

REPORT

OF THE

CONSERVATOR OF FORESTS,

FOR THE

OFFICIAL YEAR

~~1859-60.~~
1857

MADRAS:

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~~1860.~~ 1859



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From H. CLEGHORN, Esq., Conservator of Forests ; to the Secretary to Government, Revenue Department, Fort St. George ; dated Mangalore 1st May 1858, No. 337.

SIR,

1. I have the honor to report for the information of the Right Honorable the Governor in

Anisy.
Arbyle.
Boon.
Sumpajee.
Perambady.
Strisipara.
Tumbacherry.
Palghaut.
Segoor.
Conoor.

Council that during the past year I proceeded on my first tour of inspection, traversed Mysore and visited the Depôts at the mouths of nearly all the rivers on the Malabar Coast, examining great part of the Western Ghauts with a view to ascertain the exact state of the Government Forests, their extent and capabilities. I travelled through the most wooded portions along the chain of Ghauts, ascending and descending by the mountain passes as per margin, from the Bombay Frontier down to Ponany. I afterwards went across the Anamallay Hills and round the slopes of the Neilgherry Hills. I also made a circuit of the Wynâd and twice visited the Conolly Plantations at Nellumboor,

being altogether eight months absent from the Presidency.

2. As I have already submitted my views at length on several topics in accordance with the instructions of Government, such as

Jackatallah Plantations.
Neilgherry Woods.
Ootacamund Garden.
Anamallay Forests.
Canara Forests.
Streeharricottah Jungles.
Price of Timber.
Memorandum on Gutta Percha.

I shall here confine myself to a summary of my observations on the Forests generally and of the operations of the Forest Department during the first year of its existence, mentioning the further measures contemplated when it is in a state of more complete organization.

3. In the beginning of the century, an immense almost unbroken forest covered the Western Ghauts, from near the water shed to the most elevated ridges, left to nature, thinly peopled,

See { *Dr. Hove's Travels* 1786.
Buchanan 1801.
Lord Valentia's Travels 1804.

abounding in wild animals, and all the higher portions without exception covered with timber, and now the passing traveller looking down from the higher peaks of Coorg or Malabar, conceives that an inexhaustible forest

lies below him, but as he descends the Ghauts he finds that the best timber has been cut away and that the wood contractor is felling in more remote localities. I speak especially of teak, blackwood and poon spars which are every year becoming more scarce in accessible situations. The practice in this country has been the converse of that in Europe where the soft wood is thinned out and the hard wood left. Here the valuable kinds are removed and the scrub left. By one of these authorities, burning the jungles was recommended as a sanitary measure, and to diminish the number of wild animals, but circumstances have much changed. Now the axe of the Coffee planter and of the Coomree cultivator have made extensive and often wanton havoc, devastating a large portion of the area of the primeval Forest. The former is encouraged as endeavouring to rescue the soil for legitimate purposes (except when the timber is peculiarly valuable) but the squatter who clears without leave in one year the land which he abandons the next is punished and repressed. The profuse waste has been altogether prohibited in Mysore and the Bombay Collectorates, and is checked to a great extent in Canara, but has not altogether ceased. The exertion of the Collector and Sub-Collector have, however, been very successful in keeping under the destruction, called Coomree, caused by vagabond tribes in burning wood with the view of raising from the ashes a crop of inferior grain.

4. In Canara; the Forest Rules framed by Messrs. Maltby and Hall, and amended by Messrs. Fisher and Robinson are calculated to ensure a regulated and safe expenditure, if the subordinates do their duty, and if the trees be marked by the Conservancy establishment. In regard to Forest arrangements I may observe that Canara though still imperfectly organized is in advance of every other District. The arrangements for the Conservation of the Teak and Blackwood are so far satisfactory, but there are still difficulties as to the supply of firewood to the large towns and of house building timber in those parts where there are no auctions.

5. *Wants of Public Departments.* The requirements of the Indian Navy, the Madras and Bombay Railways, the Department Public Works, Telegraph, &c., have been unusually heavy, and the partially organized establishment was seriously crippled and curtailed for a time by the removal of officers, Overseers, Elephants and Bullocks required in the Field during this eventful year, so that the pressing Indents of various Departments have been met with difficulty and in some cases imperfectly.

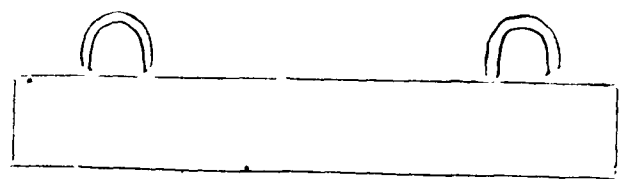
6. *The progress of the Railway* has produced marvellous changes on the face of the country, as regards tree vegetation in some districts. I may specify Palghaut, the Shevaroy Hills, and the North Arcot Hills; in these the old woods have every where fallen, to meet the urgent demand for Timber, and the pressure continues to exist in the central portions of the line between Vaniembady and Palghaut, at the two extremities the supply has been completed.

In the Official Road Book (published not many years ago) opposite Walliár we find this remark "Dense jungle, beware of Elephants," but in looking from the staging Bungalow, the traveller sees several tentative lines of Rail each 200 yards broad and so extensive a clearing of the neighbouring Forest that no Elephant would easily find a cover. The encircling hills formerly crowned with timber are now to a considerable degree laid bare. These changes so far as I can learn have been the gradual result of unrestricted cutting, but much aggravated during the last few years, in connection with the enormous demand for Railway sleepers, and for the Department Public Works. In the contracts which have been made for the supply of the Bombay Railway, one and a half Rupee has been charged per tree. In some contracts for the supply of the Madras Railway 3 or 4 Annas has been the seignorage per sleeper according to the kind of wood and the facility of transport, and with the permission of Government I would recommend that at least 3 Annas be invariably paid.

7. In other places and from other causes wasteful cutting has been observed to a less injurious extent. Lieutenant Beddome's report on the Pulney Hills, communicated by Government to the Madras Journal of Science, describes the devastation which has been committed there in the formation of plantain gardens. The Green Hills have been stripped of their woods and much of their beauty has departed. The reckless cutting there, however, has been vigorously checked by the Collector under orders from the Government.

8. *Slovenly felling.* The axe formerly in many parts was laid to the trunk one yard from the ground, while a further waste took place from diffuse hacking over a broad surface, this unnecessary loss of timber has been prohibited by a printed Circular enjoining all contractors as well as Forest employees to cut within 1½ foot of the ground, otherwise the contractors are not paid.

9. *Wasteful trimming.* The former plan of cutting logs by which one half the timber was wasted is now obsolete, I have only seen one or two specimens, and I hope that dragholes may be



altogether dispensed with, by an improved application of ropes, and the introduction of sling carts, &c. The method of trimming logs so that they may fit carts in length and width is still prevalent in many parts but is giving way to a better system. The old state of things continues only at a distance from check and control, or where there are peculiarities of tenure and few facilities of communication as in the Wynaad.

10. *Revised system of operations.* The trees are classified according to size.
 1st Class 6 feet in girth.
 2nd do. 4½ do.
 3rd do. 3 feet and upwards.
 4th do. under 3 feet; seedlings.

It is proposed that in every Forest that is to be worked, all 1st class trees be marked, and such a proportion should be cut down as will be naturally replaced by those of the 2nd class. This is clearly a sound principle, and if carried into practice will prevent the exhaustion of the Forests. It would be obviously impossible to fell and remove ¼ of the trees of the 1st class in every district. Therefore to facilitate the execution of this principle, it is necessary to divide each Assistant's range into six divisions, one of which only shall be worked at one time. These divisions should be formed as much as possible in accordance with the Geographical features of the District, and the Forest operations should be confined to the District having the largest quantity of ripe wood.

11. *Saving of Fragments.* In my visit to the Anamallay and Wynád Forests, I found the larger branches, tops and butts left on the side of the road, or in the place where the tree was cut, exposed to the heat of the sun and to the annual fires. I desired that all such pieces as would bear the expence of removal should be brought out of the Anamallay and Heggadevincottah Forests, and that no wastage be allowed in future. The importance of saving every foot of Teak (at a time when Government has been put to great shifts for its own requirements) has been strongly impressed upon every member of the Department. I am also very anxious that the use of this timber should be disallowed for common purposes, as Camp Furniture, Hospital Almirahts, Accountant's Boxes and the like.

12. *Auction sale of Timber.* It having been considered desirable that an auction sale of timber unsuited for naval purposes (tops, bottoms, slabs and side pieces) should be held at the foot of the Anamallay Hills, Captain Hamilton, the late Superintendent, was directed to make the arrangements. Great exertions were made by that Officer, and when the Timber had been collected, every publicity was given regarding the sale. Before the auction took place Captain Hamilton was removed on account of the paucity of Officers with his Corps, and the duty devolved on his successor Lieutenant Beddome. The result proved satisfactory; the account rendered shews as follows:

	Rs.	A.	P.
Amount realized	3,391	5	8
Deduct charges	189	6	4

Leaving a net profit of Rupees 3,201 15 4

Taking the average prices obtained, the timber sold at one Rupee the Cubic foot.

In this Forest this year, after the Bombay Marine were supplied, the better logs were selected for the new Jail at Salem and the Trichinopoly Barracks, while the fragments sold by auction were greedily bought by the general trader, by the Railway Department for doors and windows and by a Native Surgeon for his Dispensary building at Poolachy. In like manner wastage has been disallowed in cutting Teak for the Military Buildings at Bangalore.

13. *Teak.* This invaluable wood has received the special attention of the Department, and I may say has occupied at least two thirds of my own time during the past year. Along the whole length of the Malabar Coast from Goa to Cochin, there is now very little of this wood in a ripe state on Government land below the Ghauts, and there are only three localities above the Ghauts where I found Teak in abundance and of good size, viz.

- 1st. The Anamallay Forest in Coimbatore.
- 2nd. Wynád and Heggadevincottah, (partly in dispute between Mysore and Malabar).
- 3rd. Goond Tableau, North Canara; near Dandellie. I shall briefly notice the chief points connected with these Forests, which stand in the order of their respective value.

The Anamallay Forests have been the subject of annual Reports to Government since 1848, when their importance was first declared by Captain F. C. Cotton, (Madras Journal), and as Captain Michael's Reports have been published in the Madras Government Records, I will only now allude to the recent changes and improvements in management of this Forest effected during the past year. After the removal of Captain Hamilton, Lieutenant Beddome, Travelling Assistant, received charge. He was in the immediate neighbourhood at the time of the vacancy.

- An additional Overseer sanctioned.
- The Timber slip repaired by Wuddur contract at an expence of Rupees 500.
- The Bridge at Machenackennpollium has been rebuilt, much required for the transport of wood eastward from Anamallays.

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case which came within my observation, several valuable spars were found on a bridge, the total estimate of which was 250* Rupees. This incident will illustrate the importance of officers in the Department Public Works, Telegraph, &c., making themselves acquainted with the description of timber available and suitable for their wants. I may also mention that the Superintendent of Coorg has received several tenders for the supply of Poon spars and other timber at the distances of at least 3 miles from the Soolia river, showing the scarcity of such wood and the readiness of the Mangalore Contractors to carry it several miles to the nearest water carriage.

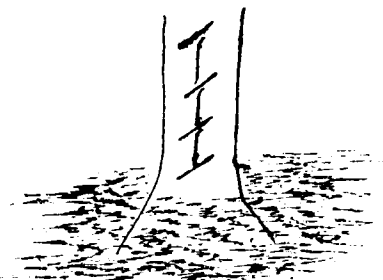
20. *Blackwood*. This valuable wood has risen much in price. Indents were received during the year both from Madras and Bombay Gun Carriage Manufactories each for 5,000 cubic feet. This tree was formerly given to applicants at 3 Rupees each, but with the concurrence of the Collector of Canara I have disallowed this practice. There is not much blackwood remaining in the Anamallay Forest, but there is a considerable quantity in the escheated forest of Chennat Nair, and it is abundant in the Wynad and Coorg. In consequence of its increasing value I have given instructions for an experimental sowing this year at Nellumboor.

21. *Sappan Wood*. This important dyewood has engaged my attention. It appears to grow with great luxuriance in South Malabar and is cultivated rather extensively by the Moplahs who plant a number of the seeds at the birth of a daughter. The trees require 14 or 15 years to come to maturity and then become her dowry. I saw more on the Banks of the Nellumboor River than any where else; why it should be there in particular is not obvious, as Malabar is generally uniform in its character. A better system of cutting and cultivating the Sappan is desirable, and the dyewood is damaged I believe by being allowed to float in salt water. The quantity raised is not great, but it grows without any care, and from the facility of water carriage to Calicut, I think that the district is very favorable for its extension. I sent a packet of seeds to Canara for experimental sowing on the banks of the Black River.

22. *The Sandal wood tree in Mysore*. Canara, Coimbatore, Salem, and a little in North Arcot has received much attention. It would appear that the spontaneous growth of this tree has increased to a considerable extent, and it seems certain that with the vigilant supervision of local officers and slight assistance to Nature in clearing the heads of young plants which are often matted down by strong creepers an addition might accrue to the revenue of these provinces. From information received from the late Assistant Surgeon Drew, I was enabled to communicate to the Commissioner of Mysore the existence of a large band of smugglers in an unfrequented path near the Carcoor Pass, who were captured by the Mysore Horse to the number of 78 with the Sandalwood tied on their backs. This seizure effectually stopped a long continued system of robbery on the Malabar frontier.

23. The "*Gutta Percha* tree of the Western Coast" so called, has been traced from Coorg to Trevandrum. All the reliable information procurable has been condensed into a Memorandum, and a large sample has been transmitted to England for report, as to its suitability for Telegraphic and other purposes.

24. *Catechu*. The enhanced value of Cutt has caused an unusual destruction of the Acacia Catechu, which was properly restricted by Mr. J. D. Robinson to certain places in the North Canara jungles to prevent total destruction.



As the V-shaped incision appeared to be deeper than required, the Collector has given instructions for the more careful treatment of the trees. This tree is greatly prized at Dharwar not for its exudation, but for its timber, which is extensively used in the Gin Factory.

26. *Bamboos*. Immense quantities of fine Bamboos are floated down the various rivers of the Western Coast. It is one of the riches of the Provinces. They are ordinarily 60 feet long

25. *Kino*. Two thousand trees, of the Kino tree, (*Pterocarpus Marsupium*), were seen along the roads through the Wynad notched, as delineated in the margin, for the extraction of Kino which is taken to the Coast where it meets with a ready market and is exported in wooden boxes to Bombay.

and five inches in diameter near the root, these are readily purchased standing at 5 Rupees per 1000, and small ones at $3\frac{1}{2}$ Rupees per 1000. Millions are annually cut in the Forests and taken away by water in rafts or by land in hackeries; from their great buoyancy they are much used for floating the heavier woods as (Mutte) the *Terminalia tomentosa* and (Biti) *Dalbergia Arborea*, and piles of them are lashed to the sides of the Pattimars going to Bombay. The larger ones are selected as out-riggers for Ferry Boats, or studding sail booms for small craft.

In addition to the vast export by sea, it is estimated that two lacs are taken from the Soopah tatak Eastward. The Malabar bamboo is much smaller than that of Pegu (*Bambusa gigantea*) which is 8 inches in diameter.

27. *Mode of floating timber*. It is curious to see the clever management of the Floaters who are a distinct class of persons. Rafts are of all sizes, usually longer than broad, and the logs bound together by the stringy bark of various trees, and stout branches passing through the dragholes at right angles to the log. In the centre of the raft a small hut is generally made of thatch, or bamboo lathes covered with Palmyra leaves, in this the floaters are sheltered at night. It is not usually considered advisable to float logs when the river is at the fullest, as the raft is apt to go over the bank and be stranded. Numerous logs may be seen high and dry all along the sides, and the following year the flood lifts them. At night, floats are brought to under steep banks or deep water, they are then tied to the trunk of some adjoining tree, occasionally the banks fall in and serious accidents occur.

28. *Introduction of Saw Machinery*. This has been much under consideration, there can be no doubt that it is most desirable to substitute the saw for the axe, especially when the planks are being prepared, economising both time and labor. Great efforts have from time to time been made with more or less success to induce Sawyers voluntarily to resort to the forests for employment.

As to the question of introducing circular saws to the little frequented forests the measure would be attended with this difficulty that, when the heavy machinery was conveyed to the Forest Depôt as the Elephant station in the Annamallays, it must either be carried back again at great expense or left exposed to the mischievous effects of extreme damp and perhaps to injury from herds of Elephants. At present, therefore, it seems more desirable that saw pits should be for the most part confined to the Coast Depôts, and that their management be left to private enterprise.

29. *Forges for Charcoal*. One of the difficult questions connected with forest conservancy is regarding the making of charcoal for iron-smelting. The forges in Canara are few, but in Dharwar, Belgaum, Bellary and Mysore there are many; and parties go into Nugger or North Canara to make charcoal in large quantity. They make a hole 4 feet deep, 8 or 10 feet broad, fill it with wood and cover it up. Having set fire to it $\frac{3}{4}$ or $\frac{2}{3}$ is burnt, $\frac{1}{4}$ or $\frac{1}{3}$ remains as charcoal. Not only is there great waste in the making of charcoal, but there is great waste when made, the charcoal being inferior. The Blacksmiths insist upon the wood being either of bamboo or jambay (*Inga Xylocarpa*) which is without reason, as I saw beautiful charcoal prepared by Mr. Lowry at Tuddry of the common woods.

Mr. Brice and Co., have instructed 20 charcoal burners, who use the more common kinds of wood, and turn out a superior article; they regulate the furnace by small holes, as do the Porto Novo Iron Company. Mr. Boesinger manufactures good charcoal. Dr. Forbes do. do. at the Gin Factory Dharwar. It is difficult to instruct Native Artizans in this matter, but it is hoped that the example of so many Europeans may be useful.

30. *Executive Engineers, Surveyors, &c.*, when making traces in the Ghauts or visiting secluded Forest Districts might render good service to this Department by informing the nearest Revenue officer or Conservancy employé when they see the firing of the jungles or destruction of timber.

I have received on several occasions useful information from the Chief Engineer, who has sent me Extracts from the Diaries of his officers bearing on the destruction of timber. On the occasion of making a new road or increasing the breadth of an old one, through a valuable Forest (as at Yellapoor) it would be desirable that the District Engineer should communicate with the Forest Assistant, so as to give an opportunity of removing the timber which is often rolled down the side of a Ghaut, or left to decay where it falls.

31. *Noxious Insects*. I have called the attention of my Assistants to the noxious Insects of country, the depredation of several common Coleoptera, being most mischievous rendering

the rafters a mere honeycomb. The importance of immersing the logs of all woods except teak in solution strongly impregnated with mineral salts as in Baurgerie's process has received my attention.

32. *Provisions for the Ryots' wants.* It is most important that whilst strict supervision is enforced in the Government Forests, Conservancy should not be carried so far as to interfere with the supply of Agricultural Implements to the bonâ fide ryot, or to obstruct the application of leaves and branches for Alkaline material to fertilize his fields. In North Canara the ryots have their *Coomuc* 200 yards above or 100 yards below Ghaut, enclosed pieces of land available for the use of their fields which is a very good arrangement when allowed to such estates as have been surveyed. But I do not recommend this to unsurveyed estates because it leads to fraudulent abuses. It is surprising how strictly these *Coomucs* are conserved.

33. *Mercantile classes buy wood.* I have already ruled in cases referred for decision that the ryot is from old custom entitled to wood for his plough, &c., but that the sowcar who wishes to make a cradle or a Palanqueen or requires wood for house building, &c., must pay for the material. There are periodical auctions at nine places in Canara where the sowcars can suit themselves, and an extension of the system so as to have talook Depôts is under consideration.

34. *Coffee.* The successful cultivation of the coffee plant is extending remarkably, and applications for grant of Forest land pour in upon the Revenue Authorities. In the Sisipara, Perambady and Sumpagee passes vast clearings are being made. In the Coonoor Ghaut six large plantations may be seen, and there are very large and numerous holdings, above 30, in the Wynâd, which from year to year will increase. The plant has succeeded admirably in Mysore, and there are patches of cultivation in Madura and even in North Canara. I may observe that in granting Forest land, it seems to me that while the destruction of Forest (Teak, Ebony and Poon spar excepted) for *bonâ fide* cultivation may be considered legitimate, yet the preservation of the fringe along the crest of mountain ridges is of special importance in a climate point of view, and this should never be given over to the axe. As these mountain crests are not suitable for the growth of coffee, the restriction cannot be complained of.

I here beg to annex Extract of letter to the Collector of Coimbatore dated 2d October 1857, which contains my views in reply to a reference upon this important matter.

"The higher Sholas clothing the Ghauts on both sides are of the utmost importance, and the climate is believed to suffer the greatest detriment from their removal. I would therefore suggest that the high-wooded mountain tops overhanging the low country (such as Hoolicul) should be preserved with rigid care, the Forest there should not be given over to the axe, lest the supplies of water may be injured. It is the opinion of many persons, in which I concur, that the vast clearings which have taken place have had a share in producing the irregularity of the monsoon which has of late years been so much complained of in Coimbatore. In order that the course of the Rivulets should be overshadowed with trees, I conceive that the hills should be left clothed to the extent of about $\frac{1}{2}$ of their height from the top leaving $\frac{1}{2}$ of the slope and all the valley below for cultivation, this available portion would far exceed in extent the higher ridges which should be conserved."

It seems to me that the immense tracts of virgin Forests in the rich valleys of the Koondahs are eminently suited for coffee cultivation, and the removal of the Forest there would not be attended with the same disadvantage as on the Eastern Ghauts, where the drier climate does not admit of the same effort at speedy reproduction.

If it be desirable to lay down a general rule in regard to the limits of elevation within which clearing for coffee cultivation should be allowed, I would specify from about 2,500 to 4,500 feet, this being I understand the extreme range within which coffee planted on a large scale is found to thrive.

It is important to give every facility for the cultivation of coffee, but it is desirable to limit the clearings of those situations where this peculiar shrub can be grown with advantage. I have observed some clearings, where the ground is so precipitous that it is extremely improbable that the soil can last many years.

It may be urged that in general, people are sufficiently alive to their own interests to select only those sites which are in every way eligible, but from the inexperience of many who embark in coffee planting, it seems desirable to lay down some rule. I need only point to the vast amount of land cleared and subsequently abandoned both in this country and Ceylon, either before or after planting.

It is to be regretted that independent of considerations of climate, Coffee cultivation should find a place in those parts of the forest where the timber is of a *superior* description, and which at present Government is put to great shifts to obtain for public purposes.

I would therefore add, that in places which are accessible and which contain very fine timber, it seems desirable that one of the Assistants in my Department, should have an opportunity of removing such timber as is available, or of marking it, with a view to its being taken at a valuation by the occupier, should he desire to do so. I especially allude to 1st Teak, 2nd Blackwood, 3d Vengay and 4th Kurrah Murdah.

35. *Tea.* I think it right to bring to the notice of Government the thriving condition of a Tea Plantation near Coonoor belonging to Henry Mann Esq., who has devoted much attention to it and has spared no expense. This is a very interesting experiment. The best varieties of the shrub were imported from China in 1854, the seeds having been given to Mr. Mann by Mr. Fortune on his return from the Tea growing Districts. There are now about 2,000 vigorous plants, and to ensure success it seems only necessary to procure a supply of workmen to teach the manipulation and separation of the leaves.

36. *Difficulty of procuring Assistants.* The removal of Captain Michael to Hyderabad followed by the withdrawal of Captain D. Hamilton and the death of Assistant Surgeon Drew put me in a difficulty for some time. The two first were most zealous and willing Assistants, and the last from his patient habits of enquiry and Botanical knowledge gave promise of peculiar usefulness. The vacancy has been filled by Lieutenant Beddome a young man who has a good knowledge of the vegetable kingdom, and was recommended to Government solely on account of his powers of observation and description, he is an excellent explorer.

I have issued a "General instruction to the Forest Assistants in a circular and try to persuade each to keep a small arranged Herbarium of Flowers and Fruit bearing specimens of *all Forest trees and their varieties* with notes. By inviting them to do this, I trust some will become at least *Observers*, if not *Botanists*.

In this Country there is no class of persons who have made it their business to attend to Forestry as a branch of Rural Economy, and of all those (about 200) who applied for employment there was not one who could be considered an intelligent Forester, except Mr. Mc'Ivor Superintendent of the Ootacamund Garden. Mr. S. Müller, Assistant Conservator North Canara, who had been early trained in the Black Forest of Germany, and Corporal Hall who had been a Forester in the Midland Counties of England. Most of the others have to be paid to learn the outlines of their duty, and generally speaking those who have been Soldiers or Artificers are the most teachable, and give least trouble. They have been well disciplined and obedience comes natural to them.

37. *Contractors.* Instead of finding a class of persons possessing knowledge of the Timber trade, there is only a multitude of rogues ever ready to tender for Contracts to receive advances and to appropriate them. On the Western Coast there are a few Moplahs about Calicut and Prubhoos at Mangalore who possess Elephants the only efficient means of dragging Timber. These last take gangs of Coolies to the Coorg and Malabar Forests and show considerable energy in forming temporary dams and floating down Poon Spars, &c.

38. *Sub Conservators in Canara.* The two Subordinates I found in North Canara under Mr. Müller (Mr. Gilbert and Mr. Buonaparte Rodrigues) appeared to be much too sedentary in their habits, deputing Peons into the Jungles when they should have gone themselves and the like. The former has been removed from the Department on account of incapacity, the latter is suspended under an enquiry for receiving bribes.

39. *European Contractors.* Two Contracts have been entered into with Mr. Ross, Resident Railway Engineer, Coimbatore, whereby he has been permitted by his first contract to cut sleepers of certain specified woods in the Forest near the foot of the Anamallay paying quarterly seignorage at the rate of 3 Annas per Sleeper, and by the second he was empowered to fell 2,000 trees in the Walliar Jungle, at the rate of Rupee 1-8 per tree.

Messrs. Brice and Co. an enterprising Firm tendered for and obtained permission to fell 2,500 junglewood trees within the Forests of Ekagolly and Codloogaddey in the Soopah Talook North Canara for supplying Sleepers to the Bombay Railway Company, and agreed to pay Rupees 2,500 (half in advance) being at the rate of 1 Rupee per tree, and on exportation a further seignorage of 8 Annas per tree, and also such quantity of bamboos as they may require to float down the 2,500 trees at the rate of Rupees 5 per 1000 bamboos. This contract is to extend over a period of two years closing 31st December 1859.

In the above contracts with Mr. Ross and Messrs. Brice and Co. strict provisions are made prohibiting their felling of valuable kinds of wood, such as Teak, Blackwood, &c.

40. *Establishment of Depôts on Western Coast.* I am desirous of seeing well arranged Timber Depôts established at the mouths of the Rivers on the Western Coast, and a classification of Timber to suit the various purchasers. European Pensioners of reputed integrity will probably be found ready to take charge of these Depôts. Contractors have this year been required to separate sound from unsound timber whilst still in the water. I pointed out at Seda-shegur and Mullial some desirable improvements but the operations were suspended on account of the recent disturbances. At the latter place the Depôt occupies an open space and a very large quantity of wood is scarcely safe without an enclosure. A small house for the European Overseer is also required. The establishment of Coast Depôts involves an extension of the Department not contemplated, but I believe that from the absolute impossibility of finding a trustworthy agency in the interior this is unavoidable.

41. *Additional Overseers required.* There are several localities as Pootoor in South Canara, Paulghaut, and the Hills South West of Vellore which require the supervision of a qualified Overseer.

I am now on my way to explore the capabilities of the first of these places which formerly yielded much timber. At the second, I believe the salary of an Overseer may be more than met from the aggregate receipts of the Walliar Jungle and the escheated Forest of Chennat Nair at present leased to Mr. Tomlinson, and at the third, which I visited a fortnight ago it is of importance that supervision should be exercised over these Hills, which the neighbourhood of the Railway has tended so much to denude. The demand for firewood has been so much enhanced by the vicinity of the rail that I have seen the roots, stocks and gnarled stems removed from the Hill side which should have been allowed to remain in order to secure a little moisture and to afford leaves for manuring the adjoining fields. Mr. Sullivan, Sub-Collector, is at all times most ready to assist in checking wasteful cuttings, but the appointment of an Overseer in his opinion is most desirable.

The tract of wood must be extensive which will cover the charge of an Overseer's salary, and therefore in several instances, I have urged the location of two talook Peons as at the top of Palamanair Ghaut, and at Devaroydroog in Mysore, the vigilance of two men during 13 months at a cost of 7 Rupees per month has produced visible results; although the Conservancy has not been adequately provided for, yet the Jungle already begins to assume a much improved appearance.

My attention has been directed to other places as *Ramandroog*, the *Nulla Mulla Hills*, the *Shevaroy Hills*, the *Nellore Jungles*, and various localities in the Northern Division. I have been in correspondence with the Collectors of those Districts, but have refrained from making any recommendations of Establishments to supervise these various pieces of Forests until I had an opportunity of personally inspecting them and judging of their requirements. I hope to visit many of these localities during the ensuing year. The great difficulty I experience is in finding suitable Overseers. The essential qualifications desired are as follows.

- 1st. Robust health.
- 2nd. Rudimentary knowledge of Forestry.
- 3d. Acquaintance with Accounts.
- 4th. Integrity of Character.
- 5th. Knowledge of Native Languages.

In addition to the absolute scarcity of suitable men, the exposure and personal risk and the low salary compared with that sanctioned in the Department Public Works have united to deter men from entering the Department, whilst the formation of the Police and Revenue Survey Establishments have attracted others whose services might have been available. Out of the large body of Europeans who have this year been sent out to India, I hope to find one or two who have the great essential of practical knowledge of woodcraft.

42. *Proposed Depôt of Books and Tools.* It has been proposed to supply a Forester's Guide and the more necessary tools to each Overseer on his appointment (See Manual.) The Conservator, as he has leisure and opportunity, spends an hour or two with his Overseers to improve their minds, and has directed the Assistants to teach the Overseers, as Medical Officers are enjoined to train their Subordinates. By adopting a system of weekly or occasional examinations, it is to be hoped that a class of Foresters superior to the present may be obtained.

43. *System of Correspondence.* Where Overseers are located or Forest operations being carried on orders are given through the Assistant Conservator in whose range the Overseer is situated, but in any case when Forest management appears to affect the Revenue or Cultivation of the District, I immediately avail myself of the advice and counsel of the Collector, and throughout I have desired to be in the position of his adviser and not as an executive trenching upon his authority.

44. *Manual of Accounts.* A Manual of Instructions for the employés in this Department, compiled by J. T. Maclagan, Esq., under instructions of Government, including simple forms of Accounts to be used, and printed circulars for the guidance of Overseers, &c., was submitted to Government on the 6th Ultimo. At this early stage of Forest correspondence, this Manual must necessarily be imperfect, but being clear and concise I believe that it will be of great use in the preparation of contracts and simplifying accounts.

45. *Proposed Herbarium of Reference.* Having received from the Royal Gardens of Kew a valuable set of named Indian Plants being duplicates issued after the publication of the *Flora Indica* of Hooker and Thomson, I intend to arrange these materials in a consultable Herbarium at the Presidency. It was indeed upon these conditions that I received the specimens. Such a collection is a great desideratum in the present day, when men of science frequently visit our capital, and we have not a single specimen of the collections of Roxburgh or Wight to shew, but can only refer to their description. I shall not ask Government for any pecuniary assistance except to supply paper, the cases and hereafter perhaps some manual assistance.

46. *Manual of Indian Botany.* I have the honor to enclose a specimen copy of the Manual of Indian Botany, now being prepared in compliance with the wishes of the Honorable Court of Directors.

The small amount of time which I can spare from other avocations, the bodily fatigue and exposure I undergo, and my absence from my library for great part of the year will necessarily protract the preparation of the work, but the great opportunities I enjoy of collecting materials are eagerly laid hold of, and I trust that the Manual may when completed, be a useful guide to the Botanical riches of the Presidency.

47. The expenditure on account of the Department generally has been as follows.

	Rs.	A.	P.
Salary of the Conservator, the Assistant in charge of the office at the Presidency and the establishment.....	17,373	0	7
Salaries of travelling Assistants and their establishments.....	6,847	10	4
Contingent charges.....	3,868	14	4
Rupees...28,089 9 3			

The income, expenditure and accounts of the Anamallay and Canara Forests from 1st July 1857 to 30th April 1858 will be submitted separately and as soon as practicable.

No. 1086.

Extract from the Minutes of Consultation under date the 5th August 1858.

Read the following letters from the Conservator of Forests.

Submitting a summary of his forest operations during the past official year. } (Here enter 1st May 1858, No. 337.)

Submitting a detailed account of the tours of the two travelling Assistants in this Department and the reasons for the appointment of a Financial Assistant at the Presidency. Also forwarding a corrected duplicate of his summary of Forest operations in lieu of that dated 1st May 1858. } (Here enter 30th June 1858, No. 384.)

1. The first of the papers recorded above, contains the Report of the Conservator of Forests on his first tour of inspection. His general route is thus described at the outset :

" I traversed Mysore and visited the (Timber) Depôts at the mouths of nearly all the rivers on the Malabar Coast ; examining great part of the Western Ghâts with a view to ascertain the exact state of the Government Forests, their extent and capabilities. I travelled through the most wooded portions along the crest of the Ghâts from the Bombay frontier down to Ponany, ascending and descending by the Mountain passes. I afterwards went across the Anaimalai Hills, and round the slopes of the Neilgherries ; I also made a circuit of the Wainâd ; and twice visited the Conolly plantations at Nelumbûr ; being altogether 8 months absent from the Presidency."

2. The Report has been perused by the Government with much interest. It is unnecessary to review the whole in detail ; the points which require special notice are particularized below.

3. After noticing the extensive and often wanton havoc and devastation caused by the axe of the Coffee Planter and the *Kumari* Cultivator, Dr. Cleghorn states that the profuse waste has been altogether prohibited in the Mysore and Bombay Collectorates, and is checked to a great extent in Canara, " but has not altogether ceased, though the exertions of the Collector and Sub Collector have been successful in keeping under the destruction caused by vagabond tribes in burning wood with a view to raising from the ashes a crop of inferior grain." The Government

resolve to communicate this para.* to the Collector of Canara (through the Board of Revenue); and that officer will be good enough to furnish a brief report of the result of his exertions for the repression of the system of *kumari* cultivation. The conservancy system in Canara is stated to be in advance of every other District though still imperfect ; a set of forest Rules are said to have been framed, which are calculated to ensure a regulated and safe expenditure, provided the subordinates do their duty. The Government will be glad to see a copy of these Rules.

Indian Navy.
Madras Railway.
Bombay do.
Department P. W.
Telegraph Department.

4. Para. 5. The requirements of the various Departments have been unusually heavy, and owing to the withdrawal of the employès and matériel of the Forest Department on account of the Mutinies, the latter has scarcely been able to meet the demands made upon it, so that the operations of the past year do not afford a fair criterion of the prospective effectiveness of the Forest Department.

5. Para. 6. Speaking of the marvellous changes in the face of the country as regards Tree vegetation, produced by the progress of the Railway, it is mentioned that a traveller looking from the staging Bungalow at Waliâr, sees several "tentative lines of rail, each 200 yards broad." The Government suppose that Dr. Cleghorn refers to the first attempts at opening the line through the Palghaut gap some 2 or 3 years ago, and which Colonel Pears noticed at the time. The question of the payment of seigniorage for Sleepers also referred to will be disposed of elsewhere.

6. Para. 7. The Collector of Madura will be called upon with reference to this para. to state whether he has succeeded in putting an entire stop to the devastation formerly caused on the slopes of the Pulny Hills by the formation of plantain gardens.

7. Paras. 8-9. The improved methods of I. felling, II. trimming which have been introduced are satisfactory; though Dr. Cleghorn mentions that in some places "peculiarities of tenure" have operated as an obstacle to the introduction of improvement. In what way these peculiarities of tenure operated disadvantageously should have been explained.

8. Paras. 10-12. The proposed system of operations and the measures taken to economize fragments, and pieces of timber unsuited to naval purposes are approved. The auctions described in para. 13 should be systematically held: at the end of para. 4 mention is made of the difficulties which still exist as to the supply of firewood to the large towns; if a regular supply of timber were ensured to the people by means of these sales, it would go far to prevent clandestine cutting; and judging from the result of the sale of teak held in the *Anaimalai* Forest they are likely to be a source of no inconsiderable gain, for even the fragments were greedily bought by the general trader, the Railway Department, &c.

9. Para. 13. Teak. This invaluable wood, the Conservator states, has received the special attention of the Department. There is said to be very little ripe teak (on Government land) below the Ghâts, along the whole length of the Malabar Coast*, and there are only 3

localities above the Ghâts where it is found in abundance and of good size, viz.

I. The *Anaimalai* Forest.

II. The *Wainád* and *Heggadevankota* Forests; partly, Dr. Cleghorn observes, in dispute between Mysore and Malabar.

III. The *Gund* Plateau in North Canara.

Sundry changes and improvements in the management of the *Anaimalai* Forests which have recently been effected are detailed; and with reference to the further development of the valuable resources of these forests, the Conservator notices that the supply of teak from the forest now rented from the *Kolangód Numboddy* (Nambúdrí?) will not last more than 15 years; "which is a serious consideration as it is the only forest from which long planks suitable for a man-of-war, can be procured"; Dr. Cleghorn has therefore conceived a scheme for consolidating the table land of the *Anaimalai* range, that belonging to Government as well as that rented, into one Government forest, to be systematically worked, and held in reserve in perpetuity for the Indian Navy. It appears probable that the forest now rented is the Janmi property of some Malabar chief, with which it is not likely that he could be induced to part, so that it is not clear how such an arrangement as the one proposed could be carried out, except by means of a money compensation. In the separate communication which the Conservator promises on the subject full particulars of the renting system should be given, and such peculiarities of forest tenure as may come under Dr. Cleghorn's notice.

10. The *Wainád* Forests adjoining Mysore are of great value, and stand second in importance. They are capable, Dr. Cleghorn roughly estimates, of supplying 2000 bandy loads or 40,000 cubic feet of teak annually, without permanently injuring the resources of the forest. But at present no means of carriage exist, by which "crooks," and other timber required for Naval purposes can be conveyed to the coast, where they would be extremely valuable. This paragraph will be communicated to the Chief Engineer, who will after conferring with Captain Francis (who is the Government believe, well acquainted with the locality) suggest a remedy, and show what line of communication could be most easily opened to the sea, or to any river navigable from where the timber could be conveyed to it, to its mouth.

In the same para. Dr. Cleghorn mentions that he has experienced great difficulty in obtaining exact information as to the extent and tenure of these forests. It is not stated whether the required information was sought from the Collector of Malabar. The Government are of opinion that the authoritative determination of these tenures is an important preliminary towards the establishment of any system of conservancy in the forests, and they understand that a report on the subject is now about to be submitted to them by the Board of Revenue with especial reference to *Wainád*.

From the Com. of Mysore 16th Jan. 1853.

„ do. Do. 16th February 1858.

„ Conservator of Forest 23rd January 1858.

„ Secretary Board of Revenue 1st April 1858.

*Extract Minutes Consultation 3rd May 1858, No. 564.

11. In the same para. of the report, Dr. Cleghorn also alludes to a subject (before noticed in the correspondence respecting the Mysore and Malabar boundary dispute) which demands immediate and careful attention. He states that the authorities at Ashtagrām and Coorg, and the Commissariat officer at Hunsūr, all drew his attention to the terrible waste of Teak which occurs in the disputed tract, "the

"timber being carted out in large quantities by three roads under the plea of passes from two "Devasthānams the limits of whose Inām land I have no means of ascertaining."

If these Devasthānams are in the Company's territory there would be no difficulty in prohibiting all cutting until the Dharmakartā of the Pagodas shewed title; and if this was deemed good, measures might be taken to prevent rigidly any cutting except within the limits assigned. But adverting to the scanty means of supervision in these remote regions possessed by Dr. Cleghorn, the Government doubt whether it would be found practicable to confine the felling within proper bounds; the better course would be to prohibit any such felling by the Pagoda people; and to fix an equivalent in money to the value of the timber which enquiry may shew they have a right to; if the Devasthānams are found to be within the Mysore Territory a communication of the views of Government will be made to Sir Mark Cubbon. The arrangement of the disputed boundary is now before Government. When the difficulty is solved, the Government will be prepared to consider the proposition of the Conservator as to an officer being specially appointed to that tract of country. They remark that the timber may be essentially serviceable for the Barracks and Riding School at Bangalore, and even for the Military buildings at Jackatalla.

12. Para. 19. Dr. Cleghorn here states that a particular survey, and well drawn lines of demarcation between Mysore, Malabar, and Coorg, are, among other desiderata, necessary for securing an uninterrupted supply of teak for the future and placing the establishment for the conservancy of this forest on a proper footing.

13. As to the suggestion following, that a European Magistrate should be permanently located in *Wainád*, the Government conceive that much benefit would result from such an arrangement. Independently of the fast increasing European population, which renders the presence of such an authority desirable, the residence of an European officer in regions so inaccessible and so seldom visited as *Wainád*, would not only enforce the observance of conservancy regulations, but keep the Government au fait as to the real wants and state of this important district; the present casual visits of the Collector are quite insufficient to do this. This question is also before the Government, for consideration.

14. Canara teak is stated generally to be of much smaller scantling than that of Malabar; the chief remaining reserve is a forest on the *Gund* Plateau the trees on which now well grown and ripe, are said to be conserved by their inaccessible position. Dr. Cleghorn

describes it to be of primary importance that this forest should be immediately worked, as it is much threatened with fire. There are two ways by which the wood may be got out, either by a rocky water course with at least 3 small falls, or by making a road of 23 miles. The Collector, and Dr. Gibson, the Conservator of Forests under the Bombay Government, incline to the latter course, whilst Colonel Arthur Cotton and Lieutenant Taylor, I. N. recommend that the rocks in the water course should be blasted. Dr. Cleghorn submits a map of the Forest surveyed by his Assistant Mr. Müller, in which the roads necessary for the working of the Forest are suggested. And he proposes that an Engineer Officer be deputed to visit the locality and report on the best mode of getting out the wood; Captain Walker of the Engineers, shortly expected from England, being one of the few Europeans who have visited the spot, and who has a knowledge of its requirements, might the Conservator thinks be directed to make an examination. The Government are fully alive to the importance of this *Gund* Forest, and as Captain Taylor of the Indian Navy is now surveying the *Kala Nuddee* near *Sedashegur*, that officer will be requested to afford the Government any information as to the accessibility of these Forests that it may be in his power to give.

15. With reference to Doctor Cleghorn's request that 100 Copies of the Map of the Forest now laid before Government should be struck off, it is observed that 200 copies of the Report have been asked for; these and a similar number of the maps will be printed and lithographed at once.

16. *Teak plantations*, p. 17 seqq. Colonel Gilbert's plantations commenced in 1804, are generally failures, owing to the injudicious selection of site too near the sea. The Conolly plantations, on the other hand, are in a very promising condition; and the Government recognise the very great importance of restoring the ancient and valuable forests of Malabar and will be glad to receive the report preparing by Doctor Cleghorn. The Conservator proposes to depute two of his subordinates to introduce the planting system in vogue there, into the *Anaimalai* Forests, and North Canara.

17. Para. 19. Will be communicated to the D. P. W. with a request that the Chief Engineer will impress upon his subordinates the necessity of care in selection of Timber for Government works. The wood (Poon spars) which Doctor Cleghorn saw used for the construction of a small bridge, it is most important to preserve for naval purposes.

18. *Sandal wood*.—The spontaneous growth of the Sandal tree has increased, it is stated, to a considerable extent in Mysore, Canara, Coimbatore, Salem, and a little in North Arcot, and the Conservator thinks that if the supervision of local officers is vigilant and slight assistance be given to nature in clearing the heads of the young plants which are often matted down by strong creepers an addition might accrue to the revenue of these provinces.

19. *Introduction of Saw Machinery*.—Para 28. The Government concur with the Conservator as to the propriety of deferring the introduction of Saw Machinery to the little frequented forests. This expensive plant can only be desirable when operations are to be conducted for a length of time on a large scale at the same place. At the Depôts the Saw Machinery might advantageously be introduced, the timber being conveyed thither entire; meanwhile every endeavour should be made to abolish the use of the Axe.

20. Para. 30. Will be communicated to the Chief Engineer, with a request that he will direct his subordinates to follow the course suggested.

21. Para. 33. The principle here laid down is fair and highly proper, and Collectors should give their aid in securing its observance.

22. Para. 34. The Government fully concur in Dr. Cleghorn's views as enunciated in this paragraph; which may be stated in a few words to be that while it is desirable to give every encouragement to the extension of Coffee cultivation, the destruction of timber must be prevented by restricting grants of coffee land to places where the shrub can be grown with advantage; and at the same time the denudation of the higher ridges and slopes of hills; which if allowed may result in a serious diminution of the rain fall, should be absolutely prohibited: while those intending to occupy land containing fine timber should be compelled to take the land without the timber, or take the latter at a valuation.

The Government are aware that the (late) Collector of Coimbatore, Mr. Thomas, was fully alive to the importance of the principles laid down; but they desire that the Board of Revenue will communicate to the present Acting Collector their wish that the views expressed in the letter quoted should be adhered to in every way.

23. With reference to para. 35 the Government notice with much interest the successful attempt by a private individual to introduce the Tea plant. Dr. Cleghorn will be good enough to keep them informed of the progress of an experiment so creditable to Mr. Mann.

Para. 36. The Government would be glad to see the general instructions issued by the Conservator, when he next reports progress.

24. para. 40. The Government will be prepared to take into consideration the Establishment of Depôts, when the Conservator lays a definite scheme before them.

25. Para. 41. The Conservator here represents the difficulty of procuring suitable Overseers. And he shews the causes which combine to prevent qualified persons from entering the Department. If on further experience, these causes are still found to operate detrimentally to the interest of the Establishment, it will be Dr. Cleghorn's duty to propose a remedy in the shape of a higher scale of remuneration.

26. Para. 44. The manual of accounts alluded to, has already been approved in Ex. Min. Con. 21st May 1858, No. 669, and 200 Copies (as amended according to the Conservator's Official Memorandum without date received July 2, 1858, No. 381,) will be struck off for the use of the Conservancy Department, &c.

27. Para. 46. The Botanical Manual under preparation in accordance with the wishes of the Honorable Court of Directors, will doubtless be a most useful production. The Govern-

ment would wish some uniform system to be adopted in the representation of Native terms in the Roman character.

28. The account of the disbursements of the Department in the last para. of the Report should have been placed side by side with one of the receipts.

29. The present Report as well as Dr. Cleghorn's 2nd letter submitting a detailed account of the tours of his two travelling Assistants will be submitted to the Honorable Court of Directors with a copy of the foregoing remarks.

(A true Extract.)

(Signed) T. PYCROFT,
Chief Secretary.

REPORT

OF THE

CONSERVATOR OF FORESTS,

FOR THE

OFFICIAL YEAR

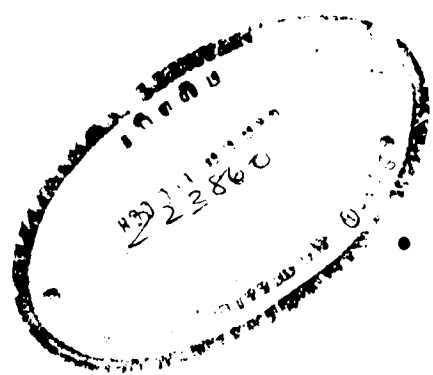
1859-60.

MADRAS:

PRINTED AND PUBLISHED BY H. SMITH, AT THE FORT SAINT GEORGE GAZETTE PRESS.

1860.

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A. North Canara Forest Report.	F. Salem Forest Report
B. South Canara Forest Report.	G. Sál Forests of Northern Circars.
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From H. CLEGHORN, Esq., M.D., Conservator of Forests, to J. D. BOURDILLON, Esq.,
Secretary to Government, Revenue Department, Fort Saint George, dated 31st August 1860.

SIR,

My annual Tour (third) commenced on 4th January 1860, by an Inspection of the Sandalwood tract in Nuggur, Mysore, and then of the Railway operations in the neighbourhood of Shemogah. Afterwards I crossed into North Canara, and observed the general state of the Forests in the neighbourhood of Sircy and Yellapoor; then I went with Mr. Müller to Hullial and to the Sidh Temple on the Belgaum frontier, which has been the subject of old standing controversy.

We passed down into the plateau of Gánd where the operations are now commencing, and reached Sedaslegur by boat.

From this my most distant point, I was summoned by Sir C. Trevelyan, to meet him at Utakamund, and en route to the Nilgiris, inspected the Nellumboor Teak plantations. I had the honor of discussing with His Excellency various questions connected with the Forest management of the mountain-ranges and visited the Australian plantations, Segúr and Mudúmallai Forests, part of Wynād and Coimbatore.

In July, having suffered from the effects of fever, I returned to the Presidency.

2. SPECIAL REPORTS DESPATCHED DURING 1859-60, AND DATES OF ORDERS.

Memorandum on the introduction of the Cinchona trees, dated 30th August 1859, No. 766.	G. O. 10th September 1859, No. 1397.
Kunúr Tea plantation, dated 27th August 1859, No. 762.	G. O. 21st do. „ No. 1272.
Report on the Mudúmallai Forest, dated 8th August 1859, No. 744.	G. O. 24th do. „ No. 2293.
Report on the Malsar Farm, dated 15th October 1859, No. 820.	G. O. 4th November „ No. 1500.
Suitability of Gali-Paravattam Hill for Coffee, dated 15th December 1859, No. 874.	G. O. 10th January 1860, No. 73.
Second Report on the Australian plantation near Wellington, dated 15th December 1859, No. 877.	G. O. 20th do. „ No. 101.
The Forests and Fuel of the Nilgiri Hills, dated 8th November 1859, No. 836.	G. O. 20th March „ No. 425.

