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Govt. of {1886} Madras.

REVENUE.

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G.O., 17th August 1886, No. 720.

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AUGUST.

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15/9/86

Government Parks and Gardens.

Report on — for 1885-86, reviewed.

G.O. 8.9.86.

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15TH APRIL 1885, No. 433, REVENUE.

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

READ—Minute by His Excellency the Governor.

ABSTRACT.—Circulating Memorandum by Mr. Thiselton Dyer, C.M.G., on the constitution of a Botanical Department at Madras.

Memorandum on the Constitution of a Botanical Department for the Madras Presidency.

His Excellency the Governor has done me the honor of requesting me to put on paper my suggestions with regard to the organization of a Botanical Department for the Madras Presidency.

2. I need not say that such suggestions can have no official character. They only represent opinions formed on the basis of considerable practical experience from the Home point of view of the botanical needs of our external tropical possessions and of the actual working of the different types of botanical establishments by which those needs may best be met.

3. India possesses one botanical institution, which, though technically provincial, must at any rate in external estimation, from its age (it has nearly attained its centenary), from its scientific traditions, and from the splendour of its maintenance, rank as imperial.

4. Whatever be now or in the future the exact official status of the Royal Botanic Garden, Calcutta, it must always be regarded as standing at the head of the botanical institutions of our Indian Empire. Placed in contiguity to the seat of Imperial Government, it necessarily ranks as the Kew of England in the East.

5. While undertaking as an administrative duty the work of a Botanical Department for Bengal and its associated and dependent Governments, it is so equipped with the resources of scientific staff, herbarium and library, as to bring into focus all that relates to the scientific investigation of the Flora of our Indian Empire as a whole and of its relation to that of adjoining countries.

6. We ought then eventually to be able to look to our botanical officers in Calcutta for the solution of all problems rising out of the practical or scientific study of Indian botany. A close co-operation, as in the past, will, no doubt, always be maintained with Kew. The two establishments will continue to work in scientific harmony. It will therefore, as the knowledge of Indian indigenous vegetation becomes better settled, only be necessary to refer to Kew such problems as, for various reasons, cannot be thoroughly settled without a reference to Europe. Calcutta will then be to British India what Buitenzorg is to the Dutch Indies.

7. It is necessary to premise thus much in order to see clearly what should be the scientific scope of the more strictly localized botanical institutions which India from its vast size undoubtedly requires.

8. Of such botanical institutions of the second order, India at present only possesses one which can be said to be fully organized. Saharunpore is a botanical centre, the scientific prestige of which is only subordinate to that of Calcutta. Its botanical work has always been traditionally regarded as localized to North-Western India and with such resources as are available unofficially to adjacent countries.

9. In other parts of India any definite organization may be said to be wanting. Not that its want has not been felt, but it has been provided for at the best imperfectly and in a tentative and un-coordinated manner. What has been done seems to have produced only moderately useful results with undoubtedly much expenditure.

10. I have put the scientific aspect of a Government Botanical Establishment to the front, because it is the solid and rational foundation of all the rest of its work. The general consensus of all civilized practice has almost always, however associated with scientific botanical work, other duties of a more practical and administrative kind. Besides a herbarium or *Hortus Siccus*, by reference to which the names of plants can be determined, it has been the custom that a botanic garden or collection of living plants should be an integral part of such an establishment. From this it flows naturally that a botanic garden will, in a country like India, be the centre at which new experimental cultures will be started and new cultural industries called into existence. Thus India owes in great part to the Calcutta Botanic Garden its great cinchona enterprise and to Saharunpore the practical inception of tea cultivation, though the initiatory stages must be credited to the Calcutta botanists.

11. I may now attempt to define, or at any rate illustrate, more precisely the actual functions of a botanical establishment :—

I. It will occupy itself with obtaining an accurate and scientific knowledge of the flora of its sphere of operations. This knowledge will be laid up, so to speak, in its official herbarium. Hence it will be the routine duty of the staff to identify and supply the name of any tree or plant which for any reason excites the interest or curiosity of any Government officer in the course of his duty.

II. It may be asked why should any one want to know the scientific name of a plant. Simply because vernacular names are numerous, loose in their application, and not current beyond their own localities. A scientific name has universal currency and is therefore the key of knowledge to information relating to the plant that bears it in any civilized language. It is true that a few vernacular names, such as Sal and Teak, become so completely and exactly limited in their connotation as to be as good as scientific names and to take their place. But the number of such cases is very few. Take Ebony for example ; this means at least half-a-dozen quite distinct trees in general and no one in particular. If a name, such as Iron-wood, of even wider application is tried, it is found to be perfectly impossible to fix it in any way whatever. But botanical names have a further advantage. Behind them is always a diagnostic description by which at need the proper application of the name can be tested. Thus when the disquieting statement was made that the Red Bark (*Cinchona succirubra*) grown on the Nilgiris was really the less valuable Grey Bark (*Cinchona micrantha*), His Excellency the Governor himself was readily able to dissipate the scare by the simple process of comparing the trees in the plantations with a technical description.

III. Besides the herbarium, there should be in the botanic garden of the establishment a good named collection of the most interesting trees and plants of the country and such others of exotic origin as are adapted to its climate and desirable to introduce. Actual visual experience is after all the easiest way of learning, and the presence of an interesting tree or plant in a botanic garden is the most direct way of introducing it to the notice of the inhabitants.

IV. The cultivation of useful plants will naturally bring to the establishment correspondence and inquiries about these and others. It will therefore assume—if properly worked—in course of time the character of a kind of Botanical Intelligence Department.

V. The effective discharge of its duties in this as well as in the more strictly scientific directions will naturally lead to correspondence with similar home, colonial, and foreign institutions. It will confer and reciprocate the advantage of exchanges. There is perhaps no line of official work in which there is a more helpful intercourse between the scattered members of the imperial body than is afforded by botanical business. If Jamaica was in want of the most authentic strain of Black Pepper, it was only necessary to invoke, through Kew, the aid of His Excellency the Governor to secure a good supply of the much-prized Malabar kind.

12. Hitherto there has been nothing precisely and collectively answering to a Botanical Department fulfilling the functions indicated above in the Madras Presidency. That one was needed, however, has long been apparent at Kew from the numerous communications, both public and private, relating to the practical as well as the scientific side of botanical business.

13. The materials for such a department are however all to hand,* and a little organization would practically effect all that is needed.

14. *Director.*—Mr. Lawson, late Professor of Botany in the University of Oxford, accepted the appointment of Superintendent of Cinchona Plantations (G.O., October 14th, 1882, No. 1116). He was further directed (G.O., April 14th, 1883, No. 443,) to take charge of the Government Botanical Parks and Gardens, and subsequently (G.O., August 15th, 1883, No. 987,) was designated Director of Government Cinchona Plantations, Parks and Gardens, Nilgiris. He made (August 19th) a preliminary report and (September 15th, 1884,) issued as Director the annual report. As regards a head for the department, a very slight extension of Mr. Lawson's duties is all that is required.

15. *Botanic Garden.*—The situation is not complicated by the existence of any Government Botanical Garden at Madras. The existing Government Garden at Ootacamund seems in every way the proper seat of the Botanical Department of the presidency. If its remoteness from the official capital is deemed objectionable, it may be pointed out that in the cases of Jamaica and Ceylon similar remoteness is no bar to great activity and has many compensating advantages. The planting industries of Southern India gravitate to its western side, and the botanical headquarters should be in the nearest feasible proximity to them. During the short time Mr. Lawson has been in charge he has succeeded in picking up the existing threads in the establishment of botanico-economic work and has reported upon them with precision and ability. We may confidently, I think, look to him for future reports, which will be inferior

to those of no botanical establishment of the Empire for interest and usefulness. The detailed administration of the Botanic Garden will always require a Curator subordinate to the Director. Mr. Lawson has the advantage of the cordial co-operation of Mr. Jamieson, who has long efficiently filled this position.

16. *Dependent Establishments.*—In order to extract the maximum of usefulness from a tropical Botanical Department, it is found necessary that it should comprise a chain of gardens at different elevations as in Ceylon and Jamaica. Ootacamund will, therefore, require to be supplemented by—

I. *An Intermediate Garden.*—Mr. Lawson apparently has this in view in his proposal with regard to Gúdalúr, where "Government would be able to grow successfully many plants, especially palms, which they cannot grow now in any of their other gardens."

II. *A Tropical Garden.*—This already exists at Barliyár. This must be an exceptionally favored spot for cultural purposes. The Mangosteen fruits here alone in British India. *Amherstia nobilis* has flowered. *Cacao* ripens its fruits (Report 1881-82). *Ipecacuanha*, under Mr. Lawson's directions, progresses. It seeded here for the first time in India (Report 1882-83). *Liberian coffee* was fruiting freely (His Excellency the Governor's Minute, pp. 9—11). *Castilloa* is successfully established (Report 1882-83). Mr. Lawson (August 19th, 1883,) described the garden as "a deadly excavation in a deadly ghât," but subsequently (Report 1883-84) he "cannot help thinking that the unwholesomeness of the place has been exaggerated," and considers "this garden for its size to be the most important one which the Government possesses on the slopes of the Nilgiri plateau." I have no doubt that Mr. Lawson's more matured opinion is the correct one. Unhealthiness judged by the European standard is part of the price which has always to be paid for the cultural advantages of a tropical garden. And in our experience the tropical *dépendance* of a Botanical Department is always complained of in this way.

