees of the buttressed spe-
cies clustered with or-
chideous plants and nick
as well
drooping trees, ~~grow on it,~~
as the Tree ferns, small
bamboos and cardamoms
and the underwood is
similar to that found on
the Neilgherry sites - The
soil is of a rich deep brown
mould,
free from stones - In Dr
Macpherson's

Mr Thomson's opinion the elevation, aquatic temperature and general climate of this ground make it a valuable locality for a nursery and one of the earliest experimental plantations.

5th The situation of the Colony Government Lands will be drawn to Dr & Mr Thomson's remarks in Mr Jones's first letter. Captain Elwyn will put a stop to any further attempt to propagate seeds or raise plants in the Govt gardens at Belvidere and will adopt immediate measures, ~~in communication with the Collector and Dr Macpherson~~, for the preparation of nurseries at the Neddiecattan site

6th The immediate charge of the preparations should be entrusted to Mr Mac Ivor, and some notice for him and some notes for him drawn up by Dr Friedan ~~and~~ drawn up by Dr Macpherson will be sent to him -

The clearing will for the present be limited to two acres sufficient for planting out the plants expected, and for a fair trial whether the seed will germinate - should this be found to be the case, the Government will at once sanction more extensive preparations for planting out the seedling plants -

6 Dr Macpherson

Para 11

site to be ready for the plants and seeds expected shortly from England, and on their arrival, endeavours will be made to obtain Mr Croft, the services of the gardener who accompanied them, to have charge of this nursery and plantations ~~Dr Macpherson~~ will be requested to state whether he can suggest any means for preparing ground on the Coorg side, in order that the plants and seeds may be divided between these two localities -

7 Adjoining the Neddiecattan site is a piece of forest land belonging to Mr Buchanan very admirably suited

onded to a Cinchona plantation, and which that gentleman has expressed his willingness to transfer to Govt. for that purpose. The Govt. fully appreciate the public spirit which prompts this liberal offer, and the site being so extremely favourable, as reported by Dr. McPherson they resolve to take advantage of it and accept the land for the purpose stated.

5. In accordance with the suggestion at the end of Para 3, the necessity of superintending the despatch of plants and seeds so as to avoid all needless risks of deterioration will be urged on the Secretary of State and the Govt of Bombay. The Govt will move the Secretary of State to send a competent gardener in charge of every supply, and application will be made at the same time for the services of Mr. Weir ~~and Grass~~, referred to in Para 14 to have charge of one of the plantations.

6 From specimens of the plants brought out by Mr Markham which have been laid before Govt by Dr Macpherson, and which he says are fair samples of the whole it appears that they were not seedling plants but ——— Root-shoots, &c. they were off-shoots from the roots of trees. They were dug up with a small portion of the root-stock they sprung, but they had no root of their own, and it is no wonder that they died. It will be pointed out therefore to the Secy of State that the failure of these plants is not to be regarded as conclusive, that in fact this batch of plants was not a fair trial of the experiment.

7 A copy of Dr McPhersons report of the 19 December has already been furnished to Mr Markham. The present one will also be communicated to him and to the Principal Inspector General Med. Dept as requested in the last para and both reports will be laid on the Editors table.

The

11 The Governor in
Council approves Dr
McPherson having visited
Coorg to inspect the land
referred to above in Para
4.

Copy
To

3 Copies
Dr McPherson Sy. of Hospitals
To The Con: of Forests
13 " " Bd of Rev
7 " " Mily Dept
1 " " P.W.D. Genl Quest. & Dept
1 " " L. R. Clarke Khan Esqr
Bombay.

Rev Depart

No 553.

To
The Secretary to the Govt of
Bombay -

Sir,

I am directed to
forward for the informa-
tion of the Government of
Bombay a copy of a
report by Dr McPherson
on the best means of
Cinchona tree into this
Presidency, and with re-
-ference to para 13 thereof
to request that you will
move His Excellency in
Council to urge upon all
departments concerned
the necessity of expediting
the despatch of all sup-
-plies of plants and
seeds which may arrive
at-

at Bombay on the way to
place in this Presidency.
2 I am directed to
request that on the arri-
-val of the Plants and Seeds
now expected, you will
cause the guard to be noti-
-fied to me by telegraph,
and also to the Superin-
-tendent of the Hort. Gardens
at Calcutta, who has
been directed to prepare
for the reception
of these plants and seeds

Capt. Campbell
7th March 1865

Revenue 1861 Dept.
Rec: of Govt for March
No 3553.

To
The Secretary to the
Govt of Bombay
Dated 1st March, 61

Requesting to be
apprised the despatch of
all Plants and seeds of
Cinchona and Potato, the
same by Telegraph to
this Govt and the superin-
tendant of the Government
Gardens at Ootacamund

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Dr. McPherson's report on the Neilgherry sites for the cultivation of the Cinchona

Revenue 1861 Departt.
Pro: of Govt for March.

No 552.

Pro: of the Madras Govt
Dtd 9th March 61.

From the Offg Conservator of Forests
Dt 15 April 1861 No 94 3 [illegible] 23 Apl 61
Forwd Grant of Sudras Dt 23 April 61
Rs 1120 - on Pro 27 May 61 No 1088

Passing orders on Papers relating to the introduction of the Cinchona tree on the Neilgherries -

Vol 70 at 173.

12 Pro March 61 No 1035

Revenue Letter to Govt

Dr. 30 Oct. 1867