3. PRESSURE ON FORESTS.—There are many causes at work which are gradually thinning the ranks of our Indigenous Forests. The first and by far the most formidable of these is *Railway requirements*. It is scarcely credible the many thousands of large Forest trees which have been felled in the neighbourhood of the various lines of Railway within the last few years.

Another source of diminution affecting only scrubby copse and minor forest, is the extension of cultivation, consequent upon the reduction of the land tax and increased facilities of communication. There is every probability that the clearing both of the forest and jungle will go on, so long as grain maintains its present tempting price.

4. **MILITARY REQUIREMENTS.**—The Barracks at Wellington are now nearly finished, and there has not been much pressure during the year from the Gun Carriage Factory or Arsenals, the only special references have been with regard to materials for gun-stocks and saddle trees.

The Palava wood (*Mimusops Indica*) is in large demand by the Ordnance Department for the former, until recently it was not included among the reserved woods, and the tree accordingly was extensively cut for private purposes. Steps, however, have now been taken to prevent this wood being removed, and the Collector of Tinnevely (where the tree chiefly grows,) has been requested to inform the Subordinate Revenue Officers in his District, that all private cutting of *Palava* is restricted. The Bér Tree (*Zizyphus jujuba*) is approved for saddle-trees.

5. **H. M. DOCKYARD.**—A reference was made from the Secretary of State for India, through the Government of Bombay, as to the possibility of supplying a durable timber called "*Aynee*" or *Angili* for the Royal Navy. The Officers in charge of the Forests in Canara, Cochin, Travancore, and the Collector of Malabar, were called upon for their opinions as to the size and quantity procurable in the respective districts. The Report of the Resident of Travancore and all the papers connected with this subject are recorded in Proceedings of Government, No. 806, dated 19th May 1860. Mr. F. N. Maltby believes, that 10,000 loads *per annum* for five years might be supplied at the rate of

* 15½ c. f.

12 to 14 rupees per candy,* to the great advantage of the Travancore State.

The Admiralty are looking to India for supplies of timber. If the Forests of this Presidency are called upon to any extent to meet the demands of the Home Government, it is evident that the conservancy of all *reserved* tracts must be rigorously enforced. There are many temptations to rob the Forests of the young trees, and the result is that mature timber (Teak especially), is becoming everywhere more scarce.

6. **RAILWAYS.**—The Madras Railway has hitherto used to a very great extent, the indigenous woods for sleepers. About thirty kinds of Timber* have been

tried experimentally, but the experiment has not been attended with satisfactory results; not always, because the woods were worthless, but from the timber not having reached a sufficient age, and from its being used in a comparatively green state. Experience has been gained and better prospects are dawning on the Company in this great essential of Railway operations. The Chief Engineer issued a useful Circular to the Officers of Districts, regarding the branding of sleepers, of which the following is an extract.

"At the time of passing the sleepers they must be branded with a letter showing the kind of wood according to the table annexed:—

"Zinc labels will be prepared which being nailed to the sleeper, will remain legible even after its decay. These will not supersede the branding, but be used in addition to it."

Mr. Ross, Resident Engineer at Palghat, is working the "Chennat Nair" Forest on contract, where there is a large supply of well grown *Errool* (14), *Véngé* (8), *Karra-mardá* (5); he conducts the operations with energy and judgment. The work is occasionally inspected by myself, or the Assistant in charge of the Anamal-lai range. Permission has also been given to the same

Company to obtain timber for the N. W. Line from the Forests of Nuggur in Mysore, which have lately been placed under the care of Dr. Oswald. Mr. Brice, Resident Engineer at Bellary, met me at Hurryhur, and we concluded the arrangements with the Mysore Government. The large and extending Timber trade on the Tumbudra is forming a new and interesting feature of the country.

TEAK, which is more durable than any description of fir, although prepared with creosote, and the best of all woods for sleepers, is considered by the Officials of the Company too expensive.

SAL, the next best, is only procurable in any quantity in Orissa. The Agent of the Madras Railway has been negotiating with Messrs. Binny and Co., for the purpose of procuring it from the

district of Ganjam. The *Pyengadu* of Burmah, which Lieutenant Williams recommended in his letter to the Chief Secretary,* as a superior wood and suitable for Railway purposes, is identical with the *Errool* of Malabar, the *Jambay* of Canara, and is the *Inga Xylocarpa* of Botanists.

JARRAH OR YARRAH.—(*Eucalyptus rostrata*), a wood from Western Australia was specially noticed in a Despatch from Lord Stanley to this Government,* and furnished to the Agents of the Railways in this Presidency. This wood "Mahogany," of the Colonists is being largely imported into Scinde and Ceylon; and Mr. Acworth intimated to me that he had entered into a contract for 7,000 Jarrah sleepers. It is important to watch this experiment, as the result is of the first moment; no wood having hitherto been found to resist white ants (*Termites*), combined with exposure to heat and moisture. A timber trade with Australia would benefit the Colony and supply the Indian market with a substitute for Teak, which is yearly becoming more scarce and costly. The first cargo of Yarra has arrived from Swan river.

Some of the species of *Eucalyptus* are considered half-hardy in the South of England, and as there are many remarkably fine specimens on the Nilgiri Hills, and a few also at Bangalore; there is reason to hope that these valuable trees may succeed on our mountain-ranges, and furnish a timber superior to any of the indigenous woods.

It has recently been proposed to substitute sleepers of cast iron for those of wood, and the plan has already been carried out on a large scale; it is thought that iron will in the end be found the most economical material for sleepers.

Trenails and Wedges.—The Indian woods which appear to be best adapted for these purposes are *Karra mardá* (*Terminalia glabra*), and *Sál* (*Vatica robusta*). The former for trenails, the latter for wedges. *Sál* is a hard wood, possessed of considerable elasticity and resists the attacks of white ants. These woods should have a second seasoning after they are manufactured, as there is a material shrinking immediately after the piece has been cut out of the log and shaped. The ends of the trenails should be dipped in tar as a precautionary measure.

7. **THE PRESERVATION OF TIMBER.**—In an economical point of view, this subject is of the greatest importance, a *g.* Railway sleepers which ought to have stood five or six years at least, have been found useless after being laid down not more than one-third of that time; in fact there are some parts of the Madras line where it was necessary that they should be taken up and replaced before the District itself was completed.

The durability of woods is affected by a variety of causes, and their liability to rapid decay may be prevented by certain precautionary measures.

I. **Season of felling.**—The sapwood is the portion of the tree first liable to undergo fermenting changes, it is to these changes that the decay is traced, and it is therefore of the utmost importance that the tree should be felled at those seasons when it contains the smallest portion of sap; in the case of trees (Teak) whose leaves are deciduous, this is indicated by the nakedness of the tree, and in evergreens by the ripening and falling of the fruit.

The proportion of heart to sapwood varies in different trees according to the age at which they have been felled and the soil upon which they have grown (ex. Teak tree in Malabar differs from Teak in Anamallai). In mature trees there is no sapwood, and it is one of the main objects of conservancy that these only should be cut. There is another point in connection with the period of felling which ought to be noticed. It is a wide-spread opinion that trees should be felled during the wane of the moon. This planetary influence is open to doubt, but the opinion prevails wherever there are large forests, the wood cutters of South America act upon it, and the natives of this country believe that the timber is much more likely to decay if cut when the moon is in "crescent."

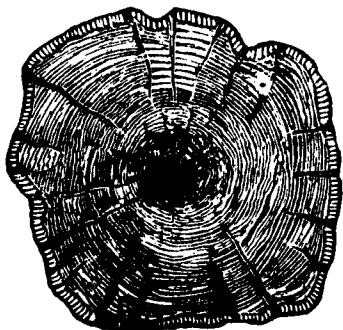
II. **Ringing or girdling.**—The custom of ringing the tree before felling has been advocated on the ground, that the seasoning is thereby expedited and also more thoroughly effected. This is doubtful at least in oil-containing trees (as Teak), but the practice appears to be contra-indicated for other reasons; when a tree has been ringed, the wood cutters object to cut it down on account of its increased hardness, this objection might be waved, were it not for another and more serious one which has been adduced; it is believed to be a fact by some, that trees felled after girdling, have the heart-shake increased. It is difficult to explain this, if it be actually the case.

* Revised specification List.

1. Teak	...	Tectona grandis.
2. Sál	...	Vatica robusta.
3. Sissoo	...	Dalbergia sissoo.
4. Pedawk	...	Pterocarpus Indicus
5. Karra mardá	...	Terminalia glabra.
6. Marrothy maram.	...	" alata.
7. Acha maram	...	Hardwickia binata.
8. Véngé maram	...	Pterocarpus marsupium.
9. Cadukai maram	...	Terminalia chebula.
10. Nicani maram	...	Conocarpus.
11. Sem maram.	...	Soyimida febrifuga.
12. Carru véngé or Chila Wungemaram	...	Acacia odoratissima.
13. Perambe maram	...	Prosopis spicigera.
14. Fruvalu maram	...	Inga xylocarpa.
15. Velvéngé maram.	...	(Vide 18.)
16. Karuveia maram	...	Acacia Arabica.
17. Dud Ilupé maram	...	Bassia longifolia
18. Katvai maram	...	Acacia speciosa.
19. Cumbadri maram.	...	
20. Somida wood.	...	(Vide 11.)
21. Aré wood.	...	
22. Angili	...	Artocarpus hirsutus.
23. Chór kalli.	...	(Vide 11.)
24. Karungalli	...	Acacia sundra.
25. Nat Vadam Cotta.	...	Terminalia catappa.
26. Vaden Cumé.	...	Bignonia xylocarpa.
27. Vella Nagé	...	Conocarpus latifolia.
28. Sadachu.	...	Grewia tiliofolia.
29. Mullu véngé	...	Briedelia spinosa.
30. Ani Carrar	...	Garuga pinnata.
31. Padri maram	...	Bignonia chelonoides.
32. Puvú maram	...	Schleichera trijuga.
33. Vilagam.	...	Feronia elephantum.
34. Hynt.	...	

III. *Splitting*.—It is of the utmost importance that timber in the process of seasoning should be protected from heat, and particularly from the hot winds. The external fibres of the wood being first exposed, contract, and as there is no corresponding shrinking of these fibres in the centre, cracks and splits are the result. These detract from the value of the wood, as it cannot be applied to purposes for which otherwise it would be available. It is not always possible to obtain suitable shelter for the timber, nor is it at all times desirable that the logs should be under cover, at least they should never be so enclosed that they cannot be exposed to a free current of air. The ends are most liable to split up, and there the cracks are generally radial, but occasionally concentric. The harder the wood, the more likely is it to crack and rapidly extend. The best modes of protection are dipping

FIG. 1.



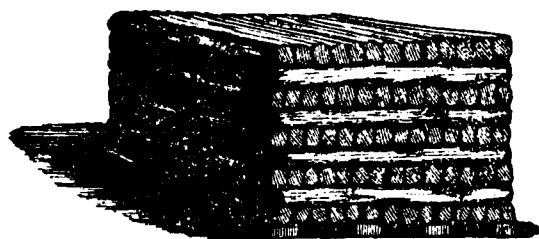
Showing radial and concentric splits.

the extremities of the log or sleeper in *shāni*,* or covering them with grease, mud, petroleum or matting. The Wood oils smeared upon timber also tend to its preservation.

The piles of wood should be supported on bricks or stones, and the ground should be strewn with ashes to prevent the growth of grass or fungi.

8. *SEASONING OF WOOD*.—Several methods have been proposed for the treatment of Timber after it has been felled. It is of the utmost importance that the sap should be allowed freely to dissolve out. Some of the modes which have been adopted are incompatible with this, and are therefore, so far unsatisfactory. The object of Boucherie's process is to displace the fermentable sap by a fluid less liable to change. His method has been largely practised in France, and there favorably reported on; but subsequent experience shows that its success remains to be proved. Another fact should be mentioned that this fluid can only be made to penetrate the softer woods, refusing, *e. g.*, to pass through fully-formed oak. Reference was made

FIG. 2.



Pile of Wood raised on bricks.

to this process in last year's summary, (paragraph 10). A full account of it is given in the Reports, &c. of the Permanent Way Company, in London, who have adopted this method in the preparation of Railway sleepers.

Timber, if expected to endure, must be thoroughly dried by exposure to sun and air; this desiccation may be expedited by first immersing the timber in water and then drying it in a current of air; the importance of ventilation cannot be over-estimated, in fact there are instances where the dry-rot has assailed beams of wood and been arrested by allowing a free current of air to act upon it. Instead of immersing the logs in water, the practice is sometimes adopted of burying them in a dung-hill. This is simply a modification of the steaming process by which the nitrogenous matter is dissolved out.

The following modes of preserving timber may also be referred to, *viz.*, the Burnettizing process and that of Mr. Bethell. The former which consists in charging the wood with a solution of chloride of zinc, appears on the whole to be the best and most practicable. It has been thoroughly tested in Her Majesty's Dockyards, and found to withstand not only the effects of moisture, but the inroads of insects and fungi. The fact that insects and dry rot are in this country the greatest enemies of timber is all in favor of the chloride of zinc. Mr. Bethell uses creosote, with the object of "coagulating the albumen and preventing putrefactive decomposition." His process has been and still is being tested on the Railway. It would be premature to give an opinion on

Sir Wm. Burnett's and Mr. Bethell's processes.

* Cowdung and water.

this experiment, but expectation is not now so sanguine as it was some time ago. The fact is, the creosoted sleepers have of late been found decayed in the centre, the interior portion scooped out, leaving nothing but a deceptive shell, in some instances not more than half an inch in thickness. Much credit is due to Mr. B. MacMaster, Resident Engineer, Salem, for the careful observations which he has been making for some years, on the sleepers laid down along the districts under his charge. The result of these observations* will be interesting and important.

Apart from the tendency of Timber to decay from causes existing in itself, and the attacks of fungi, insects and the like; it is said that another and very important source of destruction is, the applying end to end of two kinds of wood, as for instance, "Oak to Malabar Teak, or Lignum Vitæ, the harder of the two will decay at the point of juncture. If this be really true, it is a matter of great importance, and its truth should be established or overthrown by experiment."—(*Gard. Chron.*, 30th June 1860.)

In summing up this subject, it ought distinctly to be borne in mind that no tree ought to be felled except those which have arrived at maturity, unless strict attention be paid to this rule, the most careful seasoning may fail and premature decay be induced. Another error frequently committed is, that of painting *green* wood for stakes, posts, and the like. The almost inevitable result of this is, that the centre is transformed into touchwood. Considerable difficulty is experienced by this Department in having always the requisite amount of seasoned wood in store. It is therefore of importance that Public Departments should forward their indents, so as to allow sufficient time for the proper selection of the tree and due seasoning of the log.

One great advantage of careful seasoning, seldom taken into account is, the increased facility of carriage both by land and water. Captain Morgan calculated that the seasoned logs (Teak) carried up the Sigūr Ghāt to the Wellington Barracks, are 25 per cent. lighter, after lying two years in Depôt below; this would be a material consideration in estimating the cost of the Lawrence Asylum, or any other large buildings on the Nilgiris. Again, as to floating, the seasoning of the logs is indispensable: two years are required for Teak and Sāl, and three years for Blackwood.

9. *KUMARI CULTIVATION*.—The Government have issued definite orders on the future treatment of Kumari cultivation in Canara, which is now prohibited, except in cases where the land has been so cultivated within the last twelve years. It is understood that under no circumstances, valuable forests are to be so treated.

It has been shown that the system is injurious to the welfare of the wandering tribes by whom it is practised, for although Kumari is itself profitable, the growers are not the gainers, the Soucars on the coast enjoying the larger share of the profits. Moreover, the cultivation is probably prejudicial in a sanitary point of view, and the ease with which a subsistence is obtained has an effect upon the people by no means conducing to enterprise and healthy development in any form.

The benefits, such as they are, following this rude system of culture are only temporary, the crop of the first year brings good returns, and the clearance may be useful to health; but the ground being abandoned after the gathering of the crop, becomes quickly overgrown with dense impenetrable scrub, more injurious to the inhabitants than the forest of lofty trees which had been destroyed. When Kumari does not interfere with the growth of valuable timber as in the taluq of Bekul (where it is exhausted), the Government has exercised forbearance, and Kumari has been allowed to continue for the present. The operations of the Mallialis on the Shervaroy Hills have, in like manner been restricted.

10. *TELEGRAPH DEPARTMENT*.—The demand for Telegraph posts is much less than it was formerly. Instead of using Teak for the support of the wires, *Mutti* (*Terminalia coriacea*) is employed in those Central Districts where Teak is scarce, and Sāl in the Northern division.

So long as the timber was sunk in the ground, the posts were constantly damaged by the ravages of white ants; but now that a metallic socket has been supplied, the wood is safe from their attack. A further precaution is taken to preserve the lower end of the post by running liquid dammer into the metallic sheaths, so that the enclosed part of the post is encased with a coating of resin.

* Mr. M. informs me that "decay of sleepers nearly always commences under the chairs, these hold water like a cup, which gradually soaks into the wood."

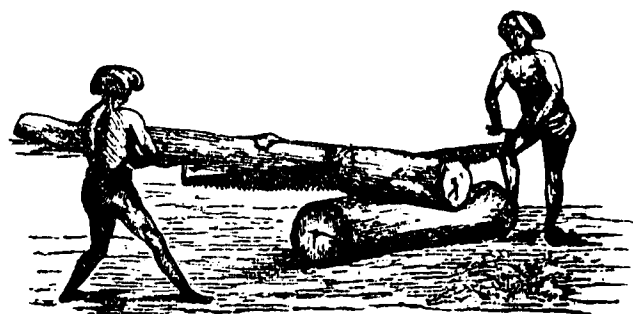
11. **AUCTIONS.**—The system of periodical Auctions is continued. All sound timber which would otherwise be left to rot or burn is collected and disposed of in this manner. The numerous heavy indents and constant pressure on the Forests dispose of most of the wood as soon as it is arranged in the Depôts, so that the Sales are confined to the 2nd and 3rd classes of timber. It is most important that this system should be continued, as, if we do not enable the people to procure wood by purchase, illicit practices will certainly spring up.

12. **ECONOMICAL WORKING.**—In my first Report, allusion was made to the system of slovenly felling and wasteful trimming, which generally prevailed throughout the country. I am not able to state that these practices have been abandoned by the Forest tribes, who are notoriously improvident, but wherever Government is working the Forest under the supervision of their own Officers, the rules laid down as to felling, squaring and seasoning, are strictly attended to.

The introduction of the cross-cut saw in lieu of the rude woodman's axe made by the village blacksmith is a source of great economy and the use of this implement is insisted upon wherever practicable. As it is very expensive to bring gangs of trained sawyers from the towns, it

is found more advisable to instruct the Hill tribes (Mulsars) and Wud-durs in this occupation, and by paying ready money for the work done, a great improvement is taking place.

The marginal Fig. 3 shows the method of using the cross-cut saw which may be purchased in the shops for about 8 rupees. Planks and sleepers are now prepared for the most part by the saw instead of the axe, and a great saving of material is hereby effected.



Natives using the Saw.

The introduction of Saw machinery was referred to in my first summary, and the opinion I then expressed that it should be left to private enterprise was approved by Government. Since that time a large Steam Saw Mill has been in active operation at Wellington, under the superintendence of an Engineer, which is indispensable.

When the logs are prepared, they are placed upon carts and carried to the Inland Depôt or to the rivers, as the case may be. The annexed sketch (fig. 4.) shows the usual way of loading a country cart with a squared beam of, say 18 or 20 cubic feet.

The effects of the great destruction of trees are already visible. The extravagant waste of the wood in the roofing of Native houses, is gradually being diminished, at least in our large towns, where the increasing value of timber is distinctly felt. The manufacture of tables or other furniture from a single piece of wood is seldom seen, and materials less valuable than Teak are now used for camp chairs and ammunition boxes.

13. **NOXIOUS INSECTS.**—The injuries sustained by the woods and forests from the attacks of destructive insects can scarcely be estimated: those which are best known to us as wanton and indiscriminate destroyers are, the white ant (*Termites*), and the carpenter bee (*Xylocopa*). The former attacks the timber not only during its growth, but after it has been felled; the latter confines its ravages to the dead wood. Much good might be effected if the public servants attached to Government buildings were instructed to destroy this insect, whenever it is seen by them. It is this large blue wood-cutter (*Xylocopa*), which tunnells through the beams and posts of our public buildings which they frequent in numbers. The passages are from 12 to 15 inches long, and more than half an inch in diameter. If the insects are numerous, their ravages are dangerously destructive and they soon render the beam unsafe for supporting the roof. The accompanying engraving (Fig. 5.) illustrates the mischief caused by these carpenter bees in a log* of Cadukai (*Terminalia Chebula*), the wood appears as if pierced by an Augur, and well represents the peculiarly injurious nature of their attacks. It would be very useful if officers in charge of buildings, directed their attention to the best means of ejecting or destroying these Hymenopterous insects.

White Ants.—Numerous expedients have been suggested to arrest the ravages of white

* Sixteen carpenter-bees were found in a cubic foot of wood.



ants, all of which have been only partially successful. Some of these appeared in the Government Records and have been circulated for information.

Captain Fraser, Bengal Engineers, mixed yellow arsenic (*Flural*) with the paint, white-wash and masonry of the King's Magazine, Fort William, and the building was favorably reported upon after three years.

Captain Man and Captain McPherson, painted the joists and planking of several buildings at Singapore, with *Gambier Composition*, the result was perfect success although the buildings had been previously infested with white ants.

GAMBIER COMPOSITION.

"*Gambier composition*—Dissolve 3 pints of gambier in 12 of dammer oil over a slow fire; then stir 1 part of lime, sprinkling it over the top to prevent its coagulating and settling in a mass at the bottom; it must be well and quickly stirred. It should then be taken out of the cauldron and ground down like paint on a muller till it is smooth, and afterwards returned to the pot and heated. A little oil should be added to make it tractable, and the composition can then be laid over the material; to be treated with a common brush.

Against the *teredo* I substituted the same portion of black varnish or tar for dammer oil. I of course omitted the grinding down which would not answer with tar.

Extract from *Milburn's Oriental Commerce*, 1813.—'Gutta Gambier is juice extracted from the leaves of a plant of the same name (*Uncaria Gambir*) growing in Sumatra &c., inspissated by decoction, strained, suffered to cool and harden, and then cut into cakes of different sizes or formed into balls. Chief places of manufacture—Siak, Malacca, and Bittang. It is used by the Malays with the leaves of betel in the same manner as *Catch* (or *Catechu*) in other parts of India. For this purpose the finest and whitest is selected; the red being stronger tasted and rank is exported to Batavia and China for the purposes of tanning and dyeing.'

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Colonel Scott, Acting Chief Engineer at Bombay, records instances of timber being boiled under pressure in various antiseptic solutions with very satisfactory results; but considerable apparatus is necessary and the expense forbids its use except in large public works.

Little or nothing is on record regarding the many insects which prey upon our Forest trees. The subject is most important, they perhaps effect more injury than all the other sources of decay. The only one who has paid particular attention to this branch of science and who is able to supply information is, Mr. S. N. Ward, C. S. By means of his beautiful figures, I hope to interest the subordinates of the department in this part of practical Forestry.

If any meet with pieces of timber attacked by wood-boring beetles, I should be glad to receive specimens showing the burrows, and especially if they contain the larvæ.

14. EXTENSION OF SYSTEM.—I. *Ossoor and Denkinakottah*.—Steps have been taken towards the appointment of an Overseer for the conservancy of the Sandalwood jungles in Ossoor and Denkinakottah. It was thought desirable to extend the system of conservancy to these Forests, it being necessary to provide against the theft of the Sandal trees, and to prevent the young plants from being destroyed by strong creepers which grow everywhere around. The progress of the Bangalore branch Railway, moreover, pointed out the propriety of having a subordinate of this Department, to number and Register the trees available for sleepers, &c.

II. *Madura*.—In compliance with a recommendation made by His Excellency Sir C. Trevelyan, in paragraph 33 of his Minute, dated 8th February 1860, an Overseer has been appointed to the Madura Forests, to prevent the reckless cutting of Timber, and to mark from year to year the trees which arrive at sufficient maturity and are fit to be felled. His attention will be particularly directed at first to the slopes of the Pulni Hills and Cumbum valley which are reported to contain valuable Timber.

III. *Cuddapah*.—This district has hitherto been inadequately explored and conserved. It has now become necessary that the jungles there be brought under strict surveillance. The Railway which is to run through the whole length of the district is advancing, and the demand on these Forests for sleepers and the like matter will soon become pressing. An efficient Assistant has been appointed for this duty.

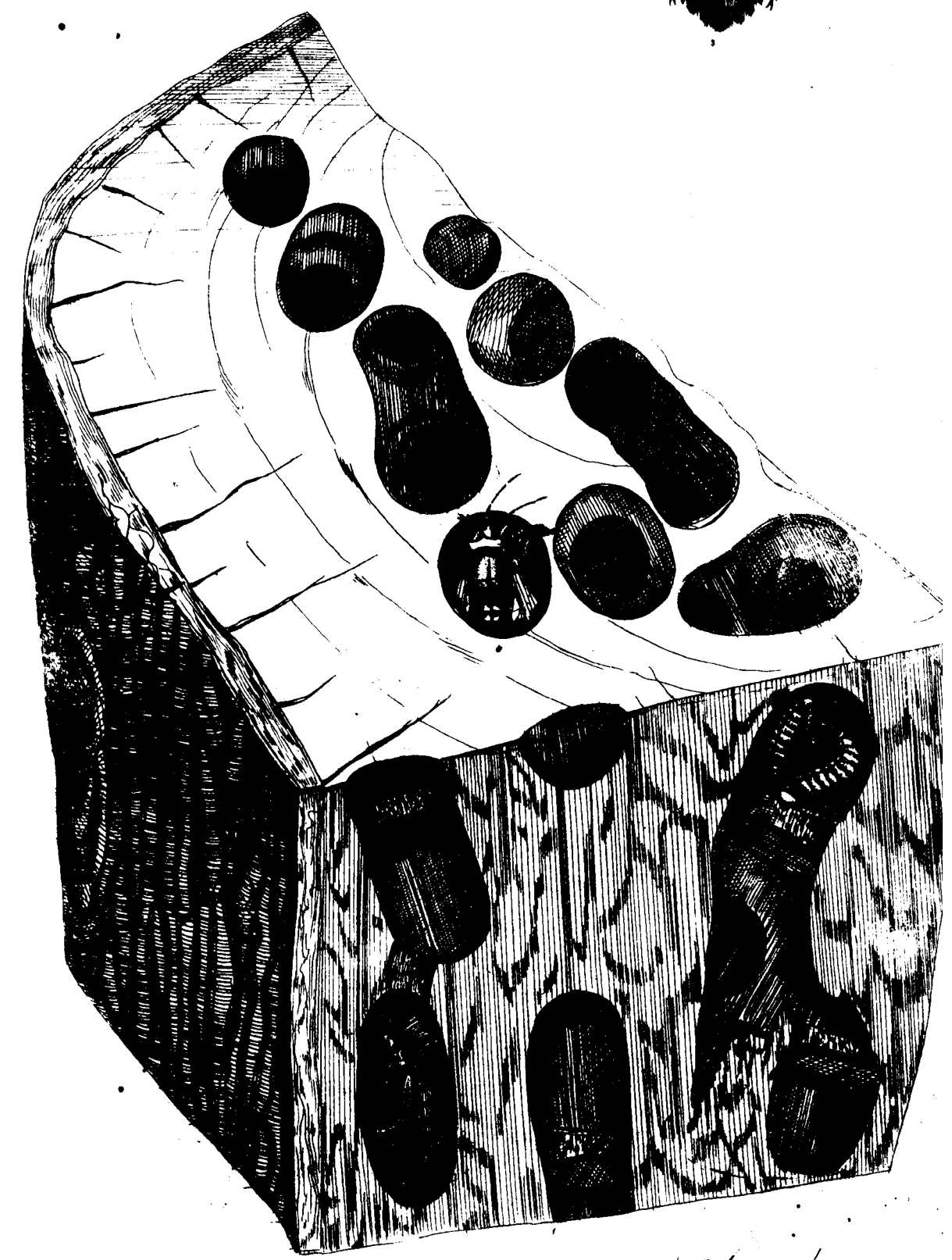
IV. *Kurnool*.—The present and prospective operations of the Irrigation Company, as well as other Public Works have invested the Forests of the Nallamallai Hills with considerable importance and the attention of this Department has been drawn to them by Government. A brief account of these Hills, by Captain J. G. Russell, was published about eight years ago in the *Fort Saint George*

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In connection with increased attention to the forests of this Presidency, I may observe that

* Proc. Government, No. 690, dated 4th April 1860.

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Wood perforated by Carpenter Bees / Xyllocopa /

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applications for our rules have been received from Ceylon, Hyderabad and Nagpore, where Forest establishments have been or are about to be organized. The Portuguese Conservator in the Territories of Goa is in constant co-operation with my Assistant, Mr. Müller.

15. **FINANCIAL RESULTS.**—The Accounts of the Department for the past official year have been forwarded to the Board of Revenue as directed in paragraph 37, No. 886, dated 18th February 1860, of the Board's Proceedings, and referred to in the latter part of paragraph 5, of Proceedings of Government, No. 1021, dated 21st June 1860. From the following Table it may be seen that the operations in the several Forests have been financially profitable :

Financial Results of Conservancy for 1859-60.

NAME OF FORESTS.	Receipts by the sale of Timber, &c.		Disbursements including the cost of establishment and contingent charges.		Balance in favor of Government.	
	RS.	A. P.	RS.	A. P.	RS.	A. P.
Anamallai.....	2,65,953	1 0	22,484	9 4	2,43,468	7 8
Sigūr.....	2,593	3 6	2,147	15 3	445	4 3
Salem.....	29,482	6 7	4,040	6 6	25,442	0 1
North Canara.....	2,00,767	13 1	57,664	6 10	1,43,103	6 3
South Canara.....	8,650	11 7	1,897	11 8	6,752	15 11
Nilgiri Sholas.....	909	14 0	50	0 6	859	13 6
Total..	5,08,357	1 9	88,285	2 1	4,20,071	15 8
<i>Deduct General Charges.</i>						
Pay of the Conservator of Forests, Establishment, Contingent charges, &c....					21,722	12 3
Actual Profit....					3,98,349	3 5

16. **NORTH CANARA.**—Mr. Müller's report is carefully drawn up. It contains a full statement of the operations in detail and is creditable to him. The principal portion of it will be found in Appendix A.

Mr. Müller enters fully into the effects of introducing the *Amani** system, the benefits of which are not so much seen in increase of revenue as in economy of material. In paragraph 13, he has given a tabular statement of the receipts and expenditure for seven years, which shows the result of conservancy from the beginning.

We have still much difficulty in arranging the contracts for felling and transporting timber on account of Government, but there is less trouble in this respect than formerly.

The operations in Gúnd are commenced, and with the united efforts of Captain Walker, the District Engineer, and Mr. Müller, I have no doubt, they will be successfully carried out. I may here state that as regards Government Forest on the Malabar Coast, it is chiefly from the plateau of Gúnd that we look to meet the prospective demands of Her Majesty's Navy.

In the adjoining territory of Goa, the cultivators formerly cut down all trees indiscriminately, but of late years a very strict conservancy has been kept up; there is an officer specially appointed to the purpose, who frequently meets Mr. Müller on the frontier.

I have the great satisfaction of knowing that the Collector of this District takes a deep interest in Forest management and co-operates cordially with Mr. Müller in the extensive operations now in progress.

17. **SOUTH CANARA.**—As Canara is now divided, the Southern Forests require separate notice. These are under the charge of Mr. E. Thompson, Overseer, generally stationed at Pátúr, who forwards his Reports through the Collector, and is in frequent communication with him. Mr. Fraser, the Collector's Report on Forest revenue, is in Appendix B. The suggestion made in paragraph 3, regarding the supply of fuel to Sandal stills, met with my entire concurrence and the system has been altered. These Oil merchants now stand on the same footing as the other people. A large contract has been entered into, for the supply of Mangalore with wood from Sooliab. It will probably be necessary to strengthen Mr. Thompson's hands, by granting him a small permanent Establishment.

18. **ANAMALLAI RANGE.**—Lieut. Beddome's report of the working of this fine reserved Forest is given in Appendix C. The first point specially calling for remark is the unusually large income which, as explained in my last year's Report, (paragraph 14), arises from the value of Timber sold in 1858 and 1859, being included along with that of 1859-60.

It will be observed that the wood sold to the Bombay Government for Naval purposes, is much smaller in 1859-60, than in 1858-59. Again, the timber sold to the Agents of the Madras and Great Southern of India Railway Company, is much larger than in previous years. The trees felled, comprehended various kinds of the better indigenous trees, as well as Teak and Blackwood.

Owing to the extreme difficulty of obtaining axemen and sawyers, all available hands being engaged at remunerative rates by the Railway Company, there was much less timber felled than usual. The attention of the Establishment was directed to the removal of old outlying timber scattered about in the Forests. The dragging of this to the* slip by elephants was an important work, and, has much reduced the list of "wood unaccounted for."

After careful inquiry, the rate of Cart hire above Ghát has been increased 20 per cent., this G. O., dated 4th November 1859, was unavoidable. The Malsar Farm was abolished, and these No. 1500. wild denizens of the Forest are now under instruction in sawing and carpentry. They are not yet skilled workmen, but they are improving, and their labour is of immense value to us; being *indigenous*, they enjoy comparative immunity from the diseases incident to casual residents in that trying climate.

The commencement of a Teak Plantation has been made, the great difficulty is the want of labor, which is much to be regretted as the soil and climate are peculiarly favorable to the growth of Teak: another hindrance is the abundance of wild animals, which occasions the necessity of strongly fencing the nursery. One of the peons has been thoroughly instructed in Teak sowing at Nellambúr.

It is proposed that the Superintendent of this range should visit the neighbouring hills during the non-working season, removing any ripe trees at Pomachi, visiting the Palghat and Walliar Jungles, and making arrangements for the periodical cutting of the Sandal trees in Collegal.

19. **SIGÜR.**—This Forest had been held in contract for three years, by one Hoossain Baba, whose lease expired last year (*vide* Report 1858-59, paragraph 13), when the Forest came under the management of this Department, and is now carefully supervised by Captain Morgan, whose Report forms Appendix D.

The sale of jungle Timber and Sandalwood has, as predicted, "covered the expenses and yielded a profit." The young Teak trees are coming on well, and if the increase of cultivation in this valley does not materially encroach upon the Forest, there will be a sufficient supply of moderate scantling for Utakamund in future years.

The depôt at Sawyers' village was well stocked when I inspected it a few months ago. As a general rule, we deliver at the depôts; but in this case, the position below Ghát is unfavorable for auction sales, which answer better at Utakamund; consequently, the arrangements for transporting the timber, fall upon Captain Morgan.

20. **MÚDUMALLAI.**—This Forest rented by Government from the Raja of Nellambúr is also under the charge of Captain Morgan, an abstract of the operations forms Appendix E. During the past year 37,602 cubic feet in the log, have been delivered at Wellington, in addition to a large quantity of wrought timber from Gundelpe Workshop supplied to the Barracks.

The Account Current of the operations passed through the Department Public Works, as the expenses have been paid out of the Barrack estimates. It is proposed that during the remainder of the lease (three years), the Forest shall be worked by Captain Morgan on account of Government and the timber stored at Sawyer's Village till required for the Lawrence Asylum and other† Public buildings about to be erected at Utakamund. Periodical Sales for the benefit of the Community will take place.

21. **SALEM.**—A brief Report of the operations of this District will be found in Appendix F. The proceeds consist of two items, seignorage for sleepers supplied to the Railway Company amounting to Rupees 23,471-10-0, and seignorage for House building material taken by Wood merchants at 1 Rupee per cart load, which realized Rupees 6,010.

* The formation of a Ghát in lieu of the rude timber slip, has been entered in the Budget and will greatly facilitate the operations of the Department.

The great pressure for Railway sleepers is nearly over in this Central Province, and we have now to consider matured arrangements for the ordinary demands which may be expected.

A statement is annexed, showing the number of sleepers delivered during the year in the Salem district, and the trees furnishing them, as far as it has been possible to ascertain them. Considering the difficulty of getting accurate information from Native contractors, this return cannot be considered absolutely correct, but it is sufficiently so to enable us to deduce some useful results.

No.	Native Name.	Botanical Name.	Total.
1	Pillé Marda	Terminalia	34,260
2	Maruti	Terminalia alata	26,717
3	Vella Naga	Conocarpus latifolia	25,092
4	Véngé	Pterocarpus marsupium	18,960
5	Kar Marda	Terminalia glabra	18,502
6	Cadukai	do. chebula	16,132
7	Sadachu	Grewia tiliaefolia	11,138
8	Cumbadri		9,405
9	Acha	Hardwickia binata	8,064
10	Erruvalu	Inga xylocarpa	7,657
11	Dud Ilupé	Bassia longifolia	7,101
12	Kátvai	Acacia speciosa	7,054
13	Sál	Vatica robusta	6,540
14	Aré		4,860
15	Auny Curre	Garuga pinnata	4,453
16	Pádrí	Bignonia chelonoides	3,317
17	Carru-véngé	Acacia odoratissima	2,651
18	Pedowk	Pterocarpus indicus	2,615
19	Ilupé	Bassia	2,463
20	Chella Wúnjé	Acacia odoratissima	2,411
21	Nicani	Conocarpus	2,254
22	Sem	Soymida febrifuga	2,215
23	Vel-véngé	Acacia speciosa	2,108
24	Kalai Murdah	Terminalia	1,974
25	Carrungalli	Acacia sundra	1,922
26	Marda	Terminalia	1,851
27	Erúl	Inga xylocarpa	1,856
28	Perumbé	Prosopis spicigera	1,471
29	Nát Vaddam cottay	Terminalia catappa	1,395
30	Puvu	Schleichera trijuga	1,353
31	Karivalem	Acacia Arabica	1,264
32	Mullu-véngé	Briedelia spinosa	1,212
33	Sissú	Dalbergia sissoo	1,182
34	Valagum	Feronia elephantum	1,108
35	Chórkalli	Chloroxylon Swietenia	675
36	Palai	Mimusops hexandra	669
37	Ték	Tectona grandis	659
38	Nir Marda	Terminalia	241
39	Someda	Soymida febrifuga	225
40	Kurrentumbi	Diospyros	203
41	Jallari	Vatica	116
42	Kurkuttah	Zizyphus glabrata	92
43	Yellak cadukai		84
44	Athee		80
45	Angili	Artocarpus hirsutus	50
46	Valai		26
47	Miladi		20
48	Coné	Cassia fistula	18
49	Chittacha	(Vide 7)	14
50	Vadur coomé	Bignonia xylocarpa	10
51	Tumbi	Diospyros ebenaster	3
52	Cuddapai		1
Total.			2,45,743

NOTE.—The number of trees furnishing sleepers is not so large as this list indicates, 10 and 27 are *Inga xylocarpa*; 5 and 24 are the same *Terminalia*; and 7 seems to be identical with 49.

It will be seen that by far the largest number of sleepers are obtained from trees of the General *Terminalia*, and *Conocarpus*, Natural Family COMBRETACEÆ, remarkable for the height and size of their trunks, and the toughness of their timber; their durability *under ground* has not been altogether satisfactory, and the Cadukai (*T. Chebula*) especially appears to be liable both to the attack of fungi and of the carpenter bee, and ought to be excluded from the specification List.

The LEGUMINOSÆ are next in importance, the trees supplying the wood being *Pterocarpus* (Véngé), *Inga* (Erúl), *Hardwickia* (Acha), and various species of *Acacia*. Well grown timber of these kinds is deservedly prized by the Engineers.

As the Native name frequently applies to a genus rather than to a species, it is very doubtful whether those marked Sál and Pedowk are really the true species, although obtained from trees belonging to the genera *Vatica* and *Pterocarpus*.

The Railway Engineers generally have most confidence in Sál, Ilupé, Kar Marda, Véngé, Chella Wúnjé: Teak being too expensive for general use as sleepers.

22. NILGIRI SHOLAS.—The increasing wants of the Hill stations, the requirements of the G. O., No. 425, 20th March 1860. Wellington Barracks, and the assignments to settlers have drawn G. O., No. 1,161, 13th July 1860. attention to the necessity of conserving the remaining woods on the Nilgiri Hills. The subject is treated of at length in the Records noted in the margin. The Establishment for supervising the Forests on the plateau, consists of the following:—

Utakamund. 2 Overseers. 7 Peons.

Kunúr. 1 „ 0 „

These are about to be placed under the charge of an Assistant Conservator.

The Rules approved by Government as applicable to Utakamund, are:—

“First.—The whole of the Sholas, or woods, in the neighbourhood of the station to be absolutely reserved, not only for their beauty, but also from fear of injuring the water springs; their limits to be marked; no private cutters to be allowed inside; old trees to be felled by servants of the department, and brought outside, and to be sold there by public auction. Trees to be planted where required, in vacant spaces.

Secondly.—Suitable woods at a distance from the station to be selected and marked out in lots of moderate size; and a number of these lots, amply sufficient for a year's supply, to be put up to auction annually. The Contractor to be permitted to clear the ground entirely within his lot or lots, with the exception of such trees as may be marked by the Conservancy Department, previously to the sale.

Thirdly.—The cleared lots to be planted, as required, by the Conservancy Department.

Fourthly.—No private felling of any kind, or for any person, to be allowed in woods or on land belonging to Government.”

23. TEAK.—Teak scantling of large size is becoming more and more scarce all along the West Coast. The fact is, in Malabar, *first class logs* are not easily procurable. This dearth has lead to the employment of other indigenous woods, which previously were in little or no demand. In the Railway Department, much as Teak is valued, it is found to be too expensive for many purposes to which it was formerly applied; and, as is stated in another part of this summary, experiments are now being made with the view of securing suitable and less expensive substitutes. In the building of private houses, the same difficulty is experienced, and builders are having recourse to *Véngé*, *Karamarda*, and the like.

Whilst there is a great want of large Teak logs, there is no lack of small beams and poles.

24. TEAK PLANTATIONS.—The increasing demand for woods, available for Government purposes, renders it of the utmost importance that the various Plantations should be carefully watched and conserved, especially now that the Home Government is looking in this direction to supply her Dockyards. The largest and most valuable Forests are reserved for the purposes of Government, and measures have been adopted not only to prevent inroads upon them with the axe and conflagration, but to watch the growth of the plants and provide against their being choked by the undergrowth which springs up around them. The most important of these Plantations are the “Conolly plantations.” These young Forests have been specially referred to in both of my preceding annual summaries, and their value to the State will every year become more perceptible. Hitherto they have been a source of expense, but last year the returns for the first time

Expenditure 1859 60...3,493-0 6
 Income..... 5,165-2-9
 1,672-2-3

exceeded the expense of their maintenance: situated as these plantations are on the banks of the Nellambūr river, the value of the timber is enhanced by the fact that it is so easily transported, while the Malabar Forests are so much exhausted. The Forest is of such importance and at such a critical period in its history, that I would recommend that in the absence of the Conservator, the Collector of the district should periodically visit it, and take measures to secure a strict adherence to the regulations laid down regarding it. This course appears to be indicated all the more by the circumstance that the plantation in question was originated by a Collector of the district. These Forests are situated in the Ernad taluq. Their extent has not as yet been definitely ascertained, it has indeed been proximately stated, but it is of the utmost importance that they be carefully surveyed. At present the survey of Wynād is going forward and as at certain seasons of the year it is, I understand, difficult to proceed with it, on account of sanitary considerations, I would earnestly urge that such intervals be employed for determining exactly their extent as well as the leases of land set apart for planting purposes. There is one interesting feature of these plantations which ought to be stated. They are now made use of as Training schools, where the planting system there followed, is taught to subordinates, who are gradually introduced into it. One of these thus taught, has been deputed to the Anamallai Forests, one to North Canara, and two to Mysore.

25. AVERAGE GROWTH OF TEAK.—A knowledge of the rate of growth is the basis of all our systems. We are groping in the dark so long as we are without knowledge on this point. The scale which at present guides our operations is:

10 years growth, 18 inches at 6 feet from ground.					
22 "	do.	36 "	"	"	"
37 "	do.	4-6 "	"	"	"
62 "	do.	6 "	"	"	"
93 "	do.	7-6 "	"	"	"

The above figures are taken from a memorandum of Dr. Brandis, Conservator of Forests in Burma, and accords very much with my own observation.

26. BLACKWOOD.—Blackwood seedlings have been planted to the number of several thousands in North Canara and the Nuggur district of Mysore. This wood is largely used in the manufacture of furniture at Bombay, &c. the price has been rising for some years, and it is now nearly the same as that of Teak.

27. AUSTRALIAN PLANTATIONS.—The progress of these plantations having been detailed in a separate Report, I need only state that Overseer Hall, performs his duty efficiently. I have reason to believe that the object of supplying the Wellington Barracks with fuel will be fulfilled. An additional sanction of Rupees 2,500 was made by Government towards an extension* of these plantations. The work is advancing, but meanwhile it would be premature to report further upon it. It is worthy of remark that the pests of our plantations *below* Ghāt are, white Ants, spotted Deer and wild Hogs, whilst *above*, devastations are committed perhaps to a greater extent by Rats, Hares, Porcupines, Grubs, and Frost.

Rats.—The Nilgiri rat (*Mus providens*, W. E.) is a serious enemy, working underground, eating across the tap-root, and continuing its devastations after the young plant is safe from frost and hares.

Frost.—The frost during certain months of the year is detrimental to the young trees, situated in the low lying swampy ground of the Hills, but it seldom affects those planted on the slopes. As a general rule it ceases to act injuriously after the plant has completed the second year. The sign of the young tree being frost-bitten, is a patch or ring of softened and discolored bark with fissures, usually an inch or two above ground, and the leaves dropping off.

Hares.—The hares in the clear moon-light nights nibble off the leading shoots, returning again and again until the plant's development is seriously checked, giving it a dwarfed and unseemly aspect. After the young trees, however, have attained a height of about two feet above ground, they cease to be a temptation to the Hares; but other causes of anxiety and sources of injury now present themselves.

Grubs.—Various kinds of grubs assail the tender plant, some of them entering from below

* A consignment of Jarrah seed is expected from Australia.

pierce into the heart-wood, and continue their excavations upwards. Many precautions have been taken to render the plantations secure from these sources of injury with some degree of advantage.

The most successful mode of dealing with rats is that of depositing phosphorous pills* at the entrance of their holes. The formula is furnished in Ure's Dictionary of Arts, Manufactures and Mines, is certainly superior to any expedient hitherto adopted to get rid of the nuisance in question.

Overcrowding.—The error of crowding the trees too closely when planted, and subsequently of neglecting to thin them after they have shot up, cannot be too strongly insisted upon. Planting operations elsewhere have suffered, and in certain instances have utterly failed from the neglect of pruning and thinning, and trees which otherwise might have developed into first class Timber, have choked each other; the closeness of growth preventing a free circulation of air and an adequate supply of nutriment to the individual plants.

28. DISTRIBUTION OF TREE SEEDS.—It is a principle acted on in the department, to send seeds to those quarters, where their growth is probable, and their possession would be esteemed an acquisition.

This principle is specially regarded in those instances, where we have received consignments from distant quarters. This reciprocity of favors operates beneficially, both in a scientific and economic point of view. While this is the case, individuals who thus transmit seeds, should use discretion in selecting such species, as will be likely to prosper in their new habitats. In the course of the year, seeds have been despatched to Scinde, Hongkong, Melbourne and Sydney.

29. AVENUES.—(A.) The District Engineers have generally nurseries for raising shady trees, which have in several Districts been planted with good effect along the trunk roads. A few weeks ago, the District Engineer of Coimbatore sent three selected laborers to be instructed at the Australian Plantation, in the planting, pruning and trimming of trees. Bungalow Sepoys ought, I think, to be charged with the care and watering of the trees in the compounds of Dāk Bungalows, and the same condition might apply to servants in charge of other public buildings, as Choultries, Soldiers' Rest-Houses, &c.

(B.) *Madras*.—It is admitted to be better to grow trees from seedlings than from branches. The former method is slower and requires more watching and watering; but the trees last much longer, and are more symmetrical. It is of the utmost importance that the trees planted be under careful supervision, otherwise it will be impossible to ensure their healthy development, and the main objects of the avenue—ornament and shelter, will be lost. It is desirable, therefore, that such measures be adopted as will be most likely to secure these objects. Some progress has, indeed, been made in this direction, the planting of certain portions of the Public roads having been placed under skilled superintendence. A few of the principal Avenues in Madras, adjacent to the Horticultural Gardens, are under the care of Mr. Brown, and the growth of various trees suitable for Avenues will be carefully watched by him. At Utakamund, the planting of the Highways has had a similar advantageous beginning, the road from Utakamund to Wellington being under the immediate superintendence of Mr. W. G. McIvor; while the margin of the lake and the planting of the former Station generally, is under the Improvement Committee.

(C.) *Districts*.—It is my own personal opinion, after travelling through the greater part of the Presidency, that as a general rule, the Avenues of each District should be placed under the Collector. The reasons are, that Engineers are tempted to lop and otherwise injure the trees when they are engaged on works in the neighbourhood; and this, in addition to the immediate damage sustained, operates badly upon the Natives as an example, and therefore renders conservancy under such circumstances difficult. Besides, the Public Works Department complain that their Establishment is insufficient for the permanent management of the Avenues and as it is not desirable to divide responsibility, the plan which most commends itself, appears to be, the reverting to the former system. The Collector also has great influence over the Villagers and has subordinates in every village.

(D.) *Canal Banks*.—The Godavery and Kistnah Channel Banks have been carefully planted by the Officers in charge, and this should be carried out along all the ramifications. The Irrigation and Canal Company are desirous of commencing the same good work and introducing useful trees at once. The Agent of that corporation is now in correspondence with this Office, how to conduct the general measure of planting, through the medium of the Canal Officers.