III. A variety of other Parks and Gardens would, as at present, continue to be under the Director's charge. A similar arrangement works well in Jamaica and elsewhere. But it should be regarded merely as one of administrative convenience, and the botanical work proper should as far as possible be concentrated in its own seat.

17. *Herbarium.*—A thoroughly worked up and named collection of the plants of the Peninsula must, from what I have already said, be an indispensable feature in the organization of the department. It should not merely be the standard of reference for the department, but the official Government herbarium of the presidency. I think I may assume without argument what every civilized Government now admits that the study of the natural features and productions of the country it administers is one of its obvious duties. It must, I think, be also allowed that Madras has very imperfectly so far recognized this. The bulk of our knowledge, still confessedly most imperfect, of the botany of the southern portion of the Peninsula is due to the unofficial labors of two distinguished Botanists—Doctor Wight and Colonel Beddome. The existing Government herbarium is preserved in the Government Central Museum, Madras. It comprises the important collections of Colonel Beddome, which, I believe, were purchased by the Government. Mr. Lawson has inspected the herbarium and reports, "the specimens . . . . . are in excellent order. The sheets on which they are fastened are free from dust, and there is no trace of the plants ever having been attacked by insects." It is clear, therefore, that it has been admirably conserved. But I understand that the plants are kept tied up in bundles in drawers and the genera arranged * alphabetically, while the plants of separate collections have been kept distinct. These facts, if true, tell their own story ; they prove that the herbarium cannot have been much used at Madras for scientific purposes. Now a herbarium is after all an instrument which it is little use keeping, however carefully in its case. To be efficient, it requires the living presence of a skilled botanist who is constantly using it, noting its defects, and sparing no pains to make it perfect. I am far from wishing or intending in the remotest degree to reflect on Dr. Bidie. It is only necessary to refer to his reports to wonder how he can possibly manage to carry on single-handed so successfully all the lines of work comprised in the museum under his charge. Mr. Lawson with characteristic activity has set to work to create a herbarium at Ootacamund. In his tour, accompanying His Excellency through the Anaimalais, he made large collections (Minute, October 3, 1884) ; as detailed in his (1883-84) report, he has had liberal assistance from other quarters. He has got together some 4,000 † species, "the most part of which are correctly named." Some help in this respect has been rendered from Kew.

The herbarium under Dr. Bidie's charge has been reinforced on the other hand with upwards of 4,000 sheets from Dr. Wight's invaluable herbarium, which has been presented to the Royal Gardens as a private gift. Other contributions have also been made. Now I

* This is no longer the case. They have been carefully arranged according to the *Flora Indica* so far as that work has gone.—M.G.D.

† Many more—and as a pure labor of love.—M.G.D.

cannot see the use of the Government running, as is now practically the case, two independent State herbaria. What it possesses in this direction should, in my opinion, be concentrated where it is most wanted and will be most used, namely—in connection with the proposed Botanical Department at Ootacamund. I would recommend, therefore, that the necessary steps be taken to transfer to Mr. Lawson's charge the Government herbarium from the Central Museum, Madras, and this, with the collections he has made and will continue to make, should be housed in a proper building.* In return Mr. Lawson should be instructed to have prepared a mounted set of authentically named and typical representatives of the Peninsula flora, which might, as heretofore, serve as a standard of reference for residents in Madras who wish to identify their plants.

This being arranged, it should be the business of the Botanical Department, with the necessary Government authorization put formally on record and with the recognized assistance of the Forest Department, to push on the scientific investigation of the Flora of Southern India. The department should be in constant correspondence with the Central Imperial Indian Herbarium at Calcutta. It should charge itself, in fact, with the adequate performance of its share of the systematic botanical survey of India. To further this end the Madras Government should be prepared to make a small annual grant for the maintenance of collectors in districts of which the vegetation is still imperfectly known, more especially in the contiguous Native States. The flora of the apices of all peninsulas is always peculiar and interesting. Some of the most important problems in the geographical botany of India still await their final solution pending the investigation of the outlying parts of Southern India. The department would take care to furnish Calcutta and Kew with sets of their new collections. Both would reciprocate by donations from their duplicates, and Kew would furnish the elucidation of the freshest modern botanical scholarship. The Botanical Department would on this ground alone speedily attain a scientific position and reputation, and the Madras Government, by giving its countenance to the work, would remove from itself the reproach under which it undoubtedly at present labors of having done nothing officially for the botanical investigation of the countries under its rule, or of having materially contributed anything to aid in the preparation of the Flora of British India now in preparation at Kew under the authority of the Secretary of State.

18. *Museum.*—Mr. Lawson has got together "a small collection of woods, fruits, seeds, and other vegetable products of economic interest to those living on the Nílgiri plateau." Such a collection is an indispensable adjunct to the department. It should not, however, be a showy or expensively installed collection for public display. The proper seat for this would be the Central Museum under Dr. Bidie's charge at Madras. But it should be a working series illustrative of the business and communications on economic subjects passing through the Director's office. Recent correspondence, for example, with regard to Piney Tallow has shown that even in the presidency itself the history of its botanico-economics is very imperfectly known. As each subject is from time to time worked up, the specimens illustrating it, carefully and properly authenticated, should be preserved for future information and reference. The same museum like the herbarium might, with a proper official understanding, subserve the purposes of the Forest Department, and that department might with great propriety make some small annual contribution in respect of the maintenance of both.

19. *Library.*—It is obviously unwise economy to refuse a competent man the needful appliances for his work. A small, but carefully selected, library should gradually be brought together, which should comprise all the leading books on Indian botany, especially such as are cited in the "Flora of British India." To these should be added all works useful for reference bearing on the actual or possible cultural industries of Southern India. The library, being an office library, should be in the same building as the Director's office and at no great distance from the herbarium and museum.

20. *Correspondence and Archives.*—The great thing in administrative existence is to deal with a subject when it arises effectively and once for all. What strikes me, as I believe it has struck others, in connection with Indian work is the perpetual and recurrent oblivion of the past. Correspondents constantly write to Kew from Southern India as if the country had only recently been rescued from the deepest obscurity, and this is true, not merely of private individuals on their own behalf, but of representatives of large enterprises whom it might have been supposed would have mastered the A B C of their business before plunging into its actual inception. It seems absurd that practical men should constantly prefer to write Home rather than to utilize sources of information available on the spot. What then is imperatively needed is, in connection with the botanical establishment, a sort of intelligence department in which all available information on any subject likely to interest the planting or industrial communities should be systematically posted up and filed. This is done at Kew in simple self-defence. When the routine correspondence is examined each morning, it is impossible to predict from what quarter of the world or upon what subject an inquiry may present itself. It is necessary

* The climate of Ootacamund is better for the conservation of plants than that of Madras—perhaps even than that of England. The old laboratory can be adapted for a very small sum.—M.G.D.

then to have the materials for such inquiries cut and dried in advance. And the same system, to meet in degree the same need, is required at every botanical centre. As soon as it is known throughout the presidency that there is an officer with the necessary means of information prepared to deal with reasonable inquiries, there is no probability that his services will not be put in requisition. The annual reports of the department should briefly touch on any subjects which have been brought under its notice and occupied its attention during the year. Records should also be given of the progress of interesting plants entrusted to planters and others in different parts of the Presidency for experimental purposes. In the Botanical Department in Jamaica and to a less extent elsewhere it is found convenient to prepare and issue from time to time for general information a carefully prepared *précis* on any subject on which for the moment more than ordinary interest is manifested. Of course when the more trivial matters are filtered out and dealt with, the more difficult may, either officially or semi-officially, always be referred to Kew for the best available Home scientific examination and report.

The routine Government papers relating to botanical matters, which are from time to time issued by the Madras Government, and of which it has for some time been so obliging as to furnish Kew with copies, will afford an admirable nucleus for the Director's archives. It is a matter of constant surprise to me how admirably served the Government is even with the present system. But the information does not appear to me to permeate, and it is to facilitate this that the arrangement I now propose is directed.

21. I have now dealt with all that appears to me material relating to the organization of the department. I observe, however, that in his letter of August 19th, 1883, and report for 1883-84, the Director recommends that an extended series of meteorological observations should be undertaken by his department. This, from what I have observed elsewhere, I venture to think unadvisable. Such observations should, of course, be taken on the Nílgiri plateau. But meteorology has now passed out of the amateurish stage. If undertaken by the Government, as is certainly proper, it should be with the best methods and in harmony with the work of other meteorological stations throughout the Empire. It is not within my province to say what department of the executive should be charged with this duty. But I am quite clear that it is unadvisable for the Botanical Department to burden itself with what is in no way within its proper scope.

Arrangements might, however, very properly be made for posting the daily meteorological data at the entrance of the Botanical Garden.

22. The suggestions I have made will involve some immediate expenditure. The Madras Government has however, I believe, earned large sums by the cultivation of cinchona. Supposing that the proposals I have made commend themselves to His Excellency's Government, then I think there is a strong case for a fair, but in no way extravagant, outlay to put the new department on a proper working footing. And I here feel bound to point out, though entirely on my own initiative, that the salary and position of the Director will require consideration. Mr. Lawson was presented to the India Office for his present appointment in reply to an official communication of May 6th, 1882, in which "the services of a person of good scientific attainments and botanical experience together with some administrative capacity" were asked for "to take charge of the Government Cinchona Plantations on the Nílgiris." For this a salary of Rs. 600 a month was offered. Now Mr. Lawson's official duties were very speedily extended, and in all probability they will be still more so. I am quite sure that the Madras Government, on general grounds, will not be satisfied that a salary which it deemed proper for one set of duties should still be held sufficient when these are very considerably added to.

* * * *

24. *Agri-Horticultural Society, Madras.*—This is the only Botanical Garden in the plains of Southern India and, though subsidized by the Government, is not under its control. Founded in 1835, its establishment and early management owed everything to its first Secretary, Dr. Wight. The Government granted it 7 acres of land, to which an extension was sanctioned in 1855. From a sketch of the history of the Society drawn up by Dr. Bidie in 1869, it is abundantly evident that its operations have been of the greatest usefulness to the Madras Presidency. To its experiments in 1840 may be attributed the introduction of coffee cultivation. This is merely to cite one instance; but, if it had done nothing more than encourage the cultivation of European vegetables and of indigenous and naturalized fruits of superior quality, it would have earned the lasting gratitude of the community. It is much to be regretted that in more recent years the more scientific aspects of the garden seem to have been sacrificed with little consideration. That, however, is a matter upon which, as a private institution, the Society is entitled to judge for itself. At Kew we can only measure its activity by its proceedings, which certainly, for quick appreciation of the wants of the moment and careful editing, are not surpassed by anything of the kind published in India. The operations of the Society would not, I think, be interfered with by that of the Botanical Department which I have proposed. On the contrary I think that relations of the most friendly kind should always be cultivated between them. Furthermore, in consideration of the support which

Government extends to the Society, I think it might be fairly asked to act as agent to the department and undertake to receive and transmit its consignments of plants from and to other countries.

25. For the sake of directness of expression I have written this memorandum in the first person. Sir Joseph Hooker, however, authorizes me to say that, having given his best attention to the matter, all that I have written has his entire concurrence.

W. T. THISELTON DYER.

KEW,
10*th February* 1885.

ORDER—dated 15th April 1885, No. 433, Revenue.

Miscellaneous.

His Excellency the Governor in Council cordially approves, and is much indebted for, the suggestions for the constitution of a Government Botanical Department in this Presidency, which have been put forward by Mr. Thiselton Dyer with the concurrence of Sir Joseph Hooker. The measure will, besides subserving the interests of science, be of great and immediate practical utility, while it can in present circumstances be carried into effect at a very small cost to Provincial Funds, to which it is hoped the sanction of the Government of India and of Her Majesty's Secretary of State will be readily accorded.

2. Mr. Lawson will, of course, be the head of the new department, and his pay should, in the opinion of Government, be raised from Rs. 600 to Rs. 800 per mensem rising to Rs. 1,000 in five years. He is serving at present under no definite conditions, and the Government consider that his service from the commencement should be declared to count for leave and pension, and that he should be admitted to the benefit of the more favorable leave rules. Application will be made in the Financial Department for sanction to these proposals.

3. Under the new arrangement, Mr. Lawson will retain charge of the Cinchona plantations and the superintendence of the Botanical Gardens and Parks on the Nílgiris as at present. His official designation will be Government Botanist and Director of Cinchona Plantations.

4. On receipt of sanction, orders will issue on the minor points of organization noted in Mr. Thiselton Dyer's memorandum.

(True Extract.)

(Signed) W. WILSON,
Ag. Secretary to Government.

To the Financial Department.
,, the Director, Government Cinchona Plantations, Parks and Gardens, Nílgiris.
,, the Superintendent, Government Central Museum.
,, the Board of Revenue.
,, the Director of Revenue Settlement and Agriculture.
,, the Superintendent, Revenue Survey.
,, the Inam Commissioner.
,, the Public Department.
,, the Military Department.
,, the Public Works Department.
,, the Accountant-General.

Exd. W. H. French.

150 Copies.

S.W.D.

No. 1093 Rec'd 9 May 1885

Recorded.

(Signed) J.S.

Govt. of {1885} Madras.

REVENUE.

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Recd. *Encl.*

G.O., 15th April 1885, No. 433.

No. 1093 Rec'd 9th May 1885

APRIL.

S.E. III Circle

Botanical Department.

Orders passed on proposals regarding the constitution of a — in the Madras Presidency.

With order

26TH OCTOBER 1885, No. 1188, REVENUE.

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

READ—the following Proceedings of the Board of Revenue, dated 1st October 1885, No. 2783 :—

Read—again Proceedings of the Board of Revenue, dated 23rd July 1885, No. 2175.

ABSTRACT.—Communicating Government Order approving proposal to establish an experimental botanical garden at Calicut, and requesting certain Collectors to report on the places suggested for the establishment of experimental gardens.

Read—also letter from the Collector of North Arcot, dated 3rd August 1885, No. 278.

Read—also the following letter from C. A. GALTON, Esq., Acting Collector of Bellary, to the Secretary to the Board of Revenue, dated 12th August 1885, No. 2858 :—

In reply to Board's Proceedings, dated 23rd July, No. 2175, I have the honor to state that an experimental garden established on the Rámandrug plateau or in some portion of the Sandúr valley would enjoy the most favorable conditions to be obtained in this district, but I presume the object is to test the capabilities of the district generally, and in that case a locality which presents a fair sample of the climate and soil ought to be selected in preference to one possessing exceptional advantages. The different taluks vary so much that it is rather difficult to make a selection, but I think, on the whole, Hospet will be the best spot. The soil is fertile (red, not black), and the town is on the line of rail. There are moreover irrigation channels from the Tungabhadra close at hand, so that irrigation could be obtained if required for experiments. I have no doubt a suitable site could be selected in this locality, but land commands a high price. For wet lands taken up for the railway, Rs. 300 an acre, and even more in some cases, was paid.

2. As regards Rámandrug, I may mention that there is in existence a garden situated in a basin just below the plateau, which was formerly a soldier's garden and is the property of Government. It is at present in possession of General Fischer, who, I believe, pays no rent, but obtained permission to make use of it as a vegetable and flower garden. There are some good fruit trees planted by former Collectors, but the garden has been neglected of late and is overgrown. If required, it could, I imagine, be made available at once without cost. I can ascertain, if desired, the terms on which General Fischer obtained the garden.

Read—also the following letter from L. R. BURROWS, Esq., Collector of Nílgiris, to the Secretary to the Board of Revenue, dated Ootacamund, 12th August 1885, No. 212 :—

With reference to Board's Proceedings, No. 2175, dated 23rd July 1885, calling for report on paragraph 2 of G.O., No. 786, dated 3rd idem, Revenue, I have the honor to state that, if it is decided to establish an experimental botanical garden in South-East Wynaad, Gúdalúr, the head-quarter station of the Deputy Tahsildar, appears to me to offer every advantage for the purpose, in preference to Nellakóta or

S.W.D.

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2. As regards Rámandrug, I may mention that there is in existence a garden situated in a basin just below the plateau, which was formerly a soldier's garden and is the property of Government. It is at present in possession of General Fischer, who, I believe, pays no rent, but obtained permission to make use of it as a vegetable and flower garden. There are some good fruit trees planted by former Collectors, but the garden has been neglected of late and is overgrown. If required, it could, I imagine, be made available at once without cost. I can ascertain, if desired, the terms on which General Fischer obtained the garden.

Read—also the following letter from L. R. BURROWS, Esq., Collector of Nílgiris, to the Secretary to the Board of Revenue, dated Ootacamund, 12th August 1885, No. 212 :—

With reference to Board's Proceedings, No. 2175, dated 23rd July 1885, calling for report on paragraph 2 of G.O., No. 786, dated 3rd idem, Revenue, I have the honor to state that, if it is decided to establish an experimental botanical garden in South-East Wynaad, Gúdalúr, the head-quarter station of the Deputy Tahsildar, appears to me to offer every advantage for the purpose, in preference to Nellakóta or

any other stations in the tract. Gúdalúr is near Naduvatam, and an experimental garden there can easily be supervised by Mr. Lawson whenever he visits the Cinchona plantations, and the Revenue subordinates can keep an eye on the garden.

Read—also the following letter from G. McWATTERS, Esq., Collector and District Magistrate of Salem, to the Secretary to the Board of Revenue, dated 26th August 1885, No. 2088 :—

With reference to Board's Proceedings, No. 2175, dated 23rd July 1885, I have the honor to strongly recommend the establishment of an experimental botanical garden on the site near the Yercaud lake lately acquired for the purposes of a park by the Local Fund Board. I have consulted Dr. Shortt in the matter, and I enclose copy of his letter to me.

Enclosure.

Letter from J. SHORTT, Esq., M.D., Retired Deputy Surgeon-General, to the Collector of Salem, dated Yercaud, 24th August 1885.