* "Hog's lard, ground Cocoa-nut and Phosphorus form the most certain bait and poison combined." (Baker's Ceylon, p. 109). Care must be taken in mixing the Phosphorus, of which very little suffices.

The proposal of planting the Canal Banks is highly to be commended, and the expense will be amply repaid by the increasing value of the timber.

(E.) *Railway*.—The Railway Companies have on several instances applied to the different Public gardens for a large number of young trees, so that I presume, they intend to plant both along the lines and near to the stations; this measure will tend to the comfort of travellers and ensure a partial supply of fuel and sleepers.

30. *FIREWOOD*.—The consumption of firewood has always been great, inasmuch as it is essential to cooking, and in particular districts the supply has been described by writers as barely sufficient; but the question of supply is one which is now pressing more urgently on the attention of all the District authorities.

In connection with the progress of Railways and the undertaking of large Public Works, the scarcity of fuel is severely felt and my attention is drawn to it *everywhere*. The *bond fide* Ryot is understood to have a prescriptive right to the fuel and leaf manure required for his house and field, and an abundant supply of them is obviously beneficial, enabling him to apply the dung of his cattle to fertilize his lands.

The large towns are supplied with firewood by persons who purchase annually at auction, the contract for cutting certain portions of the neighbouring jungle, and the apportioning of woodlands is made with reference to the period when it will reproduce itself. The Contractors are allowed to remove, under regulations, the low bushes and less valuable kinds of trees. A list of reserved trees is published in the District Gazettes, and hung up at the Tahsildar's Cutcherry.

It is customary to cut the wood into billets of 3 or 4 feet length, which are split into two or four pieces according to the diameter, and carried to market, where such billets are retailed and delivered at the door. The price varies exceedingly in different districts and at different seasons; but I may mention that the average has risen about 25 per cent. in most of the large towns within a few years.

This is the fuel used for cooking by Europeans and a large proportion of the Native population, who also use bratties made of cowdung. In Bellary and other barren districts, the firewood chiefly consists of branches of thorny bushes, there being almost a total absence of forest trees.

In such localities, the cost of conveyance and the difficulty of procuring wood is in some cases excessive. Small poles are not to be obtained even for the rafters of huts; the lower fallen leaves of the American aloe come into great use as a substitute for fuel, for which it is not well adapted, containing little combustible matter.

The seignorage on firewood varies in different districts,* and the general regulations also differ with reference to the natural supply of fuel, which is more or less abundant all over the country. After watching the effect of the local rules, which are to a certain extent experimental, we will be able, I hope hereafter, to generalize principles and to arrange the management of fuel, charcoal and bamboos, upon something like a uniform system. In illustration of what is doing in this respect, I have inserted in the Appendix, the Rules in the Coimbatore District, finally passed by the Board of Revenue, the Collector and myself. An addition has yet to be made in regard to charcoal.

PEAT.—On the Nilgiri Hills, turf fuel is now used more than formerly, and it is very desirable that this economical material should be utilized as much as possible, so as to lessen the demand for wood and charcoal.

The peat of the Nilgiris is different from that of Europe, as regards the producing plants. Several specimens were lately forwarded to Dr. Percy of the School of Mines, London, for analysis.

The only other sample which has been submitted to chemical examination so far as I know, was brought from Thibet, by Dr. Falconer.

31. *CHARCOAL*.—This subject was alluded to in last year's summary, it is one of great importance, and again demands special notice. There is great necessity for insisting on the strictest economy in the preparation of charcoal, as it is, the Native workers have recourse in its manufacture to measures which at once rude* and extravagant. In various parts of the country, there are slight differences in the mode of preparation, but all are faulty and objectionable in an economical point of view. The branches selected for charring are generally those of large, valuable hard-wood trees, which are left to decay. Teak, Blackwood and Erol, being

* Wall's Report on the Silver and Lead ores of Kurnul, recorded in G. O., No. 1040, 27th July 1858.

† About 750 pounds.

always preferred when there is a choice; the charcoal burners, however, are strictly prohibited from appropriating timber of this description, and are only permitted to use the branches when the trees have been felled for another purpose. Various trees, however, are preferred, depending on the purposes to which the charcoal is to be applied. Measures have been adopted towards the

instruction of some of the Hill tribes in the art of economical burning, the principal error being in allowing the process* to be performed in the open air, instead of in closed kilns.

Charcoal is an article of considerable consumption in the towns, especially at Utakamund, and the certainty of a future supply is attended with some anxiety. It has been proposed to levy a seignorage of one Anna upon the piled parah, and this seems reasonable.

32. *BAMBOOS*.—The demand for the bamboo will always be very great. Enormous quantities are brought to the Presidency by Railway, so that the jungles close to the line are rapidly being exhausted. It seems, therefore, advisable that some measures be taken to regulate the cutting, as has lately been done in the case of fuel. The propriety of this may be perceived by the fact that, while in one district they disappear, in the adjoining Collectorate there is frequently a superabundant supply. Throughout Canara, there is a uniform tax of 8 Annas per hundred, and I am of opinion that a similar impost might be made with advantage in other Districts, except in certain localities where for sanitary considerations the thinning of the jungles should be encouraged.

The immersion of bamboos in water and especially in a solution of sulphate of iron, (ಅಸ್ತು ತೆಲೆ. Annabhédi Tel.) or in lime water, is attended with the best results. The sweet sap is thereby extracted, which, if allowed to remain, is certain to induce rapid decay. When it is intended to split the bamboos for reapers, this should be done before they are steeped in the metallic bath.

The coast merchants prefer the bamboos which have been months in the water attached to rafts, these are "water seasoned" by being floated to the sea shore down the Nellambur and Sedashegur rivers. The bamboos are often 18 yards long and are brought down in immense floats tied together in bundles of fifty by the root ends which are turned towards the forepart of the float.

Note.—Teak, Sál, Blackwood, &c. improve by lying in water, or in the soft black mud of an estuary, there is one exception viz. Hedde, (Manjé Cadambé) *Nauclea cordifolia*, which deteriorates from steeping and should be carted to its destination.

33. *FANCY WOODS*.—The Forests of Southern India contain a great variety of woods which may properly come under this head; but the markets of Europe are so distant and the cost of freight is so heavy, that few are exported to England and France, save Ebony, Rosewood (or Blackwood), Satinwood and Sandalwood. Occasionally beautiful specimens may be seen, equal to any thing ever made up into furniture in England.

EBONY is chiefly obtained from Coorg and Canara, (various species of *Diospyros*), and is of a superior description, being perfectly dark in color, smaller pieces are procured from Caddapah, Salem, Nuggur, &c., but there is no steady demand, though it is a peculiarly fine timber for Cabinet work, and some of it is well veined for ornament.

SATINWOOD.—I have seen very fine Satinwood at Cotaputty in the Tengricottah taluq of Salem. I fear that a good deal of the oldest and best was destroyed by the Railway Contractors; but this locality is evidently suited for the development of the tree, and I hope that it may yield a supply for the Gun Carriage Factory, where the wood is used for naves of wheels. The timber sells at nearly the same price as Teak and Blackwood and is employed by Cabinet makers. It is singular that this tree was not conserved under the Native Government, whilst Teak, Blackwood and Sandalwood were rigidly protected. Here, it is proper to observe that, we possess a very limited knowledge of the fancy woods, I believe that several varieties were displayed at the Madras Exhibitions, which, if better known in Europe, would be largely employed, as high prices would be given, covering the expense of transport. Their value doubtless will yearly increase as they become better known to foreign Timber merchants.

34. *DYEWOOD*.—*Sappan tree*. Some efforts have been made to extend the growth of this plant, by sowing the seeds on the bank of the river near Shedashegur. A packet likewise was forwarded to Scinde for trial on the bank of the Indus.

* Circular No. 10 in Appendix explains the proper mode of manufacture.

† Also Madar, *Calotropis gigantea*, and *Parkinsonia aculeata*.

Nearly all the straight pieces are sent to England and the crooked roots to China, the latter undoubtedly produce more dye in proportion.

35. CINCHONA.—An attempt sometime ago made to introduce this invaluable Plant into India, failed. The Calisaya plants brought by Mr. Fortune, died on their way from Calcutta to Darjeeling. The success of the Dutch in Java has been very encouraging, and if the efforts about to be made in this Presidency are attended with similar success, no ordinary benefit will accrue to the country. The great expense of Quinine and the rapid disappearing of Cinchona trees in South America, renders such an experiment of the utmost interest and importance. The arrangements made by Mr. Markham for the transmission of the plants from Peru to this country have been completed, and are in every way judicious. Taking advantage of the experience and success of the Dutch in Java, a careful comparison has been made between the soil and temperature, in which the Cinchonas have thriven there, and the climate and geological conditions of various parts of the Western Ghâts. There are certain important points connected with the growth of this plant, as the rain fall of which we are ignorant, but so far as our knowledge extends, sites have been proposed, so as to correspond as nearly as possible with the soil and climate of the Java plantations. The preparatory steps necessary for the safe transport of Mr. Markham's collection from Calicut or Madras to the Nilgiris, have been taken by Government,* and Mr. W. G. McIvor selected for preparing sites and carrying out the preliminary work. The conduct of the Dutch in raising cuttings and protecting them from the direct rays of the sun has been noted, and if necessary, their example will be followed.

At present, the experiment is to be confined to Ceylon and the Nilgiris; a few plants being entrusted to Mr. Hall at Kunur, and Mr. New, at Bangalore, who will watch their progress in his Conservatory.

36. TEA.—Southern India promises well to afford favorable sites for the growth of Tea. Numerous experiments have been made and attended in several instances with marked success, as regards the healthy growth of the plant. In order, however, to complete the experiment and allow the Tea grown in the Presidency, to occupy its proper place in the market, it is necessary that the art of manufacturing it, should be introduced either direct from China or from Government Plantations in the North Western Provinces. Unless something of this kind be done, Tea grown in Southern India, cannot attain that commercial value which it might probably acquire, were it generously taken up. The Tea shrub is remarkable for its hardiness. The cultivation extending over a great breadth of latitude. It prefers a climate where the mean temperature is from 67° to 73°. This valuable plant may be seen at several places on the Nilgiri and Pulni Hills, in Coorg, on the hill sanatorium of Nundidroog, on the Shervaroy and Bababooden Hills, at Curtallam, and in various parts of Travancore. Although Tea plants have been introduced and are growing at each of these localities, they are not all equally promising, and the place in the market which any of them is to occupy has not yet been ascertained, and cannot be so until the introduction of competent manipulation completes the experiment.

37. COFFEE.—Applications for Forest land are numerous. The settlers usually select localities in heavy jungle, which are in the immediate neighbourhood of Trunk roads; and if the timber appears to be valuable, the Collector refers the application to this office for an opinion.

It is of the utmost importance that no encroachments should take place, boundary lines and trenches ought in every instance to be carefully laid down, so as to avoid subsequent misunderstanding. The Government is establishing rules, which will enable every one clearly to understand the exact limits of his property, and what penalties are incurred, if they are trespassed.

38. POTATO.—It is of great importance that the cultivation of the Potato be carefully attended to, and soils best adapted for its healthy and vigorous growth selected. In Bengal, for the last six or seven years, this esculent has been deteriorating, and it was found necessary to apply* to this Presidency for a supply of seed Potatoes, the tubers being larger, firmer and of better flavor on our mountain ranges, than in the Sikkim Himalayas.

The cultivation is rapidly increasing in Mysore and on the Nilgiris, and the demand for them is not confined to the European, although at first they are not relished by the Natives; in a short time the taste is developed and they are prized, not only because they are palatable and nutritious, but because they are profitable.

39. PROGRESS OF THE DEPARTMENT.—At the close of this Report, it may not be out of place to draw attention to the fact, that since this Department was instituted three years ago, many changes have occurred, and the field of operation has gone beyond the original scheme. In this way difficulties have sprung up which could not have been anticipated, and defects therefore can be pointed out, which, while matter of regret are only the natural consequences of circumstances beyond our control.

The Establishment is now too limited to embrace all the duties which at present devolve upon it. The extent of country to be conserved is out of proportion to the means placed at the disposal of the Department for its protection. Originally it was not contemplated that we should organize a Police Establishment, as it was understood that the Forests would be under the same protection as other public property.

The number* of sanctioned Peons is quite inadequate, and the Forests are consequently only partially protected. It was not expected that the Police should enter the Forests and extend their surveillance to the growing trees, but it seems only reasonable that when the Timber has been felled, marked, and taken out of the Forests, the Mofussil Police should restrain theft, and that they should report any transgression of the Forest rules coming within their knowledge, in the same way as they would warn a householder of the insecurity of his premises, or the vicinity of robbers, and so forth. It is only this general care that I seek, and if it be not extended to Government Timber, as to other property, public and private, the necessary result must be a considerable increase to my watching Establishments.

40. FOREST ASSISTANTS.—I have reason to be satisfied with the exertions of my Assistants; during my absence, Lieutenant Beddome has been nominated* to act for me, and Captain Brine who, conducted the operations in the Paumbem channel succeeds to the charge of the Anamallai range.

In a separate letter, I have recommended that the valuable Teak forest on the confines of Wynad, should be placed under Captain Gib, and I hope that this arrangement will take place immediately. The range will extend from the border of Coorg to Gundelpett.

One great want of the Department is, an additional Assistant, who, while learning his duty, could afford useful aid and afterwards be competent to fill any unexpected vacancy (such as those which have occurred this year). Two hundred Rupees staff salary would be sufficient. The advantage of a trained Assistant on emergency is self-evident.

41. OVERSEERS.—There is still great difficulty in obtaining the services of robust men, possessing all the requisite qualifications indicated in previous Reports. If the sanctioned amount allowed for the Department had not been expended, I would have recommended the location of Overseers at Kurnul, Kotagiri, &c.

42. EXPLORING TOURS.—During the past three years, annual tours of about nine months' duration have been made, during which a very large portion of the Presidency has been traversed, and all the more important Forests have been to some extent explored.

Considerable additions have been made to our knowledge of the interesting and important region of the Anamallais and confines of Travancore, by a second exploring tour of Lieut. Beddome, the Report of which has already been published. The Sál Forests of Gumsúr were visited by me in the early part of last year, and an extract from my Diary is contained in Appendix G. When Mr. Beddome has visited the Nala Mallai range in Kurnul, there will remain no extensive tracts of importance wholly unexplored. The further examination of these will be undertaken, as circumstances permit.

43. SELECTIONS FROM THE FOREST RECORDS.—The Government have lately sanctioned the reprinting in a portable form, of a Selection of the Miscellaneous Reports on various subjects, connected with the Vegetable Kingdom, which have been printed in loose sheets, during the last few years. For some of these, inquiries are frequently made at this Office, and being scattered through Government Records of various years, they are not easily referred to. I hope to pass this compilation through the Press, during my leave to England.

44. PUBLIC GARDENS.—There has been no change in the superintendence of the three

* Pro. of Board of Revenue, dated 7th May 1859.

* G. O. No. 956, 9th June 1860.

G. O., No. 323, 15th March 1859. Public Gardens, which as usual have formed the subject of separate Reports. That for Utakamund has been recorded as per margin.

The subjoined tabular statement is a return of all the plants, and packets of seeds sold and distributed during the two last years. The aggregate amount in each institution is considerably increased.

Return of Plants, Seeds, &c., sold at the Government Gardens.

GARDENS.	1858-59.					1859-60.					Decrease	Increase.
	Fruit Trees and shrubs.	Timber trees.	Shrubs and flowers.	Parcel of seeds.	Total.	Fruit Trees and shrubs.	Timber trees.	Shrubs and flowers.	Parcel of seeds.	Total.		
Madras.....	71	740	1,566	133	2,510	69	821	2,781	109	3,780	0	1,270
Bangalore.....	77	9	588	305	979	918	114	519	527	2,078	0	1,099
Utakamund.....	287	3,350	4,376	170	8,183	1,336	12,892	2,613	170	17,011	0	8,828
Total...	435	4,099	6,530	608	11,672	2,323	13,827	5,913	806	22,869	0	11,197

45. MANUAL OF INDIAN BOTANY.—I know of no book more wanted: there are many inquiries for such a guide amongst the increasing number of Europeans, who come out to this country. The characters of the *genera* of plants should be abridged, and the economic uses introduced, of which our knowledge was much increased by the successive Madras Exhibitions. The work should be printed in small type, so as to form a book of easy carriage and convenient reference.

I have occupied myself during occasional leisure hours, in preparing a Manual of this kind, as directed in G. O., No. 767, 10th June 1857. But as the duties devolving upon me increased, the time available for this collateral occupation has unavoidably diminished. I take home the materials, and hope to progress with the work.

46. HERBARIUM AND LIBRARY.—The Department is now so developed as to render it of importance, that a Herbarium and Library for reference be established and attached to the Office. Already a nucleus of both of these is in existence, and it only remains that that they be fully recognized and such measures adopted, as will render them of real and permanent use to the Department. It is believed, that by judicious arrangements, considerable additions might be made from time to time both to the Library and Herbarium. Important contributions are periodically received from Sir W. Hooker, Director Royal Gardens, Kew, from Dr. Thomson, Calcutta, and regular communication is kept up with other centres of influence. A few purchases would now be advantageous, and I propose seeking permission to make them as occasion arises.

47. OFFICE ESTABLISHMENT.—The duties have been carefully performed, by Native Surgeon, F. Appavú, who has labored well to get the Accounts into a proper system. The utmost simplicity compatible with accuracy is necessary in the Financial arrangements, as Writers and Accountants cannot be persuaded to remain in the Forests, and the system existing previous to the formation of the Department was very defective.

H. CLEGHORN,

Conservator of Forests.

* The Report of the Lál Bāgh, Bangalore, is forwarded to the Commissioner of Mysore, and the Annual Report of the Madras Gardens, is published by the Committee of Management.

APPENDIX A.

NORTH CANARA.

I have the honor to submit herewith my annual Report, with the accounts enclosed for the official year 1859-60.

2. The Collector having already furnished the Account Current up to 31st December 1859, I have only to submit the accounts for the remaining portion of the official year.

3. For the purpose of bringing the operations of the entire year under one view, I have drawn up another Account Current from 1st May 1859 to 30th April 1860. In this, all the items belonging to South Canara, which were entered before the division of the District, are thrown out. A memorandum of Cash is also appended.

4. This account shows an income of Rupees 2,00,767, with an expenditure, including the cost of the fixed Establishment, of Rupees 57,664, thus leaving a profit of Rupees 1,43,103.

5. *Memorandum of Wood unaccounted for.* This exhibits the balance of logs in store last year; the supply and disposal during this; with balance now on hand. Last year the estimated value of timber on hand was put down, at Rupees 1,10,771-12-0; while now, there is a balance of the value of Rupees 1,32,767, exceeding the former by Rupees 21,996. This difference is not caused by having put a higher value on the timber than was done last year, but by having a greater quantity in store.

6. I beg now to offer some remarks about Forest operations in particular. In doing this, I shall try to compare the works, Establishment, Income and Expense of previous years with those at present.

7. Hitherto it has been customary to review the Forest operations under two heads, viz., *Amani* and Contract works. Strictly speaking, all works are *Amani* or all works are done by contracts; which means, every one who works is paid for cutting, squaring, carting, (or floating below ghauts) by measurement. The only difference is that the contracts above the ghauts (where all timber is carted) are small, lasting for a few months only; whereas those below the ghauts are necessarily large, extending over several years, and must therefore be always reviewed separately.

8. There has been an increase of work, which necessarily entailed also an increase of the Establishment. Previous to introducing the system of working the jungles ourselves and selling the timber at regular Depôts by public auction, the establishment had only to mark trees in the jungles, which were then sold standing in large lots. After the Contractors had cut the logs, the establishment had to stamp them on removal and in general, to look after the Contractor's works. This was easy and much of it could be done, and in reality was done by Peons. But now, trees are cut by Contractors for Government. They have first to be marked, and when the logs are cut and squared, they have to be numbered, measured, and carted to depôts. At the depôts they have to be sold, delivered, and stamped. This is additional work and for the time being, additional hands are required, which have been called "Temporary Establishment."

9. The following table shows what has been the additional work of the Establishment, leaving the large contracts out of the question.

Talûqs.	No. of trees cut.	Contents.					Brought to Depôt.					Remaining in Forest.				
		Logs.	Candies.	Qr.	G.	T.	Logs.	Candies.	Qr.	G.	T.	Logs.	Candies.	Qr.	G.	T.
Ankôla...	200	452	535	1	3	19	284	284	0	3	13	168	251	1	0	6
Yellapûr...	3,696	7,490	10,128	2	3	12	7,087	9,296	1	2	16	403	832	1	0	16
Sundah...	3,191	6,433	6,831	2	2	16	6,373	6,293	2	3	9	60	87	3	4	7
	7,087	14,375	16,047	3	0	7	13,744	15,874	0	4	18	631	1,171	2	0	9

It thus appears, that 7,087 trees were cut; and 15,874 candies were carted to depôts, under the immediate superintendence of the Establishment. Add to these 1,571 logs containing 1,426

candies of old dry and fallen teak, and junglewood collected, and now at the depôts; we have a grand total of 17,300 candies of work begun and finished during the year. It is clear that the above work adds also to the usual expenditure in this instance, the 17,300 candies cost Government, Rupees 22,786-14-4, or at an average, Rupees 1-5-3 per candy; nearly the same as last year, when the average was Rupees 1-6-2. Logs cut last year, but carted to depôts during this, are not included in the above calculation, nor are those now prepared, but still in forest.

10. By comparing the receipts and expenditure of the last seven years, as per table below, it might be inferred that the new system in operation during the last three years does not show much difference, and even what it shows, might be said to be in favor of the old system.

Official year.	Receipts.			Expenditure.			Remarks.
1853-54	144,235	4	9	50,370	9	0	Years under the old system.
1854-55	85,014	5	7	37,310	6	8	
1855-56	150,609	8	0	32,647	8	4	
1856-57	160,639	6	4	44,490	15	1	
1857-58	70,656	10	7	22,869	3	2	Years under the new system.
1858-59	100,604	10	9	34,325	7	9	
1859-60	206,683	7	8	56,959	14	3	

11. This falling off (except for the year under report) is not due to the system, but to our Contractors not bringing timber to the coast in 1857 and 1858. Consequently, below the Ghauts there were less receipts and expenditure; but above, the change of the system told immediately. The subjoined table in which the Revenue is divided for the upper and lower Taluqs will exhibit this.

Official year.	Receipts in North Canara.						South Canara.			Total.		
	Upper Taluqs			Lower Taluqs.								
1853-54	29,368	8	9	1,14,866	12	0	...	...	...	114,235	4	9
1854-55	12,913	1	7	64,990	6	0	7,110	14	0	85,014	5	7
1855-56	19,050	15	8	1,29,369	13	4	2,188	11	0	150,609	8	0
1856-57	7,242	10	2	1,52,016	9	0	1,380	3	2	160,639	6	4
1857-58	13,265	6	2	55,208	7	11	2,182	12	6	70,656	10	7
1858-59	59,756	2	6	35,569	13	4	5,278	10	11	100,604	10	9
1859-60	147,348	7	0	59,335	0	8	...	...	...	206,683	7	8

It appears that the revenue in the upper Taluqs, previous to introducing the *Amani* system was very small, and that the greater part was derived from the Coast sales, &c.

12. The *Amani* system above the ghauts may be said to have been in fair operation during the last three years (the fourth year is not counted, being the year in which little could be done on account of the opposition experienced from the wood Merchants.) The profits of a year's work are always shown in the year following. So we have for the work

Of 1857 the Revenue in 1858.....Rs. 59,756

„ 1858 „ „ „ 1859..... „ 147,348

„ 1859 we have stock on hand for about... „ 87,592

The average revenue from the upper Forests for the four years, from 1853-54 to 1856-57, is little more than Rupees 14,668, while the average of the last three years (excluding the value of present stock on hand), is Rupees 73,490, or five times greater.

13. The higher receipts are not the only benefit of the new system; but there is also less waste of timber. On looking over the old accounts, it appears, that about 20,000 trees annually were sold out to Contractors. (The highest price obtained was Rupees 1½, and the lowest only 2 Annas per tree). The trees then cut were either very small, or if large, only the finest logs were taken, and the rest of the wood was left to burn; now we cut all that is useful and collect the odds and ends also.

14. As remarked above, the receipts have fallen off in the lower Taluqs, because the Contractors either entirely or partially failed to bring timber in time. What we had, was mostly

defective or small, and therefore the deliveries to the Bombay Dockyard have much fallen. In former years, from 60,000 to 100,000 Rupees worth of timber was selected; but during the last 2 years the value of the selected Teak did not come up to Rupees 30,000, and in this year only Rupees 10,000.

15. Now as Gúnd is opened up, we shall get large and fine timber in future, and the Bombay Government instead of going into the market for it, may have their requirements met from the Depôts.

16. The average receipts derived from the upper and lower Forests having been given, I will now analyse the expenditure in the same manner:—

Official year. .	Expenditure in North Canara.						South Canara.			Total.	
	Upper Forests.			Lower Forests.							
	RS.	A.	P.	RS.	A.	P.	RS.	A.	P.	RS.	A.
1853-54	1,899	4	10	48,471	4	2	....	...	...	50,370	9
1854-55	3,075	6	9	34,017	15	4	217	0	7	37,310	6
1855-56	3,371	2	8	29,276	5	8	....	...	...	32,647	8
1856-57	3,614	15	4	40,875	15	9	....	...	...	44,490	15
1857-58	12,560	4	3	10,000	2	0	208	8	0	22,869	3
1858-59	24,956	14	3	8,305	10	6	900	15	7	34,325	7
1859-60	40,965	0	4	17,974	13	11	....	...	...	56,959	14

This table shows that in the four years previous to the introduction of the *Amani* system there has been very little expense; while the heavy items were all incurred below the ghauts. The expenditure bears a fair proportion to the receipts. Above the ghauts it has been increasing the same manner as did the receipts. On the Coast the expenditure decreased, as did also the revenue (caused, as already remarked by the failures of Contractors). This table will also show that averages struck over the seven years mislead; but if the comparison be made between the year previous and that after the jungles were worked by Government, it will give a more correct result.

		Rupees.
The average expenditure in the upper Forests of the first 4 years, is	2,990	
The average expenditure of the last 3 years	26,160	
In the table of receipts it has been shown, that the average revenue for 4 years, was		14,668
Do. expense do. do. as above.....	2,990	
Profit, Rupees...		11,678

If the same is calculated for the 3 years under the new system, the result is:—

		Rupees.
Average receipts for the last 3 years.....	73,490	
Do. expense do. do. as above.....	26,160	
Profit, Rupees...		47,330

Thus exceeding the former Profit, by Rupees 35,652 annually. By comparing the works done in the above seven years, it just turns out, that in those years in which business went on above the ghauts, the Contractors below did not bring timber; and in those years when the Contractors worked well, the *Amani* system above was not yet introduced.

Assuming, however, that both the works above and below the Ghauts go on satisfactorily, higher average of the expenditure of both must be taken, to arrive at an approximate estimate for future years, thus:—

		Rupees.
Average expenditure above the Ghauts and under the <i>Amani</i> system.....	26,160	
Do. below the Ghauts, when Contractors have done their work	33,172	
Total average Rupees...		59,332

On the other hand, the average receipts of those years may safely be taken, as below :—

	Rupees.
Average receipts on the Coast, when Contractors brought timber	1,15,310
Do. above the Ghauts, under the <i>Amani</i> system	73,490
Total.....	188,800
Subtracting the expenditure.....	59,332
The average annual Profit will be....	1,29,468

I have only to remark, that any mistake in the above calculations will lie rather in the average receipts, having been taken too low for the future.

17. *Sandalwood* cut and prepared in Bilgy and Sunda taluqs, was sold for Rupees 7,824-9-1. There is about the same quantity cut and stored at Sirey which will be prepared into billets during the monsoon, when the Establishment has less work. I did not show this in the Memorandum of wood unaccounted for, as the quantity now at Sirey is only roughly cut and can neither be measured nor weighed.

18. *Reckanasta or stunted Teak and Jungle wood*.—Last year we had 10,300 pieces, containing 2,400 candies; they were sold for Rupees 3,382. This year we have 12,846 pieces, containing 3,695 candies, which will be disposed of next season. Jungle places taken for permanent cultivation, are chiefly in Yellapur taluq, where 77 spots (area 1,031 acres) have been cleared during the year, at a cost of Rupees 698-10-0. Besides the revenue from the wood, these places will henceforth yield annually Rupees 1,306-12-6 in Land revenue.

19. *Seignorage account*.—This shows an income of Rupees 4,700-10-2; chiefly collected from Villagers at 8 Annas per tree. In taluqs where there is no Establishment, extra hands are required for this, and seignorage *Gumastahs* on Rupees 5, are appointed for the fair season. Inland the *Patells* are ordered to superintend the cutting, according to the Permits, and get a fee of 1 Anna* for each tree marked.

20. *Bamboos* pay now a seignorage of 8 Annas per 100, throughout. There are three items in the Account Current, taking the first only, viz. Bamboos to villagers, it is shown that they have paid 868-7-0 for an article which was formerly free. This amount is collected from the villagers on the frontier, or from persons living in towns, for Ryots who live in the jungles, do not pay for those used in building their huts.

21. *Firewood account*.—If compared with those of previous years, this shows a decrease of income. It is, however, only apparently so. Above the Ghauts we received nothing at all, the Dharwar forests were thrown open (of which the *Desais* or *Inamdars*, who had some forests on their *Inams*, chiefly availed themselves) and so no one required this article from us. The Dharwar forests being now closed again, it is very likely that next season, there will be calls for this article.

22. *Billet-cutting*, from the Kanagalut trees was stopped last year, but 6,284 defective jungle trees of 43 kinds in six different jungles were marked and sold by auction, in six lots. In the aggregate, Rupees 1,715 were realized. The purchasers were permitted to cut up the wood in any shape they pleased, but have to pay, besides the jungle *Darkhast*, an additional 2 Annas for every candy of wood cut up for building purposes, and 12 Annas for every ton of firewood. Two years were granted for the work. One for working in, and the other for working out of the forests. There are now cut 5,928 pieces containing 2,706½ candies, and 124,000 round billets of firewood, the produce of 5,191 trees. The result is as under :—

5,191 trees cost in proportion to the whole.....	Rupees	1,406	11	0
2,706½ candies at 2 Annas	„	338	5	0
124,000 billets of firewood, about 372 tons.....	„	279	0	0
Rupees... 2024 0 0 or 6¼ As. per tree.				

* This was an Experiment agreed upon by the Collector, Sub-Collector and myself, and which Mr. J. D. Robinson reported as working well.

† Kanagalu is *Dillenia pentagyna*, this tree was in great request by the Bombay Merchants, from the wood splitting easily.

The benefit consists not only in getting a small value for wood, which was formerly thought useless, but in saving the good trees, especially the Kanagalu which has been nearly extirpated. The ultimate result is a profit, but also an additional work for the Establishment.

23. I have now marked 5,000 other defective jungle trees for next season; but the present batch is somewhat better, having some good trees among them. They will be disposed of in the same manner as were the above.

24. *Contracts and Contractors*.—The present state of the works of each Contractor, is as follows :—

1. *Messrs. Brice and Co's* contract for 2,500 jungle trees for Railway sleepers, ended 31st December 1859. The Forest work was finished within the prescribed time, but the sleepers have not yet been exported by sea. Seignorage due has been paid also. The contract is therefore finished.

2. *Pondshemvi* for conveying 3,747 Teak from the Sunksal jungles to Gungavali, had two years time for his work, ending 31st March last. Of 6,217 logs (the produce of the above) delivered to Contractors, he brought 3,065 within the stipulated time. The balance (3,151 logs) remain to be brought.

Considering the very large number of Logs to be conveyed from the ghauts to the coast in two seasons, and the otherwise satisfactory working of the contract, I recommended an extension of time till February 1861, within which time the Logs can be easily brought down, being now all collected near the river ready for floating.

3. *Wishwanatha*.—Contractor for conveying 2,000 jungle trees from the Sulaghiri forests to Sedashigur. Two years of the three granted for the work, have now passed without a single log arriving at the depôt. In my last annual Report, I stated that “this work was in a very backward state.” This is now much more the case, and the chances of the contract being fulfilled in time, are much diminished. However, the Contractor assures me, that he will not fail to bring the whole next season.

4. *Mr. Pinto*, contractor for 2,000 Teak and Blackwood trees from the lower parts of Günd, has his work in an advanced state. He has now collected 2,102 logs, of which 502 have already arrived at Sedashigur.

5. *Venktesha Prabhu's* contract for Shivapur teak has been annulled, and the balance of the logs in the Forests (2,268) has been given out to a new contractor, Mr. Pinto. Two years, ending 31st March 1862, are granted for the completion of the work.

The terms for Venktesha Prabhu's contract were

For selected.....Rupees 2-6-7 per candy—For rejected Annas 2-7

Mr. Pinto's terms are, „ 2-5-9 do. do. „ 2-8

Decrease..... 0-0-10 Pie, Increase „ 0-1 Pie.

From this it would appear that the present terms are lower; considering however, that 775 logs were in the Kalanady, and about 400 are nearly brought down to the foot of the Shivapur ghaut, on which the new Contractor will have less expense, the terms are in reality much higher. The above 755 logs have arrived at the depôt.

25. *Teak Planting* has been stopped from want of funds; 7,000 seedlings were raised last year. The expense was rather high, considering the small number of seedlings, however the same number now will, I hope, not cost half of what they came to last year.

The planter Abreo* has returned from Nellumbur plantation. Want of funds precluded me from spending money on preparation of ground to receive seedlings. The time has now passed and the work on a larger scale is therefore necessarily deferred to next year.

26. *The present Establishment* numbers 51 persons, exclusive of those in my Office, and are classed as under.

ESTABLISHMENT.	Overseers and Subs.	Mootsadies and Gomasthas.	Peons.	Total.
Fixed or sanctioned	3	10	16	39
Temporary.....	0	0	12	12
Total.....	3	10	28	51

* Having been fully instructed at the Conolly Plantation, I trust that he will introduce the system successfully and economically.—H. G.

Temporary hands employed by myself, are not included here, as they are required for a few months only; whereas the above are entertained throughout the year.

Statement of wood unaccounted for shows, that about 48,000 candies of timber came to, and were taken from the depôts during the year. Besides these, there have been at least 20,000 logs, which had to be numbered, measured and stamped, such as the stunted teak, defective junglewood, and odds and ends, which cannot be exhibited in the memorandum. This requires hands, and time.

We have now 11 Depots in 4 Taluqs: considering that 1 Peon at least is required to watch the timber; 11 men are thus employed. On the coast (Sedashigur and Gungawalli) one man at each place is scarcely enough, as there, during the nights, continual attempts are made to steal teak, which is easily floated off to outlying Pattimars. From all this, it will be obvious that the Establishment is small compared with the work.

Another cause which reduced the effective strength of the Jungle establishment, is sickness. During the year under report, sometimes nearly half the establishment was laid up with fever, and one man died of it. The same was the case with workmen; several died of cholera at Kulgi and the consequence was, that those who remained unaffected ran away from the work. Of 190 coolies at Kaneri, no less than 35 were sick for a long period.

In conclusion, I am thankful to state that my health has been very good, during the whole year.

I have the honor to be,

Sir,

Your most obedient Servant,

S. MULLER,

Asst. Conservator of Forests.

SEDASHIGUR, 24th May 1860.

NOTE.—This report conveys some idea of the extensive operations in North Canara, which (from three visits of inspection I can testify,) require great physical exertions and incessant vigilance. Allowance must be made for Mr. Müller's difficulty of writing in a foreign language.—H. C.

APPENDIX B.

SOUTH CANARA.

The annual Report on Forest Revenue being now due, I have the honor to forward an Account Current, showing the transactions of the South Canara Collectorate, during the past official year 1859-60.

2. The account I now send, though referring to South Canara only, has one item of Receipts, and another of Charges, appertaining to North Canara. I refer to the sums marked A and B. The Bills for the sums so marked, were received from Mr. Müller, the Assistant Conservator, and admitted in the accounts of this District for January, as the accounts for North Canara had not been then regularly opened.

3. The revenue in this District is a mere trifle, as compared with that of North Canara; and no remarks are necessary on the items comprising it for the year under review, save that for Sandalwood stills. The increase in this item over the revenue of last year, is due to the whole rent being credited to Forest revenue, instead of as before to Mótarfá. I think the present mode of supplying the workers of these stills with firewood, is a mistaken one. Instead of assigning to each still a certain area of Forest, I would make them purchase their firewood at the same rate as other parties do. They are nearly all Mangalore merchants who make the oil for export to Bombay; and I do not think they are entitled to any special privileges in the way of firewood. Any additional cost in the preparation of oil, by putting the supply of firewood required in its manufacture on a proper footing, will fall on the consumers, who are well* able to pay the charge, as the article is a luxury, not a necessary.

* The Collector's suggestion was at once adopted.—H. C.

4. Mr. Thompson, the Overseer, has addressed me on the subject of renting out to Contractors the privilege of cutting in the Government jungles, and transporting by water from Bantwal, firewood for use in Mangalore town. I think this is a most advisable proceeding,* and I shall endeavour to get contracts, as the town is now mostly dependent for this necessary on Bekal. A supply from Bantwal will lower the present market price, which is high.

5. I beg to forward a receipt, to show that the whole of the Revenue borne by the Account Current, has been duly credited to Government in the year under report.

I have the honor to be,

Sir,

Your most obedient Servant,

MANGALORE, 14th June 1860.

(Signed) J. FRASER, Collector.

APPENDIX C.

ANAMALLAI RANGE.

I have the honor to forward the annual Accounts of the Anamallái Forest, for the official year 1859-60, countersigned by the Collector of Coimbatore, according to E. M. C., dated 12th of November 1857, No. 1153, paragraph 9.

2. The two first items on the credit side, are for timber sold in 1858 and 1859, to the Bombay Dockyard. The next item, viz., Rupees 52,657-1-0 is for the Teak planks cut last season and which I handed over to the Dockyard Agent last February. In addition to this, the sum of Rupees 15,033-0-7, has been realized during the year by the sale of timber at public auction, and by private sales to the Department Public Works and Railway Departments. These sums added together, give the amount of Rupees 67,690-1-7 as the receipts of the year; whilst the expenditure has been Rupees 12,592-12-9 exclusive of the Pay of the Establishment, which amounts to Rupees 9,891-12-7; making in all, an expenditure of Rupees 22,484-9-4.

3. Owing to the impossibility of procuring many axemen in the past season, very little timber has been felled; this, however, has been advantageous in one way, as it enabled me to employ the elephants in getting out much of the old timber lying about the forests. The sum of Rupees 15,001-0-11 above alluded to, has chiefly been realized by the sale of logs, heads and butts, that have long been lying about in the forest. In addition to this, an enormous amount of the outlying timber has been brought to the head of the timber slip, and much more to the various depôts at the sides of the cart road; amongst this latter, I may mention all the large logs that were outlying between the cart road and the bungalow station of Tunacadavá.

4. Regarding the items on the expenditure side of the account, I have only to mention that the rate of cart hire above ghát this season, has been increased from Rupees 2 to Rupees 2-8-0 per plank; the particulars of all these items have been reported from time to time in my monthly reports, and I have nothing further to add respecting them. The Mulcers have commenced sawing in the Forest this season, they are as yet very rough at the work, and very irregular in their attendance. I hope, however, to induce some of them to become permanent sawyers; they are, as you are aware, a wild unmanageable race, and when they have earned a few Rupees, they generally refuse all work, until they have spent them.

5. A Peon has been trained to planting at Nellumbúr, and I hope to commence the formation of a small Teak plantation immediately. The want of labor I expect will, as usual, be my chief difficulty.

6. Memorandum No. 2, has been carefully prepared, as regards the timber remaining in the Forests, there is not much now outlying in the jungles. 129 logs and heads are all that we could find in the dry season after the fires had bared the forest: these have all been stamped, numbered, and brought to account in this memorandum.

* A contract has been given, the trees being first marked in the Sulia Jungle, by Mr. Thompson.—H. C.

7. The following is a Comparative Statement of Teak timber supplied to the Bombay Government for Dockyard purposes, in the year 1858-59 and 1859-60.

Comparative Statement of Teak Timber supplied to Bombay Government for Dockyard purposes, in the year 1858-59 and 1859-60; showing the increase or decrease in the number of planks, quantity and class delivered, and the amount realized in each year, the rates being determined by the Collector of Malabar, from the market valuation.

For the year 1858-59.						For the year 1859-60.					
No. of Planks.	Class.	Quantity.		Rate per 100 kols.	Amount.	No. of Planks.	Class.	Quantity.		Rate per 100 kols.	Amount.
		Kols.	B. V.					Kols.	B. V.		
748	1st	56,107	9 3	75	42,080 8 7	311	1st	22,301	9 6	100	22,301 12 6
446	2nd	25,565	10 7	65	16,617 8 6	228	2nd	13,069	8 6	90	11,762 11 7
743	3rd	33,164	8 10	55	18,240 6 4	305	3rd	13,713	11 14	80	10,971 3 0
229	4th	9,345	7 14	45	4,205 6 4	81	4th	3,115	1 1	75	2,336 5 0
101	5th	3,813	11 2	40	1,525 6 2	23	5th	750	3 2	70	525 2 11
157	Inferior.	6,557	7 1	30	1,967 3 0	242	Inferior.	11,899	8 6	40	4,759 14 0
2424		134,555	6 5		84,636 6 11	1,188		64,849	6 3		52,657 1 0

I have the honor to be,

Sir,

Your most obedient Servant,

(Signed) R. H. BEDDOME, Lieutenant,

COIMBATORE DISTRICT, 1st May 1860.

Asst. Conservator of Forests.

Note on Paragraph 5.—It is worthy of remark that Teak planting seems now to be forced upon us, the demand is increasing, while the supply is diminishing, for instance, the Dutch Governor *Van Rheede* records of the "*Tectona grandis*" in the *Hortus Malabaricus*, 1690 "*Ingens arbor usque ad Calicutam.*" In the present day, nothing but scrubby stumpshoots are to be seen within three stages of Calicut, indeed, till we reach Mombat, and these are the re-production of a former growth, natural to the country, and which will with care again become of importance.—H. C.

APPENDIX D.

SIGÚR.

In May 1859, a sanction of Rupees 50 per month, was granted by Government for the conservation and working of Sigúr Forest. With this sum, amounting to Rupees G. O. No. 668. 450 (in nine months) and the sale of Timber and Sandalwood, the following results have been obtained :—

Rupees 1,000 have been remitted to the Accountant General, Rupees 100-10-11 is the balance of cash in hand, and the Timber on the ground may be valued at Rupees 4,000.

With so small a sum as Rupees 50 to commence with, it was some time before any wood could be collected, by an early sale of Sandalwood the means for working the Forest on a larger scale were obtained, and next year if wood be carted to Utakamund, I have no doubt but that a sale of some 10,000 Rupees worth might be effected.

Carriage of Timber.—At present the great drawback is the carriage of the timber, parties who may purchase timber from the depôt at Musnycoil, find themselves without the means of conveying it away. Consequently the number of purchasers is very limited. The sales of Teak and Végé for the last eight months, only realizing Rupees 457-1-6.

Timber felling.—The operations in the Forest have been chiefly confined to the felling of ripe Teak trees and Végé. The trees are felled in November, December and January, when the tree is wintering; during the rising of the sap in March, April, May and June, the Curumbers are employed in squaring the felled trees. For the remaining five months, the men are employed in felling the trees after the fall of the moon, when the sap descends, and for the remainder of the month when the sap is ascending, they are employed in squaring the felled logs. By this order

the timber seasons well and readily. There are but fifteen Curumbers and five pairs of buffaloes working in the Forest at present. Should the sale of the timber be increased, I propose to enlarge the establishment.

Steam-saw-Mill.—The works at Wellington Barracks being nearly finished, I would strongly recommend that the Steam-saw-Mill now working there, be removed* to Utakamund and made over to the Mudumallai and Sigúr Forests. The great drawback to the sale of timber in Utakamund, is the want of sawyers. Could we saw up our timber in Utakamund, the Public Works there, could be readily supplied, and the surplus sawn-timber disposed of by auction.

Sandalwood.—The Sandalwood cutting is proceeding regularly. A large number of the trees cut are quite decayed and fetch but little in the market; had these trees been cut in their prime, much loss would have been avoided. I propose a regular cutting of all trees which have made heart-wood and show signs of decay in their tops. The value of the Sandalwood is decreased some twenty or thirty per cent. by heart shake. The stealing of Sandal wood† by Moplahs, is now put a stop to. The vigilant measures pursued in Malabar and Mysore have contributed to this end.

(Signed) W. R. MORGAN, Captain,

1st Asst. District Engineer,

UTAKAMUND, 30th April 1860.

in charge of Sigúr Forests.

APPENDIX E.

MUDUMALLAI.

Supply of wood.—During the past year, the supply of wood delivered at Wellington, has amounted to 41,079 cubic feet, this contrasts favorably with the former year when the supply was only 13,279 cubic feet, owing to my having been removed from the Forest and another Officer placed in charge. In addition to the above supply, 6,244½ cubic feet of wrought timber from Gundelbett workshop, were also delivered at Wellington. Had this wrought timber not been required, the deliveries from the Forest would have amounted to nearly 60,000 cubic feet; the carriage from the Forest having been diverted to Gundelbett workshop.

Roads.—The Forest roads have been much improved from Tippiacadú to Carúr Hill, a road has been made 13 miles long with branch roads to Goganulla valley, Nardy and other parallel vallies, in all, some 21 miles in length. The road near the Karkhana, passes over the bund of a tank with two *calingulas* bridged, the formation of this tank has been of great benefit, securing a supply of good water in the hot weather to the people and cattle of the establishment. That bund makes a good road where formerly only an impassable swamp existed, and which swamp cut off all communication with the best parts of the Forest.

Curumbers.—The number of Curumbers has been increased. When I first commenced felling in the Forest I had eight, I have now 110 men steadily at work.

Sawyers.—Death and fever have terribly thinned the sawyers. I have now but five sets, where I should have at least ten. Consequently, I have a large amount of logs, which I cannot possibly move, until they are sawn.

Elephants.—The elephants now working in the Forest are five in number. We had six, but one died in August last, owing to the severity of the monsoon, and the others were so affected by the weather, that it became necessary to send them to Gundelbett for a time.

Buffaloes.—I have increased the number of buffaloes to 25 pairs, and by feeding them in the hot weather on grain, have been enabled to keep them in good condition. The buffaloes are only available for small logs, the sides of the Hills where the Teak is felled are very steep, and any log over 16 cubic feet, requires elephant power.

* The removal of the Steam-saw-Mill as suggested, may hereafter be advisable; but the services of an Engineer would be indispensable.—H. C.

† The suppression of the illicit trade in Sandalwood is highly satisfactory.—H. C.

Timber Carts.—I have now in the Forest, ten large carts capable of carrying beams of 30 cubic feet slung under the axle. The sling carts have been found very useful; in addition to these, are 24 small carts for working in the Forests with 20 pairs of bullocks and 20 drivers. Our carts are employed in bringing beams from the out-stations to the Karkhana, and to the main road near Tippúcadú where dépôts are formed. In the monsoon weather, when the Forest roads are impassable, Contractors' carts carry the timber from the dépôt at Tippúcadú to Utakamund. I have found it very advantageous to employ the Forest bullocks; these people being apt to overlook the important matter of feeding cattle entrusted to their care.

Coolies.—The rise in wages, increase of cultivation in Mysore, owing to good monsoons, and the great demand for labor on these Hills has rendered the procuring of labor for the Forest very difficult; however, owing to the main roads having been finished and little labor being required to keep them in order, this disadvantage has not been much felt.

Mode of felling the Trees.—During the past year a large amount of timber has been felled, attention being paid to the seasons. In December, January and February, the Curumbers are simply employed in felling—the tree wintering for those three months. In March, April, May and June, when the sap is rising, the Curumbers square the felled trees, and for the remaining five months they fell and square, felling after the full of the moon when the sap is descending, and squaring the other half of the month when the sap is ascending. By preserving the above order, the timber seasons more readily and better.

Provision Store.—The former Provision Store being thatched, was dangerous; moreover, in the monsoon season, grain was apt to get damaged. I have therefore built a new Store-house with a ventilated flat roof, this will secure us from all danger of fire and loss by damage of grain.

In conclusion, I have the honor to remark that the Forest lease has still three years to run, that to get the utmost we can out of the Forests in that period, is the most profitable course* to pursue; that if a large dépôt be formed at Musnycoil and only small quantities of timber are carted up to Utakamund, much of the carriage now employed in carting to Uty might be employed in carting to Musnycoil, and in three years' time a supply for Public buildings for some years to come might then be obtained,—a supply which might fairly be estimated at 200,000 cubic feet of seasoned timber.

(Signed) W. R. MORGAN,

1st Asst. District Engineer,

in charge of Mudumallai Forests.

UTAKAMUND, 30th April 1860.

APPENDIX F.

SALEM.

I have the honor to submit for the information of Government, the following brief Report of my operations in the Forests of Salem, for the year 1859-60.

2. On several occasions I visited the Cottaputty jungles with the Officers of the Railway Company, for the purpose of supplying sleepers to the Madras line, from Tripatore to Salem.

3. I believe there are very few Contractors under engagement to the Railway Company, and as these men were not cutting quick enough to meet the immense demand, the Company was at last obliged to purchase sleepers from persons who would supply them even with four or five at a time; and the consequence was, that I was overwhelmed with applications from petty Contractors, so that my peons were not able to mark trees for them with sufficient rapidity, and I had no alternative but to allow these men to cut in the jungles with little control† over them.

* The energetic working of this Forest is clearly advisable and has been ordered in G. O., 16th July 1860, No. 1,521, paragraph 4; as the Barrack Funds are exhausted, I propose in a separate letter that it should be worked on behalf of Government upon the same system as the North Canara and Anamallai Forests.—H. C.

† i. e. comparatively.—H. C.

4. At first (1858), the amount of rejected sleepers was about 15 per cent., but latterly the woodcutters got into the way of cutting only those trees that are fit for sleepers. On looking over the statements of rejected sleepers, I find the average rate now is five per cent.*

5. The trees marked by the Forest peons were all approved of by the Officers of the Railway Company; and these were mostly Végé, Acha, Kalli, Cadukai, Carru-végé, Carrúgalli, and Ve-végé.

6. The manner of cutting is still without judgment, and great waste of timber is the consequence. A tree is marked by a Forest peon, and registered as containing four sleepers, and given over to the woodcutter he cuts the tree down, and may perhaps adze it into one sleeper. As the woodcutter pays nothing to Government for the timber, he cares little whether the tree will cut up into four or one sleeper, and has not the requisite skill to quarter the log. The only method I can see of preventing this wastage of timber is, that Government should gradually take the whole control of working the Forests under the *Amani* system.

7. Besides the supply of sleepers, there is a considerable amount of timber cut for building purposes, and I may say an increasing demand for export. I have granted 300 licenses for permission to cut 6,470 bandy loads of timber in the Forests of Salem, for the year 1859-60. A seignorage fee of one Rupee is paid† for each bandy load of wood: this amount is collected at the different Tannah stations under the management of the Collector, and has unfortunately been entered in the books as land revenue, without a separate column. I have no hesitation in saying that a much larger amount might be realized, if the owners of the licenses were made to abide by the terms laid down in the license.

8. I would recommend a strict limitation of the practice of *Púnakad*‡ cultivation by Malliallis in these jungles, and an entire prohibition in the virgin Forests which remain. This rude system has increased of late years to such an extent on the Shervaroy Hills that the tops are quite denuded of timber. I also remarked the same destruction going on, in the Javadi Hills, and have addressed the Collector on the subject. Mr. Fane, when Acting Collector, issued a proclamation on the subject; and it is very desirable that leave should in every case be obtained from the Revenue authorities, as in Canara.

9. Mr. Yarde, the Overseer, reports having marked 2,803 Sandalwood‡ trees on the Javadi Hills, varying from 3 to 14 feet in length and 10 to 30 inches in girth. About 15,000 young plants have been counted and registered. I am now proceeding to these Hills for the purpose of ascertaining whether any of these Sandal trees are full grown and fit to be cut into billets.

I have the honor to be,

Sir,

Your most obedient Servant,

L. BLENKINSOP,

Asst. Conservator of Forests.

APPENDIX G.

NORTHERN CIRCARS.

Extract from Diary.

Eskapilly.—On 31st January 1859, I took advantage of the departure of Her Majesty's steamer *Dalhousie*, to visit the Northern Circars. On the following day, the vessel touched at Eskapilly in Nellore, to take in Treasure. The shore is barren of wood, palmirahs are seen among the sand hills, but except the extensive salt-pans, there is nothing of any interest.

On the 2nd February, I landed at Masulipatam, which used to be considered a bleak station, but it has been much improved since the year 1838. There are now avenues of

Casuarina muricata.

Inga dulcis.

Pongamia glabra.

Dalbergia Sissoo.

The trees have not yet grown large, but they afford shade and shelter, and relieve the former

* The diminished ratio of rejected sleepers from 20 per cent., to 5 per cent., is satisfactory.—H. C.

† The restraining of *Púnakad* (i. e. *Kumari*) is important, it should be under the same restrictions as in Canara. Orders to this effect have appeared in the Salem Gazette.

‡ The discovery of so many Sandalwood trees in a new locality is interesting, and may be a source of revenue hereafter: the quality of the wood has yet to be ascertained.—H. C.

dreary aspect of the station; the best of the Sissoos have a bole of 15 or 20 feet high, with one foot diameter.

My attention was directed to a Mangrove* belt lying on the edge of the backwater, which was formerly barren waste. In the year 1839, two canoe loads of seeds of species of *Rhizophora* (Uppu ponna) *Avicennia tomentosa* (Mada chettá) and *Sonneratia*, had been procured by Mr. Rohde (at that time Assistant Judge), at a cost of 25 Rupees; the seeds were dropped into the mud of the estuary by convicts. The belt sprung up quickly, and has been annually cut, yielding a trivial revenue both for firewood and feeding cattle. It is also useful in preventing the channel from being clogged with drift sand. In the Canal basin, I saw about a dozen firewood boats which had come in during the night from the Godaverí, and concealed below the heaped up billets, I recognised house beams of Yépi (*Hardwickia binata*), and Siriman (*Conocarpus latifolius*.)

Vizagapatam, 6th.—This is a picturesque station, but the red soil does not seem suited for tree culture, and the only place where I found fine trees were in the gardens of Goda Surya Pracasa Row and Narrain Row; there were Mangoes, Sapodillas, Oranges, and *Lagerstræmia Regineæ*. The Cashew-nut thrives well at Waltair. On my return, a few weeks later, I inspected, at the suggestion of Mr. T. Knox, Principal Assistant to the Government Agent, an exceedingly interesting private garden, formed at Ankapilly, by the late Goda Surya Pracasa Row. This interested me exceedingly, and I addressed the Agri-Horticultural Society on the subject, thinking the matter deserving of their notice. A silver medal and certificate were awarded as heirlooms to the family. The size of a few exotic trees as Mahogany, Cayaputi, and other MYRTACEÆ, particularly attracted notice, showing the richness of the soil and the comparative humidity of the climate under the shelter of the Vindyan† Hills. The greater part of this Collectorate is Zemindari. I have nothing to remark save that I hope enlightened proprietors will take up the subject of planting on river banks as a speculation, which will probably prove profitable as the present demand for timber is sure to continue.

Bimlipatam.—In proceeding along the beach, I found the sand binders *Spinifex squarrosus* and *Ipomea pes Capræ* (goats-foot creeper,) with the addition of *Phoenix acutis* (the stemless date,) not found further south. The large Sugar factory at Chettavulsah receives its supply of firewood from a great distance, and experiences considerable difficulty in obtaining sufficient quantity.

Chicacole.—The Belgaum walnut, (*Aleurites triloba*), thrives well, several hundred trees have been planted along the road by the District Engineer. The Dividivi, (*Cæsalpinia coriaria*) is in great use among the Chucklers, and fruits freely.

My attention was directed to a wood called "Damonu" or "Karkana," light and elastic, this comes nearer than any other indigenous wood, I have seen to Lancewood or Hickory. It is said to be *Grewia tilieifolia* or *G. elastica*. It is procurable in the bazaars (8 inches broad), and is used for houseposts, gig shafts, dooly poles, spear handles and fishing rods. Many hundred poles could be obtained from the Parla Kimedy jungles. It seems eminently suited for purposes where strength, lightness, and elasticity are required. The bark should be allowed to remain, the poles should be steeped in water and then rubbed with oil.

Topes of mango and tamarind are to be seen at Chicacole, Masulipatam, Berhampore and Russelcondah; they would be of great use to the travellers along the northern road about Hurripur, and in the neighbourhood of Teckelly.

The scrubby jungle begins at Cassibuga and extends beyond Itchapore, but it is evident that the sea-face of the mountains in this district, does not contain any tree vegetation which can be denominated Timber. I met in a Dāk bungalow, Mr. Clarkson, an intelligent officer of the Trigonometrical Survey, who corroborated this statement and pointed out on the map the positions of the Forest wood tracts, and I found his information very correct.

Berhampore.—On the 12th February, I reached Berhampore, and had a conference with the Collector Mr. G. S. Forbes, as to the Sál Forests of Gumsúr, it will be remembered that his predecessor, Mr. W. Knox,† "urged the propriety of some measure being adopted for the due economy and preservation of the Forest timber of this district."

* This affords a main supply of fuel to the station, and is conserved under the orders of the Collector.

† Under G. O., 73, 10th January 1860, two Wardian cases containing Coffee plants were forwarded from the Bangalore Garden to the new sanatorium on the Galiparvatum behind Vizagapatam.

It may be well here to mention the attempts hitherto made to turn these Forests to account. In 1851, Mr. G. Williams entered upon a contract to supply Railway sleepers: this was the first effort made to work the Sál Forests of the North Circars. The wood was found to be superior; but the contract failed. I need not enter into particulars, as the correspondence was published in the Railway Records for 1852.

The late Mr. Overseer Harton, also felled and despatched Sálwood from Cuttack to Madras, on account of the Gun Carriage Factory, and a Commissariat Overseer (Mr. Weldon)* is now employed upon this duty in the Sumbulpúr mahals. With these two exceptions, I believe that no systematic operations have hitherto been attempted. The following Extract from a Minute of the late Commissioner of Cuttack will explain one source of failure.

"There is much difficulty in getting timber of the dimensions required by the Gun Carriage Factory. The largest trees near to the river have been removed, and the Rajahs do not evince a willingness to cut those in the more distant Forests, and require much persuasion to induce them to afford the requisite aid; without which, no timbers of the desired dimensions can be procured. Again, the labor of the coolies employed by the Rajahs to remove the timber, is compulsory and unremunerated. On the other hand, if they be employed by the Agent, the Rajah or his servant exacts a portion of their hire. They are, therefore, not over-willing to lend a helping hand."

The only printed record of the Gumsúr Forests, is a list of the trees with remarks on their uses, (published in Balfour's *Cyclopædia of India*, page 1910,) carefully compiled by Lieutenant Macdonald, giving much useful information; the Botanical names chiefly extracted from Sutton's Oorish Dictionary, are somewhat antiquated, and occasionally erroneous. I took this list with me, and have corrected the names of such trees as were observed in my short excursion.

The Sál tree of Hindostan extends in a nearly unbroken belt of forest along the Terai, from the Ganges at Hurdwar to the Barrampúter, (*Falconer*). It is abundant also on the banks of the Indrawatti (*Beddome*).

It belongs to the genus SHOREA, and is indigenous to the mountainous parts of the Vizagapatam and Ganjam Collectrates. It is a smaller tree in Golcondah and Kimedi than in Gumsúr, and I have not seen any specimens south of the Godaverí.

There was some doubt as to the Botanical identity of the Gumsúr tree, but I was fortunately able to determine this point when in Calcutta three years ago, by comparing specimens received from the Honorable Walter Elliot, then Commissioner of the Northern Circars, (who first drew my attention to the subject) with the sub-Himalayan specimens at the Botanical Garden, Calcutta; and again by bringing down twigs this year, I find them accord precisely with Roxburgh's plant.

It may be well to notice the singular aptitude of the seed of this tree for speedy germination, in connection with prospective measures of conservancy.

"The seed has the utmost susceptibility of germination, with a vitality so limited in duration that it will not survive many days unplanted. The Sál seed ripens at the commencement of the rains and after the first shower, falls *actually sprouting* from the tree. I have frequently seen in the forests near Kurdwar, the radicle of the germ protruded (that is growing), while the fruit was still attached to the parent tree. In consequence, young plants come up in the utmost profusion, and very often so thick as to choke each other: they form patches of forest, which are literally impenetrable, till the woodsman removes them as *Bullees* or *Kurrees*. In this manner the forests are maintained wherever a tree remains standing to perpetuate the stock." (*Falconer's Report*, page 30).

The most important and accessible of the Sál Forests are in the Taluq of Gumsúr and in the Zemindary of Bodogoda, both of which are traversed by rivers which admit of rafting the timber to the coast during the freshes which, however, are of short duration. The names of the principal jungles in Gumsúr are Kukuluba, Gulleri, Juggernatprasad, &c. It would probably not be of much use to particularise all the Mootahs or Estates. The accompanying sketch map prepared by Captain Phillips, 5th N. I., indicates the route I followed, the area occupied by

* Subsequently to my visit, Mr. Weldon was recalled, on account of various difficulties he met with, in fulfilling the duties entrusted to him.

Sál Forests, with the roads and water communication between the forests and the coast. The Sál is the most useful as well as the most abundant tree in these Forests, which are therefore distinctively called Sál forests. It was coming into foliage at the time of my visit, and I had opportunities which never occurred to me before of observing its mode of growth.

The tree grows remarkably tall and straight in the forests. In open places, it yields a thick trunk, throws out branches and becomes umbrageous: young and old are cut down without distinction from the five years old sapling to the full grown tree, and this has been proceeding for a lengthened period without any conservancy rules; thousands of young trees are removed to form posts for native houses, and telegraph poles; others of a larger size, might be useful for public works and officers' houses; and if sawn longitudinally they would give excellent half round sleepers. With this heavy drain upon the Forests, young plants spring up in the greatest profusion, and often so thick as to choke each other. The woodsmen remove the promising poles, and provided that a few trees remain as standards per acre, to perpetuate the stock, so remarkable is the germinating power of the seed that, there is no fear of exterminating the forest. I measured the straight stump shoots of two year's growth, and found them 12 feet high and 3 inches in diameter at the base. Large patches of Sál forest are cleared annually for the purpose of cultivation, and this is usually effected by fire. I came upon several places where some hundreds of fine straight charred poles were standing.

The Khúnds do not, however, destroy fruit trees indiscriminately. They are careful to preserve the mango and the date, the wood-apple and the *Rottleria tinctoria*, the bastard sago and the elupi; the two last as already stated, yield intoxicating liquors.

In Gumsúr and the other Government tracts of Forests no taxes are levied as by the adjoining Zemindars* and no revenue whatever is derived from them.

Throughout the inland part of Gumsúr, there is far more timber than is required for local consumption, but there is no doubt that with the exception of the Hill tracts, the jungles are rapidly diminishing from Government lands, on the level country and up to the foot of the Gháts, partly owing to the increase of cultivation and partly to meet the demand for timber at Aska, Berhampore, Russelcondah, &c.

In the days of the Rajahs, the felling of timber was systematically discouraged, so as to render the country less accessible to a military force.

At present there is no system of Forest conservancy, but orders have been issued by the Collector, forbidding the indiscriminate destruction of trees. I may also state that I explained fully and particularly to the principal wood merchants and to the Aska firewood contractors, that low cutting of trees and reservation of the finer kinds was of the utmost importance to the Government and to the people themselves. They promised to follow my instructions. The probability of the appointment of a Government Overseer was intimated to them, and that his salary would be met by a small tax.

Certain trees are always carefully preserved, they are chiefly,

- | | |
|--------------------------------------|---|
| 1. Mango. | 5. <i>Rottleria tinctoria</i> , <i>Súndosagúnda</i> . |
| 2. Dato. | 6. <i>Caryota urens</i> , Solopo. |
| 3. Wood-apple, <i>Koeto</i> . | 7. <i>Bassia latifolia</i> , Mohollo. |
| 4. <i>Bauhinia</i> , <i>Bovada</i> . | |

The two last are reserved on account of the intoxicating liquors which they yield, and which are in great request. From what I witnessed, it is to be feared the Khúnds are becoming a dissipated people.

Ganjam.—There is an abundant supply of wood for burning in this district. In some parts it has been much reduced as in the Beredy Zemindari, where all the large trees have been consumed in boiling salt, the usual mode of manufacture by solar evaporation not being practised there. Again in the Gumsúr taluq on the banks of both rivers leading to Aska, great clearances have been made, often preceding cultivation, but sometimes occasioning the destruction of fine Sál timber.

* Such as 2 Annas on a new Bandy, 1 Rupee on a new Boat; 1 Rupee 8 Annas on a Mast; $\frac{1}{2}$ Anna on a bandy firewood; 2 Annas on a bandy of Bamboos; $2\frac{1}{2}$ on a bandy load of Planks; and other small sums on Wood taken for Ploughshares, Sugar Mills, Oil Presses, &c. The Zemindars also collect money on honey, dammer, arrow-root, and other jungle products, which are sold separately or collectively to a Jungle renter.

As this district requires opening up, and there is a great abundance of wood, all that seems necessary is to reserve the Sál and a few other superior woods, confining the firewood cutting to the woods of less value. Instructions to this effect were fully given in my presence to the Contractors, who tender for the supply of the Aska Factory.

The road from Russelcondah has been cleared up to Durgaparsad, near the foot of the Kalinga ghaut. The Khúnds come down once a week to the market at Belligunza, bringing oil seed, wheat, turmeric, and a little cotton, they return the following day. Captain Harrington is building a large Choultry as a rest-house for them. It is intended to continue this road to Sumbulpore, where it joins the high road to Nagpore. It opens up much of the Sál forest although it avoids the river and keeps to the high ground, where the trees are not so well grown. Side tracks would be required in various directions, but these would be easily made. It may be well to mention that there is a made-road from Ganjam to Russelcondah (viâ Berhampore), in which the streams are all bridged, and further that bandies have recourse to the forest from Russelcondah and even Itchapore, a distance of 76 miles.

It was a most interesting sight to see 80 children of the State (*Sirkar ki Buchay*), as they call themselves,—rescued Meriahs, engaged in making a road, which is calculated to open up the resources of the country and to civilise the Khúnds. The wages of these Meriahs was 4 Rupees *per mensem*; boys 3 Rupees *per mensem*.

I put the following questions to the headman of a Meriah village, and who, I believe, was the first man rescued from death.

1st Question.—Are there any persons who would prepare rafts and float to Ganjam; constant employment would probably be given.

Answer.—Yes, my people would readily prepare rafts of Sál on the river-bank, but we do not wish to leave our fields. (*i.e.* floaters must be engaged).

2nd Question.—What would be the cost of cutting a log 5 feet in circumference and 15 feet long.

Answer.—Such a log would be cut and squared for 4 Annas, and dragged to the river for 2 Annas more.

The general result of my tour of inspection may be summed up thus:—

The Sál forests of Gumsúr are the most valuable tract of wood on the Eastern Coast, and the only one I have seen which would repay European superintendence. Still it could scarcely rank in value with a second class Forest of the Western Coast.

Perhaps there are parts of Rajahmandri and Masulipatam, which may hereafter be found to contain teak of more value than the Sál of Kimedi and Gumsúr, but at present there is nothing left on Government land, save seedlings of comparatively small girth, the Godaveri river banks having been cleared, and the best wood entirely exhausted.

In consequence of the unhealthy climate of Gumsúr, and the difficulties which would be experienced by European or Eurasian Overseers, I think the work of felling and preparing rafts should be organized at Ganjam.

The working operations of the Sál forests in Gumsúr taluq, would be divisible into three distinct stages.

I.—Felling and transport to river bank.

II.—Floating the rafts to Depôt (Ganjam).

III.—Shipping to Madras.

In addition to those operations, the Forest Assistant or Overseer should be charged with the necessary measures for conserving the young trees.

The first should be carried out by Natives—Khúnds, Meriahs, or Ooriahs, with a Conicopoly and perhaps a *Gomastah*, the latter might probably be secured at the rate of 12 or 15 Rupees *per mensem*. The second would be arranged by floaters, procurable in the towns of Russelcondah and Suradah, or at least in Ganjam. The third operation must be left to coast traders, such as Messrs. Valleix and Linares of Gopalpore, or Hoffland of Vizagapatam. The depôt should be at Ganjam, where there is generally a Salt Agent and subordinate of the Department Public Works.

The rafts would come down early in the monsoon (July or August), and the timber remain

in store till the close of the rains, when ships arrive. A sufficient quantity to meet the demand of the season should be sent by the first freshes, as cartage is very expensive. The timber should be put under cover, as Sál suffers much injury from exposure, splitting, and warping. When there is a sufficiency of timber, an advertisement might be inserted in the *Fort Saint George Gazette*, intimating that a ship might obtain freight.

CONCLUDING NOTE.—The sanctioned amount allowed for the fixed establishment of the Forest Department being all but expended, I am unable to propose any definite arrangement at present. I feel certain that it would pay well to have Overseers for Gúmsúr, Kúrnál, Kótagiri and Southern Salem.

APPENDIX II.

RULES FOR THE PRESERVATION OF JUNGLES IN THE DISTRICT OF COIMBATORE.

1. No Timber exceeding 12 inches in diameter, nor any of the Trees specified in paragraph 8, are henceforth to be felled in any of the jungles, the property of Government.
2. The villagers may cut fuel and firewood for domestic purposes in low jungles and brushwood, without taxation, as they have hitherto, but *not for sale*.
3. Charcoal burners may only cut in such places as may be assigned to them and are *not* to cut the trees noted in paragraph 8, whether in those places or elsewhere.
4. The land to be assigned for cutting fuel, &c., shall in all practicable cases, be selected near the inhabited villages, so that the clearings may prove an advantage to the residents.
5. The people may likewise cut wood required for the erection of their dwelling houses, but this privilege will be restricted to *bond fide* Ryots, the wood to be so felled must not be more than 3 feet in circumference at 2 feet from the ground, nor be one of the kinds noted in paragraph 8, in all cases 30 standard trees must be left on every acre of ground.
6. Wood required for agricultural implements will be allowed to be taken untaxed by all Ryots, and in the same manner bamboos also may be cut for the actual and *bond fide* erection of their houses, *not for sale*.
7. No fruit tree shall be cut down or injured; in like manner all trees likely to become timber, as well as saplings of every kind should be preserved.
8. The names of the trees and shrubs, to be always reserved for the value of the wood or of their products, are mentioned below:—

I.—Trees to be reserved for the value of their timber.

- | | | |
|------------------|--------------------------|-------------------|
| 1. Sandal. | 7. Palmirah. | 13. Cuddum tree.† |
| 2. Red Saunders. | 8. Jack tree. | 14. Babul tree. |
| 3. Ebony. | 9. Acha marum. | 15. Siriss.‡ |
| 4. Satinwood. | 10. Maruda tree. | 16. Catechu. |
| 5. Teak. | 11. Common Terminalia. | |
| 6. Blackwood. | 12. Glabrous Terminalia. | |

II.—Trees or shrubs to be reserved for the value of their products.

- | | | |
|-------------------|--------------------|--------------------|
| 1. Custard apple. | 5. Elupé. | 9. Secoymarum.§ |
| 2. Guava. | 6. Cashewnut. | 10. Pinnay tree.¶ |
| 3. Soapnut. | 7. Tatancottay. | 11. Tamarind tree. |
| 4. Capila-rung,\|\| | 8. Surul Chukkay.* | |

9. On fuel firewood and bamboos cut for sale, a fee of 5 Annas for every cart load, one Anna for every bullock load, and 3 Pice per man's load will be levied, and the amount so collected will form a fund to be laid out in new plantations or in the preservation and improvement of the existing ones.

1 Man 2 maunds 3 Pice.
1 Bullock 8 " 1 Anna.
1 Cart 40 " 5 "

|| *Rottleria tinctoria*.

* *Ventilago Maderaspatana*.

† *Nauclea cadamba*.

‡ *Acacia speciosa*.

§ *Acacia concinna*.

¶ *Calophyllum inophyllum*.

10. A fee of *one anna* will be levied on every basket of charcoal made in Government woods.

11. The village officers are authorised to collect the fees at the rates above set forth, and remit the same to the Talúq Treasury like other collections of revenue: any extra collection, misappropriation of the funds, &c., will render them liable to the penalties provided for in Regulation IX of 1822.

12. Every case of evasion of the payment of fee on the part of the people, and of the unauthorised cutting of wood will be considered as a fraud, and dealt with accordingly.

13. The preservation of the Government jungles, topes, and fruit and timber trees from destruction, devolve upon the Village officers, who will be held responsible for any breach of these rules: where the Forests are extensive, and cannot be conveniently and efficiently overlooked by them, they will be aided by the Talúq Establishment.

14. These rules are applicable to all the Talúqs, exclusive of the Nilgiri Hills.

CIRCULAR NO. 10.

TO MAKE CHARCOAL.

The best sized wood for this purpose is what is, generally understood as Billets. An ordinary sized kiln requires about 25,000 billets cut as nearly as possible of the same length. Procure a pole about 25 feet long and 6 to 8 inches thick, straight and of uniform thickness. Provide yourself with four forked sticks of the shape of *fig. 1*. Erect the pole perpendicularly

FIG. 1.

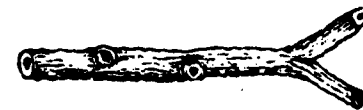


FIG. 2.

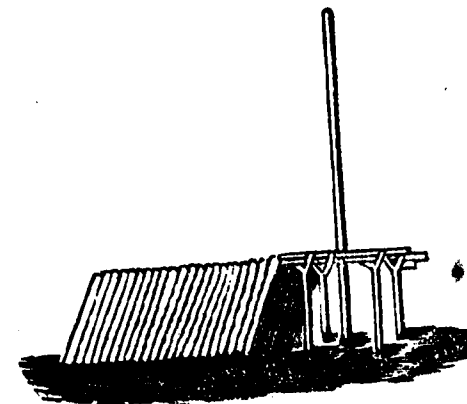
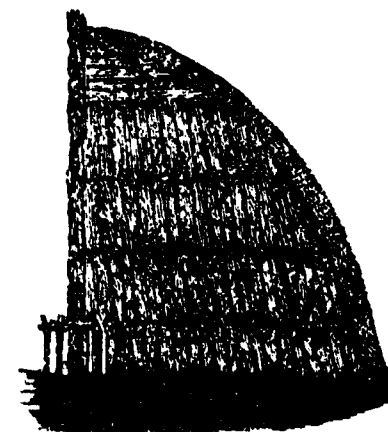


FIG. 3.

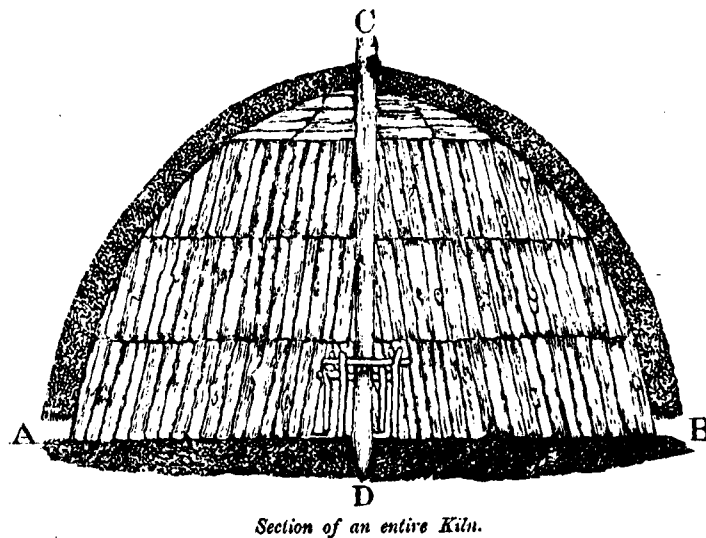


Section of one-half of the Kiln.

on the spot where the kiln is to be made and place the four forked sticks round it, arranging pieces of wood from fork to fork and across, to make a hollow space in the centre of the kiln for containing combustible matter, this forming a space of about 18 square inches as *fig. 2*). Provide the person stacking the billets with a yard measure, and let him proceed to place the end of the measure against the pole, sitting at the other end of the measure, the billets are then to be placed in an almost perpendicular position against the cross pieces, and as close together as possible, each cooly stacking right and left to join his neighbour's work on either side. Thus he goes on stacking until he has come to the end of his measure; all having done the same, a perfect circle will be the result. After having filled up all interstices that may have occurred from crooked or large billets, each cooly pulls out his measure to another yard in length and proceeds as he did before. Having done this the third time, the kiln will measure 18 feet in diameter, which ought to take 25,000 billets. The coolies then mount the first layer of billets and commence stacking from the pole, until they come to the end of the first layer, and so on a third and fourth layer, until the kiln is completed, (as shown in *fig. 3*). Cover in the whole kiln with turf, turning the grass side

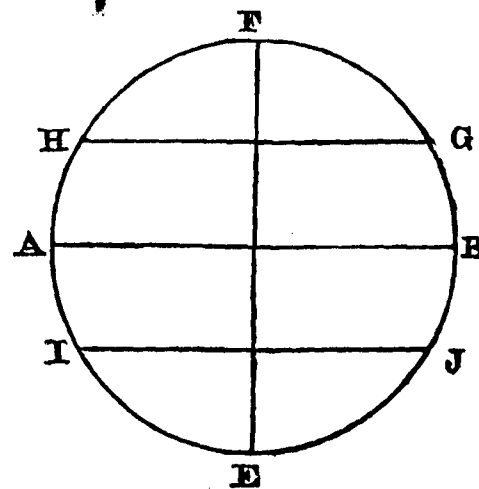
inwards, commencing from the bottom; after which throw a small quantity of loose earth over the turf, beating it down with the back of a spade.

FIG. 4.



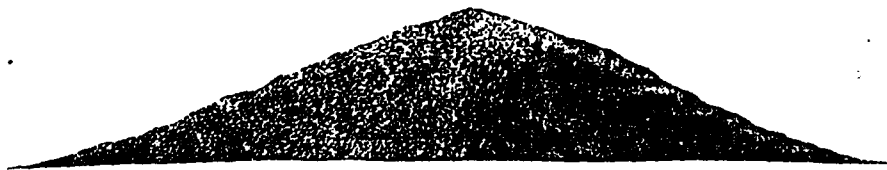
After the whole kiln has been covered in, let one or two men ascend the kiln and pull out the pole, leaving an empty space from top to bottom of kiln. From the top, drop in a ladle full of ignited charcoal, and immediately this is done, open out one turf at the bottom of the kiln, say at A. This will cause a draft of air in the direction of A D C, and in a few minutes, flames will

FIG. 5.



be seen ascending at C. Let this continue for 5 or 10 minutes; till you have satisfied yourself the billets in the centre of the kiln are on fire, when one man must be sent up with a large turf to close the opening at C over which he should sprinkle earth to keep in all flame. *From this moment no flame must be allowed to escape from any part of the kiln.* When the opening at C has been closed, one at B should be made. The billets in the direction of D A and D B will then ignite faster than any other, and when smoke is seen escaping between every turf in the direction of A C. and B C. the openings at A and B must be closed and fresh ones made, say at E and F; these will be closed in their turn and others made at G H and I and J. Shortly after this is done, it will be perceived that smoke is proceeding uniformly from every crevice, when all air holes at the bottom must be closed. The whole kiln will then fall in and assume something* of the following shape at the end of 36 hours.

FIG. 6.



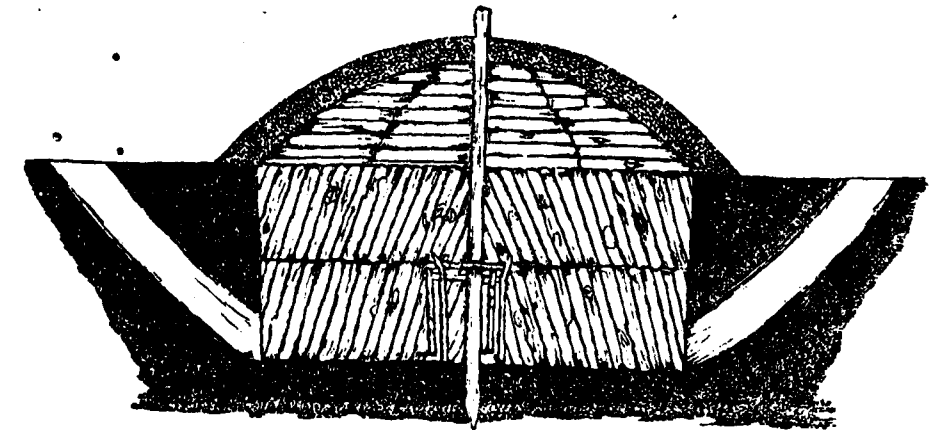
Earth enough must then be thrown on with shovels to *extinguish all smoke.* At the end of 36 hours more, the charcoal may be raked out. A few buckets of water should be in readiness, if required to put out the sparks of fire which may remain.

* The bulk remaining should not be so much reduced.

Great care must be taken to stop every fissure in the casing, and if from bad management the heap settles, and the casing falls in at any part, the cavity must be filled up with green wood kept ready for the purpose, and sods thrown on and covered with earth. As soon as the dense smoke ceases, and the wood burns with a light transparent smoke, the whole is closed in and watched, least any fissures should open.

In burning in pits, the system is the same, but vent-holes are formed in the sides, and the covering of sods &c., being more accessible, is more easily formed and kept.

FIG. 7.



In pits, the wood is more conveniently packed, as shown above (fig. 7) and the logs in the middle of the lower course should be dry and have a few chips and refuse charcoal from former kilns among them; in other respects the practice is the same as with the piled kiln.

FIG. 8.



In some places, it may be convenient to form a kiln by digging out the side of a hill, as (fig. 8), but in all cases the system is the same. If the process is properly conducted, the bulk is but little reduced.

In this tropical climate, where vegetation is so rapid, it is not necessary to cut down trees for charcoal, but merely to lop off lower branches. On dry forest land, a crop of wood can be obtained every fifth or sixth year, and on marshy land, every third year.

H. CLEGHORN,

Conservator of Forests.

MADRAS, 6th September 1860.

N. B.—Much of the material embodied in this Circular, was obtained from a European engaged in the manufacture of Charcoal, and from Mr. Rohde, C. S.

H. CLEGHORN.

REPORT
OF THE
CONSERVATOR OF FORESTS,
FOR THE
OFFICIAL YEAR
1860-61

Madras:
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1861.

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No. 656.

APPENDIX.

A. Anamallai Forest Report.	J. Rules for the Conservation of the Salem Jungles.
B. Sigúr Forest Report.	K. Remarks on Tea.
C. Mudumallai Forest Report.	L. Report on the Government Botanical and Horticultural Gardens at Ootacamund.
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From CAPTAIN H. R. MORGAN,

Officiating Conservator of Forests.

To J. D. SIM, Esq.,

Secretary to Government, Revenue Department, Fort Saint George.

SIR,—1. I have the honor to report for the information of Government, that I have inspected the following Forests during the past year, and have written the undermentioned special Reports.

2. FORESTS VISITED.—Salem Forests... .. Reported on.

Denkincottah....	do.
South Arcot.....	do.
Nellambúr Teak Plantations.....	do.
Neilgherry Sholas.....	do.
Cinchona Plantations.....	do.
Mudumallai Forest....	do.
Sigúr Forest.....	do.
Anamallai Forest.....	
Australian plantations.....	

3. SALEM.—A complete establishment for Salem has at length been organised with a set of Rules* approved of by Government. The Forests had suffered much from the Railway pressure, it is to be hoped that under a careful system of conservation they may at all events be preserved from total destruction,† a fate they were fast approaching under the old system. The Penagram Forests of Achawood, on the banks of the Cauvery, are yet unworked, and if not destroyed by the Bunjarras and others to feed their cattle, will, when opened up by a good road afford a valuable supply of timber for the Salem market. The system of pollarding the large trees and cutting saplings for the food of cattle in the dry season has been strictly forbidden, and Native officials in remote parts warned to prevent it.

4. CONOLLY TEAK PLANTATIONS AT NELLAMBUR.—These plantations consisting of nearly eleven hundred acres of young Teak from the age of one to fifteen years are progressing favorably, but from want of funds, the planting for the last three years has fallen off from one hundred to some fifty acres annually. A fresh grant of 6,000 Rupees has been made, and I have no doubt but that we shall soon make up the lost ground. Owing to want of funds the thinning of the old plantations had not been carefully attended to, the consequence is that, some of the plantations stood still and others rather retrograded; this will now be remedied, and with an Assistant to supervise the thinnings, the plantations will soon recover. I have suggested that the Assistant in charge of the Neilgherry Sholás should also supervise these plantations, as the present Native Sub-Conservator though quite equal to the task of planting out (a work he has hitherto executed with great ability) is not equal to the judicious thinning of these very valuable young plants on which the proper growth of the timber so much depends. A road from the foot of the Carcúr Ghat to Nellambúr passing through much Government Forest land is also in contemplation, this will tend much to open up this hitherto avoided part of the country, and by encouraging bazaar men and settlers, coolies will become obtainable: hitherto it has been the persevering policy of of the Theropád of Nellambúr to keep out every one, and under pretence of keeping a bazaar and supplying travellers with grain, &c., he has hitherto contrived to starve all travellers putting up at Nellambúr, as the answer in general is, no grain, no sheep, no fowls.

* Vide Appendix J.

† Vide Mr. Blenkinshop's Report, Appendix E.

A survey of the Nellambúr plantations has been recommended; at present it is only by the number of trees planted, we arrive at an approximate area.

5. NEILGHERRY SHOLAS.—An Assistant Conservator with two Overseers and seven Peons have been granted for the preservation of these Sholás, and for the due supply of firewood and charcoal to the inhabitants. Wood is supplied at the Sholá side at 12 Annas the load of 750 lbs., and charcoal at 10 Annas the bag in the Cantonment. A large sholá for the supply of Ootacamund was sold to the highest bidder at auction under certain conditions, and the system appears to have worked well, at least no complaints of dearth or scarcity of wood have reached me. People have only to hire a cart, send it to the sholá and obtain their wood, the cost per ton rarely exceeding Rupees 4-8-0, a moderate price I consider. Coonoor and Wellington Barracks are supplied from a sholá in their vicinity under the same conditions. The gaps in the sholas are planted with the fast growing *Australian Acacia*, *Stricta* and *Molissima*, which make excellent firewood, splitting easily, and burning even when green. As there are no large forests near Ootacamund, I have suggested that the Devi Forest, distant some eight miles, should be worked; if a good road were made to this forest, Ootacamund might be supplied from it for years to come, and if the trees are judiciously thinned out, the forest will become a very valuable site for a Cinchona plantation. The soil is very superior, the aspect is good, abundant moisture in the ravines, and the elevation from 6 to 7,500 feet. I am now proposing that a road of an easy gradient not steeper than 1 in 18 be made by Burgher labor under the Assistant Conservator, this road will open a new part of the Hills and at the same time render firewood abundant.

6. WELLINGTON FIREWOOD PLANTATIONS.—These plantations have not hitherto made the progress expected of them, the causes are plain, the greater part of the plantations face the south, and from being exposed to the monsoon the surface soil has been completely washed away. Had the Northern face of the valley been first planted, I have no doubt from the excellence of the soil on that face, that the progress of the plants would have been every thing we could have desired. The system of pitting is not good for rapid growth. I have recommended the trench system and a larger planting of the *Acacia Molissima* which grows quicker than the *Stricta* and multiplies itself by suckers to an unlimited extent.

7. CINCHONA PLANTATIONS.—The Cinchona plants in the gardens embracing at least five very valuable varieties are progressing favorably; in November next the ground at the Neddittum site will be put in order, and by July there is every probability of some 50,000 plants of the valuable red bark (*C. Saccubra*) being ready for planting out. There will also be plants of other varieties, more suitable to a greater elevation, such as the Dodabetta site 7,400 feet, and the Avalanche site. Further supplies of seeds and plants from Kew are also shortly expected, and there is every probability of our soon being in a position to stock at least a thousand acres. We are also promised seeds and plants from Java, but with the exception of the *C. Calisaya*, they have nothing of any value.

8. TEA PLANTATIONS.—I have inspected the tea plantations of Messrs. Mann and Rae, the former has not been much extended, but the Tea produced from it, though manipulated by a person who has not been properly taught, is of a superior description and promises well for Neilgherry Tea. The latter plantation contains only young plants, but covers an extent already of some thirty acres, and is daily increasing; when these trees bear seed some three years hence, a nucleus for the supply of future plantations with seed to almost an unlimited extent will be created, and there is but little doubt, but that in a very few years hence, the Neilgherries will be in a position to export Tea largely. The present system of grass-puttah holding by the Burghers must first be placed on a proper basis, before parties will come forward to colonise these hills. The Burgher holdings should be as clearly defined as those of any other individual,

unless this is done, endless vexatious disputes must arise, and consequent discouragement to colonisation. The selling of sholas has been a subject of deep consideration, if Tea and Cinchona plantations are to be formed by speculators, they must have some Forest land, say, ten per cent. of the entire grant; for the woodlands they should pay a far higher rate than for grass-land, the reason being that not only must the expense of planting fresh land be undertaken by Government to supply the loss of Forests

destroyed, but the shola land being in heart is ten times more valuable than the grass-land, which takes from two to three years of digging and manuring to get it fairly in heart. An upset price of 2½ Rupees per acre for the grass land, and 10 Rupees for the shola-land would be a fair approximation. The land to be sold outright to the highest bidder. The surplus amount obtained by the sale of the wood-land, to be bonâ fide expended in the creation of new woodlands. The present rate of 10 Rupees per acre for grass-land seems to be too high for the fee simple.

9. SAW-MILL IN OOTACAMUND.—A saw-mill is much required, the Native sawyers charge very high and spoil the wood; if a saw-mill driven by the surplus water from the lake were established, it would be a boon to the public and a saving to Government. At present plank sawing adds fifty per cent. to the cost of the wood. The amount of sawn timber required by the public would probably amount to 10,000 square feet per month.

10. ANAMALLAIS.—The sales of wood in this Forest have fallen off more than thirty per cent. in the last year, the reason alleged is want of axemen. But Rupees 44,078-2-5 were realized in 1860-61, against Rupees 67,259-10-5 in 1859-60. There was also a change of Officers during the working season, which may probably have caused some difficulties. There are many improvements required in this Forest, such as a new timber slip; the present make-shift of a slip being in most places simply the rocky bed of a water course, and the labor and expense entailed in slipping the dockyard planks by means of elephants is very great. A proper slip is far more required than a new ghât; a slip made of logs of trees would cost not more than 3,000 Rupees, whereas a ghât of 1 in 20 would cost 15,000 Rupees, and the cost of carriage would exceed that of slipping by fifty per cent. A ghât was traced and estimated for, but in my opinion it is not required. The present cost of slipping the planks by elephants is some 1,500 Rupees, if men were employed on a proper slip the cost would be under 500 Rupees. I have directed an estimate for a slip to be prepared, and hope to submit it shortly. The proposition to establish a saw-mill, cannot, I fear, be entertained, as the present establishment though very strong *apparently* for the work turned out, is barely able to get through the ordinary demands. A saw-mill would require a skilled Establishment, and the chances are that, fever would soon incapacitate them from labor. As a rule in these very feverish jungles, it does not pay to attempt any thing beyond what can be accomplished by the rudest labor. The Teak plantation here has not been very successful, a small clearing of two acres was planted, but most of the plants died; it is a question, if it is worth while to plant here, for though we have excellent soil, a fine situation, and Teak growing remarkably well, we labor under the following disadvantages, viz., a very feverish locality, scarcity of labor and 40 miles of land carriage. If it could be shown that the Anamallai timber fetched by ten per cent, only a higher price in the market than Nellambúr Teak, then it would pay to plant on the Anamallais; but at present prices are much the same, and as we have thousands of acres at Nellambúr excellently adapted for Teak planting with water carriage, it does not seem expedient at present to extend the Teak plantations on the Anamallais. Further, the only market where we should not be undersold, would be the Coimbatore market, and the amount taken would be insignificant. To plant 100 acres and keep them clean for one year requires the labor of some 12,000 coolies or 33 daily laborers. We have great difficulty in obtaining sufficient labor to repair our roads, how then could we obtain labor for large plantations.

11. MUDUMALLAI.—The returns from this Forest during the past year appear small, but only half a year is represented, the forest having been worked for the Wellington Barracks for the first six months of the year, and only made over in November last to the Conservancy Department. This Forest is rented from the Theropád of Nellambúr and has been worked for the Wellington Barracks, supplying them with more than 1,50,000 cubic feet of Teak at the market rates prevailing in Ootacamund and Mysore. On the adjustment of the Barrack Accounts with the Forest, it was found that the Forest possessed in prepared timber, plant, and money due by the Barracks for timber supplied, a sum amounting to Rupees 52,012-8-0. Thus by the working of this Forest, the Barracks have gained largely, as formerly they obtained their timber from the Anamallais at a cost of 4 Rupees the cubic foot, and with great difficulty. If we allow the

50,000 × 4=	20,000
50,000 × 1-7=	71,875
saving Rs.	1,28,125-

Barracks must have obtained at least 50,000 cubic feet of this timber from the Anamallais at a cost of Rupees 4 the cubic foot (the Ootacamund market then supplying no timber) instead of Rupees 1-7-0 the rate charged by Mudumallai Forest, then have the Barracks gained by Mudumallai nearly a Lack and a half of Rupees, besides a very great saving effected in the time occupied, as a glance at the returns would soon show. Their timber supplies before Mudumallai was worked, averaging some 10,000 cubic feet annually; afterwards they rose to 40,000 cubic feet, or four times as much.

There are still some two years of the lease to run, and every effort is made to get out as much timber as possible and store it at Sawyer's village, as unless we have this supply of timber for our Public buildings, Sigūr Forest being exhausted, we must go either to Mysore or the Anamallais for our timber; from the former, we can obtain no long timber, and from the latter, it will cost us 4 Rupees a cubic foot. The Jail, New Church, Lawrence Asylum, and Barracks, will require a considerable amount of timber, and that our Depot will afford a full supply of well seasoned long and short wood, is satisfactory.

12. SIGŪR.—The sales of Sandalwood from this jungle have been very satisfactory. Ripe wood (which otherwise might have decayed) has been cut in every available spot, young trees have been carefully tended, and the system of conservancy extended far down the Moyar valley.

The Teak has not been felled, but young trees have been looked after, and preparations made for forming a small experimental plantation.

Jungle woods such as Vengé, Kurramurdah, &c., find but few buyers, the expense of sawing in Ootacamund, acting as a bar to all purchasers. Good and economical sawing would tend much to a large consumption of the superior jungle woods. On the expiration of the Mudumallai lease, we shall only have Sigūr to look to for Teak, and it becomes a question whether we should not take a perpetual lease of Mudumallai, if obtainable on reasonable terms.

13. WYNAAD.—Very little has been done in these Forests as yet, beyond preventing the passing of timber into Mysore, general illegal felling and clearing the Forests for cultivation called Coomree. Until the survey has determined boundaries, it would not be advisable to commence operations of any kind.

14. MADURA.—The conservancy of these Forests has but just commenced, and there is no doubt room for considerable improvement, a small sum for the working of these Forests as an experiment has been sanctioned, and it remains to be seen with what success. It is to be hoped that the felling of the timber by the Forest Department and periodical auctions will be found preferable to the License system, which at the best, always occasions trouble and is of doubtful advantage; parties taking out Licenses always felling the smaller trees and leaving the ripe ones as they cost more in the first instance though they pay best in the long run. I myself am a decided advocate for working all valuable jungles, and it remains to be seen, if Madura is to be classed under this head, or like Salem to be left to the License system. Mr. Sperchneider's report next year will, I trust, decide the question.

The renting of the Forest products has always been a vexed question, as parties under pretence of collecting them, steal Sandalwood, damage young trees, and often carry off logs. I am of opinion that the Forest products were better managed by the Conservancy Department where the products are collected in valuable jungles, barks, dyes, seeds, &c., collected from scrub jungles might fairly be open to all.

An increased Establishment for the Madura Forests has been applied for, and, I trust, that next year we shall be in a condition to work them systematically.

15. NORTH CANARA.—This very important Forest has not fallen off, though Mr. Muller complains greatly of his present Establishment. An increased Establishment has been applied for, and it is to be hoped that with increased means conservancy will be more strictly enforced. I do not agree with Mr. Muller in the idea that the Establishment should be under the Collector, who must already have sufficient occupation, without being troubled with the executive details of the conservancy system, and which more properly belong to a separate Department. It appears that Dr. Cleghorn thrice visited the Forests of North Canara, but refrained from recommending a much increased Establishment. Looking at the magnitude

of the operations and the small pay of the present Establishment, I have deemed it absolutely necessary to recommend an increase. I believe Dr. Cleghorn had no other objections against an increase, but "Financial pressure."

The clearing of the Kalanuddy has been again delayed in consequence of the Department Public Works, being unable to furnish an Overseer for the work, it is very important that the rocks in this river should be blasted. A sum of Rupees 6,000 has been granted, but as yet none has been expended. I trust we shall be able to obtain a skilled Overseer from the Department Public Works before the present dry season commences to enable us to make some progress this year, or we shall lose a very large return. The sum of Rupees 6,000 is only for partial clearings of the Kalanuddy river, to clear the river effectually, Mr. Müller roughly calculates the cost at a lac of Rupees, but even this large sum would be more than repaid by the immense quantity of valuable jungle woods which could be cheaply brought down. It is of the most vital importance to our Forests that we should avail ourselves to the utmost of water carriage when procurable, and to neglect even the partial clearing of the Kalanuddy will be to throw away money, for those jungle trees now in their prime, the value of which might be at once realised, must decay in a few years, and thus be lost.

16. SOUTH CANARA.—The operations in these Forests for the last year are satisfactory; the Revenue is steadily increasing, whilst at the same time the pruning and careful preservation of numerous Teak and Blackwood saplings is carried on, the beneficial effects of which will not appear for some years to come.

Jealousy between the Revenue and Forest Departments is complained of, and time alone will convince the Native Revenue authorities that they must support the Department instead of thwarting it on all occasions. Collectors, however, anxious to support the Forest Department, are constantly ignored by their own Native subordinates. An additional Establishment has been proposed for these jungles, and a grant of Rupees 3,000 for working them. As the system becomes further developed, it will be necessary to take over the eventual working of them, instead of carrying on the stump fee system. It is also desirable that Teak plantations should be formed on the banks of the river in the Sóliah jungles, and it will be necessary that a separate grant be made next year for the above object.

17. CUDDAPAH.—These jungles have been but lately taken over, and a small Establishment sanctioned. They are worked much on the same principle as the Salem Forests, viz., the License system, and it does not appear to me that we shall ever be able to introduce any other system. The jungles are thin, the valuable trees far apart and roads but few. The principal wood of commerce is the Red Sanders or *Pterocarpus santalinus*; a heavy seignorage is readily paid by merchants on this wood.