With reference to the Proceedings of Board, dated 23rd July 1885, No. 2175, and your endorsement thereon, No. 2060, of 21st August 1885, with the copy of the Board's Proceedings, No. 1354, dated 7th May 1885, forwarded to me for opinion as to whether the Shevaroy Hills would be a good place for an experimental botanical garden, I have the honor to state that no better place could be found for such a purpose. These hills are situated 78° 20′ east longitude and 11° 50′ north longitude; they are somewhat centrically located, and bounded on the east by the Arcot Collectorate, on the west by Coimbatore, on the south by Trichinopoly, and on the north by the province of Mysore. The average height of Yercaud, its principal station, is 4,420 feet, whilst the highest point, the Green Hills, is 5,000 feet above sea level; the average rainfall 65 inches, the maximum temperature 75°, and the minimum 48° F. The climate may be pronounced in one word "Italian." These hills are skirted by the Madras Railway; the Shevaroy hill station is 12 miles and the Salem station 14 miles from Yercaud. The advantages of the vicinity of the railway I need not dwell on, whilst Madras is 216 miles and the distance travelled over in about 16 hours by rail.

2. The soil is rich, varying from disintegrated granite, ferrugineous clay intermixed with nodules of laterite and granite boulders. Most foreign plants grow well here, some few only require attention during infancy or until they become established in the soil. Most Indian and foreign fruits attain perfection, the rarest is the Cherimoyer, which, I believe, has only fruited on these hills and nowhere else in India. All the Australian gums and acacias and other plants thrive well here; as a curiosity we have the Cajeput tree flourishing among us, as also the cinchona, coffee, tea, nutmeg, cinnamon, rubber, &c., and a variety of other trees; most of these have received no care beyond being put down. Taking all these circumstances into consideration, it strikes me that no better locality can be selected for a botanical garden, possessing as it does a good climate, the railway close at hand, and its somewhat central situation to other districts and vicinity to Madras are advantages which should not be lost sight of. I would beg to suggest that two gardens, one at Yercaud and the other on the western side of these hills towards Nágalúr at an elevation of from 2,500 to 3,000 feet above sea-level, should be selected, and between these two points a varying climate from such as exists at Barliyár and Coonoor can be obtained. As regards Yercaud itself, the Local Fund Board already possess a splendid site, which they have recently acquired, of some 14 or 15 acres near the lake; this land is well and centrically situated, with a good soil and command of water, and it can at once be converted into a park and botanical garden; the two combined in one would add to the beauty and appearance of the place and increase its value as a scientific garden at the same time.

3. Should further information of these hills be considered necessary, I would beg to refer you to the "Hill Ranges of Southern India," Part II, article—The Shevaroy Hills.

Read—also the following letter from J. LEE-WARNER, Esq., Collector of Tinnevelly, to the Secretary to the Board of Revenue, dated Kuttálam, 16th September 1885, No. 490 :—

In reply to Resolution, dated 23rd July 1885, No. 2175, I have the honor to report that all the Divisional officers whom I have consulted are in favor of opening a

garden at some selected spot in the hills about Ilanji or Kuttálam; but they are emphatically of the opinion that to make it a success, a reliable officer working under the orders of a specialist must be always on the spot. Mr. Brasier suggests that if no suitable Government forest can be taken up, an area sufficient for all practical purposes can be acquired from owners of coffee plantations, some of whom may be found willing to surrender the uncleared portion of their estates. At the same time I must bring to the Board's recollection that prior to 1853 there were nineteen spice gardens managed under Government auspices, of which thirteen were on the hills and six in the plains below, all within the Kuttálam influence. When it was found in 1852 that the charges from Fasli 1216 to Fasli 1261 had been Rs. 76,290-14-0, while the collections for the same period reached only Rs. 49,141, meaning a net loss to Government of Rs. 27,149, it was decided (*vide* extract from the Proceedings of the Board of Revenue, dated 24th February 1853), that they should all be disposed of by public auction to the highest bidder. Mr. Cocq bought the Paradési and other spice gardens just above the falls of Kuttálam, where his successor, Mr. Clark, exhibits with just pride to visitors his magnificent cloves, nutmegs and mangosteens which are the only relic now of the labors of so many Collectors and the expenditure of so much money.

2. My own opinion is that we should take the lesson which history teaches. It has been shown that these experiments fail when they are conducted by Government, whose employés are not personally interested in their success. If Mr. Lawson or any other specialist wants to make an experiment with a new plant, his best plan is to engage the interest of the planters. Mr. Clark, for instance, I feel sure, would be delighted to try any experiments suggested to him, especially if they are shown to promise a good return to his labor. Seed could be supplied to him, or more use could be made of forest agency. I am aware that the Forest Department hold that botany is not a branch of forestry, but inasmuch as the forest rangers have their huts scattered about the hills with little patches of cleared ground round them, and there is generally some care-taker who has nothing else to do, I do not see why arrangements should not be made between the Conservator and Mr. Lawson to institute experiments there. These hills are very feverish at certain times of the year, and I am afraid that the reliable officer, who, Mr. Brasier recommends, should always be on the spot to give his whole time and attention to the carrying out of botanical experiments, would not be proof against it.

Read—also letter from the Collector of Ganjam, dated 20th August 1885, No. 2984.

Read—also letter from the Collector of Ganjam, dated 19th September 1885, No. 3461.

Resolution—dated 1st October 1885, No. 2783.

The above papers contain the replies of the Collectors consulted as to the most desirable localities in which to establish experimental botanical gardens, the formation of which was approved in G.O., 3rd July 1885, No. 786.

2. The Collector of Nílgiris recommends Gúdalúr as offering every advantage and being within easy reach of the cinchona plantations about Naduvatam, whence the proposed garden could conveniently be inspected by the Director.

3. The Collector of Tinnevelly is in favor of opening a garden at some selected spot in the hills about Ilanji or Kuttálam, provided that a reliable officer working under the orders of a specialist like Mr. Lawson be always on the spot. At the same time, the Collector points out that the hills are very feverish at certain times of the year. The spice gardens established at Kuttálam in 1806 were sold by auction in 1853, the Madras Government of that day being of opinion that it was doubtful whether any object would be gained by their retention as public property (Extract from Minutes of Consultation, 8th February 1853).

4. The Collector of Ganjam suggests Russellkonda and Mahendragiri (about 5,000 feet above sea level) as suitable localities.

5. The Collector of Bellary selects Hospet as the place best suited in the plains for the purpose of a botanical garden, having the Tunghabadra channels close at hand; but he remarks that on Rámandrug, which is the best locality if the object of the experiment is not to test the capabilities of the district generally, there is already a garden, now neglected, but formerly kept up by the soldiers, which could probably be made available at once without cost.

6. The Collector of Salem, supported by the opinion of Dr. Shortt, strongly recommends the establishment of an experimental garden near the Yercaud lake on the site lately acquired by the Local Fund Board.

7. In North Arcot, the most suitable localities are Chittoor and Palmanér, both of which have been tested by the actual experience of the Board's Third Member.

8. The Board recommend that in addition to Ootacamund, Coonoor, Barliyár and Calicut, experimental botanical gardens be established at Gúdalúr, Kuttálam, Russellkonda, Hospet, Rámandrug, Yercaud, Chittoor and Palmanér.

(True Copies and Extract.)

(Signed) E S. LAFFAN,
Acting Sub-Secretary.

To the Secretary to Government, Revenue Department,
with papers in original.
Copy to the Director of Revenue Settlement and Agriculture.
„ to all Collectors.

ORDER—dated 26th October 1885, No. 1188, Revenue.

Miscellaneous.

Referred to the Director of Government Cinchona Plantations for remarks.

(True Extract.)

Ag. Secretary to Government.

To the Director, Government Cinchona Plantations,
with 14 enclosures in original to be returned.
„ the Board of Revenue.

Exd. W. H. French.

50 Copies.

to doubt for a moment Mr. Lee-Warner's statement; but the planter has generally too much upon his hands to pay that close attention to the cultivation of new plants which is so necessary, when the conditions of their growth, in a new country, are imperfectly understood. Mr. Lee-Warner speaks highly of the country about the falls of Kuttálam, and as this is a place of great botanical renown, I do not think that Government could do wrong in establishing a garden here.

7. In addition to the above, I think that a garden in the neighbourhood of Russellkonda in Ganjam would prove of use, as it is in the extreme north of the presidency and on the east coast. I do not however know anything of that part of the country.

8. I would suggest then that, in addition to the gardens at Ootacamund, Coonoor, Barliyár, and the one sanctioned at Calicut, there should be established four new ones, Rámandrug, Gúdalúr, Kuttálam and Russellkonda. If these new gardens are sanctioned by Government, the cost of making them and the cost of their upkeep would be as much as Government would find advisable, while their proper inspection would occupy as much time as the head of the Botanical Department could conveniently afford.

Order—dated 3rd December 1885, No. 1337, Revenue.

Miscellaneous.

The Government consider that to begin with it will be sufficient to establish gardens at Gúdalúr and Kuttálam under the management of trained overseers. Mr. Lawson should visit Rámandrug and Yercaud and report, after inspection, in which of these localities he would propose to establish a garden. Russellkonda appears to be too remotely situated to be convenient, and the question of establishing an experimental garden there may for the present be omitted from consideration.