The conservation of these jungles was commenced only just in time, a few months later, an enormous havock would have been occasioned. When we consider that the Railway runs through their entire extent from Naggari to Cuddapah, exactly the same effects as followed the Establishment of the Railway through the Salem District would have taken place in Cuddapah. The substitution of iron pot sleepers for wooden ones on the Northern parts of the Line will tend much to relieve the Cuddapah jungles, though it is a question, if the very salt-earth in the Cuddapah and Bellary Districts will not soon corrode the iron, and cause a return to wooden sleepers. The packing of the wooden sleepers in sand and gravel, besides exposing their surfaces to the air, has tended much to preserve them; wooden sleepers tightly packed above and around with the salt-earth that prevails to a great extent in the Salem and other Districts, were soon destroyed the best Vengé sleepers not escaping.

The Railway passing through the principal jungles in Cuddapah, occasions a great traffic in wood, and the demands in consequence are already becoming very great. No planting of any kind has as yet been undertaken in the Salem and Cuddapah jungles, but if the demand for timber goes on at the present rate, it will become absolutely necessary to plant. I would not recommend an elaborate system, such as is pursued in Nellambūr, but simply the ploughing up of a few acres in an eligible spot, sowing the seed of Forest trees broad-cast, and then thinning out. Transplanting in such dry and hot regions, unless very considerable and expensive precautions were adopted, would most likely fail. There are many favorable spots for the above experiment in the Bālpilly jungles of Cuddapah and the Cotaputty jungles of Salem, also in the Denkincottah jungles where the cedar tree flourishes.

18. AVENUES.—I am of opinion that the Avenues should be placed under Collectors, and heads of villages made responsible for the proper care of the trees; at present the Engineer Department has the charge of Avenues; but I do not find that Overseers and others take much interest in the preservation of the trees, and villagers may cut the trees to pieces to feed their cattle, without the headman attempting to prevent them or inform against them. If the Engineer Department simply planted the trees and then handed them over to the Collector, the system would no doubt work better, the heads of villages being held strictly responsible for the preservation of the trees from wanton destruction.

19. FIREWOOD.—To supply the increasing demands of the Railways, Iron smelting and Indigo concerns for firewood, now engages my serious attention. A tax of 12 Annas per ton or 6 Annas per bandy load has been levied in some Districts; but large concerns, such as the Tirunamallai iron works, and Mr. Fischer's works in the Ahtūr Talūq of Salem, object to pay this small tax, and representations have been made for a remittance of the above tax. I am of opinion that all great works should compound for their firewood, the Railway, the Iron smelters, the Sugar and Indigo factories, &c., compounding for the tax would save a vast amount of vexatious watching and levying of small sums.

It will soon be necessary to plant many acres of ground with quick growing Acacias to supply the enormous demand for firewood, which is daily on the increase. Some idea of the consumption of firewood may be formed, when I mention, that at Tirunamallai a circle of some 12 miles in diameter, which abounded in small wood, is now almost entirely denuded of every tree, and this in the course of some seven years. In the Salem District, the consumption of firewood annually amounts to many thousands of tons; in Cuddapah the export is becoming considerable; in South Arcot, especially at Tirunamallai, the expenditure is enormous. It is clear that some remedy must be devised. I recommended to the Railway Agent the growing of the *Inga dulcis* along the banks of loose earth on each side of the Railway. If this were persevered in throughout the Line, in a few years they would become entirely independent of external supplies. Instead of planting this useful tree for firewood, prickly pear has been planted, which is quite useless, and is further a public nuisance. The Aloe has also been largely used; it makes a good fence, but should give way to a fuel producing tree.

20. FENCES.—Our Nellambūr Teak saplings were, I believe, found useful for a rapid fencing of the Line; this year we shall have a large number to dispose of. I may mention it has been found, that if the upright posts for fences are buried in gravel so as to secure efficient drainage, they last twice as long as when simply buried in earth. The same effect has been found to follow when sleepers are so treated.

21. PLANTATIONS FOR FIREWOOD ON THE NEILGHERRIES.—There are certain situations where plantations for firewood on the Neilgherries might be found to answer; land intervening between sholas where probably trees once grew and on which there is only a dense brushwood growing on rich soil, if the brushwood is cut down and burnt in the dry weather, and the seed of *Acacia stricta* and *mollissima* scattered broad-cast, firewood plantations might be raised at a cost of about 20 Rupees per acre, but our space is limited and we cannot command many acres of the above description. There is a good extent at the Governor's shola now being worked. On the first rains falling, it would be necessary to thin out the plants, and for the first year at least to keep down the weeds, &c. Any other mode of raising firewood plantations especially in grass-land would cost from 70 to 100 Rupees per acre. With respect to the *A. mollissima* or yellow flowering Australian Acacia for firewood plantations, it is a curious fact, that hares rarely touch it, whereas they will destroy the *A. stricta* by hundreds; the reason I conceive is that one is much more bitter than the other, the roots of *A. mollissima* when dug up, emit a powerful and very unpleasant odour. The bark of the *A. mollissima* is useful for tanning, and from the wood I have obtained tar.

22. PEAT.—The use of Peat does not seem to be on the increase, the cause is not clear to me, as Peat when mixed with firewood or even alone forms an excellent fire, indeed a better could not be desired. Natives have an objection to it, as in their opinion the fire is not so cheerful as the blaze from wood, and consequently, they imagine the heat given out is less, but in this, they are much mistaken; in trying some Peat charcoal at Wellington a few years ago, it was found that the radiating heat from Peat charcoal was fifty per cent. greater than that of wood charcoal.

23. CONCLUDING REMARKS.—In reviewing the Forest Conservancy results of the year, it is of importance to bear in mind that though the revenue has not increased, destruction of Forests over a very large area of country has been arrested; complete Establishments for some Districts organized with rules clear and distinct. Planting in various localities has been carried on, and preparations made for increasing this important branch of conservancy. The Cinchona experiment is promising. Improvements are contemplated in the working of various Forests as yet not systematically worked or conserved, and the Accounts are audited monthly instead of annually.

Sickness has been rife amongst the Officers of the Department; Dr. Cleghorn and Lieutenant Beddome are on sick leave to England; Captain Brine on the Neilgherries, Mr. Morison at Madras, and Mr. Reid who relieved me from the charge of Mudumallai has died. Thus out of an Establishment of eight Officers, one has died and four are absent sick. From this it will be seen that a Forest appointment is no sinecure, the utmost precautions at times being inadequate to the warding off of fever.*

24. ASSISTANTS.—I am well satisfied with the exertions of my Assistants for the past year, many of them have had very laborious duties to perform; and through their exertions, the Conservancy system though still in its infancy, is beginning to assume a definite shape; but it will take years to properly develop the system, so that it may become a very important feature in increasing the resources of the country.

25. GOVERNMENT GARDENS, OOTACAMUND.—These gardens during the past year have been considerably improved, the grassing of the lower part gives a lawn-like appearance which was not possessed before. The glass houses have been of the greatest use in acclimatizing the

Cinchona plants received by Mr. Cross, and in the raising of seedling plants. Mr. McIvor's success in raising seedlings and propagating cuttings from the plants brought by Mr. Cross has been very great.

The trees are in the highest health, and their rate of growth is exceedingly fast; the Dutch plants average about six feet a year, and I see no reason why our plants should not equal theirs. Mr. McIvor is quite right when he says, shelter not shade is what the plants require. What was observed by Mr. Cross of the habit of the *C. succirubra* in dense shade on the Andes, has been observed by me in the habit of the *Eucalyptus robusta* when planted in dense shade in Ootacamund. I have also observed that trees grow best in partial clearings where they obtain light, air and shelter. Eight feet apart appears a fair distance for the plants, the Dutch in Java make it twenty-five, consequently, the area to be supervised is enormously increased. I have some doubts about the yield of bark from the pruning system. I think it will be found better to cut down the trees and plant new ones, however, this is a matter for experiment and Mr. McIvor will soon be in a position to give the results of both processes. Further, the *C. succirubra* is so easily propagated from cuttings, that Mr. Cross informed me that he simply went through the Forest, cutting off branches, trimming them, and sticking them in the ground, when they struck readily.

The receipts of the Gardens for the past year appear to be on the increase, which is satisfactory. Mr. McIvor's suggestion that the Apprentices should be chosen from the Gardeners, appears judicious, and, I would recommend its adoption. Rupees 15 is not sufficient to ensure a European Apprentice of fair abilities, if the sum were increased to 20 Rupees, it is possible that promising lads would come forward, more especially as there will be openings for advancement in the Government Cinchona plantations.

26. OFFICE.—Native Surgeon F. Appavoo has rendered satisfaction in carrying on the complex duties connected with the Office, the labors of which have now much increased, the Bills requiring to be submitted monthly. My head clerk, Mr. Spring, has exhibited a considerable knowledge of the general duties appertaining to his Department, and is well qualified for promotion.

27. HERBARIUM.—The removal of the Herbarium to the Museum, where proper accommodation can be provided for it, and where every body will have access to it, having already been discussed, I have only to remark that the nature of the Conservator's duties taking him so much away from Madras, he can have neither time or opportunity to supervise the Herbarium; all he can do, by the aid of himself and Assistants, is to add to it.

* Mr. Blenkinsop of Salem is dead.

28. USEFUL PRODUCTS WHICH MAY BE CULTIVATED AT DIFFERENT ELEVATIONS ON THE NEILGHERRIES.—On the upper plateau of the Neilgherries—Tea may be cultivated at an elevation from 5,500 to 7,500 feet; Coffee from 3,000 to 5,000 feet; Cinchona, according to varieties from 5,000 to 8,000 feet; Neilgherry nettle which produces some of the highest priced Hemp in the world from 6,000 to 7,000 feet in very rich soil; Cotton, viz., Sea Island and New Orleans from 3 to 5,500 feet; Kulhutti has produced some very superior staple grown from Sea Island Cotton seed; Potatoes are produced from 4 to 7,500 feet, those grown much below 4,000 are wanting in flavor; Kulhutti produces the best Potatoes on the Hills, elevation 6,500 feet. The proportion of Starch yielded by the Kulhutti potatoe exceeds the average given by "London" as the yield of the English potatoe. *Eucalyptus robusta* one of the best timber trees of Australia grows well between the elevation of 5,500 and 7,500 feet; indeed, all the Australian trees of every kind flourish here.

FINANCIAL RESULTS.—The financial results exhibit a profit of more than a lac and a half of Rupees and with a stock of timber worth nearly four lacs of Rupees.

North Canara, our most valuable Forest, is steadily improving.

The Anamallais will this year I trust show a more favorable balance.

Mudumallai has a large stock of timber on hand available for any public works that may be commenced.

Sigúr has proved profitable.

Madura will this year show more favorable results.

The South Canara returns though satisfactory may be expected to increase.

Salem and *Cuddapah* will this year show an improved balance sheet.

The Neilgherries nearly pay the expenses of conservancy, and next year if

Wynad is worked, the returns will more than cover the outlay.

Nellambúr is improving, the demand for poles will no doubt cover the expense of planting in future.

I have the honor to be,

Sir,

Your most obedient servant,

(Signed) H. R. MORGAN Captain,
Acting Conservator of Forests.

8A 42

Financial Results of Conservancy, for 1860-61.

Names of Forests.	Receipts by the sale of Timber, &c.		Disbursements including the cost of Establishment, Contingencies, &c.		Balance in favor of Government.		Excess of Expenditure over Receipts.		Value of Timber on hand.	
	RS.	A. P.	RS.	A. P.	RS.	A. P.	RS.	A. P.	RS.	A. P.
Anamallai	44,078	2 5	29,911	15 11	14,166	2 6	...	...	71,494	5 7
North Canara	2,53,149	2 8	78,394	7 1	1,74,754	11 7	...	...	1,54,006	0 0
South Canara	9,951	3 0	1,682	4 8	8,268	14 4	...	...	.....	.....
Mudumallai	2,500	0 6	16,345	9 8	.....	.....	13,845	9 2	99,492	4 0
Sigúr	11,657	2 8	5,201	1 10	6,456	0 10	...	...	15,509	8 11
Neilgherries	4,422	9 0	4,788	5 3	.....	.....	365	12 3	.....	.....
Salem	15,376	0 0	4,363	4 1	11,012	11 11	...	...	.....	.....
Madura	2,568	5 1	1,517	5 4	1,050	15 9	...	...	.....	.....
Cuddapah	4,131	0 8	1,257	9 6	2,873	7 2	...	...	.....	.....
Wynád .....	.....	.....	2,555	3 10	.....	.....	2,555	3 10	.....	.....
Nellambúr	4,615	6 8	2,907	4 7	1,708	2 1	...	...	.....	.....
Total Rupees...	5,53,149	0 8	1,48,924	7 9	2,20,291	2 2	16,766	9 3	3,40,502	2 6

Deduct General Charges.

Pay of the Conservator of Forests, Establishment, Contingent charges, &c.....

19,792 14 2

Excess of Expenditure over Receipts in Mudumallai Forests

13,845 9 2

Do. Neilgherry Sholas ..

365 12 3

Do. Wynád

2,555 3 10

36,539 7 5

Actual Profit Rupees... 1,83,731 10 9

APPENDIX A.

COONNOOR, 3rd June 1861.

No. 14.

From CAPTAIN J. J. BRINE, *Assistant Conservator of Forests.*

To CAPTAIN H. R. MORGAN, *Officiating Conservator of Forests.*

SIR,

1. I have the honor to forward the annual Accounts of the Anamallai Forest for the year 1860-61, countersigned by the Collector of Coimbatore, in accordance with Extract Minutes Consultation, dated 12th November 1857, No. 1,153, paragraph 9.

2. The amount realised by the sale of Timber to the Bombay Dockyard during the past year is Rupees 23,698-1-3. The remainder of the assets is derived from the sales of Rosewood to the Gun Carriage Manufactory at Madras, proceeds of auction sales, Timber supplied to the Railway Company, and to private individuals, and seignorage of trees felled. These, in the aggregate amount to Rupees 20,380-1-2, making a total of receipts of Rupees 44,078-2-5, for the past official year. Against which on the debit side, on account of expenditure, is the sum of Rupees 20,069-3-11, exclusive of the pay of the Establishment, viz. Rupees 9,842-12-0, making a total debit of Rupees 29,911-15-11. Thus the profits for the past year amount to Rupees 14,166-2-6 against those of 1858-59, which were Rupees 45,173-8-6. To account for this falling off, I beg to remark that my predecessor, Lieutenant Beddome, experienced great difficulty in obtaining the requisite number of axemen in the previous season, hence the amount of timber cut was but small. You will also be pleased to observe that while in consequence of this, little work of a remunerative description was being done, yet comparatively a large expenditure was being incurred. Not that it was unnecessarily so, but merely with reference to the year's profit returns. One item for Commissariat Elephants, amounts to Rupees 2,437-8-6. These animals do not work nearly so well as the Forest Elephants. The former drag the logs with their teeth, the latter by the aid of a collar round the neck, and are constantly in the sick list with sores and galls. The falling off in the profit returns for the past year is certainly large, but I have every confidence that a steady improvement will be the rule for the future. 1,345 planks having been cut this year, while it is estimated that 3,000 will be cut in the ensuing season.

3. I took charge of the Anamallai Forest from Lieutenant Beddome in the beginning of last September, up to which period about 350 planks out of the 1,500 estimated for, had been cut. I had at first some little difficulty in procuring axemen in sufficient numbers; but towards the close of the working season they came forward more readily, and I was thus enabled to keep the work going till the end of February, and so make up for lost time. The services of the eight Commissariat Elephants I was enabled to dispense with in the beginning of February. They had been chiefly employed in dragging out of the jungle such logs and planks as remained. These have now all been placed in Depot, and I do not think there is any more cut-timber now outlying in the forest.

4. One thousand three hundred and forty five planks for the Bombay Dockyard have been cut in the past season, and the whole of these have been brought to the foot of the slip, a distance of 15 miles from where they were cut, and are now being

rapidly carted away to Mungarah in readiness for being floated down the river to Ponany. The value of the planks, including logs, heads, and butts, is Rupees 86,470-8-0.*

5. From the readiness with which axemen offered themselves for work latterly, and their assurance that they would all come to work in the ensuing season, I was induced to estimate for the cutting of 3,000† planks. A respectable native has also entered into a contract with me to deliver 500

* I fear this amount will not be realised, it is far too high a valuation. H. M.

† Many axemen have come forward this year. H. M.

planks at the foot of the slip annually; and has deposited, as present security, Government

† This arrangement has not been approved of by me, the rate is too high. H. M. Promissory notes to the value of Rupees 2,000. The planks are to be delivered on the above spot at the rate of one Rupee per cubic foot.‡

6. I consider that a saw-mill on the American principle, worked by water power; would be of great advantage, by the saving it would effect. The loss of good timber by the present rough mode of literally digging out the planks with an axe is immense. One saw-mill would not of course entirely supersede the use of the axe; but it would undoubtedly be of great service in converting into planks all the fine logs of timber now lying in Depôt on the road side. The best locality for erecting this mill would be on the banks of the stream, where this road crosses it about $\frac{3}{4}$ of a mile from Tunacadavú, that being the most central position with reference to the timber to be sawn, as well as the most convenient for superintendence. I estimated 600 Rupees for this mill, but that was only for the mere cost of putting it up, and adapting the stream to it, but does not include of course the cost of machinery.§

7. The small experimental Teak plantation is now thriving pretty well, though at first owing to the failure of both monsoons, I was afraid that all the plants would perish for want of water, and some of them did.

8. Owing to proper precautions having been taken by clearing away the brushwood, &c., the periodical fires have passed through the Forest without doing any damage.

9. I have experienced much the same difficulty with reference to Mulser labor, as described by my predecessors. Some, eight or ten of them, were tolerably regular in their attendance as sawyers. They are not very good workmen at present, but are improving.

10. The present cart road has been extended between two and three miles further westward to enable us to cart away the timber when felled; and the whole existing road and slip has been repaired. I have also brought to the notice of the District Engineers of Coimbatore and Malabar the state of the two principal roads leading from the Forest. That from the foot of the slip to Mungarah, the floating station, and by which the planks are conveyed to the river, is much in want of repair. The other road which commences at the slip, and proceeds thence through the town of Anamallai to Pulachy, is in very good repair. There are, however, four nullahs in the eight miles between the slip and Anamallai, which require to be bridged. On account of the abruptness of their banks it is with difficulty, and at considerable risk to the bullocks, that large and heavy logs of timber can be carted across them. It is by this road that all the Rosewood logs, required by the Gun Carriage Manufactory, are conveyed, as well as such other timber as may be purchased by the Railway Company and others. The District Engineer of Coimbatore has informed me that he has instructed the Officer in charge of the Range to include these bridges in his estimate. I consider it to be of the highest importance that the approaches to the Forest should be kept in good repair, as of course the extension of the sale of Timber must materially depend upon the means of transport. The distance from the foot of the slip to the Railway Terminus at Coimbatore is 40 miles, and with the exception of the four nullahs abovementioned, is in good order.

11. While residing in the Forest, I twice made excursions to the river, which is the boundary between the Cochin and Madras Forest. It lies about 7 miles south of Tunacadavú.* About a mile from the cart road is the Anagundy pass, over which the path to the river leads. That portion of the Forest lying between the top of the pass (which has an elevation of some 600 feet,) is exceedingly rich in Teak and Rosewood of the largest size; as well as other useful timber. The sholas abound in Poon† and Dammer trees. This part of the Forest does not appear to have been ever worked, owing, I imagine, to the

difficulty of removing timber after it was cut. It was my intention, this season, to have more fully explored both this part of the forest and the river above alluded to, to ascertain if it was practicable to float timber down it to the Cochin river, into which it flows. Could this be done, it would, I am sure, open up the resources of the Forest in a remarkable degree. I noticed many Teak trees measuring as much as 15 feet in girth, 4 feet from the ground. The finest timber of all kinds also grew in the vicinity of the river.

12. Although it was duly advertised in the local Gazettes, there was no annual auction sale of timber at the foot of the slip this year, as no buyers were present on the day of sale, viz.

5th December 1860. This is the most unhealthy period of the year in that locality, and I proposed in future to have the sale of timber in August or September.

13. The past season has been a more than usually unhealthy one, owing to the want of rain, and all hands have suffered from it more or less. I took up my residence in the Forest on the 9th of September last, just as the feverish period was commencing. I did not leave it, with the exception of a few days, being compelled to do so by fever, and being at that time without medical aid, till the 20th November; and I then retired to Anamallai, eight miles off, where I remained till the 6th December, when I was obliged to quit, owing to a severe attack of fever, from the effects of which I am still suffering. My medical attendant has advised me to abstain from re-visiting the Forest until my health shall have been completely re-established, and has therefore, recommended my taking six months' sick leave. I regret very much, the being compelled to adopt such a course, as I had hoped to have personally carried out the estimate for the ensuing year, as well as various other matters connected with the working of the Forest, during the period of residence in it. I trust, however, that I shall be able to give such directions to the Officer who may be appointed to act for me, as will enable him to carry out the views which my experience of the Forest and its work, has taught me to be right ones.

14. The annexed statement shows the comparative quantity and value of Timber supplied to the Bombay Government in the year 1860-61, denoting the increase or decrease in the number of planks, quantity and class delivered, and the amount realised. The rates being determined by the Collector of Malabar, from their fair market valuation.

Comparative statement of Teak timber supplied to the Bombay Government for Dockyard purposes in the year 1859-60 and 1860-61, showing the increase or decrease in the number of planks, quantity and class delivered, and the amount realised in each year.

For the year 1859-60.										For the year 1860-61.									
Number of Planks.	Class.	Quantity.			Rate per 100 Koles.	Amount.				Number of Planks.	Class.	Quantity.			Rate per 100 Koles.	Amount.			
		Koles.	B.	Y.		RS.	RS.	A. P.				Koles.	B.	Y.		RS.	RS.	A. P.	
311	1st	22,301	9	6	100	22,301	12	6		254	1st	19,363	3	4	75	14,522	7	3	
226	2nd	13,069	8	6	90	11,762	11	7		123	2nd	7,405	4	2	60	4,443	3	3	
305	3rd	13,713	11	14	80	10,971	3	0		108	3rd	5,171	10	13	50	2,585	15	3	
81	4th	3,155	1	1	75	2,336	5	0		55	4th	2,031	5	14	40	812	9	6	
23	5th	750	3	2	70	525	2	11		24	5th	744	4	6	30	223	4	11	
242	Inferior	11,899	8	6	40	4,759	14	0		92	Inferior	4,442	3	3	25	1,110	9	1	
1,188	...	64,849	6	3	...	52,657	1	0		656	...	39,158	7	10	...	23,698	1	3	

(Signed) J. J. BRINE, Captain,
Assistant Conservator of Forests.

APPENDIX B.

Administration Report of the Sigūr Forest, for the Official year 1860-61.

1. Since I took charge in December 1860, the Curumbers attached to this Establishment have been employed in felling Sandalwood.

2. Six thousand rupees have been remitted to the Collector of Coimbatore, being money realised almost entirely by the sale of this wood. As the Government allowance during the past year was only 50 Rupees a month, this gives a clear profit of Rupees 5,400; besides having in store at Masnicōvil about 63 candies, valued at say Rupees 4,600, ready for sale. There being very few ripe Sandalwood trees in the vicinity of Masnicōvil of Sigūr, I sent the

Curumbers in January to a place called Talamallai, where there is a good deal of Sandalwood of fine growth, but it being an exceedingly unhealthy place, I had to withdraw them last month.

3. At Talamallai there are 1,200 billets ready to be brought to Masnicóvil, but I experience some difficulty in procuring carriage.

4. The Curumbers are to be employed for the next two months in pruning and clearing young Sandalwood trees in the Sigúr Forest, after that they return to Talamallai. As stated in my report on the Mudumallai Forest, the Teak trees in the Sigúr Forest, are nearly all felled. I have, by your desire, sent to Nellambúr for two cooly loads of Teak seeds to be sown in some eligible site.

(Signed) W. A. GIB, Captain,

Assistant Conservator in charge of Sigúr Forests.

Ootacamund, 9th May 1861.

APPENDIX C.

Administration Report of the Mudumallai Forest for the Official year 1860-61.

1. During the first six months of the past official year, this Forest was worked for, and at the expense of, the Wellington Barracks; but it was placed under the Forest Department from the 1st November 1860. At the time of transfer there was a balance in favor of the Barracks, of Rupees 52,413-8-2. This amount must be liquidated by the supply of timber as required by the Barracks. In the past year 4,930 $\frac{1}{4}$ cubic feet of Teak have been supplied to the Wellington Barracks, and 3,832 $\frac{1}{2}$ cubic feet of Teak have been sold in the market, realising Rupees 2,500-0-6, which have been remitted to the Collector of Coimbatore.

2. ROADS.—The Forest roads are, for fair weather roads, excellent, and have been originally most judiciously traced, but become heavy in the rains, and but little carting can be performed at that season.

3. CURUMBERS.—The Curumbers continue to work well and steadily but always require advances.

4. SAWYERS.—There are only five sets of Sawyers just now, and it is difficult to procure others even at high rates of pay, they suffer so much from fever.

5. ELEPHANTS.—One elephant died last month, there remain five; but one is very small and is to be sold as soon as a purchaser can be found. Besides our own Elephants there are four belonging to the Commissariat at present working in the Forest. I propose sending away these in about two months.

6. BUFFALOES, BULLOCKS AND CARTS.—A great deal of the carting is done by our own bandies. Without them the timber fellers would be a long way in advance of the carting, for although, one would suppose self-interest would be sufficient to induce the Bandy contractors to look after their own cattle, it is not the case; they neglect them sadly, and in consequence they fall off so much in the dry season that they can hardly get through any work. I may add that the past dry season has been an unusually dry one, in fact in February last there was hardly a blade of grass to be seen, and water failed in places where it had never been known to fail before.

7. FOREST.—The forest lease has now nearly two years to run, and according to the Orders of Government the timber is being stored at Musnigudi, where there is already 33,396 cubic feet. In the Forest we have 93,290 cubic feet lying about waiting to be carted to the Depôt, in all 1,25,830 cubic feet, much of which is of fine scantling, well-seasoned, and ready for immediate use. At the Ootacamund Timber Yard there are 5,522 $\frac{1}{2}$ cubic feet of Teak. The object being to get as much wood out of the Forest as possible before the expiration of the lease, it is worked during the unhealthy as well as the healthy seasons, unlike the Anamallai Forest in this respect, which is only and I believe, can only be worked in the healthiest season. Doubtless at some seasons there is great sickness at Mudumallai, and as there is no European Assistant or Overseer or medical attendance of any

kind, the whole of the supervision and prescribing for the sick devolves upon the Superintendent of the Forest, and those unacquainted with the working of a Forest have little idea of the difficulties that have to be encountered when fever breaks out and disables a large number of the Sawyers, Drivers, Coolies, Mahouts, &c.; but I am happy to say that since I took charge in December last there has not been more than the usual amount of sickness in the Establishment. The Mudumallai Forest is the only place that the Nilghiri Hills can be supplied with Teakwood from. The Sigúr Forest is well nigh exhausted, the price of Anamallai timber is too great, in consequence of the demand on the coast, and the Mysore Forests are too distant. It therefore appears that should the Madras Government contemplate erecting many buildings on the Hills, it will become a question for consideration, whether the lease of the Forest should be renewed or not. I am given to understand by Captain Farewell, Special Executive Engineer, Wellington, that should the proposed Jail be built at that Station he will probably require 40,000 cubic feet of Teak. This can be supplied from the Ootacamund Timber Yard and Musnigudi as required.

(Signed) W. A. GIB, Captain,

Assistant Conservator in charge of Mudumallai Forests.

Ootacamund, 9th May 1861.

APPENDIX D.

No. 54.

To Captain H. R. MORGAN,

Officiating Conservator of Forests.

SIR,

1. In reply to your letter No. 458, dated 16th April 1861, I have the honor to inform you that as I have only had charge of the Forests for two months I am unable to give you further information than is contained in my last reports. No timber is supplied from the Wynad Forest (reserve) nor have any Forest improvements been effected for the bringing out of wood. This Forest of large extent has been partly traversed by me, and I am now on my way to Wynad to visit it again. The system of robbery and spoliation, I believe, is suppressed, and no Teak timber is now allowed to pass into Mysore without permission, nor is cutting Teak permitted. My peons by constantly patrolling the Forest, its boundaries, and by watching the outlets to the East, see that these Orders are upheld.

2. The Mysore Forests are worked under the management of the Superintendent of Astagram. Its conservancy is under me, and all irregularities are reported by me. I am now traversing these Forests and making arrangements for Teak Nurseries. A better description of cart to enable us to carry large logs will shortly be introduced. Hona and Muttee wood are now permitted to be cut in the Hunsúr Forest; and this season Teak alone will be cut in the Inoor Maree Gudy Forests. Teak has brought a very good price this season at the Mysore Government sales. I beg to bring to your notice that it would be of the greatest advantage to the Mysore Government if the charge and collection of Sandalwood were placed under the Assistant Conservator; but this responsible duty could not be undertaken unless the Assistant's services were placed solely at the disposal of the Mysore Government for the purpose of looking after its Sandalwood and Forests.

(Signed) ALEXANDER HUNTER,

Officiating Assistant Conservator of Forests.

Nungund, 30th April 1861.

APPENDIX E.

CAMP DENKENCOTTAH, 2nd May 1861.

No. 221.

To CAPTAIN H. R. MORGAN,

Acting Conservator of Forests.

SIR,

1. I have the honor to submit herewith my annual Report of the Salem Forests, for the official year 1860-61.

2. **TIMBER.**—The great demand for timber has been for sleepers for the Madras Railway; this has continued throughout the year, but not to so great an extent as it was for the past year. The demand for timber for house-building, &c., has been the same as last year, with a slight increase.

3. **SLEEPERS.**—I am glad to say there is a marked improvement in the supply of sleepers for the past year. In District six, the Engineer, Mr. Hederstedt, informed me that he is receiving none but sawn sleepers; if this system could be introduced on the line, I have no doubt the sleepers would last a much longer time, and a better description of timber will be brought into the market. The present system of adzing the log into one sleeper must be very injurious to the Forests.

4. **WOODS.**—The description of timber now used for sleepers are Vangé, Ácha, Kulle Muddaray, Muddaray, Sál, and Shullawengee.

5. **VANGÉ.**—This wood is now becoming scarce. The best logs have been taken out by Wood-merchants for building materials, which fetch a much higher price in the market than the Railway Company are paying for their sleepers. I have known as much as a Rupee a cubic foot to have been given for a good log of Vangé.

6. **ÁCHA.**—This wood is very seldom used for sleepers on account of its hardness in resisting the augers, boring instrument, &c.; but the Natives are very fond of this wood for house-building and for decorating their temples. Several cartloads of this timber have been taken out of the Cottiputty jungles during the past year.

7. **MUDDARAY.**—This and Kulle Muddaray, both of the same genus, are very largely used for sleepers. A good supply of this timber can be had from the Cottiputty and Chittarey jungles. I have seen Muddaray trees in the Cottiputty jungles of seven feet in diameter, but these trees are very rarely selected by the wood-cutters.

8. **SAL.**—A small sprinkling of this timber is to be found in these jungles, but of a poor description.

9. **SHULLAWENGEE.**—All the Acacia tribe are well adapted for sleepers, but few of them attain the size required by the Railway Company.

10. **TEAK.**—This most valuable wood, I regret to say, does not arrive to any size in these jungles, there are cases of trees attaining to three feet in diameter, but these are very rare. On the Yellagiri, Javady, Chittary and Shevaroy Hills, thousands of saplings are to be found, and with little attention and care, these in a few years will be fit to cut into sleepers. The custom of the Malliallies in setting fire to the jungles year after year has destroyed many of these young plants, and others have been removed by wood cutters for spokes and felloes of wheels, as soon as they attain to any size. This year much has been done to put a stop to the jungles being fired.

11. **SANDALWOOD.**—Several thousands of young plants are to be found on the Hill ranges of this District; the yearly practice of setting the jungles on fire prevents great number of them coming to maturity, and those that are nearly fit to cut are removed clandestinely by Malliallies and others, and the billets taken into the North Arcot District. The head man of each village should be made answerable if any trees are cut in his range, this would to some extent put a stop to theft.

12. **SATINWOOD.**—All the best trees have been cut years ago, but there are thousands of promising young saplings coming on, and by strict vigilance I hope to be able to supply the wants of the Gun Carriage Manufactory.

13. **BAMBOOS.**—Immense quantities of fine bamboos are brought into Salem for Trichinopoly and other Districts, these are cut from the slopes of the Shervaroys and conveyed into Salem by carts and coolies. Others again are taken to the Railway stations of Tripatore and Vaniam-bady to be conveyed by rail to Madras and other large towns; these latter are cut on the slopes of the Javadies. Hitherto there has been no tax (except in one Talúq of this District) for this most useful produce of the jungles. I beg to suggest that a tax of 12 annas may be levied upon each bandy load of bamboos.

14. **FIREWOOD.**—From 50 to 100 bandy loads of firewood are taken into Salem daily, cut from the surrounding jungles within 15 miles of the town of Salem. In Dr. Cleghorn's report submitted to Government for the official year 1859-60, it is there mentioned that a seignorage fee from 4 to 8 Annas a cart load is levied on this article in five Districts of this Presidency. As the consumption of fuel has been very great of late years in this District, I consider that a seignorage of 6 Annas per bandy load will be necessary for the preservation of the jungles.

15. **GENERAL FEATURE.**—Judging from the few sholas that are now remaining, and from the information that I have obtained from the Hill people, I should say there must have been some magnificent Forests in this District fifty years ago. The constant practice of Punacad cultivation by the Malliallies has a great deal to do in destroying the jungles, and where sholas formerly stood, you see now nothing but stunted jungle. The mode of renovating Forests by planting, in my opinion, will not answer in this District, on account of drought that is so much felt here, that to attempt to form plantations will be fraught with great uncertainty and loss to Government.

16. **SYSTEM.**—A seignorage fee of one Rupee per bandy load is levied on all timber for house building materials by the Collector's Peons, and to those that wish to supply sleepers to the Railway Company the seignorage has been exempt, the consequence was the wood-cutters took advantage of this, and sold their sleepers in the market rather than take them to the Railway Company. I brought this to the notice of Dr. Cleghorn and Captain Morgan, and proposed to them making the wood-cutters pay the seignorage for their sleepers in lieu of the Railway Company, and also they should take out a license for not more than fifty bandy loads at a time, and pay the amount of 50 Rupees in advance; by this system the Collector's Peons are not required to collect the tax as formerly. Captain Morgan on his tour of inspection proposed the pre-payment system to Mr. Brett, and requested that I should be allowed to receive the tax and forward it on to the Collector's Treasury. This the Collector has concurred in, and from the 1st of March the new system has been introduced with satisfactory results. The returns for the past two months have been 1,150 Rupees.

17. **ESTABLISHMENT.**—At present my Establishment consists of one Overseer and 12 Peons. As there are five Talúqs and about eight outlets to each Talúq the present Establishment is quite inadequate to the wants of this District in conserving the Forests. This subject has been laid before Government by the Acting Conservator of Forests and the Collector, and it is unnecessary for me to go into details.

18. **RULES.**—A set of Forest Rules for the preservation of jungles in this District should I think be published in the District Gazette for the guidance of those that wish to cut Timber in these Forests. (*Vide Appendix J.*)

19. **DENKENCOTTAH FORESTS.**—These Forests have only just been made over to the Forest Department. I am therefore unable to give any opinion on them. One Overseer is in charge of these Forests, and the receipts for the past 3 months have been Rupees 738.

(Signed) L. BLENKINSHOP,

Asst. Conservator of Forests Salem.

APPENDIX F.

OOTACAMUND, 10th May 1861.

No. 8.

TO THE CONSERVATOR OF FORESTS.

SIR,

I have the honor to forward the usual Administration Report for the past year of the range under my charge.

2. Having assumed charge so late as the 26th January last, I am unable to furnish an account of extended operations of the work in this range.

3. The appointment is a new one, having only been sanctioned as recently as 2nd November last; the duties connected with it are,

1st. The Conservancy of the innumerable Sholas on the hills.

2nd. The planting of such of them as are cut down with quick growing trees adapted for fuel.

3rd. The arranging for the supplies of firewood and charcoal to the stations of Ootacamund, Wellington, and Coonoor; and,

4th. The oversight of the experimental Australian plantation near Wellington.

4. The first of the above, viz., conservancy of the Sholas, without the aid of the Revenue Authorities is an impossibility. I find that young saplings are being continually cut in Sholas, still the Forest establishment has never brought up any one for thus transgressing. The Burghers are those who are chiefly engaged in this illicit transaction, and as every nook in their neighbouring sholas is known to them, it is a most difficult matter to catch any one actually cutting or carrying away wood from the sholas. I would therefore beg leave to suggest that on my finding any young saplings cut in a shola, and reporting the same to the Collector, he be empowered to fine the Monegar of the Nado in which the shola is situated. This plan I feel assured would check the waste now going on. It may not be out of place to state here, that on my assuming charge, I learned that the Collector had established a rule that each Burgher requiring wood to build a hut was to pay a certain seignorage to Government for the wood cut down, but up to the present time I have not received one Rupee on the above account, though lots of wood have been taken away for building purposes.

5. Another cause of great havoc is the annual burning of the grass by which many trees at the edges of the sholas are destroyed, for the prevention of this the Revenue Authorities ought to lend their aid.

6. As yet no young trees have been planted out, in consequence of there being none ready for that purpose, but I have started a Nursery in one of the sholas cut down by the last firewood contractor, which I think ought to furnish trees sufficient for planting this and another shola cut down by the same person. It must be evident that it is out of the question fencing in such large sholas, at the same time it is necessary that cattle should be kept out of recently planted sholas, and therefore I suggest that the Collector be empowered to fine the Monegars should cattle be found trespassing in the newly planted sholas after they have been warned to prevent them grazing in the neighbourhood of their sholas.

7. The supplying of Ootacamund with fuel for one year from 1st April last, was sold by public auction on the 12th March and produced Rupees 3,900, the purchaser being Mr. Wilson, who has permission to fell the trees in the western portion of the Governor's shola; the Contractor seems to be working very fairly, but a constant watch requires to be kept over his people to prevent them from cutting trees on the margins of the streams.

8. The contract for charcoal was made about a year ago, but owing to the Contractor cutting in spots where it was forbidden, his Contract has been annulled, and it was put up to auction on the 8th of this month, and realized Rupees 260 for the year. The charcoal to be burnt in the same shola as formerly, viz. the Devy shola.

9. The contract for supplying firewood and charcoal for one year from 1st May to Wellington bought at public auction by one Moideen for Rupees 2,400, and would have produced more, but Colonel Woodfall who has been felling largely for a Coffee plantation in the vicinity of the Cunur Ghât disposes of his wood to coolies at 6 Pies the load, who find a ready sale for it at Cunur, which station is thus generally supplied. I consider means ought to be adopted to prevent a recurrence of this. Coffee Planters prefer Forest land as better adapted for the growth of Coffee, and it is granted on the same terms as grass land, but when they pursue the course of selling this wood as fuel, I think Government ought to fix a seignorage on every load carried out of the Plantation for sale.

10. I regret I am unable to give flourishing account of the Australian Plantation at Wellington, most of the ground planted appears to me ill suited for the purpose, trees which have been planted for three years and upwards are stunted, and parts of the ground have been planted two or three times without success. I would recommend that instead of planting the whole ground, only such portions as seem suitable for the purpose be planted. I much fear that many years must elapse ere any return can be looked for. In one small portion of the plantation the trees are strong and healthy, it is a well sheltered nook with good soil. The money granted for the carrying on of this experiment is now nearly expended, and a further supply must be obtained if the plantation is to be continued. I subjoin what has been done in the plantation since November 1859, the date of last report.

Twenty-nine acres have been planted with 35,000 young trees.

Three acres of ground are cleared, and part pitted and part trenched ready for planting.

About 20,000 seedlings are in the Nurseries ready for planting out.

A new Nursery is being established in a better locality.

Some 300 or 400 young trees fit for poles might be thinned out, but at present there does not seem to be a ready sale for them.

The amount expended up to the 1st May, of Rupees 2,500 granted by Government, for which accounts have been made out, is Rupees 1,656, and a claim is preferred by the special Engineer at Wellington for about Rupees 600 on account of stores, &c., furnished a long time ago.

(Signed) J. H. M. BABINGTON, Major.

Assistant Conservator of Forests, Neilgherries.

APPENDIX G.

No. 374.

NORTH CANARA,
SIRSE, 27th May 1861.

From W. FISHER, Esq.,

Collector of North Canara,

To CAPTAIN H. R. MORGAN,

Acting Conservator of Forests.

SIR,

1. In forwarding Mr. Müller's Forest Report for 1860-61, I cannot but think, that the financial results will be deemed satisfactory. We have not only a large income, but a large stock of timber also, though we can only show what has actually reached the Depôts.

2. I concur with Mr. Müller in thinking, that immediate attention should be paid to the reorganization of the Forest Department, on a scale commensurate with the work to be done and the revenue obtained from the North Canara jungles.

3. On this subject, however, I have appended a note to Mr. Müller's letter on the subject, herewith submitted.

4. I have no doubt that the Forest and Revenue Departments cannot be separated without injury to the interests of both, and it is a subject of regret to find, that the relations between them are not of as intimate a description as they used to be, when the Department was more immediately under the Collector.

5. I take the greatest interest in Mr. Müller's operations, having witnessed and been largely concerned in every step taken in Forest conservancy in this District, but it is otherwise with my subordinates, and the creation of a separate conservancy has led to a loosening of bonds, which, with Natives, is sure to take place when direct responsibility is removed, and room is given for Departmental jealousy, or the want of interest which is usually displayed by them, in all matters in which they are not personally concerned.

6. Under any circumstances, I would urgently press the immediate consideration of a scheme for re-organizing the Department, and therefore beg to call your attention to my remarks on what Mr. Müller has designated his private report.

7. Mr. Müller's account having proved to be incorrect, has been returned to him for revision; but I need not detain his report, and will transmit the enclosure as soon as it has been received and examined in this Office.

(Signed) W. FISHER,
Collector.

TO CAPTAIN H. R. MORGAN,

Acting Conservator of Forests.

SIR,

I have the honor to submit herewith my annual Report on the North Canara Forests.

I. FINANCIAL RESULTS.—1. The enclosed Account Current show a credit of Rupees 2,53,149-2-8, and a debit of Rupees 78,394-7-1, thus leaving a balance of net profit of Rupees 1,74,754-11-7. This is the largest sum ever realized, but still there is nothing extraordinary that would call for remarks. The Account Current exhibiting but the actual cash transactions, cannot show the total of the business done.

2. The "Memorandum of wood unaccounted for" shows a stock of timber on hand of the estimated value of Rupees 1,54,006. This statement, though it shows the timber cut and conveyed to Depôts under the superintendence of the Establishment, cannot exhibit the total of our transactions. Several thousand candies of wood are cut annually as clearings from lands taken up for cultivation which are not in this account; there are also several thousand trees annually sold by auction in the Forest, all of which, when cut by the Contractors, have to be numbered and measured.

3. Annexed is a comparative statement exhibiting the proportion each Talûq has in the receipts and expenditure under the different headings.

4. The receipts under Teak are not so large as they had been in former years, but they have vastly increased under junglewood and clearings. The difficulties in conveying Teak from the Forests to the coast have also increased unproportionably, which will, however, be reduced when the project of clearing the Kalanuddy has been carried out.

5. Clearings from the cultivation lands form now annually a large item. Last year we had circa 20,000 pieces, containing about 8,000 candies which sold for Rupees 36,000. There are many places taken up for permanent cultivation, and the wood growing on such lands (mostly inferior) is now cut and disposed of by the Forest Department. This entails a vast amount of work and trouble, but in the end it is a well paying business.

6. The profit of the seignorage account is Rupees 6,323, which at 8 Annas per tree, to the residents of our District, gives 12,646 trees for local consumption. According to the new rule, all wood granted to residents of the District has to be paid for by the candy. Taking the above number of trees as the annual local want at 1½ candy each at the average of 8 Annas per candy, the realization would be Rupees 9,484. In the absence of more reliable data, it is too soon to build any calculation on the above.

7. Bamboos have given a profit of Rupees 4,658, which at Rupees 9 per 1,000 (average rate) gives about five lacs.

8. Having reported on firewood of North Canara in my remarks on Rule 10 for the Coimbatore District, I have no further remarks to make.

II. ADMINISTRATIVE RESULTS.—1. It need scarcely be remarked that on account of the ready market for all kinds of wood our North Canara Forests desire the best attention. This fact renders the conservancy here much more difficult, and necessitates a much larger Establishment than in other Districts, where there are no roads or rivers, and consequently no such ready market. This, however, appears to me to have been much overlooked, else my recommendations with regard to the Establishment would have received more attention. I have only to refer to the fact, that the Establishment, fixed and temporary for the District, with all the allowances, costs only Rupees 11,770-15-11 whilst in 1859 and 1860, the fixed Establishment charges alone for the small portion of the Coimbatore District (Anamallai Forests) amounted to Rupees 12,230-8-6.

2. In North Canara it need scarcely be said that we want an extension of the Conservancy system, as it embraces already all kinds of trees. The greatest want is strong healthy and intelligent Overseers, who take an interest in the business. It is not affirmed too much, if I assert, that a few hundred Rupees more pay to the establishment would be a positive gain. I beg to refer to my private report on this subject dated 21st April 1861.

3. PLANTATION.—Up to this year our plantations have always failed, because, I could not give my time for this work, and had no one of the Establishment who could do the planting business. This season, a large piece of ground was prepared, seeds were sown, and thousands of them germinate every day, which in due time will be transplanted. The old seedlings of Teak and Blackwood thrive well.

4. Coomry grants have been much reduced this year and I hope we come gradually to the conviction, that a total abolition would in the end be best for the people as well as for the jungles. In North Canara it cannot be said that Coomry might be cut in certain parts where the jungles are not valuable, because all our jungles are valuable, if not now, they will be so in future. A single road passing through the jungles makes a vast difference. For instance, six years ago no one would have thought the timber on the Kyga ghat of any value (now all coomried by Malapur Bascarapah), but now, as the road over this ghat will soon be open, the wood so recklessly burnt for coomry would be worth lacs of Rupees.

5. Cutch was formerly extensively prepared for exportation; but, now cuttings have been stopped on account of the dishonesty of the Contractors. I have repeated applications for cutch trees, but I am as yet not clear under what rule to grant the cuttings. Whatever rule is adopted, people will cut 20 times the quantity allowed. I am inclined to try an export duty on prepared cutch.

6. Land for Coffee could be taken up in Supah Talûq. The ground is admirably suited and lies sufficiently elevated 1,200 to 2,000 feet. Most of the Natives in Supah have a few plants in their gardens, even the Coomry cutters whom I often advised to extend their plantations, instead of cutting coomry, but they will not. Now, as Beitkul will be opened, European planters ought to be encouraged to raise plantations, which, I think, would improve the Supah Talûq and its inhabitants, an impossibility so long as coomry exists.

9. CORRON.—Jungle land, 24 miles from the coast, has been taken up for cotton cultivation. The experiment is being carried out on a large scale, and from what I can judge, I believe it will succeed. The second crop came out with great vigour in these last hot months, and the plants retained their vitality. If this experiment is successful, thousands of acres of scrubby jungle land, unfit for rice cultivation, will be taken up, and be turned into cotton fields.

10. The great desideratum in our District is a Revenue survey, without which, a systematic Conservancy is an impossibility. It is utterly out of my power to know each of the many 100 of jungle places asked for cultivation, whether or not it would be advantageous to have them cleared or reserved, and as for the Establishment, if some of them are ordered to report on the piece of jungle applied for, it depends much on the amount of bribe or other influences which makes the Forests either valuable or not.

11. The close connection of the North Canara Conservancy with the Revenue Department renders it desirable in my opinion that this should not only continue, but that it would be better if our Department should, as it did before, form part of the Collector's. I ought to be an Assistant to the Collector and not Assistant Conservator, not that the official name makes any difference to us, but it does to our respective Establishments. Without the Collector and his Establishment

I would, in many cases, be unable to carry out my plans. Should the Establishment form part of the Collector's as it did before, the Collector would have better means to promote deserving men of my Establishment in other Departments, or transfer such as would be better off some where else, or also reduce them if necessary. At present my Mutsuddies on a pay from 8 to 15 Rupees are condemned to this salary, there being no chance for promotion, nor could I reduce them if necessary, in this Department, the pay being already too low, and any reduction would only increase the amount of other pilferings, so extremely easy here.

12. The past year was one of great difficulty. There is not a man of the Establishment, except myself, who has not been sick more or less. A great deal of work had to be executed by substitutes. The workmen also were nearly all sick and many of the works were retarded. Of the Contractor's coolies at Seiwaper and Kanery many were sick for a long period, 13 died, in consequence of which 47 men ran away to Mangalore. It is true, the North Canara jungles are healthier than many other Forests of the Presidency; but it is nevertheless a fact that many Europeans as well as Natives cannot stand living in our Forests.

SEDASHIEGUR,
13th May 1861.

(Signed) S. MÜLLER,
Asst. Conservator of Forests, North Canara.

APPENDIX H.

MANGALORE, 6th July 1861.

From J. FRASER, Esq., Collector of South Canara.

To CAPTAIN H. R. MORGAN, Acting Conservator of Forests.

SIR,

1. I have the honor to forward herewith the accompanying Statements, showing the transactions of the Forest Department, during the past official year 1860-61.

2. The revenue of the year under report amounts to Rupees 9,951-3-0, the greater portion of which is derived from Sandalwood stills. The increase from this source during the past year, as compared with the previous, is Rupees 4,294-15-2.

3. The revenue of the year under review exceeds that of the previous one by Rupees 4,409-5-3, as shown in the margin.

4. The increased price obtained of late years for Sandalwood-oil, has attracted the attention of the merchants of the District who consequently made larger purchases than usual of Sandalwood in Mysore, and hence the increase in the number of stills.

5. The supply of fuel required for the use of the Stills, was regulated last year by the same rules, as were in force during the preceding year. On the sale of the present year's contract, however, the Sandalwood Still Contractors were told that they would have to pay for their firewood at 4 Annas per tree, the trees being marked and made over to them from time to time by the village Potails, who will be paid for their trouble by a fee of 2 Annas on the Rupee. Consequent on this arrangement, there will be a considerable decrease in the revenue under this head in future years, though there will be a proportionate increase under that of seignorage.

6. The increase of Rupees 160-13-4 in the revenue under the last named source, arises from the growing demand for timber both in the District and in the town of Mangalore.

7. As regards charcoal used by iron smelters, they have made the same hitherto without any payment. It has been determined that in future they shall pay a seignorage of 6 Pice for each mura of charcoal they prepare, of which 2 Pice will be given to the village Potails to encourage them to keep a strict account of the amount used.

8. It is proposed in the coming season to commence plantations of both Teak and Blackwood, with this view, supplies of seeds have been written for both to Malabar and North Canara. It is also proposed to sell a quantity of rejected Teak which is now standing and only going to decay in the Suliah jungles, and a number of Poon trees, a few fit for 2nd and 3rd class spars, but

17. In conclusion, I have to state that I have met with every possible assistance from J. Fraser, Esq., the Collector. He has several times issued orders to the Taluq authorities, but they always found means to delay their fulfilment or to avoid them altogether.

(Signed) E. THOMPSON, Overseer,
Forest Department, South Canara.

UPARANGODY, 9th May 1861.

APPENDIX I.

MADURA.

1. I have the honor to submit the following brief Report of my operations, together with the annual accounts of the Madura Forests for the official year 1860-61, countersigned by the Collector of Madura.

2. In July 1860 the system of selling full grown standing trees in Government Forests was brought into force with the Collector's approval as a temporary arrangement. The rate being 5 Rupees for Teak, Blackwood, Vengé and Anjelly, and for the tops and butts 2 Rupees per bandy load. All other kinds, such as Puluchee, Kusturee, Kungilium, Veckalee, Karungalee, Kadumbai, &c., 2 Rupees per tree, and when taken by the bandy load one Rupee. Provision was made in the case of *bonā fide* Ryots to cut what agricultural implements they required free of charge from among trees of an inferior or stunted sort, such as Odusally, Munjanatty, Vulkai, and Ussil; and such of the first mentioned trees as were clipped, hollow or stunted were sold at 2 or 1½ Rupees each, and those of the last mentioned kinds if found in similar condition at half a Rupee each.

3. By this arrangement a considerable amount of timber for building purposes was cut during the year, and I may say is increasing in demand. I have granted 292 licenses for permission to cut 1,035 bandy loads of timber, the seignorage fee is invariably collected by the Officers of the Forest Department, by whom also the trees are marked and given over to the purchasers without the least inconvenience.

4. The trees marked were mostly Vengé, Teak, Blackwood and Vaugé. The first two mentioned trees are in great demand in the District as the Natives value them very much; but I regret to state, that the method of felling is without judgment and great waste of timber is the result; thus for instance, after a tree has been marked by the Forest Establishment and delivered over to the purchaser who is generally a wood-cutter, the axe is laid one yard and a quarter from the ground, while others waste by hacking over a broad surface. I believe this is owing to the want of trained wood-cutters, as felling and squaring timber have never been made a constant employment by Natives in the District.

5. It is remarkable that stunted (in some instances young) trees and small pieces of wood easily removed on carts sell the best in proportion; the reason of this is, that the unskilled wood-cutters are unable to split up the larger trees into joists. This is one disadvantage of the present system of granting licenses for felling trees, as it leads to the destruction of young trees while the larger ones are left standing. Another disadvantage of the present system is that the forests are not worked in succession, as the applicants are allowed to cut and convey timber from the Forests nearest to the village, hence the Forests on the North and South face of the Pulni hills and in the Cambam valley are constantly worked. The only method I can see of preventing this is, that the Amani system now pursued in the other Forest Districts should be adopted immediately in this District also, and the sale proceeds of the timber will then undoubtedly increase and Government derive a paying revenue from these Forests. For although the Madura Forests are of considerable extent, it is of the utmost importance to preserve those finer portions which are easily worked.

6. So far as I can judge, about 3 to 4,000 logs of sizes will be required to supply the annual demand of the bare country to the eastward, and in the event of the Amani system

being introduced into this District, it should be one of the principal duties of the Forest Department to regulate the felling with a view to this permanent demand and the prospective requirements of the G. S. I. Railway from Salem through Carúr to Madura will probably oblige us to indent upon the Cambam Forests. I propose to form Depots at the following places. Bahsamuthrum, Virupatchy, Periacolam, Cambam and Nattam (see Trigonometrical map) and should Government take the management of working the Forests under the Amani system, I believe one or two Elephants would prove economical in dragging logs of great length from the hills which are in great demand and which cannot otherwise be managed.

7. Besides the supply of timber for buildings purposes, a considerable number of bamboos were cut by traders during the year on the Virupatchy hills (North face of the Pulni hills) where alone they are found in great numbers. I granted 270 licenses for felling 40,722 and thus realized Rupees 272-3-10, the tax being 1 Rupee per thousand, and 8 Annas for the smaller sort.

8. Since the discontinuance of the renting of the Forest products such as gums, dammer, honey wax, fruits and leaves in medicine; great depredations are committed in the Forests in collecting them clandestinely by those persons who formerly rented them from Government. Thus in collecting fruits and flowers, branches of trees are brought down, barks of trees are entirely stripped off, and such careless treatment of trees cannot be checked by the present small establishment I am now allowed. I would suggest that the old plan be adopted, as it would not only be a source of revenue to Government, but the renters would be made responsible for any destruction that might be committed in the Forests. I am of opinion that should Government take the control of working the Forests, it is desirable that the Forest products should also be collected and disposed of by them.

9. The prohibition of Coomree cultivation so much practised in former years in this District is a perfect success. I would propose that permission to cultivate a new field should in every instance be obtained from the Revenue authorities after the spot has been inspected by the Forest Officer in charge.

10. As the new settlement of Kodakanal is rising into importance and the number of visitors is on the increase, I have been obliged to lay a seignorage fee of 5 Annas per cart load of wood cut for fuel in the Kodakanal shola, the amount realized has fully covered the expense of keeping up a Peon for the preservation of the shola.

11. It is remarkable that no notice has been taken up to this time of the Sandalwood jungles on the Pulatur hills. I have on more than one occasion visited these jungles; most of the larger trees have been cut and taken away clandestinely and the young plants are now very numerous; a few, however, are large enough to be cut up and prepared for sale. Vigilant supervision is absolutely necessary to preserve them from fire, creepers and smugglers, as the larger trees are daily lessening.

12. In conclusion, I have the honor to remark that the Establishment now sanctioned for this District is almost too small to carry out systematic conservancy. The services of an English writer would be necessary to attend to accounts and other duties which would otherwise devolve on me. The newly discovered Sandalwood jungles on the Pulatur hills should immediately be conserved as an addition might accrue to Forest revenue of the District.

(Signed) E. SPERSCHNEIDER,
Overseer Madura Forest.

APPENDIX J.

RULES FOR THE CONSERVATION OF THE SALEM JUNGLES.

1. No license to be granted for less than twenty-five bandies. The money to be paid in advance. The time allowed in each license to be limited to two months.
2. The license and tickets to be shown when the carts pass the Tannah stations. Each piece of wood to be marked by the Peons, and the number of bandy loads to be entered on the back of the license.

the majority fit only for boats. From these two sources there ought to be a net return of at least 3,000 Rupees, but to enable the Department to secure this income, and perfect the planting and pruning operations which are contemplated, the sum* already allotted for the South Canara Forest expenditure should be increased by 1,000 Rupees, and I solicit your aid in procuring sanction for this additional sum.

(Signed) J. FRASER,
Collector.

To CAPTAIN H. R. MORGAN, *Officiating Conservator of Forests.*

SIR,

1. In compliance with the subject of your letter No. 459 of the 16th ultimo, I beg to forward the following Report on my proceeding, during the official year 1860-61.

2. SUPPLY OF TIMBER.—I cut no timber, I merely mark the trees and then they are given out to merchants who pay a seignorage of 6 Annas per candy, on as many candies as they think they can cut and bring down to Mangalore in one season. During the year, there has been seignorage paid on 3,128½ candies which amounts to Rupees 1,173-3-0.

3. BAMBOOS.—These are given out to the merchants also on payment of a seignorage of 8 Annas per 100. During this year there was 1,85,608 bamboos cut. The seignorage on which amounts to Rupees 928-0-8.

4. CONFISCATED TIMBER.—Under this head I have placed the timber that was cut and left behind by the merchants last working season. Of this timber we had 263½ candies, the auction price of which amounted to Rupees 541-11-0.

5. BOATS.—The timber merchants are allowed to make boats of jungle wood for the purpose of carrying their provisions, a store of which they have to take with them down the river for themselves and coolies. They are charged 3 Annas per running foot on all boats that they cut. There were twenty-one boats cut this year, the seignorage of which amounts to Rupees 76-11-0. The name of the wood chiefly cut for boats is Doope,† it is a soft wood and is fit for nothing else. A boat made of it will last in salt-water for five or six years, but it would not last over two in fresh water.

6. SANDALWOOD STILLIS.—There were 594 Stills at work, the revenue of which amounts to Rupees 5,037-4-0. The stills are all erected in the Udipy Talúq along the foot of a range of hills known as Ander Ghat. The soil is poor in this locality and the jungles inferior. A good tree of any kind being seldom met with, but even if there was good timber in this part, it is too far from the river, and the present market value of jungle or common wood, would not pay land carriage.

7. ENGINEER'S DEPARTMENT.—During this year their supply amounted only to 10 candies of jungle wood and 3,108 bamboos, and as they cut the timber and bamboos themselves and paid the usual seignorage on them, the amount is included in that of timber supply.

8. FIREWOOD.—This still continues to go into the market free of duty, and without an Establishment or a constant watch on the roads and rivers in the District it must continue to do

so. In the beginning of the year under review, I got an offer for a contract* to supply the town of Mangalore with firewood, but when the time came for making it, the man did not appear, so there was no contract made. His reason for not taking it, I am unable to ascertain. I have not seen him since; but I rather suspect he was frightened out of

taking it by others who knew, that if a contract was once made for firewood, it would put a stop to bringing it in free.

9. TIMBER SUPPLIED TO RYOTS BY POTAILS.—I am unable to say any thing under this head, as I can get no information from the Tahsildars or Potails. On my annual tour through the jungles I call on the Potails to show their books; but the answer I invariably get is, that they are sent to the Talúqs, and if I write to the Tahsildars, they do not answer my letters, or if by chance I get an answer, it is to say that they have no time to attend to the subject of my letters;

* Rupees 2,000, Government Proceedings dated 16th April 1861, No. 848.

* This is the contract alluded to by J. Fraser, Esq., in his annual Report on South Canara Forests, for the year 1859-60 H. M.

so, between the Tahsildars and their Potails, I am kept perfectly in the dark concerning the working of the above system; but, as far as I can understand from other sources, the system is not working well. There is a quantity of timber cut in the year under this head, but I am led to believe the money received is very little.

10. CHARCOAL.—No person in this District seems willing to make a contract for the supply of charcoal. The town of Mangalore is supplied from the Malabar jungles.

11. BLACKWOOD CONTRACT.—In the beginning of the year there was a contract entered into with A. J. Saldanha, to cut and bring to the coast 1,020 trees of Blackwood, and as he had to girdle, cut and prepare the logs for the market, the time allowed him was three years and six months. He has failed in his agreement, and the Collector intends to hold him responsible for any loss that may arise by the re-sale of the contract. The fact is, he bid too low, if he fulfilled his contract, he would lose at least one Rupee in each candy, he sees that now, and considers the first loss best (*i. e.*) the loss of his deposit money.

12. PRUNING.—The following abstract table will show the number of trees pruned and registered during the working season in the Suliah jungles.

ABSTRACT.							
Teakwood.				Blackwood.			
Young trees...	...	...	976	Young trees...	...	...	249
Saplings...	...	...	6,402	Saplings...	...	...	348
Plants...	...	...	38,462	Plants...	...	...	54,478
Rejected trees...	...	...	2,122	Rejected trees...	...	...	17
				Ripe do. ...	...	...	38
Total..				47,962	Total...		
					55,130		

Of the rejected trees in the above table, some are partly burnt, some are broken by the fall of larger trees and some are old and hollow. None of them will improve by standing any longer, and as we have no teak of any kind in the market, I intend to have them cut and brought to the Coast, either by my own Department or by contract. I have seen the greater part of those trees myself, and I am of opinion that their average measurement would be about one candy a tree.

13. The expense of pruning the above number of trees amounted to Rupees 333-14-7. Pruning is now stopped as the coolies are all employed in field labor. The larger half of this jungle has yet to be pruned; but the coolly labour will not be procurable before January next. The Duffadar and three Peons that were appointed to look after the pruning of this jungle (with the sanction of the Collector) kept on the strength of my temporary Establishment, as I think it advisable to have some one to look after this part of my range. My other Duffadar and four Peons being fully engaged with the timber merchants, have no time to spare, so that if the Duffadar and Peons at present in it were discharged, it would be left to itself as formerly, and my annual visit is not sufficient to conserve it, especially as I get no assistance from the Taluq authorities.

14. PLANTING.—I have got some excellent planting ground along the banks of the Pins-veny river (Suliah), but the want of assistance has prevented me from doing any thing yet. In January last, the Collector ordered the Tahsildar of Pátur to gather some Teak seed* with the view of having some nursery beds formed; but it was found after the seed was gathered that it was all bad; before this was found out, the time for gathering more seed was past, so it had to be given up for this season.

15. I have now touched upon all the points connected with my Department, and some of them are unsatisfactory enough; but, it must be borne in mind, that I have no assistance whatever. I have to do everything and see everything myself, and Taluq authorities being jealous of their authority, make my operations, if possible, more difficult than they otherwise might be.

16. The whole of the timber and bamboos brought down this year, I had to measure and count with my own hands, and at the same time I had to superintend the pruning of a jungle thirty miles distance from the place where timber was measured.

3. If Satinwood is cut, the Department Peons to point out the trees. The seignorage on this kind of wood to be 3 Rupees per bandy load.

4. Ácha maram, Vellá Naga, Vengé, Maddee, Kul Maddee and Blackwood, to be charged 2 Rupees per bandy load.

5. The license to specify the name of the wood to be cut.

6. No wood except Satinwood to be felled when the tree is less than three feet in circumference, at three feet from the base.

7. Peons to proceed with the wood merchant and mark the timber when practicable.

8. The charge for firewood to be 6 Annas a bandy load.

9. Bamboos to be charged as follows :—

A bandy load of bamboos of the larger kind, termed in Tamil, Valai, 12 Annas the load of forty-eight. A bundle of bamboos of the smaller kind, termed in Tamil, Mungil, 6 Pice, per bundle.

10. Persons requiring to cut bamboos to take out a license.

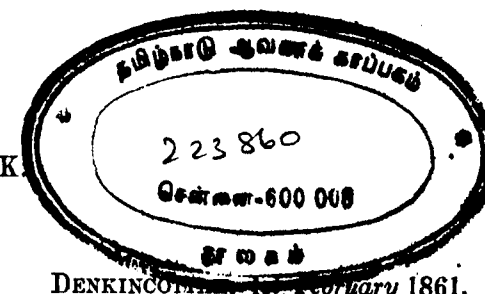
(Signed) H. R. MORGAN, Captain.

Officiating Conservator of Forests.

SALEM, 7th June 1861.

APPENDIX K

No. 352.



To THE SECRETARY TO THE BOARD OF REVENUE,

Fort Saint George.

SIR,

1. With reference to the request of the Board of Revenue conveyed in their Proceedings No. 329 of 18th January 1861, as to "how far it is now desirable for Government to obtain, from the North West Provinces, a few skilled Tea manufacturers, in order to test as fairly as possible the merchantable character of the leaf as produced in those localities of this Presidency where the cultivation has been tried, and plants now exist," I have the honor to offer the following remarks :—

1st. To ascertain the market value of the Tea grown on the two plantations of Messrs. Mann and Rae, is of the utmost importance, as until that question is settled, no extension of Tea planting can be looked for.

2nd. As far as a knowledge of the soil, climate and situation can enable one to judge, I am of opinion, that Tea at least equal, if not superior to the Assam Tea which sells for 2 Rupees per pound in the market can be produced. But Tea equal to the Kangra Tea which fetches Rupees 3-8 per pound on the spot, cannot well be produced for the following reasons :—

I. Kangra is in latitude 32° north, and at an elevation of some 2,000 feet above the sea. The best Tea grown in China is at an elevation of 2,000 feet above the sea, and 29° to 30° north.

II. Ootacamund is but 12° north, and allowing 2° northing for every 1,000 feet of elevation, 6,000 feet the best height for the cultivation of Tea (as above that elevation the seed does not ripen) gives 24° north latitude, a little under the mark; but some allow 3° north per 1,000 feet of elevation, if that is allowed, we have a Tea plantation on the Neilgherries at 6,000 feet elevation, equal to 30° north, or the situation most suitable.

3rd. When I was on the Shevaroy in January last, I saw a few Tea plants in Mr. Richardson's Coffee plantation; but these were quite unfit for the experiment, neither do I think the soil or climate suitable for Tea.

4th. I have taken advantage of paragraph 3 to bring to the notice of the Board, the great difficulty that exists of obtaining land on the Hills for the purposes of Tea planting. At present nearly the whole of the Hills at an elevation of from 5 to 6,000 feet is practically held by the Burghers under the more than dubious title of what is called a grazing patah. Let a settler make application for land in the neighbourhood of a Burgher village; and the land, though it has not been cultivated for years, is immediately claimed by the Burgher village, and a preposterous sum per acre demanded; if the demand be not acceded to, a complaint is lodged and the land pronounced to be Burgher land. I have had personal experience of this, and unless some remedy be devised, the obtaining of manipulators will be quite useless, as under the present rules, land suitable for Tea being unobtainable, colonisation is impossible.

(Signed) H. R. MORGAN, Captain.

Officiating Conservator of Forests.

APPENDIX I.

REPORT on the Government Botanical and Horticultural Gardens at Ootacamund for 1860-61.

In submitting this Report, it gives me much satisfaction to be able to state, that considerable progress has been made in the Gardens during the past year. The upper portion of the lower Garden being recently improved by the formation of lawns, flower beds, walks and bowers; while in the upper portion two terraces, and one parterre has been added, and thus gradually year by year, the Gardens steadily progress towards completion.

The Quinine yielding Cinchonas from Peru, introduced by Mr. Markham, form the most

<i>Plants introduced.</i>	
Cinchona Saccirubra or red bark....	2,361
Cinchona Calisaya, Calisaya bark....	6
Cinchona Nivida, genuine grey bark..	840
Cinchona Micrantha var. provinciana.	905
Cinchona Peruviana or Patu de	
Gallinazo	42
Species without name.....	298
Total Rupees..	4,452

The above is the total number of Plants on the 9th September 1861.

valuable addition ever made to our Gardens. At the present time we have upwards of 4,400 plants in very promising condition, and more seedlings daily germinating. Many of the imported plants are from 2 feet, 10 inches to 3 feet 2 inches high, and some of their leaves measure $14\frac{1}{2}$ by 10 inches. The average monthly growth of these plants, being about 3 inches, while the maximum growth made by the most luxuriant shoots since their introduction (five months) has been 18 inches, which gives a monthly growth of upwards of

$3\frac{1}{2}$ inches; but some of the shoots have grown 8 inches during the past month; while during the first month, they scarcely grew any, as they were checked by being transplanted out of the Wardian Cases; in fact, some of the plants have only recently fairly recovered from the disease and damage contracted in the Cases, and from the effects of being transplanted in a weak state. Therefore it may be expected that the four months yet to come of the growing season, will produce a greater average growth than that recorded above. The first of our seedlings are from 8 to ten inches high, and 9 to 13 inches in diameter across the leaves. The average growth of the seedlings being about 2 inches per mensem, the maximum growth made by the most vigorous plants being $3\frac{1}{2}$ inches.

The Orders of Government of the 3rd July 1861, having placed this undertaking under my superintendence, with an efficient Establishment; the Cinchona operations and progress will in future form the subject of a separate report. Various and conflicting recommendations have been laid before Government, with reference to the cultivation of these plants. On looking over the correspondence, I find I have omitted to explain the facts, which have led me to form an opinion in some respects, different from others, with reference to the description and amount of shade required by the plants in cultivation. Many of the travellers on the Andes, while passing through the Cinchona forests, and observing the trunks of the Quinine trees, under the dense shade appear to have lost sight of the fact, that their leaves and branches having overtopped the forest, were exposed fully to the influence of light and air. The leaves are the laboratory in

which the Quinine is formed, and their true position in the natural state of the plant should form the subject of our enquiries. The trunk-bark being merely the repository, its position is unimportant. The following facts induce me to believe, that the leaves and most of the branches of every tree which produce Quinine on the Andes, overtop the forest. Von Tschudi, the eminent German traveller, gives the following account of the method by which the Bark collectors discover the position of the Quinine trees. "In the loftier districts of the forests, the Peruvian bark is found. In May the Indians assemble to collect bark, for which purpose they proceed to the Cinchona forests. One of the party climbs a high tree, to spy out the *Manchus* or spots where there are groups of Cinchonas. He is called a *Cateador* (searcher). It requires great experience to distinguish the groups by the tints of their foliage. The *Cateador* then leads the party through the almost impenetrable forest to the group." "Weddell, Poeppig, Karsten, Markham, and other writers on the subject, mention the Cinchonas being discovered by the "hues of their foliage," thus the leaves must overtop the forest, or they could not be seen." Mr. Cross in his notes on the red bark states, "I observed that many of the "red bark" trees, when growing under dense shade, lost a portion of their branches, and sometimes all of them during the wet season, or if not, they assumed a weak climber-like habit, which; if exposed, suddenly at any time to influences of a damp or drying nature, would be likely to cut them off altogether." From these quotations it appears that to secure the existence of the plant requires it to overtop the forest trees to obtain light and air, and Physiology teaches that this is especially necessary for the production of Quinine. Thus it appears that the advocates of dense shade, are not borne out either by observation or first principles. I am of opinion that *partial shade* would facilitate the growth of the young plants, by affording them shelter and preventing the heat of the sun from parching and hardening the soil; but, at present, I feel quite unable to say, what description or amount of shade could be employed with greater advantage. Experiments have been commenced with the object of testing this important point. I consider perfect *shelter* to be very necessary.

In this report it may be expected, that an outline of the method to be pursued in cultivation, should be given; but, I regret, that, at present, I am not in a position to give this with any degree of correctness. I, however, may mention that we propose to put in the plants at 8 feet apart; and when the trees become too crowded, a certain number will be cut away to afford bark, and give space for the others to attain full size. I would not recommend that the trees left to form the plantation should at any time be cut down for their bark, but that a system of removing alternate branches be adopted instead. The removal of the first pair of branches will probably take place the third or fourth year after planting, and this to be continued until the sixth year, on the seventh year, the new branches formed, where the first were cut off, can again be removed, by this time the tree will have attained a good size, and probably formed from 20 to 30 pairs of branches; thus the pruning off of alternate branches, will therefore progress yearly up the stem for ten or fifteen years, and this would give the branches sufficient age to attain a diameter equal to small trees, and these branches when cut will produce a large proportion of "trunk bark."

In removing the branches, they should be cut off at about a foot from the main stem, in order to give space for the formation of new branches, which would immediately shoot as the Cinchona possesses great power in rapidly developing latent buds.

By this mode of treatment, it appears to me, that a very great advantage will be obtained over that of cutting down the trees; because this would give a constant and yearly increasing supply of bark, without injury to the trees; as at no time would they be deprived of so many branches as would effect the formation of roots, or check the growth of the tree.

Of other plants introduced from Peru by Mr. Markham, I may mention the Cherimoyer, an excellent species of Custard Apple the Schinus Molle or Mastich gum tree, and three varieties of the Aju or Peruvian Peppers. All these are progressing satisfactorily.

Another very important introduction is the green-dye plants from China. In April last I received from the Secretary to the Board of Revenue six plants in good order; namely, four plants of the large variety, and two of the small. All are thriving well, and appear suited to this climate.

Of ornamental plants, the most important are the varieties of variegated Begonias, brought out by Mr. Dawson, and a few new species of Australian shrubs.

FINANCES.—Table A. Appendix exhibits the financial position of the Garden, on the 30th April 1861, of which the following is an Abstract :—

The amount of receipts being

	RS.	A.	P.
By Seeds and Plants sold	1,624	12	0
„ Government allowance	1,200	0	0
„ Superintendent's salary	2,400	0	0
„ Pay of Apprentice and writer for August and September 1860. 70	0	0	0
Rupees...	5,294	12	0

The expenditure during the same period, being

For Contingent expenses	496	0	8
To Garden Establishment	2,099	2	8
„ Superintendent's salary	2,400	0	0
Excess of receipts over expenditure	299	8	8

Total Rupees.. 5,294 12 0

Table B, shows the distribution of plants, seeds &c., for the official year ending the 30th April 1861.

The total number of Fruit trees, and Fruit bearing shrubs.

Distributed during the year, being... ..	196
Timber trees..	5,389
Shrubs and Flowers..	2,745

Total No. of plants... 8,530

and 231 collections of seeds, making the total value of plants, seeds, &c., sent

out from the Garden during the year... ..	2,676	6	4
The amount of this sum realized being... ..	1,624	12	0
Amount presented to the Ootacamund Improvement Committee. Vide Order of Government dated 24th November 1860, No. 2,223, paragraph 7... ..	171	3	0
Leaving a balance still due to the Garden, on the year's transaction of... ..	880	7	4
Total Rupees...	2,676	6	4

In the above, the allowance for the Writer and Apprentices not having been received for many months, has consequently not been brought either to debit or credit on the accounts.

In the official year ending 30th April 1860, the total value of plants, seeds &c.,

sold from the Garden was Rupees..	1,809	6	0
The total value of the same for the present year, being... ..	2,676	6	4

which gives the very satisfactory result of an increase of more than one-third.

CONSERVATORY.—The Conservatory sanctioned by Government in 1856, is still unfinished. The amount of the supplementary estimates having (I believe) been expended without completing the work. This is to be regretted, as much of the space in the building cannot at present be used, owing to the leakage from the roof. I have pointed this out to Captain Farewell, the Engineer of the range, and trust the work will shortly be completed.

SEEDS.—The seeds produced here last year are of inferior quality, owing to the extreme drought of last season, the plants did not attain maturity, and consequently produced imperfect seeds.

HEDGES.—The weeping willows have been planted to form hedges in the ornamental part of the Garden, they have also been used to form borders round large flower beds being placed in this manner.  These have been found to grow readily, and it is anticipated they will form good borders as well as fences.

APPRENTICES.—The progress of the Apprentices has been most unsatisfactory. The amount allowed being insufficient to induce other than boys of 10 or 11 years of age, to accept the employment; these boys having received

Proposed Scale.			
1. European or East Indian Apprentice... ..	20	0	0
2. Native Apprentices at 7-8-0 each.....	15	0	0
	35	0	0

Present Scale.			
1. European or East Indian Apprentice... ..	15	0	0
2. do. do. do. at 10 each. 20	0	0	0
	35	0	0

nothing but play and destruction, and upon whom any attempts to teach, have been thrown away, as it is impossible to make them take an interest in their employment. I would therefore suggest that instead of European and East Indian boys being engaged as Apprentices, that two of the most intelligent and deserving of our Native Gardeners be promoted to Apprentices on the scale given in the margin; these men would carry out carefully and faithfully the instructions they received and therefore would be very useful during their Apprenticeship, and as only men who took an interest in their employment would be promoted, it is likely they would become very useful.

This arrangement would naturally cause emulation among the Gardeners in our Establishment for to merit promotion to Apprentices; and, I think, would be productive of good results. I therefore, trust the Government will sanction the proposed scale, as it incurs no additional charge to the State.

The salary of 20 Rupees per month for an European or East Indian Apprentice, would be sufficient to procure a boy with a fair education and some intelligence; and 7½ Rupees for a Native Gardener would be sufficient to induce the best men that can be had to accept the employment.

In concluding this Report, I beg to tender my thanks to Dr. Jameson, Saharunpore, for numerous valuable Himalayan seeds. To Captain Morgan, Officiating Conservator of Forests, for plants of the Wellingtonia Gigantea and Cryptomeria Japonica. To Messrs. Veitch, of the Royal Exotic Nursery, London, for many ornamental plants gratuitously presented to this Institution.

(Signed) W. G. McIVOR,

Superintendent Botanical Gardens.

GOVERNMENT GARDENS, OOTACAMUND, }
17th September 1861. }

APPENDIX M.

Dr. Livingstone's remedy against Fever.

"A pill composed of three or four grains of Resin of Jalap, three or four of Calomel, an equal number of Quinine, a drop or two of Tincture of Cardamoms to dissolve the Resin, and Ginger or Cinnamon to form the bolus."

"It ought not to purge, the quantity of Resin must be regulated to produce only a gentle movement, which when felt, is accompanied by perspiration and sound sleep. A check to this perspiration has, in my own experience, given rise to vomiting of large quantities of pure blood."

Copy of Mrs. Livingstone's letter.

"We make a pill of equal parts of Resin of Jalap and Calomel, Rhubarb and Quinine, say, for a powerful man, eight grains of Resin of Jalap, eight grains of Calomel, four or six grains of Rhubarb, and four or six grains of Quinine, make the whole into pills with Tincture of Cardamoms. This relieves the very worst cases in a few hours. We then give Quinine till the system is affected with Cinchonism. The Calomel removed at once from the system, and curiously enough, decreasing doses serve. In some of us half a grain of the mass produces as much effect as twenty-four grains did at first."

(True Extract and Copy.)

(Signed) H. R. MORGAN, Captain,

Officiating Conservator of Forests.

TABLE A.

Directions for the treatment of Teak seeds.

(Signed) H. R. MORGAN, Captain,
Officiating Conservator of Forests.

[illegible]

(Signed) W. G. McIVOR,
Superintendent Botanical Gardens.

PROCEEDINGS OF THE MADRAS GOVERNMENT.

Read the following Report of the Conservator of Forests:—

Submitting his report for the year 1860-61.

(Here enter 24th September 1861, No. 656.)

ORDER THEREON, 25th April 1862, No. 894.

1. The Government deem it useless at this late period to review this report in detail. They will therefore limit their remarks to a few subjects of importance.

Salem Forests.

2. The Penagram Forests of "Acha" wood on the banks of the Cavery are stated to be much injured by the Brinjaries and others who feed their cattle on the young branches of the trees. The attention of the Collector will be called to the subject through the Board of Revenue and he will be instructed to aid the Forest Department in arresting the further destruction of these Forests. The Government wish to know why these Forests if so valuable as represented, have not been conserved and worked by the Forest Department.

3. The Teak and Sandalwood plants in the Salem Forests are also stated to be destroyed by the Malialies and others setting fire to the jungles year after year. The Collector will use his best endeavors to prevent this practice.

Vide paragraphs 10 and 11, Appendix E.

4. The Collector will report through the Board of Revenue on the suggestion of Mr. Blenkinsop to levy a tax of 12 Annas upon each bandy load of bamboos, and of 6 Annas on each bandy load of fuel. The proposal to

Appendix E, paragraphs 13 and 14.

make the headman of each village answerable for all trees cut in his range cannot be entertained. The village Officers are bound to prevent, as far as they can, the spoliation of the Government Forests, and to afford every assistance in detecting offenders. If they fail in either respect they should be punished by the Collector, but it is the especial duty of the Conservancy Department to look after the Forests, and the Government cannot consent to relieve them of their responsibility.

5. The suggestion in paragraph 18 to publish in the District Gazette the rules passed for the preservation of the jungles should be at once adopted; separate copies also should be struck off for circulation in the villages adjoining the jungles.

Neilgherry Sholas.

6. The proposal in paragraph 5 to make a good road to the Divi Forests has since been met to a certain extent by a grant of funds. The Assistant Conservator in charge of these Sholas requests in his Report (vide Appendix F,) the assistance of the Revenue authorities to prevent the cutting of young sapplings, the destruction of the newly planted Sholas by cattle. The Board's attention will be called to these points.

7. Major Babington states in paragraph 9 of his report that the contract for supplying firewood and charcoal is kept down by Colonel Woodfall who has been clearing land for a Coffee plantation in the vicinity of the Coonoor Ghât disposing of his wood to coolies at 6 pice the load. He proposes that a seignorage be levied on every load carried out of the plantation for sale, but this cannot be done unless the land was granted subject to this condition.

Tea Plantation.

8. The favorable account given of these plantations in paragraph 8 is gratifying, and the Government trust that Captain Morgan's expectations will be fully realized.

9. As to the suggestion (paragraph 9) to erect a Saw Mill at Ootacamund, the Government observe that in his report, dated 30th April 1860, Captain Morgan suggested that the Steam Saw Mill used at the Wellington Barracks should be removed to Ootacamund, but the Government do not concur in this proposition.

Vide page 109, Cleghorn's Forests and Gardens of South India.

TABLE B.

Return of Plants, seeds, &c. distributed from the Horticultural Gardens at Ootacamund, for the official year ending the 30th April 1861.

Year and Months.		Fruit trees and shrubs.	Timber trees.	Shrubs and Flowers.	Parcels of seeds.	Value.			Total value.		
						RS.	A.	P.	RS.	A.	P.
1860	May... ..		1,291	131	44	334	4	0			
"	June... ..		11	63	34	200	14	0			
"	July... ..		302	605	30	325	4	0			
"	August... ..	42	498	755	24	470	4	0			
"	September... ..	1	481	403	21	395	2	0			
"	October... ..	153	2,996	170	19	469	4	4			
"	November... ..			169	16	118	3	0			
"	December... ..			73	15	96	9	0			
1861	January... ..		1	204	10	83	6	0			
"	February... ..		5	33	6	94	8	0			
"	March... ..		4	107	9	66	8	0			
"	April... ..			32	3	22	4	0			
Total Distribution.....		196	5,589	2,745	231	2,676	6	4	2,676	6	4

GOVERNMENT GARDENS, OOTACAMUND,
16th September 1861.

(Signed) W. G. McIVOR,
Superintendent, Botanical Gardens.

Annamalais.

10. There was a large falling off in the sales of wood in this Forest. The decrease amounted to Rupees 23,182 or 34 per cent. The causes assigned are not satisfactory. The Government expect better results in 1861-62. Paragraph 10 of Captain Brine's report (Appendix A) in which he explains the

Sales in 1859-60.....	Rs. 67,260
Do. in 1860-61.....	44,078
Decrease.....	23,182

state of the roads leading from the Forest will be referred to the Public Works Department. Paragraph 11 should receive the Acting Conservator's immediate attention. In that paragraph Captain Brine talks very highly of the portion of the Forest on the Anagundy Pass, and states that it is exceedingly rich in teak, Rosewood and other useful timber, but that it has never been worked. Many of these teak trees are stated to be 15 feet in girth, at a height of 4 feet from the ground. Such valuable resources should not be lost. Captain Morgan will procure and submit an early report on the expediency of working this portion of the Forest.

Mudamallay Forest.

11. The proposal to renew the lease of the Mudamullay Forests should be separately submitted with full information.

Madura.

12. The proposal in paragraph 14 (Clause 2), to leave the collection of the Forest products to the Conservancy Department instead of renting them will be referred to the Board of Revenue for their opinion. The Sandalwood jungles on the Palator Hills, alluded to in paragraph 11 of Appendix I, should be carefully preserved, and these trees which are large enough should be felled and sold.

South Canara.

13. In this District as well as in North Canara jealousy between the Revenue and Forests Departments is complained of. The Government cannot deal with vague and general assertions of this nature. The Assistant Conservators should bring to the notice of the Collector any instances which occur of want of willing co-operation on the part of the Revenue Officers of the District.

Cuddapah.

14. The observations in paragraph 17 (Clause 2), regarding the advantage of wooden sleepers over iron pot sleepers will be communicated to the Railway Department. The proposal in the same paragraph (Clause 3) to introduce planting in the jungles in Cuddapah and Salem should be separately submitted.

Firewood.

15. Any well considered suggestions which Captain Morgan may offer in regard to the preservation of firewood jungles will receive attention. The Government are not prepared to grow fuel for the public. They consider that this had better be left to private enterprise while the efforts of Government are restricted to preserving and making the most of the existing supply. The subject has already received attention in paragraph 6 of the Order of Government, dated 4th June 1859, No. 744, and the Board of Revenue have been requested to adopt measures to induce private parties to invest capital in plantations for firewood. The Tope Rules afford very liberal encouragement, and if the people do not plant it must be because other modes of employing capital are more remunerative. The Board will be requested to instruct Collectors to give every publicity to the rules under which land may be taken up for planting purposes.

Page 158, Cleghorn's Forests and Gardens of South India.

16. The suggestion to grow *Inga dulcis* on the sides of the Railway throughout the line instead of the prickly pear and the Aloe, will be communicated to the Railway Department.

Government Gardens, Ootacamund.

17. The Government are gratified to learn that these gardens have been considerably improved. Mr. McIvor's suggestion to have two Native Apprentices and one European or East Indian Apprentice gardeners is approved, and the altered rates* of salary which involve no additional expense are sanctioned.

* 1 European or East Indian Apprentice...	Rs. 20
2 Native do. at 7½ Rupees each..	15

Herbarium.

18. As there is no room for the Herbarium at the Museum and the Superintendent cannot look after it, it must for the present remain attached to the Conservator's Office.

Financial results.

19. The financial results of the year are not explained in the report, but are shown in a table attached to it. The actual profit of the year

Receipts...	Rs. 3,52,449
Disbursements	1,68,717
Gain..	1,83,732

was Rupees 1,83,732 against Rupees 3,93,591 in the previous year. The decrease appears to be partly owing to the value of the Annamalai timber sold in 1858-59, but included in the accounts of 1859-60. The Board of Revenue will however be requested to submit

Vide paragraph 9 of the Order of Government, dated 30th April 1861, No. 958.

without delay their report on the accounts for 1860-61, and to point out in it the main causes to which the decrease is owing.

20. The Government learn with satisfaction that the Officers of the Department have performed their duties with zeal and ability.

21. The Government observe that the Report under consideration though dated 24th September 1861, only reached their Office on the 1st ultimo, nearly a year after the period to which it relates. The Government understand that this is owing to its being submitted in print; but in fact it ought to have been before Government three months before the date it bears. Such lengthened delay as has occurred in this case, renders the report practically almost useless.

22. Captain Morgan will take care that the report for 1861-62, due on the 30th instant, is submitted by the 30th June at the latest. He will also restrict himself to a detail of the operations of the year reported on, and its financial results. A progress report is not the place where such propositions as the Establishment of a Saw Mill, and the alteration of an Establishment should be brought forward. Such questions should be separately submitted for orders.

(True Extract.)

(Signed) J. D. SIM,
Secretary to Government.

To the Conservator of Forests.

- „ Public Works Department.
- „ Board of Revenue.
- „ Financial Railway Department.

Exd. T. McMootry.

REPORT 57

OF THE

CONSERVATOR OF FORESTS,

FOR THE

OFFICIAL YEAR

1861-62.

MADRAS:

PRINTED AND PUBLISHED BY H. SMITH, AT THE FORT SAINT GEORGE GAZETTE PRESS.

1862.

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APPENDIX.

- | | |
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| A. Wynād Forest Report. | G. Anamallai Forest Report. |
| B. Mudumallai Forest Report. | H. Madura Forest Report. |
| C. Sigūr Forest Report. | I. Nelambore Teak Forest Report. |
| D. South Canara Forest Report. | J. Cuddapah and North Arcot Forest Report. |
| E. Nilgiri Shola Report. | K. Salem Forest Report. |
| F. Wellington Plantation Report. | L. North Canara Forest Report. |

ERRATA LIST.

- Para 5, line 3 for *Jubbulpore, Pegu and possess them* read *Jubbulpore and Pegu possess them.*
- Para 40, line 23 for *dense shola* read *dense sholas.*

60
CAMP OOTACAMUND,
1st May 1862.

No. 1.

From MAJOR H. R. MORGAN,

Officiating Conservator of Forests.

To J. D. SIM, Esq.,

Secretary to Government, Revenue Department.

SIR,

I have the honor to forward my annual Report for 1861-62, of the Forests under my charge.

2. WYNAD FORESTS.—In the month of February last, I proceeded on a tour of inspection through these Forests, accompanied by the Assistant in charge, Captain Hunter. The Forests were traversed from Korchat in the east to Kooderykote in the west, a distance of some forty miles. Vast clearings for Raggi have from time to time taken place in these Forests, and there is hardly a square mile where traces of the "Tukkul"* system may

* Temporary clearing. not be seen, but owing to the richness of the soil, and moisture of the climate, the Teak tree has, in most places, defied all efforts at extirpation.

In some parts suckers from the old stoles, shooting up some fifty feet straight as a fir, may be counted by thousands. In other parts it is lamentable to see the destruction caused by Coorumbars; acres and acres of girdled Teak trees of every size, from the sapling six inches in diameter, to the noble tree upwards of three feet. It is the sale of these girdled trees, from which at present, we derive a revenue, and to clear out the Forests thoroughly, it will take at least three years, so numerous are the girdled trees. Very high prices have been realized for this dry Teak, as it is called, eight Annas a cubic foot, or on an average ten Rupees a tree, some of the trees being small, this rate may be considered, as very remunerative.

3. *Contractors.*—The only thing to be guarded against is fraud on the part of the Contractor, who readily signs a contract, to take away every tree squaring more than six inches, but contents himself with taking only the choicest trees, and leaving the indifferent ones, to the manifest loss of Government. On examining the proceedings of a Contractor, both in the Korchat and Kooderykote Forests, I speedily ascertained that he had helped himself to some of the finest green trees in the Forest, some I measured were fifty feet in length, squaring to fourteen inches, and if cut in two, worth 3 Rupees a cubic foot in the Mysore market. The amount of personal supervision required in a Forest, owing to the distances, is great, but absolutely necessary, as it is impossible to control a Contractor without it.

4. *System of Tukkul or temporary clearing.*—I am happy to report that the system of Tukkul or temporary clearing is on the decline in these Forests, we only found it in full operation in a few places. A complaint was speedily lodged against the parties and the system has, I would hope, received a check. In some places where Tukkul had been very extensively carried on, the Teak tree was quite extirpated, and a noxious growth of weeds and scrub jungle was all that was to be seen.

5. *Assistant to be a Magistrate.*—To render the Assistant in charge of these Forests, fully effective, I would recommend that he should have Magisterial powers, as Forest Officers in Jub-

Appendix A.

bulpore, Pegu, and possess them. Captain Hunter in his report, points out that his hands would be much strengthened, if granted Magisterial powers, and as Coffee planters and others are to be made Magistrates, I think it would be much to the advantage of Government if the Forest Assistant was a Magistrate.

6. **THE HOONSOOR FOREST.**—Whilst examining the Wynád Forests, I took the opportunity of examining the Hoonsoor Forest, which by an Order* of Government No. 577, 28th April 1859. R. D. had been made over to this Department; but the Order for some reason has never been carried out.

7. **Wasteful System pursued.**—The wasteful system of felling pursued by the Contractors who leave (tops of trees ten to fifteen feet in length, and squaring from ten inches to a foot) behind them, to be destroyed by fire, has already been reported to Government. The reckless system of Tukkul, more prevalent in this than the Wynád Forests, has also been detailed, and a project for placing and working the Wynád and Hoonsoor Forests under one Assistant, has been submitted to Government; unless speedy measures are adopted, this fine Forest will be ruined, or at least thrown back for years to come.

8. **The advantage of a Ghat via Tamburcherry.**—The opening of the Tamburcherry Ghat will enable us to carry our timber to the coast at a cost of about 16 Rupees per ton. Whereas the present price of carriage is 50 Rupees. The price of timber on the coast is from 75 to 100 Rupees per ton, according to quality, and it would be very remunerative at even 75 Rupees a ton, or 1 Rupee, 8 Annas the cubic foot. We could fell and deliver the timber at 12 Annas the cubic foot, this would leave at least a profit of 12 Annas the cubic foot, but if only first class timber was sent to the coast, a greater profit would be realized; indeed, the timber could afford to pay a toll of 2½ Rupees the cart or 5 Rupees the ton, merely for using the Ghat; as without the Ghat, one of our principal markets would be closed to us.

9. **Boundaries.**—I regret to report that the boundaries of the different Government Forests have not yet been decided. The consequence is, that in many places we cannot work the Forests, and the Assistant is liable at any time to be involved in a law suit. It is very advisable that not only should the claims of the Devastanum people be settled, but boundaries clearly defined.

10. **Title to land.**—The priest of the ancient Tiromalli Pagoda, claims all the land in that part of the country, and just as I had arrived, made over his so-called claims to various Chetties, who at once began felling, in order to obtain a title, and when called upon to show their title deeds, would at once produce a smoked cadjan leaf, or bamboo, with the title ante-dated some fifty years, to prove the antiquity of their claims. I found the whole system of titles a chaos, it was impossible to say which was Government Forest land; a squatter actually claimed the whole of the Teak Forest of Koderykote, though he knew it had been worked by Government, years before he came there. No claim is too preposterous to be set up, and it is voluminously supported by basket loads of forged documents. Every day increases the evil, and the only remedy that I can suggest, would be the appointment of a Special Commissioner, well versed in Malabar tenures and the history of Wynád to proceed to the spot, and give a title, his decision to be beyond appeal. In this manner our Forest boundaries may be settled and the work of conservancy proceed.

11. **Grants of land.**—I had several applications for land, and it became necessary to draw a line, accordingly, the line of the Teak belt was chosen; all other land in Wynád, though there might be a considerable amount of Blackwood and Vengay on it, was given up, as a general rule. In the north of Wynád, just outside the Teak belt, there is a good deal of Blackwood; but unless we could fell it, and were prepared to remove it, I do not see the use of keeping out the pioneers of civilization, viz. the Coffee planters, for the sake of merely conserving timber we cannot make use of in any way.

12. **Financial condition.**—It will be seen from the returns that the expenses of conserving Wynád have been more than met by the receipts, and next year I anticipate a profit of at least 10,000 Rupees, if the Hoonsoor Forest is incorporated with the Wynád Forests and worked systematically. A grant of Rupees 5,000 has been sanctioned, which I have no doubt will be enough for the present.

13. **Teak a Royalty.**—Captain Hunter speaks of Teak being a Royalty, and I have already brought to the notice of Government the extreme value of the Teak Forests, and the little probability there is of the Devastanum people ever having been granted the right to cut Teak.

14. **The settlement of the ownership of the 5,000 logs of Teak mentioned by Captain Hunter** is much required, I myself saw many hundred logs at Kakencottah, which had been passed across the river, (after the order to prevent carrying of Teak out of the Forests had been issued) in order that the owners might say it had not been cut in Government Forests.

15. **MUDAMALLAI FORESTS.**—I have visited this Forest three times during the past year, the working of the Forest has been energetically carried on. The Bangalore Barracks, Railway, Neilgherry Barracks, Jail, and other works have been supplied with timber, whilst large Depôts containing 90,000 cubic feet of timber, have been formed at Sawyers village and Tippacadoo, by Captain Gib.

16. **Appendix B.**—I do not think from what I saw that much Teak fit for felling will be left in the Forest by March 1863; at my last visit we were cutting on the borders of the Wynád Forests. As the boundary line was not clearly defined, there was some doubt, and I stopt the felling in that direction, and requested Captain Hunter in charge of the Wynád Forests to have the boundary line defined as early as possible, it was supposed to be clearly known to the Adigarie of the Monenad Umshum, but to no one else.

17. **Financial Results.**—It will be seen from Appendix B, that the expenditure is more than equalled by the receipts, whilst a large quantity of seasoned timber has been collected, so as to be available for any Public Works, either at Bangalore or the Neilgherries.

The Lawrence Asylum alone will require some 30,000 Rupees of wood this year, and possibly the Bangalore Barracks and Railway, nearly an equal amount.

18. **Stock of wood on hand.**—The value of wood on hand on the 1st of May 1862 is Rupees 1,31,211-0-6 against on 1st May 1861, Rupees 99,492-4-0, which leaves a balance in favor of the Forest of Rupees 31,718-12-6, besides the value of the plant purchased during the year. Very valuable assistance has been afforded by the Manager Kistnapah.

19. **SIGÚR FOREST.**—I have visited this Forest during the past year, the Teak is strictly conserved, but no operations in Teak or Vengay have been carried on during the past year.

20. **Waste land.**—Large demands for waste lands in this Forest have been made under the new Act, and much difficulty in meeting the demands is felt. Where all the finest trees grow, there the Coffee planter selects his ground, and to reserve all would perhaps check Coffee planting too much, still some medium must be observed, to give away land which produces Teak and Vengay trees, worth squared from six to twelve Annas a cubic foot on the spot, would be ruinous to the interests of Government. I think Teak might be reserved and Vengay or other woods if sold, should pay a seignéage of one Rupee per cart load.

It has been ruled that, where there are valuable trees, parties desiring the land should purchase them standing, at their value, and this seems a fair rule; still, under these conditions, I do not think much land would be taken up.

21. **Financial results, Appendix C.**—The results of working the Sigúr Sandal-wood jungles are, according to Captain Gib, nearly twenty thousand Rupees, of course the profit would have been less, if a portion of the supervision had been charged. The great amount of Mudamallai wood in Depôt relieves the Sigúr Forest much, as it requires rest, owing to Contractors in former years, having taken out nearly every Teak tree fit to be cut.

22. **Future proceedings.**—The work of Sandal-wood cutting is still proceeding, and a large range of country remains untouched, for years to come an annual profit of Rupees 20,000 may be expected from these jungles. Want of labor in the direction of Hassanoor, whither our works tend, will prevent our realizing a larger sum than the above. The jungles are but thinly inhabited, and very unhealthy. Local labor is not readily procured.