(True Extract.)

Ag. Secretary to Government.

To the Director, Government Cinchona Plantations, &c.
" the Board of Revenue, with fourteen enclosures returned.
" the Director of Revenue Settlement and Agriculture, with copy of G.O., No. 1188.
" the Superintendent, Government Central Museum, with do.
" the Financial Department, with do.
" the Accountant-General, with do.
" the Honorary Secretary, Agri-Horticultural Society, with do.
" the Public Works Department, with do.

Exd. W. H. French.

120 Copies.

Govt. of {1885} Madras.

REVENUE.

Issued

Recd. 12/12/85. Encl. 1

G.O., 3rd December 1885, No. 1337.

DECEMBER.

Experimental Botanical Gardens.

Considering it sufficient to establish — at Gúdalúr and Kuttálam under management of trained overseers, and Mr. Lawson directed to visit Rámandrug and Yercaud and report in which of those localities he would propose to establish a garden.

17th August 1886, No. 720, Revenue.

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

Read—letter from M. A. LAWSON, Esq., Government Botanist and Director of Cinchona Plantations, Nílgiris, to the Secretary to Government, Revenue Department, dated Ootacamund, 6th July 1886, No. 32.

Abstract.—Forwarding the annual Administration Report on the Government Botanical Gardens and Parks, Nílgiris, for the year 1885-86.

REPORT OF THE DIRECTOR, GOVERNMENT BOTANICAL GARDENS AND PARKS, NILGIRIS, FOR 1885-86.

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I. Season.—The weather during the past year was all that could be desired for carrying on horticultural operations. The amount of rain registered was 52·48 inches, spread over 142 days. The early part of the season was dry, but the monsoon broke unusually early, after which the rain was light and continuous. The frost during January was severe, but owing to the dryness of the weather, little harm was done.

II. General Condition of the Gardens and Parks and improvements which have been made in them during the year—(1)—Ootacamund—(*a*) *Government Gardens.*—These gardens have improved in appearance during the past year, the lawns were kept constantly mown and are in good order. The trees and shrubs which had been planted during the two previous years are doing well, and are beginning to make a show. The ground at the entrance of the gardens has been laid out and shrubs and flower beds have been planted with the view of improving this formerly unsightly piece of land. The ravine above the Doctor's house has been cleared of brambles and brushwood and will be planted up with shola trees as soon as the monsoon rains begin. The rest of the upper part of the gardens was planted up during the past year with a large variety of ornamental shrubs and trees. A considerable portion, however, of this land is still very rough and untidy, but I expect to be able during the next dry season to put this in order at a small cost. The ground lying around the old Cinchona laboratory has been levelled and sown with different kinds of grasses, the seed of which was presented to the gardens by His Excellency the Commander-in-Chief with a view to experimentation upon their value as fodder. Next year this ground will be laid down in permanent grass and form part of the gardens. The roads and walks in the lower part of the gardens are in fairly good order but want re-gravelling; some of the

paths also in the other part of the gardens have been re-made or improved, but there is still a good deal wanting before they can be said to be in a satisfactory state. A tank to supply water for the fountain which it is proposed to place in the pond opposite the band-stand has been made, and pipes laid down to the pond; but, owing to the great difficulty of getting a proper jet, the fountain has not yet been started.

Kitchen Garden.—During the past winter, I converted one of the terraces in the upper part of the gardens into a kitchen garden which has been sown with all the more common kinds of European vegetables, and I shall report upon them next year. The vegetables obtainable in Ootacamund are very good, and I do not expect that they will be much improved upon. There is, however, room for improvement in our fruit trees, especially the Native ones. The European kinds as a rule do not thrive.

Garden for Herbaceous Plants.—On another terrace adjoining the kitchen garden, I began an herbaceous botanical garden, but the plants have not done well, owing I think chiefly to its very exposed situation.

Nurseries.—The old nurseries having become overcrowded with plants, I am converting the remainder of the terraces into new ones, and these will be completed during the present season. Our stock of plants has increased enormously both as regards variety and numbers, as will be seen from a perusal of the price list which was printed for distribution last spring.

Buildings.—A carpenter's shop and tool house were built in the lower part of the gardens to take the place of the old ones which have been converted into store-houses.

In my last year's report I stated that the conservatory on the lawn facing the entrance gates was in a very bad state of repair and would not last many years longer. That to repair it thoroughly would cost a large sum of money, while all the plants which it now contains would have to be removed if it was restored. I therefore recommended that this house should be allowed to remain as it is until it was no longer serviceable and that it should then be pulled down and rebuilt on some other part of the gardens, because if this building were removed from its present site there would be a continuous stretch of lawn from the entrance to the gardens to the band-stand tank. Government in reviewing my report in paragraph 3 seem to approve of my suggestion, and I would therefore recommend that the conservatory should be removed during the forthcoming dry season as the upper lights are still in good condition and might be worked up in constructing a new green house; but I cannot guarantee their soundness without repairs after the present season, and, if Government approve, I will send in specifications and estimates. The estimates, however, must needs be only approximate; for until the old building is pulled down, it will be impossible to say exactly how much of the old material can be used. Making a rough guess, I think it would be about Rs. 2,500. The roof of the curator's house is in a bad state of repair, being now many years old, and, consisting as it does of native tiles and mats, it leaks considerably, and I would ask that the present roof should be replaced during the coming winter with corrugated iron and Coonoor tiles.

The witty practice of destroying labels or of changing their places is not confined to public gardens in England, as it has been manifested during the last year in these gardens.

(*b*) *Government House Gardens.*—These are in a better state than they have been hitherto. The lawns about the place are in fair order, flower beds and shrubberies have been planted, which make the place look less bare, and now that proper spouting has been put up around the roof of Government House and that of the Private Secretary it will be possible to plant creepers up the walls. In my last year's report I stated that many of the trees in front of Government House were in a bad condition, and that I thought they would not last many years longer, and I regret to say that my prognostication has only been too fully verified. Several scores of big trees have been cut down during the year, and as many more will, I am afraid, have to be removed during the present one. The green house which was put up last season has proved to be a good one for growing plants in.

The blue-gums which are in close proximity to the servants' houses ought to be removed as, in my opinion, they are dangerous. The trees are one hundred and fifty feet in height, and if during one of our high winds any were to be blown down and fall over these houses serious damage and even loss of life might be the result.

(*c*) *Stonehouse Park.*—The trees which were planted out on this estate the year before last are doing well. A little planting was done during the past year, and a little more which will be carried out during the present season will complete all that is wanted. Barbed wire for fencing this estate has been ordered from England, and will be put up as soon as it arrives.

(*d*) *Church Hill Park.*—The usual upkeep has been maintained.

(*e*) *Crewe and Ottley Hall Estates and adjoining ground.*—These estates were kept weeded during the year and portions of them planted with trees and shrubs. The land lying between Crewe Hall and Stonehouse was fenced to keep out cattle. This bit of ground is in a very rough state, and I propose digging or ploughing it up during winter and planting it perhaps with potatoes or some other such crop for one season with a view of cleaning it, after which it will be put down in grass.

(2). Coonoor—(*f*) *Sim's Park.*—The condition of this park is good. Several of the bridges have been substantially repaired, and the roads and paths have all been maintained in good order. The bridle road through the new shola has been finished at a total cost, including the bridge, of Rs. 642-9-1. This road is much frequented and is, I think, a great addition to the park.

Nurseries.—These have been established and are being gradually stocked with the indigenous plants of the neighbourhood.

(3). Barliyar—(*g*) *Experimental Garden.*—Things are looking well in these gardens. Several new plants have been put out here during the year, but damage was done to some of them by wild pig. Of the old plants, the Mangosteen and Litchi produced a quantity of fruit. It is odd that there should be so little demand for these trees, for, after the mango, they are by far the best fruits which we have in Southern India, and, I believe, that they would thrive and grow rapidly in almost any part of the country.

(4). Kalhatti—(*h*) *Experimental Garden.*—No addition in the way of planting has been made to these gardens.

(5). Proposed New Gardens—(*i*) *Gúdalúr.*—I have inspected several plots of ground in the neighbourhood of Gúdalúr, any of which would be suitable for an experimental garden, and which could be leased on reasonable terms from the Rajah of Nilambúr; but I have as yet taken no action in establishing a garden there, as the time of my subordinate officers has been too fully occupied in carrying out pressing works in the other Government gardens, but I should be very glad if Government would sanction the opening out of one of five acres during the next winter. The cost of starting a garden in this locality would not be great.

(*j*) *Calicut.*—I had hoped to have seen a garden established at Calicut, as the climate is so different to that of any of the others which Government possess; but, owing to the great value of the land, the cost of obtaining a suitable site would have been so great that the project has been obliged to be abandoned *vide* (G.O. of 31st March 1886, No. 151, Revenue). The Board of Revenue in their Proceedings, No. 2783, of 1st October 1885, proposed that in addition to Ootacamund, Coonoor, Barliyár and Calicut, there should be established experimental gardens at Gúdalúr, Kuttálam, Russellkonda, Hospet, Rámandrug, Yercaud, Chittoor and Palmanér; but Government, for various reasons, objected to all except Gúdalúr, Kuttálam, Rámandrug and Yercaud, and I was ordered (*vide* G.O., No. 1337, of 5th December 1885, Revenue), to visit these places and to report upon the advisability of establishing gardens there. This I have not yet done, because the best time of judging the capabilities of a site is during the time when the natural vegetation is most vigorous and that is during the rains, but I intend visiting all these places during next July and August, and after doing so, I shall report to Government specially upon each site.

III. Proposed Museum of Natural History in Ootacamund.—In reviewing my report of last year, I was desired to obtain and submit plans and estimates for the building suggested by me. This has been done.

IV. Herbarium.—The number of dried plants collected during the last few years had accumulated to such an extent that the old office at the entrance of the gardens was inadequate for the purpose of properly storing them, and I therefore asked to be allowed to convert the old Cinchona laboratory into a new repository for the collection.

This alteration Government sanctioned, and the herbarium is now housed in its new house. The building is roomy and all that I can desire. Government is indebted to the following gentlemen for liberal donations during the past year :—

(1) *Mr. Gamble, Conservator of Forests, Northern Circle*, has again been the chief contributor and to him more than to any one else I have to return thanks for information and assistance on every possible point connected with the flora of the Presidency.

(2) *Mr. Hollingsworth, Apothecary and Assistant to the Professor of Chemistry in the Presidency College*, has also, out of his abundance, supplied me with much valuable information and many rare plants, both cultivated and indigenous.

(3) *Mr. A. E. Castle-Stuart Stuart* obligingly sent to the herbarium the collections which he made during his sojourn in the Wynaad during the past year.

(4) *Mr. J. Cameron, Superintendent of the Lâl Bagh Gardens, Bangalore*, has also continued his benefactions, consisting of several collections of plants made in the neighbourhood of Bangalore.

(5) *The Honorable A. Sahsiah Sastri, C.S.I., Dewan to His Highness the Rajah Bahadur of Pudukótah*, has sent two most interesting collections of well-dried specimens of plants which are used by the natives of the State of Pudukóta as drugs.

(6) *Mr. C. Benson, Assistant Director of Agriculture*, sent a small collection of grasses used as fodder in different parts of the Presidency.

V. Library.—Rs. 590-4-1 were spent during the year on books, Rs. 365-14-3 being spent on botanical works, and Rs. 224-5-10 on chemical works for the use of the Quinologist; the balance of the allotment of Rs. 1,200, or Rs. 609-11-11, was unexpended because it was not known what botanical works might be eventually obtainable from the library of the Central Museum, Madras. This will now shortly be determined, as I propose during the coming autumn to visit the Museum with the view of arranging for the transfer of the herbarium to this Department.

VI. Notes on some of the more interesting Plants which have been introduced or grown in the Gardens during the year.

1. *Erythroxylon coca.*—This plant grows very rapidly from seed and cuttings, and a large number were raised in the green houses at Ootacamund, but the demand for it has ceased, and I think wisely, for although there can be no doubt but that the plant would grow well in many parts of Southern India, it would not be likely to compete profitably with the vast tracts of country in South America where it is already so largely cultivated.

2. *Eucalyptus.*—Major A. C. Smith, R.E., Executive Engineer, Public Works Department, has frequently spoken and written to me about the desirability of growing the better sorts of Eucalyptus in this country for the purposes of timber. The following species flourish on these Hills :—

E. marginatus, E. siderophloia, E. calophylla, E. piperita, E. obliqua—All these are reckoned admirable as timber trees in Australia, and in the course of a few weeks I could supply the Conservator of Forests with seed of all of them.

3. *Castilloa elastica.*—Colonel Campbell-Walker in a letter to the Board of Revenue, No. 2156, of the 27th January 1886, embodied in G.O., No. 231, of the 24th March 1886, Revenue, states that this valuable *Indian rubber*-producing tree has at last been finally established by Mr. T. J. Ferguson at Calicut. I saw Mr. Ferguson's trees 18 months ago, and they were growing magnificently, and as it has at last been found easy to raise these trees from cuttings, I hope they will in the future form no unimportant item in the forestry of this place. The other rubber-producing plants have so far been a failure, either through their not yielding as much rubber as they do in America, or because we have not yet learnt how to tap the trees properly.

4. *Mahogany.*—In my last year's report I stated that I had received two casks of the seed of this plant from Mr. Thiselton Dyer. The seed arrived in magnificent

order and was distributed chiefly to Colonel Campbell-Walker and Mr. Gamble of the Forest Department and to the Agri-Horticultural Society in Madras. Almost every seed germinated and tens of thousands of plants must have been raised. From a single pound sown in the green houses at Ootacamund, between three and four thousand plants were obtained, some of these have been sold and the remainder will be handed over to Mr. Gamble.

I had the pleasure of visiting last autumn the teak forest in charge of Mr. G. Hadfield, Deputy Conservator of Forests, Nilambúr. It was a treat to see the grand growth which the teak trees had made during the last 40 years. In the forest were many fine specimens of young Mahogany trees, but they were suffering from the ravages of a grub which attacks the buds of all the leading shoots. In other situations the Mahogany might not suffer from these pests.

5. *Quilaja saponaria.*—This plant thrives well in Ootacamund and it is found that it can readily be propagated by means of cuttings, so that if it proves to be a tree of any value, it can be increased to any extent.

6. *Kumera.*—The tubers of this plant have been raised, and on being eaten, proved palatable.

7. *Ullucus tuberosus.*—I received this plant from Mr. Thiselton Dyer. It grows freely in the open air at Ootacamund, and it would seem likely to yield a heavy crop of small tubers. Its name is derived from the river Ullucus, a river in the north-west of South America, in the neighbourhood of which it is found growing wild.

8. *Arracacia and the Cochin tuberous-rooted Vine.*—On neither of these am I able this year to report, as the former has not yet produced any tubers, and the second, although it flowered at Barliyár for the first time this spring, has borne no fruit.

9. *Hop.*—I am indebted to Mr. J. L. Holland, the Manager of the Nílgiri Brewery, for some cuttings of the hop, from which I purpose raising a large stock. I fear that the climate of these Hills is not likely to suit the plant, but I shall at any rate give it a fair trial.

10. *Ipecacuanha.*—In my last year's report I was obliged to confess that I had lost a large number of these plants, but during the past year, Mr. Jamieson, who has paid particular attention to again getting up our stock, has now about 200 plants. I saw a bed of Ipecacuanha growing very vigorously in the teak forest at Nilambúr, the climate of which seems to suit it much better than that of Barliyár.

11. *Pteroxylon utile.*—Mr. Gamble gave me a considerable amount of the seed of this valuable timber tree, which is a native of South Africa. On dissecting the seed it appeared to be perfectly sound, but on attempting to germinate it in the green houses at Ootacamund, I failed completely notwithstanding that it was sown under several different conditions. I am glad to hear from Mr. Gamble that he has been more successful, so that this tree will, I hope, be added to the long list of timbers which will in future years adorn our Hills.

12. *Mr. J. Gammie, Superintendent of the Cinchona Plantations, Darjeeling.*—To this gentleman I am indebted for the seeds of several useful or ornamental plants growing in the neighbourhood of Darjeeling. The chief of which are *Phœnix rupicola, Areca gracilis, Wallichia disticha, Calamus flagellum, Hollbellia latifolia.*

13. *Miss Baker of Peermaad, Travancore.*—To this lady the gardens are indebted for sundry *Impatiens* and *Souerilas* collected on the mountains of Travancore. None of them has as yet flowered, but to judge from their leaves and their habit of growth, they appear to be different species to those which we get here, and as such will be of much interest.

14. *Mr. T. Hanbury.*—From the magnificent donation of seeds which we received from this gentleman through His Excellency the Governor last year, a very large number of plants have been raised in the green houses. Among the most interesting of the plants are the Acacias, many of which are new to the gardens, and bid fair to be very ornamental. *Fuchsia procumbens* also promises to make a fine basket plant.

15. *Coniferæ.*—Several of the Coniferæ grow magnificently on the Nílgiris. (1) *Pinus insignis.*—Trees of six years old are sixty feet in height, and those of fifteen years of age yield an abundance of excellent timber. (2) *Cupressus torulosa.*—Though

not nearly so rapid in its growth as the former, this flourishes well, and at the end of twenty-five years makes a massive tree of sixty to seventy feet in height. (3) *Cupressus macrocarpa and its varieties* grows with surprising rapidity, but from their branching character are more suited for the purposes as fuel than for timber. (4) *Cryptomeria Japonica* grows well while young, and will, I have no doubt, grow into a fine tree, but there are none of any great age on the Nílgiris.

16. *Tristania conferta, Syncarpia, Caurifolia Angophora, subvelutina and Grevillea robusta.*—All grow rapidly and make fine trees. I was told that in the Wynaad there were *Grevilleas* which had been planted out only eighteen months, that were five and twenty feet in height. It ought, however, never to have been called *Grevillea robusta*, for it has in its living state the most brittle wood I know. The branches are always snapping off with the slightest breeze; but grown in sheltered places, it becomes a noble tree. Its wood is beautifully grained and is well adapted for all the purposes of the cabinet-maker.