23. **SOUTH CANARA.**—These Forests have hitherto been worked on the stump-fee system, but this year a sum has been sanctioned, to enable the Forest Department, to fell and bring to the Depôt, Teak, Poon, and other timber.

24. **Stump-fee system.**—The system of stump-fees is not remunerative, especially when Government has a small Establishment to look after the work; for instance, trees containing 40 cubic feet of Teak, were frequently sold at Nellumbore for a stump-fee of ten Rupees, or four Annas the cubic foot; if we had felled these trees and dragged them to a Depôt, we should have obtained

nearly 80 Rupees each for them, if the outlay for felling and dragging, say ten Rupees is deducted, we should, instead of ten Rupees, have made a profit of from 60 to 70 Rupees.

25. *Appendix D.*—It will be observed from Overseer Thompson's report that the greater part of the Forests require rest, and the Overseer's time is principally taken up in training young trees of Teak and Blackwood.

26. *Systematic working.*—There are many parts that might be worked with profit, and it was my intention this year, to have gone thoroughly into the subject, and recommended (if found practicable) the formation of a regular Establishment for the systematic working of the jungles; this plan always being more profitable than the stump-fee system, where there are valuable trees.

27. *Financial Results.*—The financial returns more than cover the cost of conservancy, and I have no doubt that in course of time, these jungles will not only be recovering under conservancy, but will also yield a fair revenue.

28. *NEILGHERRY SHOLAHs.*—I have inspected the woods several times in the past year, preparations for re-planting the Governor's Sholah have been made; several thousand pits have been dug, and the young plants are ready to be put in with the first rains. Those planted out last year are doing well.

29. *Firewood Contractor.*—The case of the firewood Contractors, Wilson and Co., who threw up their contract at the end of the year, has been reported to Government, and is still under investigation.

30. *New leases of land.*—In all cases where the making over of Forest land to parties has been referred to me by the Collector, I have always recommended, that a fee of one Rupee per bandy load, should be levied by the Forest Department, in the event of the landholder, selling the wood off the estate, and that the land should only be granted on these terms.

31. *Financial results.*—The returns show a fair amount realized by the sale of Sholas,* but unfortunately the cost of the supervision, is out of all proportion to the returns; a proposition† has been submitted to Government, to place the Neilgherry Sholahs under the Officer in charge of Mudamalli and Sigur Forests, and thus save the Budget a sum of more than ten thousand Rupees, this project not having been sanctioned by Government, it was proposed to place the Nellumbore Teak plantations under the Officer in charge of the Sholahs, the matter is still under reference. Considering how very small the returns are, it is a question, if the Nellumbore plantations and Neilgherry Sholahs can at present bear the salary of even Rupees 600 a month, as recommended by me in a former letter.

32. *WELLINGTON FIREWOOD PLANTATIONS.*—I have twice inspected these plantations in the past year, and consider that they now wear a slightly improved aspect, but the cost of planting is out of all proportion to the results obtained. Major Babington gives the total money expended at Rupees 12,617-0-7. and if we add Overseer Hall's pay for four years at 1,000 Rupees a year, then the total expended is nearly seventeen thousand Rupees, over about 100 acres, or the cost is 170 Rupees an acre, or just three times what it ought to have been. Grass land can be laid out in trenches two feet deep and one foot wide for 30 Rupees the acre, to rear the plants, put them out, and supervise them, 30 Rupees is ample; thus 60 Rupees an acre is an outside cost, and would include roads, ditches, tools, &c., thus one hundred acres should have cost 6,000 Rupees instead of 17,000 Rupees.

33. *Future system of planting.*—I have ordered that trenches for the future should be the only system, and have selected an excellent site to commence upon. The estimate for planting an acre of grass or scrub jungle land, is as follows.

5,500 running feet of trenches 2' x 1' at 5 Rs. per 1,000 feet,	is Rupees	27	8	0
1,000 Plants of <i>Acacia stricta</i>	...	10	0	0
Filling in trenches	...	5	0	0
Planting	...	1	0	0
Paths, tools, sundries	...	10	0	0
		53	8	0
Supervision.....		6	8	0
Total Rupees.....		60	0	0

34. In justice to Overseer Hall, I must say that the old system was not his, nor is he responsible for the planting attempts made on soil, that would not even grow grass, much less trees.

35. *Financial results.*—In course of time there may be a demand for the thinnings, but up to this there has been no inquiry for poles, and the firewood will not be fit for the market for some time to come; under the new system the cost will be but one-third, and the progress of the trees three times as great as in the old pit system, thus finally the plantations may become remunerative.

26. *CINCHONA EXPERIMENT.*—*Preliminary remarks.*—Having been called upon to report periodically on the Cinchona experiment, now being conducted by Mr. McIvor of the Government Gardens, Ootacamund, I take this opportunity of reviewing and reporting upon the experiment from the commencement up to the present date.

No. 2244, 30th November 1861. R. D.

In the year 1859, the Secretary of State ordered the Conservator of Forests in conjunction with Mr. McIvor to select suitable localities for the reception of certain Cinchona plants shortly expected from England. A site at Neddiwattum was selected and in October 1860, Mr. McIvor received charge of certain Cinchona plants from Mr. Markham, these plants being sickly at the time of their arrival, all died; but fortunately Mr. Cross arrived shortly afterwards with 463 plants of the *C. succirubra*, and 6 *C. Calisaya* plants. A liberal supply of *succirubra* and other varieties of *Cinchona* seeds were also received at this time.

Vide letter from Secretary of State, No. 21, 9th June 1859, recorded in Proceedings of Government, No. 1,072, 14th July 1859. P. D.

The experiment seemed now to be progressing favorably under the able management of Mr. McIvor, when an order was issued by Government (on the representations of Dr. McPherson who had visited the Java Cinchona plantations) that all operations in the Government Gardens at Ootacamund should be put a stop to, and the plants and seeds taken to Neddiwattum and Dr. McPherson's Java plans carried out.

No. 552, 9th March 1861, para. 5. R. D.

Fortunately for the success of the experiment both Mr. McIvor and myself had strong doubts regarding the value of the Java mode of cultivation, and as both Mr. McIvor and myself had for many years enjoyed practical experience in Arboriculture on these hills, and were moreover acquainted with first principles, (which were certainly not embodied in the Java mode of cultivation) we were in a position to show Government that our plans were safe and worthy of trial. Government accordingly adopted them, and the experiment as far as it has gone, fully justifies the expectations formed. At the same time, however, consequent upon Mr. McIvor's representations, regarding the interference he had already been subjected to, and lest the success of the experiment should be endangered by further interference, he solicited, and obtained, entire freedom of action in his experiment, and I was simply to act as observer and reporter.

Vide Mr. McIvor's letter to Government, No. 59, 9th May 1861, recorded in Proceedings of Government, No. 1,328, 3rd July 1861. R. D.

37. *Firewood.*—It is satisfactory to know that as we have to replant woods and supply the hills with firewood, that after the Cinchona trees are stripped of their bark, the trunks (Vide Mr. Spruce's Report, pages 23 and 24) will afford an excellent firewood and thus a matter which has given rise to much trouble, will be at once set at rest for ever.

38. *Elevation and sites.*—It is a fact worthy of note that Mr. Spruce, page 28, states that the highest growing *succirubra*, (4,500 feet) gave more bark than those grown at a lower elevation, and the value of the bark of this tree at Guayaquil was nearly 800 Rupees. Again page 27, "in cutting down trees in hot plains, I have often been struck with the thinness of the bark compared to that of trees growing in temperate climes." Again, "the greater the height at which the tree grows, the larger is the proportion of alkaloids contained in the bark," page 33.

39. *The Dutch failure.*—The Dutch in Java have planted out about 500,000 plants of the *C. Lucumæfolia*, or *Pahudiana*, these at 25 feet* apart will cover the enormous area of ten square miles, and we are told that the Dutch have achieved great success (by Dr. McPherson and others), yet on inquiry it turns out that Howard the great Quinine Manufacturer, can find Quinine in neither root nor bark of the *C. Lucumæfolia* or

* Dr. Junghuhn, page 23.

Pahudiana. This stupendous blunder of the Dutch is without parallel in the history of Arboriculture, and, as if this blunder was not sufficient, we are called upon to imitate the fallacious mode of culture adopted by the Dutch in Java, viz., dense shade, and an absurd system of placing single seeds in bamboo pots. It is unfortunate that we are not in a position to know the cost of supervision, &c. per acre of Dutch planting; it would probably be found as expensive and equally futile as the rest of their arrangements. Howard, page 3, gives no hope of *C. Pahudiana* or *Lucumajolia*, ever yielding Quinine, but Drs. Anderson and Junghuhn are more sanguine. Again at page 5 Howard in his great work "Illustrations of the Nueva Quinologia of Pavon" whilst their *Calisaya* "bark yields more than three per cent. of Quinine, this plant under the same conditions does not yield half per cent."

40. *Sites*—In page 13 paragraph 3, Dr. Anderson writes "In the 1st instance from there being no one on the Neilgherries who could point out the sites on those mountains best adapted for receiving the plants, and thus they were considered to be safer under the protection of a glass-house." There is a serious error here. The proper sites were well known and settled long before a plant arrived. Placing the plants in the glass-house was done purposely to acclimatise them, and we should have been foolish indeed to plant them out at once. Again in

* Vide Mr. Cross page 5.
The climate is certainly very similar to that of the Neilgherries.

paragraph 4 page, 14. Dr. Anderson says. "The great difference" that exists between the climates of the South American Cinchona Forests and "the Neilgherries ought to have received greater attention than it has, and in the selection of sites, convenience of access from Ootacamund should

"have been made subservient to the greater consideration of climate." I have studied the climate of these hills for seventeen years. I have introduced at various elevations plants from all parts of the world, from Japan, California, China, Jamaica, Australia, &c., &c., and am informed that the matter of sites has not been properly considered! Again in paragraph 7, regarding climate, Dr. Anderson is entirely mistaken. As for dryness I can only say that in January and February I was on each occasion wet through in visiting a forest which I had selected as a site for a Cinchona plantation, and though we have one or two dry months in the year, as a rule, anywhere south or west

† Mr. Cross page 5.
The climate is certainly very similar to that of the Neilgherries, but the alluvial deposit is shallower.

of Ootacamund, the climate is humid to a degree.† At page 23, para. 16, Dr. Anderson has fallen into the same error as the Dutch, and speaks of the "shady moist woods of the mountain" as the *sine qua non* for *C. Micrantha*. It is a fact as proved by Mr. Spruce that the more shady the place the worse the bark, and the tree never flowers; page, 23. I have

observed Orchids which grew luxuriantly in dense shola, but never flowered, the same kind exposed to sunshine at a few hundred yards distance flowered in perfection. At page 10 para. 9 Dr. Anderson tells us that the plants at Tjibodas "from exposure to the sun and air are mere leafy bushes 10 or 15 feet in height," but Dr. Junghuhn page 15, tells us that the cause of this failure was "1st they were too low and too hot; 2d, they are, or rather were, shoved as it were into Spanish boots, that is, with their roots in thin, half foot thick earth, right above a ledge of rocks. In answer to paragraph 12 page 11 of Dr. Anderson's report, I can only again repeat what I said in my former report, that "a good practical gardener would have done more for them", and their gigantic failure would have been avoided.

Mr. Spruce page 23, speaking of the Red Bark says, "It is far more abundant on their northern than on their southern slope, nor did I see a single tree with flowers or fruit in a southern aspect. The northern and eastern sides of the trees themselves had borne most flowers, and, except on one tree of more open growth than the rest, scarcely a capsule ripened on their southern and western sides. These phenomena are explained by the facts that, in the summer season, the trees receive most sun from the east and north, for the mornings are generally clear and sunny, whilst the afternoons are almost invariably foggy, and the sun's declination is northerly. Another notable circumstance is that the trees standing in open ground—pasture, cane-field, &c.—are far healthier and more luxuriant than those growing in the forest, where they are hemmed in and partially shaded by other trees, and that, while many of the former had flowered freely, the latter were, without exception, sterile. This plainly shows that, although the Red Bark may need shade whilst young and tender, it really requires (like most trees) plenty of air, light, and room, wherein to develop its proportions."

41. *Temperature*.—Mr. Spruce at 2,800 feet elevation ascertained the mean temperature to be 68°, therefore it may fairly be assumed that at 5,000 feet the elevation at which the Red Bark grows best, the mean temperature was probably 58°, as I have observed on these hills, that the mean temperature is 5 degrees for every 1,000 feet of elevation, thus Ootacamund is 56° and Kulhutti, 2,000 feet lower, is 66°. The same remark will apply to the nursery at Neddiwattam which at 5,400 feet will nearly equal the temperature best suited to the *succirubra*, viz 64°; the plantation site at 6,000 feet would then be 61°, an extremely favourable temperature for developing alkaloid. As for *C. succirubra* being a tropical tree, (Page 22 Page 14, Dr. Anderson) I know many spots on the Hills, where palms such as, *Calamæ* grow at 6,600 feet or 600 feet above the

* Mr. Cross page 2, found *C. succirubra* up to 9,000 feet elevation.

elevation of the Neddiwattam plantation.* I would also here observe that Cinchonas are neither to be planted in swamps nor on bare hills, but in protected ravines which are always 5° warmer than plains and 10° warmer than swamps, and that we do not require to know the degree of cold in a swamp vide Dr. Anderson.

42. *Value of Bark and age of Trees*.—The value of the bark of the tree mentioned by Mr. Spruce as having been cut at 4,500 feet was nearly 800 Rupees and two trees, shoots from old stools, (Page 31 foot note) were calculated to yield at fifteen years of age two quintals each of bark which at 43 dollars the quintal is equal to 172 Rupees each, but the Dutch, vide Dr. Anderson's report page 10, paragraph 9, "do not expect *C. Pahudiana* to yield bark of any value under fifty years," (if it ever yields at all) of this kind they have nearly ten square miles. This is indeed a contrast!

43. *Rain-fall*.—Dr. Anderson has quoted our rain-fall at 48 inches and seems to infer that the whole of this amount falls within six months. The rain-fall in woods south or west of Ootacamund is nearer 80 inches and distributed over ten months of the year. For weeks together we have a driving mist and perhaps not a quarter of an inch of rain per diem. In the west of Ireland where it rains for more than 300 days in the year, the rain-fall is not much more than 36 inches, and the climate very moist. It has been ascertained that the greatest rain-fall on mountains takes place in a zone at an elevation of from 4 to 5,500 feet or just the elevation where the *C. succirubra* was found on Chimborazo, it is therefore satisfactory to know that the Cinchonas growing from 6 to 10,000 feet elevation, do not obtain the same amount of rain as those growing lower, consequently the amount of rainfall necessary for *C. nitida*, *Condaminea* and others, would fall far short of that required by the lower growing *C. succirubra*.

44. *Conclusion*.—From the above remarks it is clear that if we obtain certain conditions, the *C. succirubra* will be a success.

I. If the mean temperature at 5,000 feet elevation on Chimborazo is nearly 61°, and the mean temperature of the plantation at Neddiwattam is the same, then the condition of temperature is satisfactorily established and, I think, I have proved that it is likely to be so.

II. If the plants at the elevation of 6,000 feet grow well, then it matters not if the rainfall is 80 or 150 inches, (though, I believe, the latter is nearer the mark,) and we shall have secured what is indispensable to the production of Quinine, viz. elevation.

III. The planting of trees in open tracts in the Forest is, I consider, indispensable to the production of healthy bark, indeed, no one conversant with first principles could argue otherwise.

IV. The success of *C. succirubra* established, that of *C. Calisaya*, *Condaminea*, *Micrantha*, *Peruviana* &c., must follow.

V. Exception has been taken to garden cultivation for Cinchonas, I would ask why is the Cinnamon tree cultivated? Why is the soil dug and aerated? The Cinnamon tree is cultivated for its bark, the tree in dense shade and damp woods at Neddiwattam and elsewhere grows to a large size, but art, combined with nature, produces a finer article of commerce than nature alone. It is not so much the size of the tree as the amount of alkaloid contained in the bark that we require; and to produce this, we plant Cinchona as we would Coffee, Tea, Cinnamon or spices. I have already shown that the Sandal tree grown in shady moist ravines produces no fine scented heart-wood, but grown in the open, the heart wood is very superior. The like successful result will take place if the Cinchona is properly treated.

VI. From Mr. Cross' report just received, it is very satisfactory to know that he approves of the sites selected on these Hills, more especially, as he is the only practical man who has examined the sites here and those on the Andes where the best varieties of Cinchona grow.

45. *Nursery at Neddiwattam.*—On the 30th of April last, I inspected the Cinchona sites at Neddiwattam, the plants in the Nursery at an elevation of 5,400 feet were looking remarkably well, and are from 12 to 15 inches in height; they consist of 500 *C. succirubra*, *Micrantha* and *Peruviana*. At present only four beds are filled, but shortly some fifty beds capable of holding about 50,000 plants will be ready. The site of the Nursery is well chosen, the soil is a rich brown loam, and the aspect is north. Some 3,000 plants have since been sent out.

46. *Upper plantation.*—Seventy acres have been felled and burnt, and about 5,000 running feet of trenches 2' x 1½' have been dug. It will be advisable to have catch drains with silt traps on both faces of the plantation; otherwise, the rush of the storm waters will infallibly denude the plantation of the whole of the surface soil. As the sides of the ravine in which the plantation is situated, are rather steep, it will be necessary to leave one trench in ten open to serve as a catch drain, with silt traps at one hundred feet intervals, the traps may be 10' x 4' x 4', when filled, the contents should at once be removed and spread round the roots of the trees; in this manner an efficient system of manuring can be kept up. Mr. McIvor, has very properly dug his trenches at right angles to the slope of the hill, this method will greatly prevent a rush of water. From an acre of cleared land on a steep slope, I have taken after a heavy shower as much as three cubic yards of silt.

47. *Elevation.*—The greatest elevation of this plantation is 5,900 feet, it faces the north, the surface soil is excellent, the sub-soil consists of decomposing gneiss boulders.

48. *Plants.*—I examined some plants of *C. succirubra* and others which had been put out in November last; all that I saw were healthy, and one *succirubra* reported to be 9' when planted out, is now twenty-five inches in height and very healthy; this is encouraging, when it is considered that the plants were delicate when first put out, and have only just weathered the most unfavorable part of the year, and at an elevation of 5,900 feet.

49. *Overseers' houses.*—Very little has yet been done for the Overseers' houses, want of labor has been Mr. McIvor's great difficulty; bricks are ready, a site prepared, and a branch-road made. It would have tended to expedite the building of these houses, if they had been made over to the Department Public Works, as they had labor on the spot, in fact had just repaired the public Bungalow. Instead of tiles, it would be well if galvanised iron was substituted, as unless the tiles are dipped in coal tar, they soon accumulate moss in this damp climate.

50. *Cooly lines and Store house.*—A small thatched hut for the Overseer in charge of the Nursery is finished, a temporary Store-house and Cooly-lines have been run up; but it is very important, that as soon as possible substantial brick in mud lines be built; otherwise, from being badly housed the Coolies may get sick and leave. The Store house for grain should be of brick in chunam with asphalted floor.

51. *Glass-house.*—A glass-house for the propagation of the plants is much required, at present the cost of carriage cannot be under half an Anna a plant, or on a hundred thousand it will amount to 3,000 Rupees, enough to build two glass-houses. There is also some risk of damage to the plants in their carriage from Ootacamund to this; the plants can also be propagated more quickly under glass than in the nursery, and will be less liable to damage from hail, &c.

52. *Fencing.*—The best fence for the plantation would be a ditch three feet wide at top and one at bottom, and three feet deep, with a stout fence on the top four feet high; this would last for years, and be cheaper than anything I know. A wall was proposed but it would take too long to build, and be very expensive; a wall six feet high of brick in mud, could not be built out here under 3 Rupees the running yard, then 100 acres require 3,000 running yards or 9,000 Rupees; whereas a ditch 3' x 3' x 2' would cost per running yard 2 Annas and 2 Annas for the fence equal 4 Annas, or Rupees 720 against Rupees 9,000 for the wall. Rose cuttings may be planted on the loose soil taken out of the ditch, and before the fence decays will form an impenetrable barrier.

53. *Ootacamund plantation.*—A sholah containing about 40 acres has been partially trenched and filled, the situation is excellent, well protected, and the generality of the soil is a rich black mould. I have recommended Mr. McIvor to have catch-drains and silt traps, as some of the ground is very steep. Mr. McIvor has very properly trenched nearly the whole of the ground, this, I

know from practical experience to be the best plan, as it gives the plants a start of at least two years over those in pits. I have myself tried *Eucalypti* in pits and trenches on grass land, the trees in the latter, are certainly three years in advance of those in pits. The great secret is to give the plant a start the first year, after that it can take care of itself.

The trees in this plantation have in some places been left, so that the effect of partial shade may be tested. Not that Mr. McIvor is not fully confident of success in following the plan of cutting away everything, but he has determined to try both plans.

I have tried both plans with *Eucalypti* and have found the trees grew as fast again where there was no shade. In fact the shade from large trees, makes the young trees tender and unhealthy.

54. *Propagating House.*—An excellent propagating house has been built by Mr. McIvor on the newest system, with bottom heat, and from this and a lower house some 12,000 plants are turned out monthly, the success in propagating the plants has been extraordinary, and reflects the highest credit on Mr. McIvor's skill and perseverance, for it required no ordinary care to obtain such success as he has. The Cinchona plant is very delicate in its first stages, requiring immense watchfulness, but hardy enough when a year old. The lower glass-houses are full of plants in all stages, from the delicate seedling, to the large plants brought by Mr. Cross, two of which will probably seed next year.

55. *Seeds.*—Seeds of the *C. Condaminea* have lately been received from Mr. Cross, and have germinated with hardly a failure; they are now coming up by thousands, this plant is eminently suited for the Dodabetta site. A variety *C. Crespilla* which curiously enough Mr. Cross found on mountains with peaty soil, is also germinating, and will apparently suit our black peaty soil, which abounds in many parts of the grass land of these Hills.

56. *Trees planted out in the Ootacamund Garden.*—Mr. McIvor as an experiment, put out last September six *succirubra* plants, they have not grown much, as the season has been unfavorable, but they are now beginning to push their leaves, under the influence of the prevailing showers, they are perfectly healthy, and will soon increase in size, the large leaves, suffered a little from the unprecedented violent hail storms; the general health of the plant was uninjured.

57. *Overseers Houses, &c.*—An excellent bungalow adjoining the propagating house has been built by McIvor, for the Overseer in charge, and a bungalow for the Overseer in charge of the upper plantation is nearly finished, as also substantial buildings for his gardeners.

58. *Number of Plants.*—There are 1,200 large plants, from which small plants are constantly being propagated, the rest consist of seedlings and rooted cuttings. A memorandum of the plants, furnished by Mr. McIvor, is appended. The total number is 31,495.

Report on the number and condition of the Cinchona Plants in cultivation on the Neilgherries on the 30th April 1862.

Botanical Names.	Commercial Names.	No. of Plants.	Value in the London market per lb. of dry Bark.	
			s. d.	s. d.
1. <i>Cinchona succirubra</i>	Red bark	14,450	2 6	8 9
2. " <i>Calisaya</i>	Yellow bark	237	2 10	7 0
3. " <i>Condaminea var. Uritusinga</i> ...	Original Loxa bark.	12	10	7 0
4. " " <i>var. Chahuarguera</i>	Rusty crown bark ...	8,000	2 10	7 0
5. " " <i>var. Crespilla</i>	Fine crown bark ...	105	2 10	6 0
6. " <i>Lancifolia</i> from Java.....	Crown bark	11	8	2 10
7. " <i>Nitida</i>	Genuine grey bark...	2,922	1 8	2 9
8. " <i>Species without name</i>	Fine grey bark ...	1,211	1 8	2 10
9. " <i>Micrantha</i>	Grey bark.	3,786	1 8	2 9
10. " <i>Peruviana</i>	Finest grey bark.....	357	1 8	2 10
11. " <i>Pahudiana</i> from Java.....	Unknown...	425	Worthless...	
Total number of Plants.....		31,495		

Remarks.—The whole of the plants are in the finest possible state of health, with the exception of *C. Lancifolia* and *C. Chahuarguera*. Our plants in the open air, within the last two months in rapidity of growth, general health and luxuriance, having much exceeded those in our glass-houses.

The *C. Lancifolia* lately imported from Java, being affected by fungi at the roots, it is doubtful if we will be able to save it. As several cuttings of this sort although successfully rooted, the fungi, which apparently spreads along the pith, has attacked these rooted cuttings and killed them. The *C. Chahuarguera*, only lately imported, has suffered much during the voyage, the whole of the leaves and part of the young shoots having been dried up, still, as it seems not to have contracted any disease, I hope it will recover.

In the portion of our Nurseries under the protection of the shade of living trees, layers made in this position on the 3rd of January, were found not to have rooted on the 27th of April, while layers made at the same time in the open sunshine were found rooted by the end of the same month or in 28 days. The growth under the shade has also been unsatisfactory, not having in any case exceeded 4 inches in the last two months, while in the same period many hundreds of the plants in the open ground have grown from 12 to 16 inches. Nothing can exceed the luxuriance and bright healthy look of the leaves in the open sunshine, while the leaves on the plants under the shade are pale and covered with small hairs.

The six plants were placed out on the highest and coldest part of the Neddiwattum site at the end of September 1861—their height being as follows.

Height when planted out 29th September 1861.		Height on the 14th May 1862.	
No. 1, <i>C. succirubra</i> red bark.....	9 inches.	2 feet	5 inches.
" 2, do.	4 "	2 "	3 "
" 3, <i>C. Micrantha</i>	3½ "	1 "	4 "
" 4, do.	3 "	1 "	4 "
" 5, <i>C. Nitida</i>	3½ "	1 "	7 "
" 6, do.	3 "	1 "	6 "

(Signed) W. G. McIVOR,
Supt. Govt. Cinchona Plantations.

59. ANAMALLAI FORESTS.—I visited these Forests in July and November last year, on my first visit, there was no officer to give me information on any point, Captain Brine being on sick leave. I was therefore compelled to open the season, engage axemen, and superintend the general duties of the forest, myself. The head Overseer Lennon I found was either unable or unwilling to give me all the information required.

60. In August Lieutenant Ouchterlony joined and would no doubt have worked out the estimate for 3,000 planks if he had received proper assistance from his Overseers. As it was he cut 1,799 planks against 1,100 planks of the previous year. In my annual report for 1860-61, I was induced to expect a favourable result this year, from Captain Brine having reported that he had cut and *slipped*, 1,345 planks, and that the whole were being rapidly carted away to Mungarrah. On enquiry I found that Captain Brine had not cut more than 1,100 planks, of this number as late as the end of July, 100 were still at the head of the slip and 200 in the forest.

61. The estimate by Captain Beddome was for 1,500 planks, a very small amount of work for the season; but even this amount of work fell short by nearly a third and finally from Captain Brine's Report it appears that only 669 planks reached the Depot at Punani and realized the very small sum of Rupees 18,086-14-6, though the previous year's planks realized nearly a fourth more, thus showing a want of care in the preparation of the planks. As the inferior planks cut by Captain Beddome were 92, those cut by Captain Brine 192.

62. *Financial results.*—The expense of preparing these planks or rather the outlay for the receipts of the year, must be taken as follows, to arrive at a fair approximation of the cost.

	RS.	A.	P.
Expenditure in 1860-61 under Captain Brine.	29,911	15	11
Receipts for 1861-62... ..	18,086	14	6
Deficient Rupees...	11,825	1	5

Deduct from this other wood, and value of planks and logs in Forest, (the year's work is erroneously stated by Captain Brine to be worth 86,470 Rupees) gives as follows:—

Sales of planks	18,086	14	6
Other sales	4,003	11	7
Value of 450 planks, not delivered, at 16 Rupees per plank . . .	7,200	0	0
245 Heads and Butts at 10 Rupees	2,450	0	0

Total Rupees... 31,740 10 1

Balance in favor of Forest..... 1,838 10 2

This is a very poor result from our best Forest, and one possessing an excellent market, first class planks fetching 2-14-3 per cubic foot, and average timber 2 Rupees.

63. *Causes of failure.*—The causes of the great falling off in the Anamallai profits are as follows:—

I. When Captain Brine took charge in September 1860, he was perfectly new to Forest work, and moreover was very liable to fever. The Anamallais require an Officer of robust constitution and skilled in Forest operations.

II. I found that the Forest establishment, were frequently employed in cutting, dragging, carting and slipping Vengay and other jungle woods, which produced 4 Annas a cubic foot, or in other words a dead loss, as a Contractor refused to deposit Vengay at the foot of the slip under 4 Annas, 6 Pice the cubic foot. As it costs as much to fell, square, drag, cart and slip Vengay as Teak, which all round is worth 1-8-0 the cubic foot, it is apparent, when Vengay only produces 4 Annas the cubic foot and Teak 1-8-0, that we lose on every cubic foot 1-4-0. I have forbidden the cutting of any wood but Teak and Blackwood, which are alone remunerative. In June last, the monthly report of operations stated, that the Elephants had been employed during the month in slipping Vengay for a Contractor of the name of Bake, this at a time when 3 or 400 of Captain Brine's Dockyard planks, were lying at the top of the slip and in the Forest. No wonder the elephants are not considered sufficient for the work. A quantity of Ven-Teak and Vella Naga was pointed out to me lying at the foot of the slip, it was not worth and will not realize four Annas a cubic foot, and yet it cost us fully that.

III. There are no branch roads in the Forest, hence the dragging is much increased.

IV. There are no carts or bullocks; in Mudumallai Forest, there are generally twenty carts working, this is a check upon the Contractors. Anamallai Forest should have the same.

V. There are no Coolie lines, provision stores, proper Offices, or Bungalows of any kind, the situation of Tunacadavoo is very bad, dense jungle all round, and the place a very focus of miasma. All this should be altered, proper Bungalows, with glass-windows and brick-walls should be erected on a hill near the cart road, a good Office with lines should be built, a Store house with asphalted floor, and galvanised iron-tiled roof should be erected, and everything done to make the place comfortable and cheerful, instead of gloomy and unhealthy. I pointed out a spot where a well should be dug, in case of water failing in the dry season. If all these improvements were made, Natives would not entertain so great a dread, of the Anamallais, and labour would increase. That the Anamallais are unhealthy cannot be doubted, but matters are rather exaggerated, I was up there as late as the 23rd of November, and amongst some eighty people at work, consisting of axemen, cartmen, elephant men and others, I only saw one man suffering from fever.

VI. The slip I found was but the rocky bed of a water course, I gave a plan for its thorough drainage, and repair.

VII. There are a number of Teak trees in the Forest that will not split into planks, from the twist in the grain, but would make excellent logs. I recommended that these should be felled and squared, as the Railway is now open they might be carried to Madras, Salem, and elsewhere, at a profit. There are also a number of axemen obtainable who are not skilful enough to split planks, but are quite able to square logs, these men might be profitably employed on the above work.

VIII. Want of personal supervision on the part of Captain Brine is another cause, had he supervised his work or had he even been acquainted with his accounts, he could not have

reported 1,345 planks as cut and slipped. Personal supervision would have told him, they were not at the bottom of the slip, and by his books, he might have ascertained, that they had never been cut.

* IX. It has been the custom for the Superintendent to visit the Forest only from July to November, I think it would be better if he made Coimbatore his Head-Quarters, and visited the Forest every month from June to February. As during these months, work in the Forest is always going on. Merely to see the work between July and November is not sufficient, the principal carting work above the slip, does not commence before December, in fact most of the work is done in December, January and February. Axemen cutting planks up to the end of February.*

* Appendix A. Annual Report 1860-61.

64. *Travelling allowance.*—The Superintendent should draw 5 Rupees a day travelling allowance, when marching, the extra amount of supervision would more than repay the outlay.

65. *Supervision cost of.*—The average cost of supervision for the Anamallais is 10,000 Rs. per annum so that if even 40,000 cubic feet of timber are cut, the supervision amounts to the large sum of 4 Annas a cubic foot; but in Captain Brine's year only 18,000 cubic feet were cut, the supervision actually amounted to more than eight (8) Annas a cubic foot, the supervision on the Anamallais should never exceed 3 Annas a cubic foot, or for ten thousand Rupees, some 53,000 cubic feet of planks and logs should be turned out.

1 100 planks $\times 13 = 14,300$ logs.
245 $\times 16 = 3,920$
Total C. feet... 18,220

It will be seen from the above approximate data which are nearly correct, how much may be saved or wasted by a Superintendent.

66. *Anamallai profits.*—The profit for 1858-59 of the Anamallais, was 45,173 Rupees, not Rupees 2,43,468 as erroneously entered in the report for the year 1859-60; how the mistake arose I cannot say, but in looking over the Central Office accounts, I found that the profits of the Anamallais for three years, instead of one year, had been entered. This reduces the real profit of 1858 and 1859 to Rupees 1,98,294, against Rupees 1,83,732 for 1859-60, or a falling off of Rupees 14,562, entirely due to the Anamallais; the receipts from the other Forests, having rather increased than diminished, with the exception of Mudumallai, where a great outlay had been incurred to store the timber against any future demand. I have been induced to correct this mistake at this late date, lest Government should think that there had been a great falling off in the receipts.

67. *MADURA FORESTS.*—From Mr. Sperschneider's report, it will be seen that, there is an improvement in the revenue, as I anticipated, and this year I intended to have fully explored the Cumbum valley and Palatoor Sandalwood jungles, and to have organized a small but efficient establishment for working these Forests. The demand for Vengay and other woods being considerable, I have no doubt, but that a fair revenue would in course of time be realized. The receipts of this year exceed the expenditure. In paragraph 6, Mr. Sperschneider is of opinion, that to work the Forests ourselves, is the best both as regards "Revenue and Conservancy," provided there is a market. I agree with him.

68. *CUDDAPAH AND NORTH ARCOT FORESTS.*—From the returns received, the receipts exceed the cost of conservancy, but fall far short of what they ought to be. If Government accede to my request to equalize the rate on Red Sanders, viz. 3 Rupees per bandy load both in Cuddapah and North Arcot, the returns from these Forests should not fall short of Rupees 15,000 a year, or show a clear profit of Rupees 10,000. I have every reason to believe, from the reports I have received, and from what I know of these jungles, that the above return would be obtained.

69. *Mr. Spring placed in charge.*—Owing to the misconduct of the Assistant Mr. Morison, (now under investigation) the conservancy and working of these Forests has been delayed. The particulars showing how Mr. Spring was placed in charge, and Captain Beddome requested to inquire into Mr. Morison's conduct, have already been reported to Government.

No. 4 of 5th May 1862.

70. *NELUMBORE TEAK PLANTATIONS.*—In December last I visited these plantations, and marked 20,000 saplings for removal, 20,000 were marked by Overseer Hall, and 10,000 by the Sub-Conservator Chatoo Menon, in all, more than 50,000 saplings have been cut, this will tend much to relieve the plantations, many of which were suffering severely from overcrowding, as detailed in my Report in May 1861.

Thinning of the Plantations.
No. 1,553, 5th Augus 1861.
R.D.

71. *Scarcity of labor.*—Notwithstanding the extra grant of money, so emergent was the thinning work, that we were unable to plant one hundred acres as intended, only thirty were cleared ready for planting. Want of labor at the exact time of felling was experienced.

72. *Table shewing growth of trees.*—I append a table compiled, under my instructions, by Overseer Hall, from which the growth of the Teak tree, from seven to eighteen years of age may be seen; from this table will also be seen, how uniform the growth has been in the different plantations. In good soil where the trees had room, the rate of increase per annum in circumference averages, for first class trees 2 inches, second class 1½ inches, third class 1 inch.

73. *The Sub-Conservator recommended for a Pension.*—I regret to report that during the past year, the health of the Sub-Conservator Chatoo Menon, has been failing rapidly, and it became my duty to recommend this faithful and valuable servant of Government for a pension; but to obviate any delay in the current operations, I recommended the appointment of Mr. Ferguson as an Overseer; he was strongly recommended by Dr. Cleghorn as a good Forester. Mr. Ferguson was directed to proceed to the plantations as a temporary measure, and make himself thoroughly acquainted with the system introduced by Chatoo Menon.

Appointment of a European Forester.

74. *General operations.*—Every year sees the work increase, more plantations have to be kept clean, thinnings to be attended to, new ground to be cleared for planting, ripe Teak trees to be felled for sale, jungle woods of the more valuable kinds to be marked, thinnings to be floated to Calicut for sale, and lastly the rafts on the river to be watched.

75. *Proposed increase of present grant.*—In the coming Budget it was my intention to have applied for an increase of the present grant, as I considered it good policy to restrict our planting operations to a spot, where there is water-carriage to the coast. The price of Teak on the spot is nearly 100 Rupees the ton, and the locality as far as soil and climate are concerned, the most favorable in India, for the growth of the teak tree. It is true we have had a difficulty about labor, but more energetic action, will this year no doubt remedy the defect.

76. *Financial results.*—The thinnings last year realized 4 Annas each all round, this year they should bring in a little more, say 5 Annas each, the trees being somewhat larger. Some old Teak to the extent of 7,500 cubic feet has been cut, this with the thinnings should realize at least 20,000 Rupees.

Major Babington's report shews a very small return for the year, which was calculated at 6,000 Rupees but has only reached 800 Rupees. His report is certainly a very "meagre one," he does not seem to have inquired or made himself informed, why so small an amount was realized. The sales were formerly conducted by the Collector's Department, but when made over to the Assistant, he should at least have inquired into the matter, nor does he give the estimated value of the wood on hand.

Appendix I.

77. *Felling.*—Felling is not carried on in the rains, the felling for clearing ground is done in November, nor is it necessary to float the timber at once, in fact the longer it remains on the bank, the fewer are the bamboos required to float it.

78. *Seignorage on trees.*—I am quite opposed to selling valuable trees on seignorage, where there is an Establishment to work the Forest, it is a simple way of saving the Assistant trouble and conveying the largest share of the profit in the pocket of the Contractor. Trees measuring 40 cubic feet were sold on stump fee for 10 Rupees; had we felled the logs and floated them to the coast, we should have realised at an outlay of 20 Rupees, at least 60 Rupees, or a profit of 40 Rupees, versus ten, on a hundred trees, this becomes a serious item.

79. *Commisariat Elephants.*—No doubt it would be an excellent plan to use the Commisariat Elephants when not required by that Department, it would be a saving to the State, and an advantage to the Forest Department.

80. *Boundaries and Survey.*—It is extremely important that the boundaries should be marked out, I have already brought to the notice of Government the necessity of a Survey.

81. *Charcoal.*—The Assistant's idea of burning charcoal when he complains of a want of labor in his legitimate occupation of extending the Teak plantations is untenable, further, he furnishes no data of any kind.

82. *Style of Report.*—The style of Major Babington's report is unsatisfactory, there is a want of care in drawing it up; he altogether under-rates the value of the saplings, there is an immense demand for them for export to the Arabian Coast, and he should occupy himself with arrangements for floating them to Calicut, with the first freshes.

Return showing the age, circumference in inches at 6 feet from the ground, of eighteen Trees, viz., six largest, six middle, and six smallest trees in each yearly planting from 1844 up to 1855, in the Nellumbore Teak Plantations.

Year when planted.	First Class, numbered from 1 to 6 and their circumference.	Second Class, numbered from 1 to 6 and their circumference.	Third Class, numbered from 1 to 6 and their circumference.	Average height in feet from the ground.	Remarks.
1844	1 ... 40 2 ... 40 3 ... 38 4 ... 36 5 ... 36 6 ... 36	1 ... 32 2 ... 30 3 ... 29 4 ... 26 5 ... 24 6 ... 24	1 ... 20 2 ... 20 3 ... 18 4 ... 17 5 ... 18 6 ... 13	46	On good soil, distance tree from tree, about 22 feet.
1845	1 ... 44 2 ... 40 3 ... 40 4 ... 40 5 ... 58 6 ... 34	1 ... 30 2 ... 29 3 ... 26 4 ... 25 5 ... 24 6 ... 24	1 ... 17 2 ... 16 3 ... 16 4 ... 16 5 ... 16 6 ... 16	48	On very good soil, distance about 18 feet tree from tree.
1846	1 ... 30 2 ... 29 3 ... 28 4 ... 27 5 ... 25 6 ... 24	1 ... 22 2 ... 19 3 ... 17 4 ... 17 5 ... 17 6 ... 16	1 ... 14 2 ... 14 3 ... 14 4 ... 13 5 ... 13 6 ... 13	45	On good soil, distance about 18 feet tree from tree.
1847	1 ... 30 2 ... 28 3 ... 25 4 ... 24 5 ... 24 6 ... 23	1 ... 21 2 ... 21 3 ... 20 4 ... 20 5 ... 19 6 ... 19	1 ... 14 2 ... 14 3 ... 14 4 ... 13 5 ... 13 6 ... 13	40	On general good soil distance about 14 feet tree from tree.
1848	1 ... 28 2 ... 28 3 ... 27 4 ... 26 5 ... 24 6 ... 22	1 ... 20 2 ... 20 3 ... 20 4 ... 19 5 ... 18 6 ... 17	1 ... 13 2 ... 13 3 ... 12 4 ... 12 5 ... 12 6 ... 12	34	On not very good soil, stony in places, distance about 10 feet tree from tree.
1849	1 ... 27 2 ... 24 3 ... 24 4 ... 24 5 ... 23 6 ... 22	1 ... 16 2 ... 16 3 ... 16 4 ... 16 5 ... 16 6 ... 15	1 ... 13 2 ... 12 3 ... 12 4 ... 12 5 ... 12 6 ... 11	40	On very good soil, distance about 10 feet tree from tree.

Return showing the age, circumference in inches, &c. (Continued.)

Year when planted.	First Class, numbered from 1 to 6 and their circumference.	Second Class, numbered from 1 to 6 and their circumference.	Third Class, numbered from 1 to 6 and their circumference.	Average height in feet from the ground.	Remarks.
1850	1 ... 26 2 ... 25 3 ... 24 4 ... 24 5 ... 24 6 ... 23	1 ... 17 2 ... 16 3 ... 16 4 ... 16 5 ... 15 6 ... 14	1 ... 12 2 ... 12 3 ... 12 4 ... 12 5 ... 12 6 ... 11	35	Not good soil, in some parts stony, distance about 12 feet tree from tree.
1851	1 ... 28 2 ... 28 3 ... 26 4 ... 25 5 ... 24 6 ... 24	1 ... 18 2 ... 16 3 ... 16 4 ... 15 5 ... 15 6 ... 15	1 ... 13 2 ... 12 3 ... 12 4 ... 12 5 ... 12 6 ... 11	24	Some very good and some very bad soil, distance about 9 feet tree from tree.
1852	1 ... 20 2 ... 20 3 ... 20 4 ... 19 5 ... 19 6 ... 16	1 ... 15 2 ... 15 3 ... 15 4 ... 14 5 ... 14 6 ... 14	1 ... 11 2 ... 11 3 ... 10 4 ... 10 5 ... 10 6 ... 10	28	Average good soil, distance about 10 feet tree from tree.
1853	1 ... 20 2 ... 17 3 ... 17 4 ... 17 5 ... 18 6 ... 16	1 ... 13 2 ... 12 3 ... 12 4 ... 12 5 ... 12 6 ... 12	1 ... 10 2 ... 10 3 ... 10 4 ... 10 5 ... 9 6 ... 8	23	Average good soil, distance about 9 feet tree from tree.
1854	1 ... 20 2 ... 19 3 ... 18 4 ... 18 5 ... 18 6 ... 18	1 ... 16 2 ... 14 3 ... 14 4 ... 14 5 ... 13 6 ... 13	1 ... 12 2 ... 11 3 ... 11 4 ... 11 5 ... 10 6 ... 10	26	Soil very good, distance about 9 feet tree from tree.
1855	1 ... 17 2 ... 16 3 ... 16 4 ... 16 5 ... 16 6 ... 15	1 ... 12 2 ... 12 3 ... 12 4 ... 12 5 ... 11 6 ... 10	1 ... 9 2 ... 9 3 ... 9 4 ... 9 5 ... 9 6 ... 8	23	Soil good in general, distance about 9 feet tree from tree.

N.B.—These measurements were taken in January 1862.

(Signed) E. HALL,

7th February 1862.

Overseer, Forest Department.

Note.—On comparing this Table with those drawn up by Brown of Arniston, Forester, page 428, it appears that the increase of the Teak is greater by twenty-five per cent. than that of the Larch, and is three times as great as that of the Oak. The Teak at 18 years being 18 inches in diameter, the Oak at 20 years being only 4½ inches, the price of Teak and Oak is about the same, hence it follows that a Teak plantation must be three times as paying as an Oak plantation.

(Signed) H. R. MORGAN.

83. **SALEM FORESTS.**—The returns from these Forests are far more than even I anticipated, a profit of Rupees 42,947-3-8 being shown, besides Sandalwood in store to the value of 20,000 Rupees, the latter is, I think, too high a valuation.

Lieutenant Ouchterlony's report, Appendix K.

84. **Accounts.**—Lieutenant Ouchterlony's account of the pay of the Establishment and working charges, is not very clear, and I should have sent it back for revision, had time allowed, but, as it only reached me at the end of May, I am compelled to submit it in its present state, trusting Government will excuse it, as much of the confusion that has arisen in the accounts was due to the sudden death of the Assistant, and the great delay that arose in obtaining sanction for the employment of a proper Writer and Establishment.

The Extra establishment was sanctioned, but Government declined to pass their pay until the sanction from the Supreme Government arrived.

In order not to lose the services of men collected with some trouble, I directed Mr. Blenkinsop to employ them on the work of forming Depots of wood, for Auction sale, and to pay them out of the grant sanctioned for working the Forests. Without this Establishment we should not have obtained half the results noted above.

On Mr. Blenkinsop's death, Overseer Yarde was left in charge of the Forests, and neglected to pay the men, though in justice to Overseer Yarde, I must say, he carried on the duties of the District very well, and I have already recommended him to Government for a portion of the Assistant's allowances, during the time he had charge of the District.

85. **Lieutenant Ouchterlony assumes charge of the District.**—On Lieutenant Ouchterlony assuming charge of the District, I directed him at once to pay the men, as they had been employed on Government work, and the satisfactory returns of the year were principally due to their employment.

86. **Disarrangement of plans through the death of the Assistant.**—Mr. Blenkinsop having last year accompanied me in an extended tour, lasting nearly two months over the greater part of the Salem Forests, and having also this year accompanied me, to some jungles in South Arcot bordering on the Cotaputty jungles of Salem, was in full possession of all my plans, and was fully prepared to carry them out, his death in October last, just as everything had been got into working order, was a great blow, and has tended much to throw things back; still from the large returns, Government will observe, that the careful exploration, and systematic conservation and working of the Salem jungles has not been without good results, and next year I trust, that under Lieutenant Ouchterlony, matters will be improved.

87. **Depots.**—Lieutenant Ouchterlony has omitted to notice in his report, that the formation of Depots was a project already ordered.

88. **Establishment.**—The full Establishment having been sanctioned by Government, pending the sanction of the Supreme Government, that matter is arranged.

89. **Travelling Allowance.**—Travelling allowance at the rate of 60 Rupees a month has also been sanctioned, indeed, considering the great distance to be traversed in the Salem Forests, it is absolutely necessary.

90. **Houses.**—Small houses at Hurrur and on the Munchy hills might be built out of the sum allowed for working the jungles, they would be very useful for the Officer, Overseers and others.

91. **Licenses.**—Salem is not yet in a fit state to dispense with Licenses.

92. **Stamp.**—Under the head of Stamps, Lieutenant Ouchterlony seems to have overlooked the fact, that none but printed Licenses were issued, a book containing several hundreds was kept by Mr. Blenkinsop, the system was as nearly perfect as possible, it was on the principle of a Check book, one-half in Tamil, the other in English. The Tamil half was torn off and given to the License holder, the other or English half remained in the book as a record. I had intended to introduce the same plan into Cuddapah, had the Collector approved of the Salem rules.

93. **Sandalwood sales.**—It could not be expected that merchants would go into the jungles to buy Sandalwood, and until brought into a town, such as Denkincothah, sales could not be effected. I had directed that tenders for the purchase of Sandalwood at Denkincothah should be advertised

for in all the District Gazettes, but not bringing the wood into Denkincothah, was clearly the cause of no buyers appearing.

94. **Nurseries.**—I have instituted a plan on a small scale for the planting out of Sandalwood trees at Sigur, if successful, it can be tried at Denkincothah.

95. **Forest products.**—These at the request of the Collector were taken over by us at Denkincothah, next year probably the results will be better.

96. **DENKINCOTTAH FOREST.**—In my report on the Salem jungles I particularly mentioned the Achawood* Forests, they cannot be worked, as you descend from Denkincothah by a paved Ghat at a gradient of one in four, the outlet near Pennagram, is up the rocky bed of a watercourse, over which even a wudder cart would fail to make way. I then explained that until a proper Ghat was made, these Forests could not be worked for anything but Sandalwood. The timber cannot at this point be floated down the Cauvery, many miles lower down, perhaps floating may be practicable, but I am not aware that there is any valuable wood below Cauveryputnum.

97. **CHENNAT NAIR FOREST.**—I visited this Forest in December last, it is worked by the Railway on a lease of three years, and has been very serviceable to them in producing Erool sleepers. It may be worth while at the expiration of the Railway lease, to locate an Overseer in this Forest, as from its proximity to Palghat and the Railway, a ready market for the sale of timber may be obtained.

98. **CONSERVANCY.**—In my last annual Report, I remarked that Conservancy was yet in its infancy, the system is every day getting into shape, and its advantages becoming manifest. The loss of North Canara has been a terrible blow to our financial condition, about one lac and fifty thousand Rupees of profit disappearing at once. Government in their Proceedings, No. 933 of 1st May 1862 have taken exception to the small returns of Conservancy compared with the outlay, and have called upon Collectors for their opinion, regarding the conservation and profits of certain Forests.