VII. Receipts and Expenditure—The budget estimate of receipts for the year was Rs. 2,850. The actual amount realized was Rs. 3,055-7-6, Rs. 3,038-4-10 being paid into the treasury and Rs. 17-2-8 adjusted by the Indian Medical Department on account of the value of drugs supplied to them. This is Rs. 205-7-6 more than the estimate and Rs. 977-11-5 more than the actuals of last year.

The receipts are detailed thus :—

		Rs.	A.	P.
Government Gardens, Ootacamund		2,499	4	3
Do.	Barliyár	353	15	7
Do.	Kalhatti	129	0	0
Do.	Jalap tubers, &c.	56	1	0
Do.	Drugs supplied to the Indian Medical Department	17	2	8
	Total ..	3,055	7	6

The budget estimate of expenditure was Rs. 27,229. The actual expenditure for the year has been Rs. 26,619-4-1 detailed thus :—

		Rs.	A.	P.
Government Gardens, Ootacamund		18,336	3	1
Do.	Barliyár	487	11	3
Do.	Kalhatti	328	8	8
Medicinal garden		262	10	0

Sim's Park.

	Rs.	A.	P.			
Temporary establishment	2,166	13	7			
Pay of a watchman	108	0	0			
Making a road and bridge	642	9	1			
				2,917	6	8
Stonehouse Park				688	2	0
Church Hill Park				96	0	0
Upper Norwood				3,120	11	8
Crewe and Ottley Hall estates				381	14	9
			Total ...	26,619	4	1

showing a saving of Rs. 609-11-11; but from this latter sum there must be deducted the price of the barbed wire for fencing the gardens which has not yet arrived. The expenditure has been Rs. 2,044-7-6 more than that of last year the excess being due chiefly to the Crewe and Ottley Hall estates having been placed during the last year under the management of the gardens, and to an increase in expenditure on Sim's Park and the upper Norwood Gardens.

VIII. Miscellaneous.—A price list of plants was printed during the past winter.

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

Return of Seeds, Plants, &c., distributed from the Government Botanical Gardens, Ootacamund, Barliyár and Kalhatti, during the official year ending 31st March 1886.

Months.	Fruit Trees.		Timber Trees.		Ornamental Shrubs and Herbaceous Plants.	
	Number of Plants.	Value.	Number of Plants.	Value.	Number of Plants.	Value.
1	2	3	4	5	6	7
		Rs. A. P.		Rs. A. P.		Rs. A. P.
April 1885	351	87 6 0	34	10 0 0	1,065	57 8 0
May ,, ...	12	5 0 0	6	2 4 0	391	75 8 0
June ,, ...	68	28 6 0	51	15 0 0	700	74 2 0
July ,, ...	..	..	734	156 0 8	336	60 10 0
August ,, ...	12	4 8 0	199	54 12 0	241	53 5 0
September ,, ...	188	47 0 0	102	21 4 6	229	57 6 0
October ,, ...	3	2 0 0	16	3 0 0	405	52 8 0
November ,, ...	33	11 2 0	243	21 4 0	60	19 11 0
December ,, ...	10	5 0 0	573	44 0 0	118	37 4 0
January 1886	50	3 0 0	1,291	49 6 0	96	40 8 0
February ,, ...	..	..	1,000	50 0 0	61	22 12 0
March ,, ...	402	101 4 0	131	38 0 0	533	144 6 0
Total ..	1,129	294 10 0	4,380	464 15 2	4,235	695 8 0

Months.	Vegetable Flower and other Seeds.		Bouquets and Cut-flowers.		Sundry Receipts.			Total.
	Number of Packets.	Value.	Number of Bouquets and Cut-flowers.	Value.	Bandy-loads of Fuel.		Packing charges, &c.	
1	8	9	10	11	12	13	14	15
		Rs. A. P.	B. C.P.	Rs. A. P.		Rs. A. P.	Rs. A. P.	Rs. A. P.
April 1885 ..	89	49 14 9	0 1	2 8 0	79	197 8 0	52 15 0	457 11 9
May ,, ..	375	85 14 9	5 8	12 2 0	18½	53 12 0	26 12 0	261 4 9
June ,, ..	323	59 7 6	10 30	64 8 0	8	24 0 0	26 3 2	291 10 8
July ,, ..	649	150 7 3	6 6	22 8 0	..	..	107 10 3	497 4 2
August ,, ..	217	65 2 3	3 13	21 10 0	6	18 0 0	6 11 6	224 0 9
September ,, ..	258	44 10 9	5 3	15 6 0	1	3 0 0	72 0 9	260 12 0
October ,, ..	129	25 8 0	0 13	5 10 0	1	3 0 0	22 0 6	113 10 6
November ,, ..	129	28 9 6	2 1	4 8 0	..	..	10 6 0	95 8 6
December ,, ..	62	12 3 3	2 1	4 8 0	..	..	44 3 3	147 2 6
January 1886 ..	71	32 15 6	6 1	8 8 0	2	6 0 0	69 11 6	210 1 0
February ,, ..	381	32 1 0	0 2	1 12 0	1	3 0 0	35 12 0	145 5 0
March ,, ..	125	27 7 3	2 5	4 8 0	..	..	18 4 0	333 13 3
Total ..	2,808	614 5 9	41 84	168 0 0	116½	308 4 0	492 9 11	3,038 4 10

Comparative Statement of Rainfall in the Government Botanical Gardens for 1884-85 and 1885-86.

Months.	1884-85.		1885-86.	
	Number of Rainy days.	Rainfall.	Number of Rainy days.	Rainfall.
April	7	3·35	4	1·00
May	12	5·20	9	1·87
June	16	5·14	28	9·76
July	12	1·87	21	4·26
August	21	6·88	14	2·82
September	17	3·03	19	6·19
October	25	22·84	20	12·79
November	21	10·22	11	8·12
December	9	4·89	10	4·78
January	...	...	..	..
February	...	...	...	...
March	4	·27	6	0·89
Total ...	144	63·69	142	52·48

Ootacamund,
6th July 1886.

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

Statement showing the Receipts of the Government Botanical Gardens and Parks for the official year ending 31st March 1886.

Particulars.	Actuals, 1884-85.	Budget estimate, 1885-86.	Actuals, 1885-86.
Government Gardens, Ootacamund.	Rs. A. P.	Rs. A. P.	Rs. A. P.
Sale of seeds, plants, &c.	1,792 2 10	2,500 0 0	2,499 4 3
Government Gardens, Barliyár.			
Sale of plants, fruits, &c.	175 14 9	200 0 0	353 15 7
Government Gardens, Kalhatti.			
Sale of plants, &c.	14 8 0	50 0 0	129 0 0
Government Medicinal Gardens, Ootacamund.			
Sale of jalap tubers, &c.	7 14 0	100 0 0	56 1 0
Total ...	...	...	3,038 4 10
Add value of drugs supplied to the Indian Medical Department, Madras	87 4 6	...	17 2 8
Total ...	2,077 12 1	2,850 0 0	3,055 7 6

Ootacamund,
6th *July* 1886.

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

Statement of Expenditure on the Government Botanical Gardens and Parks for the official year ending 31st March 1886.

Particulars.	Actuals, 1884-85.	Budget Estimate, 1885-86.	Actuals, 1885-86.
	Rs. A. P.	Rs. A. P.	Rs. A. P.
Pay of Curator	3,600 0 0	3,600 0 0	3,600 0 0
Travelling allowance of Curator and Herbarium Assistant ..	..	500 0 0	337 2 0
Pay of Curator's office establishment	550 7 10	552 0 0	550 3 4
Total ..	4,150 7 10	4,652 0 0	4,487 5 4
Government Gardens, Ootacamund.			
Overseers and fixed cooly establishment	1,693 3 11	1,728 0 0	1,697 8 1
Temporary establishment	2,995 2 4	5,000 0 0	5,713 0 1
Acclimatization of foreign plants (G.O., No. 874, dated 5th July 1872.)	500 0 0	600 0 0	596 6 11
Labelling of plants	415 14 11	350 0 0	234 5 8
Construction of cooly lines (G O., 5th May 1884, No. 1848.) ..	1,831 10 2	....	....
Contingencies	1,447 7 5	1,000 0 0	1,332 1 5
New works, drainage, &c.	1,424 10 7	....	....
Horticultural implements	712 7 7	500 0 0	556 14 0
Painting of the conservatory of green house and repairs to propagating houses.	593 9 8	600 0 0	610 6 1
Cutting down and uprooting eucalyptus and acacia on the northern slope of the garden, ...	519 14 6	....	....
Purchase of meteorological instruments	108 3 0	....	....
Herbarium establishment	776 0 0	792 0 0	792 0 0
Purchase of cabinets and materials	785 15 4	400 0 0	416 15 2
Library	42 15 3	1,200 0 0	590 4 1
Repairs of certain damages done to the gardens (G.O., No. 5719, dated 17th December 1884.)	599 15 0	....	....
Re-grassing of slopes, gravelling of walks in upper garden, formation of a kitchen garden and the clearing of ravine, &c. ..	..	1,550 0 0	1,140 0 3
Municipal assessment on building	..	169 0 0	169 0 0
Total ..	14,447 1 8	13,889 0 0	13,848 13 9

Statement of Expenditure on the Government Botanical Gardens and Parks for the official year ending 31st March 1886—*continued*.

Particulars.	Actuals, 1884-85.	Budget Estimate, 1885-86.	Actuals. 1885-86.
Government Gardens, Barliyár.	Rs. A. P.	Rs. A. P.	Rs. A. P.
Temporary establishment	488 5 2	490 0 0	487 11 3
Government Gardens, Kalhatti.			
Temporary establishment	334 14 0	340 0 0	328 8 8
Government Medicinal Gardens.			
Temporary establishment	315 4 4	300 0 0	262 10 0
Sim's Park, Coonoor.			
Temporary establishment and contingencies	1,820 8 5	2,000 0 0	2,166 13 7
Pay of a watchman (G.O., 14th July 1884, No. 843)		108 0 0	108 0 0
New works—Making a bridle road and bridge	..	650 0 0	642 9 1
Stonehouse Park.			
Temporary establishment	962 4 3	700 0 0	688 2 0
Church Hill Park.			
Temporary establishment	97 13 0	100 0 0	96 0 0
Upper Norwood.			
Temporary establishment and contingencies	1,958 1 11	3,000 0 0	3,120 11 8
Creve and Ottley Hall Estates.			
Temporary establishment	..	1,000 0 0	381 14 9
Total ..	24,574 12 7	27,229 0 0	26,619 4 1

Ootacamund,
6th *July* 1886.

M. A. LAWSON,
Govt. Botanist and Director.

List of those to whom Seeds or Plants have been distributed during the year 1885-86.

Abboy Naidu, T., Madras.
Batchelor, Mr., Ootacamund.
Beddome, Lieutenant-Colonel R. H., England.
Barclay, Mr., Deva Shola.
Crooks, Serjeant, Ootacamund.
District Forest Officer, Madura.
Do. Tinnevelly.
Do. South Arcot.
Do. Nilambúr.
Do. Malabar.
Ferguson, Mr. T., Calicut.
Fitzgerald, Mr., Travancore.
Gamble, Mr. J. S., Ootacamund.
Honorary Secretary, Agri-Horticultural Gardens, Madras.
Head Overseer, Government Cinchona Plantations, Naduvatam.
Linden, Monsieur L., Belgium.
Mackenzie, Mr. J., Naduvatam.
Money, Mrs. J. W., Deva Shola.
Secretary, Ootacamund Municipality, Ootacamund.
Superintendent, Lâl Bagh Gardens, Bangalore.
Walker, Colonel I. Campbell, Ootacamund.
Woodrow, Mr. G. M., Poona.
Yonge, Mr. G. L., Guynd.

List of those who have been Benefactors to the Gardens during the year 1885-86.

Abboy Naidu, T., Madras.
Batchelor, Mrs. E. R., Ootacamund.
Baker, Miss A., Peermaad.
Director of Government Cinchona Plantations, Ootacamund.

Gamble, Mr. J. S., Ootacamund.
Gammie, Mr. J,. Darjeeling.
Gould, Mr. M., Madras.
Gray, Mr. C., Coonoor.
Hutchins, Mr.
John, Sir. O. St., Sialkot.
Munro, Mrs. H., Peermaad.
Manager, Nílgiri Brewery Company, Ootacamund.
MacGregor, General.
Royal Gardens, Kew.
Superintendent, Saidápet Farms, Madras.
Superintendent, Agri-Horticultural Gardens, Madras.
Superintendent, Lâl Bagh Gardens, Bangalore.
Sashia Sastri, Mr. A., Dewan to His Highness the Rajah Bahadur of Pudukótah.

Order—dated 17th August 1886, No. 720, Revenue.

Miscellaneous.

The Government observe with satisfaction that the report on the Government Botanical Parks and Gardens for the year 1885-86 has been submitted within the prescribed date.

2. The weather during the year to which the report relates is said to have been "all that could be desired for carrying on horticultural operations," the rains being early, light and continuous. There was severe frost in January, but the dryness of the weather prevented this from doing serious harm. The gardens at Ootacamund, Coonoor and Barliyár are all said to be in good condition, but nothing is said about the state of the Kalhatti garden. The Government would be glad to know whether Mr. Lawson is still of opinion that this garden should be abandoned.

3. Considerable improvements have been made in the Government gardens at Ootacamund and further improvements are contemplated during the coming dry season. One of the terraces was converted into a vegetable garden during the winter, and sown with seeds of the common kinds of European vegetables. The Director promises to report upon them next year. Another terrace was converted into a herbaceous botanical garden, but the situation was found to be too exposed. The experiment should be repeated in a more favorable locality and should be extended to some of the other gardens under Mr. Lawson's control. The removal of the conservatory is sanctioned, and provision should be made in next year's budget for the cost of rebuilding it in another part of the gardens.

4. The blue-gums near the servants' quarters in Government House gardens should certainly be cut down if they are dangerous. The proposals regarding the Crewe Hall garden are approved.

5. *Barliyár.*—The Mangosteen and Litchi in this garden again produced a quantity of fruit. The absence of all demand for these trees is probably due to the fact that they are but little known. The proposed establishment of botanical gardens at various stations in the Presidency, which has already been approved, may serve to bring them, and many other useful trees and plants, to general notice.

6. *Proposed New Gardens.*—Owing to various causes none of the new gardens sanctioned in the marginally noted orders of Government have yet been opened. Mr. Lawson now asks for sanction to open out a garden at Gúdalúr. This, however, was given in the second of the orders referred to above, and the Government have been awaiting the submission of detailed proposals.

G.O., dated 3rd July 1885, No. 786.
G.O., dated 3rd December 1885, No. 1337.

Mr. Lawson appears to have misunderstood the order * of Government on the question of a site for a garden at Calicut, for a reference to the 2nd paragraph of the order will show that so far from having any intention of abandoning the project they directed the Collector to select another site. His report is still awaited.

* G.O , dated 31st March 1886, No. 251.

7. *Herbarium.*—This has been transferred from the cottage at the entrance of the garden to the old Cinchona Laboratory, which has undergone certain alterations, and is now said to be all that could be desired. The Government are much indebted to the various gentlemen who made donations during the year.

8. *Exotics.*—The Government approve of the proposal to grow the better sorts of Eucalyptus for purposes of timber, and the attention of the Conservator of Forests, Northern Division, will be drawn to the subject. The *Quilaja saponaria* thrives well in the climate of Ootacamund and can be readily propagated by means of cuttings. It still remains to be seen, however, whether the tree will prove as valuable here as in its native country, Chili. Tubers of the *Kumera* (*Convolvulus chrysorhizus*, *Soland.*) have been raised and were found palatable. The Director does not say whether these tubers were grown at Ootacamund or, as proposed in his report for 1883-84, at Coonoor and Barliyár; nor does he give any information regarding their probable value as an article of diet for the people of this country. A new tuber (*Ullucus tuberosus*) a native of South America, which was received from Mr. Thiselton Dyer, has been found to grow freely in the open air at Ootacamund. The Government await further report on its properties and value. The Director is not able to report upon the Arracacha (*Arracacia esculenta*) or the Cochin-China tuberous-rooted vine, as the former has not yet produced any tubers or the latter any fruit. Experiments in the culture of hops have been commenced: the Government await the results with much interest, for the successful cultivation of this product would probably prove of great advantage to the ryots of the Nílgiri Hills. The failure in the stock of Ipecacuanha plants which was reported last year has been effectually remedied, but Mr. Lawson thinks that the climate of Nilambúr is more suited to this plant than that of Barliyár. The remarks on the successful growth of certain *Coniferæ* on the Nílgiris are interesting and will be communicated to the Forest Department. The Director has omitted to report the results of his experiments with the Medicinal Rhubarb plant, referred to in his report for 1884-85.

9. *Financial Results.*—The receipts for the year were Rs. 3,055-7-6, the budget estimate being Rs. 2,850, and the expenditure was Rs. 26,619-4-1 against an allotment of Rs. 27,229. The decrease was largely due to the fact that less than half the grant for the library was expended, as it was not known what books could be transferred from the Central Museum Library. It is not understood why chemical books, required for the Government Quinologist, were paid for from the grant made for Government Parks and Gardens. This charge should have apparently been debited to the budget of the Cinchona Department.

10. This report will in future be replaced by the general administration report of the Botanical Department.

(True Extract.)

W Hutchins

Secretary to Government.

To the Government Botanist and Director, Cinchona Plantations.
„ the Director, Revenue Settlement and Agriculture.
„ the Board of Revenue.
„ the Accountant-General.
„ the Superintendent, Government Central Museum.
„ the Public Works Department.
„ the Financial Department.
„ the Honorary Secretary, Agri-Horticultural Society, Madras.
Surgeon-General G. Bidie, M.B., C.I.E.
„ the Honorary Secretary, Wynaad Planters' Association.
„ the „ „ Nílgiris „
„ the „ „ Yercaud „
„ The Editor's Table.

Exd. W. H. French.

150 Copies.