To give some idea of the returns under the old system, Captain Hunter states the returns of the Wyand Forests for three years to be Rupees 640, and this the first year of Conservancy, they amount to Rupees 5,389-13-9. The Collector of Salem, Mr. Brett complained bitterly of the destruction of the Salem Forest, under the old system, and a short time ago in a letter addressed to me, stated that as the returns from Licenses &c., were more than the cost of the Conservancy Establishment, that the taxes on wood should be reduced. I need hardly bring to the notice of Government the state of the Nullah mallais in Kurnool, where Conservancy is called for by the Collectors and others. In Madura and Cuddapah matters are not yet arranged, but from the former at all events, a fair revenue will, I have no doubt be eventually obtained, and the Forests conserved at the same time.

In the Sigur Forest sandalwood was cut once in 5 years, and the returns were very small, whilst bands of Moplahs constantly made inroads and carried off large quantities; four years ago, I captured a band of thirty Moplahs in Sigur Forest. The revenue has now risen to 20,000 Rs. and will for some years continue at this rate. Stealing has been put a stop to, and conservation attended to.

If Mudumallai Forest had not been worked by this Department, not a single public or private building of any size could have been commenced in Ootacamund, as the only Timber merchant in the place has not a log over 15 feet in length. Now that the system of Railways is being developed, and branch Tram-ways are about to follow, a small, but certain revenue must accrue from the conservation of all Forests: it will take years for many of the Forests to recover from the wholesale system of destruction to which they have been subjected.

Making the cutting of full grown trees compulsory is alone the salvation of some Forests, as in Salem and elsewhere, I have noticed the tendency to cut saplings, because the log just squared to a post or rafter. In many poor Forests the great end and aim was to prevent their total disappearance. To give Government an idea of what conservancy may do for the returns of a Forest, I mention the following facts which occurred a short time ago. Some two years ago, Captain Beddome then in charge of the Anamallais, recommended to Dr. Cleghorn, that he should supply a Mr. Bake with 75,000 cubic feet of Vangay at the bottom of the Anamallai

slip at 4 Annas per cubic foot. Dr. Cleghorn replied that as the distance was likely to be great the price per cubic foot, should be 6 Annas; fortunately he did not close with Mr. Bake, but agreed to supply the Railway with the above amount at the rate of six Annas per cubic foot. In November last, Mr. Bake came to me at the Anamallais and demanded his 75,000 cubic feet of Vengay, I replied, there was no contract with him. After Captain Brine took charge in December, Mr. Bake through Captain Brine again renewed his demand, and Captain Brine in several letters pertinaciously assumed the fact that Mr. Bake had a contract. I refused to entertain Captain Brine's view of the question, had I done so, Government will observe from the calculations below, how disastrous to the Revenue the result would have been.

To cut and deliver 75,000 cubic feet of Vengay at the foot of the slip, would have taken Captain Brine two years, as he did not in his year deliver more than 18,000 cubic feet of planks and logs at the foot of the slip, at a cost of eight Annas per cubic foot for supervision; the Vengay being only in logs I allow that he would have cut about double the amount say 37,000 cubic feet per annum which reduces the supervision to four Annas per cubic foot, and as he could not possibly have cut any Teak in those two years, Government would have lost two years profit.

As I consider that Government have a right to expect an annual profit of Rupees 25,000 from the Anamallais, then they would have lost two years profit or Rupees 50,000. The case then stands thus.—

CAPTAIN BRINE IN ACCOUNT WITH THE ANNAMALLAI FORESTS.

Dr.		Cr.	
To felling, squaring, dragging, carting, and slipping 75,000 cubic feet of Vengay at 4 Annas 6 Pice and Supervision at 4 Annas per cubic foot..	Rs. 39,483	By amount received from Mr. Bake for 75,000 cubic feet of Vengay delivered at the foot of the Anamallai slip at 6 annas per cubic foot.....	Rs. 29,375
To two years' loss of Revenue at 25,000 Rupees per Annum	50,000		
Total Rupees.....	89,483	Total Rupees.....	29,375
		Loss	60,108

Or sufficient to pay a Conservator for five years. There is not a single item on the debit side that is not under the mark. I do not think Captain Brine could possibly have deposited the Vengay at the foot of the slip for 4½ Annas the cubic foot, as

	As.	P.
Felling and squaring, is, per cubic foot.....	1	3
Dragging to road.....	1	0
Carting.....	1	0
Slipping.....	1	3
Supervision.....	4	0
Total, Annas...	8	6

With good management the above rates might have been sustained, but certainly not if Captain Brine's year is to be taken as a specimen; for instance the cost of his Elephants for the year was above 4,000 Rupees, he did not deliver more than 18,000 cubic feet at the foot of the slip, or the cost for dragging and slipping was nearly four Annas the cubic foot, instead of two Annas three pice.

I have, in the above calculation, allowed nothing for the seignorage on the trees which at 1-8-0 per tree producing a log of 16 cubic feet, 4,690 trees to make the 75,000 cubic feet or Rupees 7,035, or a total loss of 67,143 Rupees.

Had Captain Beddome's recommendation of four Annas a cubic foot been carried out, the loss to Government would have been much more, or nearly 77,000 Rupees.

99. SLEEPERS.—It is a question if the Railway will not have to return to wooden sleepers, it has been found at home, that the want of elasticity of the iron-pot sleeper destroys the rolling stock, and unless some method of obviating the damage be discovered, iron sleepers must be

abandoned. Travellers at home have given up their season tickets, sold their country houses, and returned to town, being no longer able to endure the concussion caused by travelling on iron sleepers. There is also the liability to damage from salt-earth mentioned in my last Report.

One cause of wooden sleepers not lasting, is, that under the chair a hollow forms, in this, water lodges, and causes rapid decay. A small piece of galvanised sheet-iron fitted over the part, would prevent the formation of a hollow.

100. MALABAR TEAK.—This wood for the use of Gun carriage wheels has been discontinued by the Superintendent, as it was found quite brittle. I have explained this to Colonel Maitland by showing him that he must have been supplied with girdled Teak. Good cross-grained Malabar Teak is superior to any wood for wheels. Girdling Teak has long ago been given up, it makes the wood brittle and deprives it of its oil.

101. SATINWOOD.—Some of the finest Satinwood that I have seen any where, is to be met with near the foot of the Anamallais; this valuable wood is rapidly disappearing, under the cultivator's axe, I would recommend a few hundred loads being cut, and stored near the foot of the hills, it could be sent to Madras per Rail.

102. TEA PLANTATIONS.—I have inspected the Tea plantations of Messrs. Mann and Rae, they are both being extended. Mr. Thomas, the Collector of Coimbatore, made a mistake in supposing that a Tea tree should be five years old before plucking, the best Tea is made from three years' old trees. I have again to offer the remark that, I do not think, much land will be taken up unless the market value of the Tea is established, and Burgher holdings carefully defined.

103. WASTE LANDS.—The numerous applications for Forest land that have poured in, has caused considerable embarrassment, where the opening up of the country is so desirable, it does not seem right, to refuse all Forest land, and I would again bring to the notice of Government, that unless ten to twenty per cent. of the land given is Forest land, it cannot be expected that any extensive cultivation of Tea or Cinchona will be tried. In a letter addressed to Mr. Thomas, Collector of Coimbatore, on certain applications for the Devi sholah, I remarked that it was not compatible with the advancement of enterprise to systematically refuse all Forest land, for Tea or Cinchona, that I saw no objection to giving the land, provided the following conditions were observed:—That the Forest above 6,700 feet should not be cut, thus leaving a ridge of 450 feet to attract the rain fall, that for every bandy load of wood sold, one Rupee seignorage should be paid. These, I think, were fair conditions for both parties, and would whilst protecting Government from all loss, have encouraged enterprise. The first pioneers should have liberal terms. Tea and Cinchona once successfully established, the conditions might be made more stringent.

104. ASSISTANTS.—With the exception of the Annamallais and Cuddapah, I am well satisfied with the exertions of the Assistants.

105. OFFICE.—Native Surgeon F. Appavoo has conducted the duties of the Office satisfactorily. My Head Clerk Mr. Spring has also rendered satisfaction.

106. MAP.—A map by Captain Hunter showing the Wynad Forests accompanies this report, if it were lithographed it would be found useful and might be appended to the report.

107. NORTH CANARA.—This our finest Forest having been made over to the Bombay Government, I have but few remarks to make.

108. Financial remarks.—It appears that Mr. Muller failed to realise the value of his wood this year, but has accumulated a large stock in Depôts, which I have taken credit for in the receipts of the year, as timber made over to the Bombay Government.

109. FINANCIAL REMARKS.—From the table above it appears that the net profit of the year amounts to the large sum of four lacs, twenty-eight thousand six hundred and thirty-nine Rupees with a stock of Timber, worth two lacs and sixty nine thousand Rupees, this is entirely due to the large amount of Timber transferred to the Bombay Government, on the making over of North Canara. If the North Canara profit is reduced to the same figure as it stood last year, viz. 1,74,754-11-7 then the results of Conservancy for the year, show as compared with last years as follows:—

	Rs.	A.	P.
Profit for 1860-61.....	1,83,731	10	9
Do. 1861-62.....	2,03,585	0	0

or an increase in the general Revenue of Rupees 19,853-5-3, had the Anamallais not exhibited such an extraordinary deficiency, the profit would have been much greater. The profits for the last 3 years then, taking the Revenue on the above data for a fair comparison will be as follows:—

		RS.
	Receipts for 1859-60.....	1,98,294
See page under Anamallais,	Do. 1860-61.....	1,83,731
	Do. 1861-62.....	2,03,585

It will from the above be apparent that notwithstanding the Department has been saddled with the whole of the Military pay, making a difference of some 20,000 Rupees in the salaries for the year, that the general results of Conservancy are in favor of 1861-62, and had North Canara not been lost to us, I have no doubt, but that next year would have shown, increasing favorable results, for though the Anamallais exhibit a deficit of Rupees 20,000, still as I have explained some 3,000 planks, worth 90,000 Rupees were cut last year, at a cost of Rupees 42,200, so that in fact, if the whole of the Annamallai wood cut last year had been sold, there would have been a profit of Rupees 50,000 instead of a loss of 20,000 Rupees, this amount of profit will only appear next year, when the planks have been sold.

South Canara has slightly fallen off for want of a proper Establishment, this Forest as I have explained, requires to be systematically worked, to produce a fair Revenue.

Mudumallai Forest exhibits a slight profit, with a large stock of timber on hand, there is also an item of Rupees 6,000 due to the Forest by the Wellington Barrack's for wood supplied, but as the matter is still under inquiry, the Forest has not been credited with it.

Sigúr exhibits a good balance and one that will annually be kept up.

The Neilgherries show a deficit due to the excessive cost of supervision, if placed under the Officer in charge of Mudumallai the balance will shew a fair profit.

Salem exhibits a large profit, and a good stock of wood on hand, the demand for every kind of wood in this District and the Railway passing through it, explain the large returns.

Madura shows a fair return, which as I have explained might be more than doubled, if the Forests are systematically worked.

Cuddapah the above remark applies also to these Forests.

Wynád, if the proposed amalgamation, of the Wynád and Hoonsoor Forests, is carried out, a handsome annual profit should be realized.

Nellumbore, the sales here were not effected by the Collector in time to appear in the annual returns, hence the apparent deficit and the large stock of wood on hand.

110. CONCLUDING REMARKS.—What the Financial results of the present year will be, can only be approximately arrived at, the loss of North Canara will of course reduce them materially, still if the Neilgherries are placed under Mudumallai, the Annamallais, South Canara, Wynád, Madura and Cuddapah worked vigorously and the pay of the 1st Assistant merged into a Forest charge, the profit may probably amount to a lac of Rupees.

As I have no longer any records to refer to, much of this Report is written from memory, I therefore trust that Government will excuse any shortcomings that may be due to want of documents.

I have the honor to be, .

Sir,

Your most obedient Servant,

(Signed) H. R. MORGAN, Major,

Late Offg. Conservator of Forests.

Financial results of Forest Conservancy, for 1861-62.

Disbursements.	Receipts.	Balance in favor of Government.	Excess of expenditure over receipts.	Estimated value of Timber on hand.	Remarks.
Anamallai.....	42,200 14 11	22,090 10 2	20,110 4 9	91,000 0 0	
North Canara.....	92,435 12 9	4,90,147 0 0	3,97,711 3 3	...	
South Canara.....	2,939 11 3	8,594 7 0	5,654 11 9	...	
Mudumallai.....	34,346 14 7	37,936 5 1	3,589 6 6	1,28,090	
Sigur.....	5,643 0 5	25,006 11 4	19,363 10 11	10,000	
Neilgherries.....	8,865 5 4	6,245 9 5	2,619 11 11	...	
Salem.....	7,515 10 10	52,124 14 8	44,609 3 10	20,000	
Madura.....	2,154 0 0	6,526 7 10	4,372 7 10	...	
Cuddapah.....	2,759 1 10	5,481 13 3	2,722 11 5	...	
Wynad.....	5,210 15 9	5,389 13 9	178 14 0	...	
Nelumbur.....	3,779 5 6	808 0 0	2,971 5 6	20,000	
Australian Plantation.....	1,473 6 0	...	1,473 6 0	...	
2,09,324 3 2	6,60,351 12 6	4,78,202 5 6	27,174 12 2	2,69,000 0 0	
<i>Deduct General charges.</i>					
Pay of the Conservator, Office Establishment, travelling allowance, Contingent charges, &c.,	22,387 14 1	49,562 10 3			
Excess of expenditure over receipts.....	27,174 12 2				
Net profit.....		4,28,639 11 3			

APPENDIX A.

Annual Administration Report of the Wynád Teak Forests for the official year ending 30th April 1862, under the charge of Captain A. Hunter, Acting Assistant Conservator of Mysore and Wynád Forests.

Wynád Forest Establishment why and when raised.—As this is the first Annual Report regarding the Wynád Teak Forest, I shall commence by showing why the Establishment was made. It appears that in the year 1858, the Conservator of Forests visited the Wynád Teak Forests for the first time, and considered them of such great value, and extent, that he recommended that an Officer should be appointed to traverse these Teak Forests, till a system of robbery and spoliation introduced during the last few years by certain trustees of certain ruined Devasthanums was suppressed. To prevent the great waste of Teak &c., and to fix the boundary and watch it, the Government on the 18th September 1860 sanctioned the present Establishment, consisting of

1 Assistant Conservator at Rupees	100	0	0
1 English Writer at „	11	10	8
1 Duffadar at „	3	5	4
1 Goomastah at „	6	10	8
14 Peons at 2 „	28	0	0

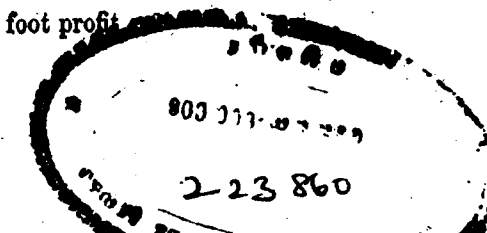
Being one-third of the pay of the Establishment, and amounting altogether, including Military pay, to Rupees 4,980 per annum. An arrangement was effected with the Commissioner of Mysore for the remaining portion of the salary and expenses of the Establishment. Captain Hunter, the present Officer in charge having raised the Establishment entered on his duties on the 22nd February 1861, and the result of his labours has been as follows :—

The extent of Wynád Teak Forests.—The Teak Forests in Wynád lie along the Mysore frontier, from Mudumallai in the South to the confines of Coorg in the North, a distance of about forty miles. The Belt of Teak on an average is about six miles in breadth. This Belt also contains an abundance of very fine Blackwood, Honah and Muttee. The central portion is the broadest and richest in Teak, it grows straight and to a good height, and contains fully fifty good teak trees to the acre. The Northern part of the Belt from Bowally to Coorg is narrow, but also very rich in fine teak. In the days of Hyder and Tippoo, these Forests were worked to a great extent, there are good cart track-road and outlets to the Eastward, and timber is easily floated down the Cubbany river.

Waste of Teak.—Of late years and previous to Dr. Cleghorn's visit in 1858, any one who chose took prime teak from these Forests into the Mysore country, paying a small stump fee, either to the Tahsildar of Wynád or to the Devasthanum representatives; but whether these fees were paid to the rightful proprietors is a very important question.

Damage done to the Teak Forests.—These forests were consequently much damaged not only from this cause, but from squatters and Coorooburs burning and felling the trees in large quantities yearly, for the purpose of cultivating Raggee.

Value of the Wynád Teak Forests.—The value of these Forests, is very great and in my opinion are now the first in importance, as Wynád will soon have outlets towards the West to the sea coast. In 1855 the price of Teak at Mysore was from 6 to 8, Annas a cubic foot, which gave the wood merchants who worked the Forests (as they chose) not less than 25 per cent. profit, and if taken to Bangalore fifty per cent. more. The Mysore Government, some five years ago, saw their mistake, and at once stopped this system of "Gooty Kanum," or stump fee and worked their Forests themselves, and now obtain at least one Rupee per cubic foot profit.



Price of Teak at Mysore in consequence of that Government taking the working of them into their own hands.—During the last three quarterly sales at Mysore, Teak* cut in the Forests which adjoin those of Wynád, the receipts per foot of first, second, third, and fourth class by auction quarterly has been on an average as follows:—

* Usual dimensions.
20 feet long 12 X 2
10 do. 21 X 21
15 do. 18 X 10
Branch pieces.

August 1861 ... at Rupees 1 9 3½ per cubic foot.
December 1861 ... at do. 1 12 7 do.
March 1862 ... at do. 1 6 4 do.

Present value of old girdled Teak in Wynád and amount sold.—Even with my small conserving Establishment during the dry weather, I have been able to work on contracts some of the Government Forests in this Belt of teak. I found that many trees, years ago, had been girdled, and would not last long. I obtained at different periods the following rates, and sold Rupees 5,389-13-9 worth.

In Kotheraycottah Forest . at Rupees 0 5 2 per cubic foot.
In Koorcheat do. ... at do. 0 6 6 do.
In do. do. ... at do. 0 8 0 do.

Expected profit, should Government work the Wynád Teak Forests.—This was a clear profit, as the Contractors had to fell, trim, and remove at their own expense, and the Railway demand is so great that I have no doubt that they would buy any quantity at the highest market price, if it was removed to Mysore.

Thus the value of Teak in these Forests if worked by Government would, I should say, bring a profit of at least twelve Annas per cubic foot, and when the road to the coast is opened, a distance of not more than eighty miles, the profit would be at least one Rupee. The supply is immense and the Belt also abound in Blackwood, Anjley, Honah, Muttce, and Cedar, and as it pays Coffee planters to saw up the Blackwood on their estates, and to send it to the coast by coolies. I have no hesitation in pronouncing these Forests as about the most valuable in Southern India.

The tenure on which the Teak Forests are held.—The Teak Forests are contained in the Eastern Umshoms or Parishes mentioned in the margin, the Forests in the two former are escheats, as they belonged to the Pychee Rajah who was killed in the palace of Poolpully in 1806 as a rebel. Those in the two latter are partly claimed by some pagodas, and the question as to who is the rightful owner to the Forest Teak lands is now before Government. In the meantime all felling in these disputed Teak Forests is stopped. Colonel Wilkes, many years resident of Mysore, in his history of that country states, that the Rajah of Coorg obtained the whole of Wynád as far as Kulpatta as blood-money, and that the Poon was a royalty. Teak to this day is a royalty of the Nellumbore Rajah in the South of Wynád.

Why Tippoo kept this Belt of Teak Forest as a royalty.—Tippoo evidently used this Belt of Teak Forest both for timber and as a barrier, in a Military point of view. He erected forts along the Belt, and through it he had his only road via Sultan's Battery into Malabar, down the Tambecherry Ghát. At Moogoodoo or Moorgull there are three stones with the name of the (two) Rajahs and the Crest of the Honorable East India Company dated 1805, and the records of Mr. Warden, who was then Collector of Malabar, might be able to throw some light regarding the tenure and boundary of these Teak Forests.

Why the Teak Forests were not declared escheat in 1824.—It would also appear that in 1824, Collector Mr. Vaughan did not declare the disputed portion of these Teak Forests escheat, the eastern boundary of which was unknown and, I doubt, if he

could have done so, as it was only in the year 1823 that the Trigonometrical Survey of Wynád was done by Captain Ward, and it could not have been published till long after. The Eastern boundary of Wynád according to the said survey runs almost in the centre of the Teak belt, and this was done by Order of the Supreme Government, with a view I imagine to give Mysore half the Teak Forest and the Madras Government the other half; however, the claims now put up by the Devasthanams are modern and it is only in the last few years that both the Mysore and Madras Governments have been made aware of the great damage and robbery committed in their valuable and extensive Teak Forests.

Resources of the Wynád Forests.—The following is a list of the Teak Forests in the Belt from Mooroogal or Moogoodoo in the North on the confines of Coorg to Tippocaudoo in the South on the high road to the Neilgherry Hills.

Name.	Resources.	Who claimed by.
Iyapenpara Kukary.....	Possessing teak in abundance.	By the Tiruelly Temple.
Kooteray Cotta.....	Do. do.	Government property.
Masaul.....	Possessing but teak young. This Forest having been exhausted of prime teak.	Do.
*Susyville *Hoolhully *Pambray *Kaper *Poolpully	Commonly called the Veddykynad. Possessing teak in abundance.	Claimed by Poolpully Temple.
Koorcheadoo Kallymallay Mungigal Toromungal Hurrygoonge Echecocon	Commonly called the Veddykynad Escheat. Possessing teak in abundance.	Government property escheat.
Edditoracottah Kalamungul..... Bene.....	Do. but not easily to be got at.	Government property escheat.
Nardimallay Tippocaudoo..... Caroor.....	Do. easily worked.	Do.
Moodoomallai.....	Do. teak nearly worked out by Government who obtained it on lease.	Claimed by the Nellumbore Rajah but the Umshom is an escheat.

The above marked* are all I believe in the Veddykynad or North portion which is the central portion of the belt from Mooroogal in the North to Edditoracotta or Ooscottah in the South.—See map.

Government, I believe, ruled in an Order dated 24th August 1841, that the Forests in the Veddykynad was their property; but still, the Poolpully Temple puts in a claim now for a great portion of it and the Nellumbore Rajah claims a large portion of the Southern portion of the Belt.

Regarding Order of Government dated 24th August 1841. Writer has not got it and therefore cannot quote it in a detail.

An idea of the resources of the teak Belt may be formed when, in 1855, the Trustee of the Tiruvelly Temple offered to give Mr. Williams for the Railway (under penalty in case of failure) three thousand Teak trees, one thousand of which were to be of not less than four feet in diameter and the rest not less than two feet from the Forest of

Resources of the Northern portion of the Belt. Offer made to Mr. Williams of 3,000 prime Teak trees in 1855.

Iyapenpara in the North (between Moogoodoo and Masaul) and he, the Brahmin Trustee estimated this portion claimed by him to contain ten thousand of Teak trees fit for immediate felling and several thousands of other useful timber trees, and Mr. Williams had no doubt he could easily fulfil the contract.

The consequence likely to arise if Forest teak lands are granted to Trustees of Temples.—The Temple Trustees have already done great damage to the Forests. If what they claim is granted they would sell all their Timber trees at once and then sell the land for Coffee (and it is the best in Wynád), but it is a fact that the large Coffee plantations between this part of the Belt claimed by the Tiruvelly Temple Trustee and his own lands have been mostly granted to the Planters by the Government or by squatters, such as the Bagherry estate, the two large Pen estates, Oliate, Calipa, Dr. Magrath's, &c.

The claim of the Trustees of Temples modern and unfounded.—If the modern custom of these Temples, of having sold timber on stump for 8 Annas per tree to the wood merchant, without the knowledge of Government (Wynád being then a sealed book to all but the Tahsildar of the taluq which contain 16 villages and 1,160 square miles of land) is to establish a claim to the proprietary right, it will be found in the records in the Cutcherry at Calicut that the revenue derived from 1851 to 54 on account of Government, for felling at the same rate was Rupees 640 for 1,280 Teak trees. The records may go still further back, and may also show that Government exercised the same right as the Temples. I am unable to state in what forests these honest men cut, who paid the Tax to Government. The tax doubtless was often evaded, and Tahsildars in a wild Taluq like this, in olden days were not backward in allowing temples every possible liberty.

The difficulty in controlling the revenue when the taluq of Wynád was under a Tahsildar.—In November 1849 for instance Mr. Chatfield writes from Manontoddy to Mr. Conolly the Collector thus, "In respect to the difficulty of controlling the revenue every body now cuts timber as it pleases them and from the nature of the country it is most difficult, if not impossible to prevent such proceedings."

On the 5th October 1860 Government directed that no teak cut in the Belt should be passed into Mysore, till the question of ownership was settled, and I stopped at least five thousand logs, which are now lying, three thousand on the Mysore frontier and two thousand on the Wynád side worth fully one lack of Rupees as they now stand, at one Rupee per cubic foot. The claimants, wood merchants state they were cut in the forests of Wynád belonging to the temples but this remains to be proved. This shows what the resources of these forests are and the above must have been less than one seasons work.

They also state that they cut and removed a great portion of the timber before the order was published, but if this was the case the Mysore authorities would not have prevented the wood passing through the first Taluq. They would have been but too glad to do so to obtain the tax on Wynád Timber, and the wood merchants have tried their utmost to evade this order.

Benefit arising from robbery of Teak being stopped.—In consequence of the robbery and spoliation of timber in Wynád being stopped, teak was sold at a fair price both at the Government Wood Depôt at Mysore and that of Madras at Mudumallai under Captain Gib, and I have even been able to sell some from the Wynád forests at eight Annas per cubic foot, the rate Government formerly got for a prime teak tree containing perhaps one hundred cubic feet.

Hoonsoor Commissariat Teak Forest much neglected and requires to be conserved.—I cannot in this report make mention in detail of the Hoonsoor large Teak Forests which is exclusively under the Madras Commissariat and worked by them, but it is highly desirable that it should be placed under the Forest Department, because the wasteful exhaustion of teak has not been stopped here. The Coorooburs revel in this Forest and have done immense damage and it is still going on. It is supposed that this Forest alone if worked under a systematic plan would give a regular supply of good timber to the State and the public. It has better means of communication than any in the Belt of Teak, and contains about one hundred and thirty square miles of Timber trees.

Means of Communication.—A glance at the map will show how rich in outlets the Belt is towards the East. With the exception of the main road in the North, these are good tracks and practicable for six months out of the year, from October till April and even May. From May to September the rains here are very heavy and the nature of the country and soil would stop carting, but this remark is not applicable to the roads leading from the main Depôts to Mysore if established as I propose at Antersuntry, Bagoor, and Koornajah. In fact towards the East they would be worked as easily as the present working Forest of Mudumallai. The Belt also enjoys the convenience of water carriage down the Cubbany river after the freshes, from Calavully and Susymallay to Humpapoor, a few miles from Mysore itself. Floaters are easily obtained at the latter place in Mysore. When Wynád is opened towards West, Teak timber could be sent down the Tambercherry Ghát as easily as Coffee, from the Kootheray Cotta and Masaul Forests via Bawally and from the central Forests of Koorcheat &c. via Sultan's Battery. The present track roads will require to be improved gradually and widened, as the Bamboo which surround all Teak Forest is very dense and chokes up their approaches. I am not yet prepared to lay out a plan of new roads for opening out the virgin Forests between Ediltorahcottah and Mudumallai.

Government Forest lands in Wynád not Teak.—These lands are principally contained in the four Umshoms adjoining the Teak Forests. They contain Blackwood, &c. and much bamboo land. In many places the land is well fitted for Coffee, the destruction of these Forests not containing teak for the bona fide cultivation of Coffee may be considered legitimate, but not so for Raggee, which spoil the land for ever from being cultivated for coffee. At least, if Raggee is cultivated on lands unsuited for Coffee, it should be done on a Puttah, with permission of the Deputy Collector and taxed at a low rate, and the present system of every man clearing and sowing Raggee where he pleases and paying no tax for the same should in my opinion be stopped. This system is carried to a great extent in the Umshoms of Ganaputhy vuttum and Moonanád in bamboo and tree jungle. The Chetty cannot afford to pay a high tax for Raggee which is cultivated to feed his servants (or to pay them the rates of wages given by the planters) who cultivate the rice lands. The price of labor is so high that they might also be allowed a portion of land at a low rent on Puttah in case they are compelled to leave their holdings but the portion given should not be extended without taxation and a Puttah. The present system as I observed is ruinous to Government and no Nair or Moplah land holder would permit such wasteful clearings without being well paid for it. By Order of Government, dated 16th January 1862, No. 402, all Raggee cultivation in Wynád is taxed 2 Rupees per acre.

Extent of Government lands in Wynád not known.—Government also possess some Forest lands towards Periat and Teriate, and in fact in several spots over Wynád, but I have been unable to find out their position, however, I have no doubt if they are well fitted for Coffee when applied for the real owner will be found. It is almost impossible to remove the squatters from them without a suit in Court.

- 1 Moonanád.
- 2 Ganaputhy vuttum.
- 3 Ellornand.
- 4 Poolpully dasum of Koorpatode.

Fitted for coffee cultivation.

Caused by Raggee cultivation.

Raggee cultivation under no check or taxation.

Teak line natural Boundary of Teak Forest.—The line of teak is the natural boundary of the really valuable Forest, it will always grow and yield well on this Belt and every exertion is used to preserve it. I believe that the Coffee planters are most anxious to know where the Government lands are available for Coffee, but the question I fear is unanswerable till they are demarcated and fixed by competent authority.

Increase of Wynád in Coffee plantations.—In 1858 Wynád contained (30) thirty Coffee plantations and now it contains upwards of one hundred estates. Europeans have greatly increased as well as labour and capital. Another great question to set at rest is the demarcation of the Teak Forest lands belonging to Government, as for instance, the extent of the Mudumallai Teak Forest, in the South of the belt, claimed by the Nelliur-bore Rajah is not known.

Map of the Teak Forests and the reason why the Government Teak Forests are not clearly laid down.—I have prepared a map of the Teak Forests in Wynád but the portions belonging to Government cannot be marked off till decided by competent authority. The Settlement and Survey parties have left Wynád, but what they have done towards demarcating and surveying the Government Forest lands, Teak or other Forest lands is not known.

Price of Forest Coffee-land in Wynád.—The Nairs towards the West are selling their Forest lands for Coffee planting at twelve Rupees an acre and one Rupee per annum quit-rent, which shows how valuable and how great is the demand for land at present and will give some idea of the value of Government land and the advantage that will be gained by having them demarcated and fixed for ever.

Population of the Teak Forests and their wants.—In the Teak Belt we have several bands of Coorooburs some of the Jani and others of Moolly caste they amount to about

Coorooburs.....	200
Gurcheas.....	50
Panniars and Pooliars.....	100
Chettys and Squatters.....	50

The former live entirely in the Forest. They are our only axemen, and without them it would be difficult to work a Forest. They do immense damage in clearing fine Forest for Raggee cultivation in fresh places yearly. The clearings are for many years after useless, even for Coffee. The destruction of useful timber trees is incalculable, but means have been taken to prevent this and this evil is now in a fair way of being put down.

It is one of my principal duties to put a stop to this "Takul" or Raggee cultivation in the Teak Forests, I have received prompt assistance from the Deputy Collector of Wynád Mr. Herbert Richardson in every case I have brought forward, and many Coorooburs and Chettys have been fined, some even to the extent of fifty Rupees.

Provision for the Coorooburs and Farm Slaves of Chettys or Farmers.—The Coorooburs through their Headmen are held responsible and the Chettys are also responsible for their Panniars or farm slaves. The practice would soon be put down if the Assistant Conservator was armed with powers to fine for such wilful waste and destruction of Government Forest, and which no amount of planting will counteract.

This power is allowed in Pegu (see Page 327, Rule 20, 21 and 22 in Cleghorn's Forests of South India).

The Cooroobur has no lack of labor. His services are constantly called for by the wood Contractor and the Planter. They will not leave their haunts in the Forests for any time, and if they must have clearings, it would be advisable to give each Headman a portion of land already cleared on Putta. Some arrangement of this kind might be made through the Deputy Collector, and the same might be allowed to the slaves of the Chettys who make this clearings in the Forest, near their rice holdings in the swamps. If we withhold the privilege of clearing for Raggee, these Chettys will be ruined and their servants will leave them,

under restrictions a piece of land might be granted, there are lots of old clearings near such holdings, and they have done what no Planter dare to, burning and felling the Forests in fresh places yearly, and will secretly continue to do so, till the matter is taken up by the Revenue authorities. I calculate that, at least, one hundred acres of Teak Forest is thus destroyed annually containing fully five thousand Teak trees, the evil has been in a great measure reached and I trust will soon be entirely stopped.

Fever and sickness in Wynád.—The months of April and May, September and October, before and after the heavy rains are the most sickly for fever, and during the rains it is with great difficulty my Establishment can traverse the Forests. The grass is there very high, leeches and flies abound, and in this large range there is not a single village, here and there one may meet with a solitary squatter or a small congregation of Jani or Moolly Coorooburs; but the Peons often find no shelter and dislike to move about in the wet season. I have lost one Peon from fever, and others have left very sick, almost in a dying state; others again have deserted and I find it most difficult to get men fit for the work on the salary now allowed, six Rupees per month.

Want of Medical aid and Medicines.—I may also observe that there is no Government Medical Officer at Manantoddy. A private Practitioner, Surgeon G. Cream, is here, who has shown my Establishment every kindness in his power, in every way, as yet without any remuneration.

Contractors.—Most of the applicants for timber are wood merchants at Mysore, who have worked these Forests before they were conserved, and claim timber now lying on the frontier of Wynád and Mysore. I have therefore been obliged to be careful in accepting and framing contracts, especially as my establishment is small, a watching one in fact, and not yet on a footing to work the Forest to any large extent. The Contractors I find are ever ready to enter into contracts, and it is with the greatest difficulty I can get them to fulfil them.

Why more revenue has not been obtained.—The large extent of my charge and my duties in Mysore have prevented me showing more revenue. The Forests have been carefully watched, I am acquainted with their resources, outlets, extent, and value, the system of Takkul cultivation has been in a great measure stopped, the boundary has been laid down and all clandestine felling and removing of felled timber (till the rightful owner is known) has been stopped and guarded.

Boundary between Mysore and Wynád.—The disputed portion of boundary eight miles, in length between Moogoodoo (the three stones and the bridge of Bawally) has been laid down. A belt of twenty-five feet having been cleared, on the 17th January 1862, I accompanied the party under Messrs. Stuart and Ricketts, and understand that when the line receives the approval of both Governments, I shall be directed to lay down the boundary Stones at every two furlongs and keep the Belt clean. These pillar stones are ready at Kakencotta. The whole boundary to the intersection of the three boundaries of Mysore, Coimbatore, and Malabar, will then be clearly defined and marked with the exception of a small portion between the fifth boundary stone in the vicinity of the Rampoor road towards the Shegabetta tree (Trigonometrical station). I have had stones prepared for this latter portion and hope to lay it down next season. The party in 1859, with Dr. Cleghorn, were prevented doing so on account of fever.

Conclusion.—Should this Report be considered incomplete, I beg to mention that as I am also Assistant Conservator of the Mysore Forests, much of my time and duty has been taken up in that country, in supervising the working of their Forests, in traversing them to prevent robbery and spoliation. In making myself acquainted with their resources and outlets. In checking the tax on junglewood and also the illicit smuggling of Sandal-

wood. In marking out the boundary between Mysore and Malabar and looking after it. It will be observed that my Establishment is but a watching one, that the charge is a large one and gradually extending, and if separated into two, greater progress and check would be the result. Especially in the working of the Wynád Forests, the value and extent of which, I trust, is now well known. The Conservator of Forests, Major Morgan, proceeded on a tour of Inspection in the Wynád Forests and traversed them from the 19th February to the middle of March 1862, and in my monthly Progress Reports, full particulars of my proceedings during the year are given.

(Signed) A. HUNTER Captain,

Acting Asst. Conservator of Mysore and Wynád Forests.

APPENDIX B.

MUDUMALLAI FOREST.

Administration Report of the Mudumallai Forest for the official year 1861-62.

Financial results.—On 30th April 1861, there was an outstanding balance of Rupees 1,954-6-4, with this, Rupees 30,000 were first granted to work this Forest with during the year. Rupees 5,000 and 917-12-5 were subsequently received from the Annamallai and Sigúr Forests respectively, total Rupees 37,872-2-9, of this Rupees 34,346-14-7 have been spent; but in order to show the exact expenses incurred in working the Forest, a portion of the Military pay and allowances of the Assistant Conservator in charge, amounting to Rupees 3,127-3-0 which was not drawn from the Forest grant must be added. This gives a total of Rupees 37,474-1-7, while Rupees 37,936-5-1 have been realized by the sale of Timber &c. &c, and remitted to the Collector of Coimbatore; balance in favor of the Forest Rupees 462-3-6. But to arrive at the exact Financial state of the Forest it will be necessary to add to the above sum, the value of the Timber felled and squared during the year and now lying in the Forest as well as of that which has been carted and placed in Depôt at Tippacaudoo, Musnigoody, and Ootacamund, and still remains at those places unsold. Placing the low valuation of eight Annas per cubic foot upon the Timber in the Forest, twelve Annas upon that at Tippacaudoo, twelve at Musnigoody, and one Rupee at Ootacamund. Thus we have—

	RS.	A.	P.
1,03,623½ cubic feet in Forests, &c.....	51,811	12	0
45,179 „ at Tippacaudoo.....	33,884	4	0
52,927½ „ at Musnigoody.....	39,695	13	0
2,805½ „ at Ootacamund.....	2,805	12	0
Rupees...	1,28,197	9	0
Add excess of Receipt and Expenditure.....	462	3	6
Add 2,041 cubic feet of Timber supplied to the Wellington Barracks at 1-4-0 per cubic feet.....	*2,551	4	0
Gives Total in favor of the Forest.....	1,31,211	0	6

*This amount has not been realized in cash, because at the time of transfer of the Forest from the Barracks to the Forest Department, it was supposed the Forest was still indebted to the Barracks, Rupees 52,413-8-2; but the Board of Revenue have lately ruled that this was not the case in paragraph 8 of their Proceedings, dated 7th April 1862, No. 2,279.

This balance would of course be greater were a portion of the pay and allowances of the Assistant Conservator in charge debited against the Sigúr Forest, which is also under his care.

Roads.—No new roads have been opened, but the old ones have been kept in thorough repair, and three new Bridges have been made.

Coorumbers.—The Coorumbers have as usual been employed in felling Teak trees only, it being against the terms of the lease to fell any other. On two occasions numbers of them have run away, but as they had received advances most of them have been brought back. •The increased demand for labor in Coffee plantations where not only the able bodied men, but also the women and children find employment, is no doubt the great inducement for them to abscond, and this will always be a difficulty in Forest operations as it is impossible to employ the women and children.

Sawyers.—There are seven sets of Sawyers employed. There is work for more, but they cannot be induced to come in consequence of the unhealthiness of the place.

Elephants.—The same four Elephants that were in this Forest last year are there still employed in dragging Timber. There was a fifth, but it being very young and too small for work was sold and the price realized placed to the credit of the Forest along with that of the Timber sold. Another sick Elephant which was sent from the Annamallai Forest in hopes that it might derive benefit from the change, died in March 1862. More elephants were much required, but until last month, when six Commissariat ones were obtained, could not be procured.

Bullocks and Carts.—The Bullocks have constantly been employed in carting Timber either to the Karkana in the Forest or to the Depôt at Tippacaudoo. Twenty-five bullocks have been purchased during the year. But unfortunately in March and April which are good months for carting almost all the Bullocks on the Establishment both old and new were laid up with sore mouths and feet, and this of course lessened the quantity of Timber placed in Depôt. Thirty-seven old and useless Bullocks were sold and the proceeds placed to the credit of the Forest with the Timber money.

Buffaloes.—The Buffaloes have, as occasion required, been employed in dragging and carting Timber.

Bandy Contractors.—Much of the Timber that is carted out of the Forest is taken by contract, but during the past year, the Contractors have given a great deal of trouble. They have been willing enough to take advances, but have been slow in working them off, and there is consequently a balance of Rupees 1,548-2-1 still against them, which they must work off in the ensuing year. For the future it is proposed to trust more to our own carts and bullocks and a number must be purchased. Provision for this has been made in the Budget estimate for the year 1862-63, and this is more urgent during that year as the lease expires on the 23rd March 1863, after which date all Timber left in the Forest escheats to the Nellumbore Rajah, the proprietor of it.

General Remarks.—The health of the Establishment employed in the Forest has been tolerably good. Of course, fever has at times prevailed, but not more so than usual in Forests. Great credit is due to Kistnappah, the Karkana manager, for the way in which he has conducted his most arduous and onerous duties. Until last month when unfortunately he had an attack it was supposed that he was constitutionally quite impervious to fever, and this peculiarity makes him invaluable for Forest work.

(Signed) W. A. GIB, Captain,

Asst. Const. Mudumallai Forest.

OOTACAMUND, MUDUMALLAI FOREST OFFICE,
5th May 1862.

APPENDIX C.

SIGUR FOREST.

Administration Report of the Sigur Forest for the official year 1861-62.

Financial Results.—During the past year there has been no felling of Timber in this Forest, but the Curumbers have been employed in the Suttiamungalum Taluq felling Sandalwood; six thousand Rupees was granted to work the Forest with, of this Rupees 917-12-5 have been transferred to Mudumallai Forest, and Rupees 5,050-7-4 have been spent, while Rupees 25,006-11-4 have been realized by the sale almost entirely of Sandalwood and remitted to the Collector of Coimbatore, leaving a balance in favor of the Forest of Rupees 19,956-4-0. There would have been a larger profit as there is still plenty of Sandalwood, but labor is not procurable owing to the unhealthiness of the District.

(Signed) W. A. GIB, Captain,
Assistant Conservator in charge of
Sigur Forest.

OOTACAMUND, SIGUR FOREST OFFICE
5th May 1862.

APPENDIX D.

SOUTH CANARA.

On looking over former annual Reports forwarded by the Collector, I find that a description of the jungles placed under my charge have not been given, and as I consider such description necessary to enable you to form a correct idea of the supplies that may be expected from them, I beg to submit the following:—

Description of the Jungles in South Canara.—The jungles in this District bears no comparison to the jungles of Malabar or North Canara where there are large tracks of Forest uninhabited, and where, by making a single road, some three or four thousand trees could be got out. Our jungles are thickly populated, not by wild or wandering tribes, but by farmers, who carry on cultivation to a considerable extent, each farmer is allowed the space of 100 yards all round his fields, on which he is allowed to cut Timber and bamboos for his own use, free of all charge; besides this, there are several tracks of good Forests which are called Merchi wurgs (Pepper wurgs). The Ryot pays a Beriz on the wurg of five Pie per Pepper vine, I believe, but whether the vines are ever counted or not, I cannot say. When the Koomki land and Merchi wurgs are separated from the Government jungles there is but little left, and on this little, ripe trees are few and scattered. I may here state that I am at present engaged in girdling 1,500 trees of restricted timber, in the jungles in the Uppenangadi Taluq, and they are scattered over a track of jungle some thirty miles long, by five miles average width. Young trees are found in abundance, and with care there may be a considerable quantity of Timber got in this part some years hence.

Cassergode Taluq.—This Taluq has been almost all under Coomry cultivation, there is at present nothing left in it except small tracks on the face of the Ghauts, and such tracks are unfortunately so situated that it would be very expensive to get Timber out of them.

Sooliah.—This jungle is situated partly in Cassergode and partly in Uppenangadi Taluq. There was formerly some good Teakwood in this track, but it is now exhausted, however, there is a quantity of young Teak and Blackwood springing up again, which are worth taking care of. During the year there has been 50,000 young trees pruned, all of which have a healthy appearance.

It is in this track of jungle that we have commenced to prepare ground for planting in. We have at present 6,000 pits dug, which I hope to be able to fill with plants during the rains.

Uppenangadi Taluq.—The greater part of the Timber and Bamboos cut yearly by the Merchants come from this jungle. Ripe trees of any kind are getting scarce; we have some difficulty in finding the number of trees required yearly.

Mangalore Taluq.—The jungle part of this Taluq runs along the face of Koodramuck, there is some good junglewood here, but restricted trees of any kind are few, the Timber in this part is comparatively speaking valueless. As there is neither road nor river leading from it, except at Naravu, where the Goorpoor river rises, at the head of this river we have some Poonspars, but merchants will make no bid for them, as they consider, that bringing them out, would be too expensive.

Oodipi Taluq.—From Mala to Andar the jungle is inferior, a good tree being seldom met with; it is in this track that the Sandalwood-oil stills are erected. From Andar to Someshwar (in the same Taluq) along the face of the Ghauts, we have some good Timber, the restricted kinds are Blackwood and Siripoona. There are five rivers running from this part to the coast; and there would be no difficulty in getting Timber out of this jungle, but merchants refuse to work it, as they consider it would be too expensive to bring Timber from there to the Mangalore market.

Timber supply.—I cut no Timber; I merely mark the trees, they are then given over to merchants who pay a seignorage of six Annas per Bombay candy on as many candies as they think they can cut and bring to the coast in one year, any Timber left behind is forfeited to Government, and sold by auction. The seignorage on Bamboos is eight Annas per 100. The following table shows the quantity of Timber and Bamboos taken to the Coast during the year.

Source of Revenue.	Amount.		
	RS.	A.	P.
3,756 Bombay candies, at 6 Annas per candy.....	1,408	8	0
30 Boats, at 3 „ per running foot.....	115	0	0
2,51,915 Bamboos, at 8 „ per 100.....	1,259	9	3
440 Sandalwood Stills, at Rupees 1-10-6 per Still.....	728	12	0
Sale of confiscated Timber.....	3	0	0
Timber supplied to Ryots by Forest Department.....	10	3	6
Total Co.'s Rupees...	3,525	0	9

This table does not represent the whole of the Forest Revenue; the remainder is collected by the Collector and his Subordinates. The following are the different heads under which the remainder is collected:—

Timber supplied to Ryots.

Sale of confiscated Timber.

Firewood exported.

Seignorage on firewood, cut by Sandalwood-oil Distillers.

Seignorage on Charcoal, burnt by Iron Smelters and Blacksmiths.

As I receive no accounts from the Collector, I am unable to state the amount collected under the above heads.

Engineer's Department.—The Engineers cut their own Timber and pay the usual seignorage on it, so what they have cut is included in the above table.

Charcoal.—There is no Charcoal made in this District for sale; the Coast towns are supplied from the Malabar jungles. The Blacksmiths and Iron Smelters of the interior burn their own charcoal and pay a fee of six Pie per Moodah to the Potails of their respective villages.

UPPENANGADI
3rd May 1862.

(Signed) E. THOMPSON,
Overseer of South Canara Forests.

APPENDIX E.

NEILGHERRY SHOLAS.

There is not much pertaining to these affording new matter. The accounts show the receipts as Rupees 6,852-5-11* and expenditure as Rupees 837-6-5. Receipts & Expenditure. As the Establishment is chiefly kept up for the purpose of conserving the Sholas, in the vicinities of the large Stations, and not as in the various Forests, for cutting Timber, it is not to be expected that the expenditure will be met by the return.

The revenue from the Neilghiri Sholas, which embraces the Hill Stations of Ootacamund, Wellington and Coonoor, is derived from the following sources, Sources of Revenue. viz., sales of contract for firewood to these Stations, contract for sale of charcoal to them, a tax of Rs. 2 on each new house, and 1 Rupee for repairing every old house of the Burghers, and also fines from people caught cutting wood without permission.

The contract for sale of firewood to Ootacamund for 1861-62, was sold for Rupees 3,900, by monthly instalments of Rupees 325, but the sum realized only amounted to Rupees 1,625. The Contractors Messrs. Wilson & Co. reporting they were losing much money, owing to Mr. James McIvor not being prohibited from selling wood, which he felled on Government land, in the vicinity of Ootacamund.

Charcoal Contract.—The charcoal contract was sold for Rupees 260, the contractor has afforded any thing but satisfaction, ever endeavouring to evade terms of the contract. The sales of firewood and charcoal to the stations of Coonoor and Wellington was sold for Rupees 2,400, by monthly instalments of Rupees 200, but the Contractor threw up his contract in January last, as he reported that the removal of the Troops from Wellington caused him to sustain a great loss, moreover in Coonoor very many parties, (generally Coffee planters) sell the felled timber off their plantations, to the people of Coonoor and Wellington; a practice, which it seems might be stopped, as the Government Pleader has stated that no Lessee can sever the wood from the land; were this once acted upon by an order of Government, it would prevent future misunderstanding.

Burghers Houses.—The amount realised from Burghers for their houses new and old appears in the margin.

Burghers Houses...	...	Rs. 279
Fines for cutting wood without authority..	"	34
		318

The firewood for the station of Ootacamund was procured from a large Shola, generally known as the Governor's Shola, situated (where the cutting was carried on) about seven miles from the Church. The charcoal was burned in the Shola known as the Peria or Devy Shola. The wood for Coonoor and Wellington was procured from a large Shola, a continuation of the Shola, which the Barracks got a grant of.

Nurseries.—As there was no regular conservancy Establishment previous to this year, every thing in the way of Nurseries &c. here, for replanting the Sholas had to be initiated. But in a small shola which during the preceding year had been rented to the contractor Madanah, and almost entirely cut down, 20,000 young plants, chiefly suckers of the *Acacia Molissima* were put down, and appears thriving very well, about 24 *Eucalyptus* plants also were planted, which also are growing very well. In the Nursery at this Shola, there are about 80,000 young plants of the *Acacia Stricta*, ready for transplanting as soon as the season admits of the operations.

A small portion of the Governor's Shola has been pitted and will be planted as soon as the season will allow of it. A Nursery has been made in this Shola and a quantity of seeds of *Acacia Stricta* and *Molissima* and *Eucalyptus* sown, which are just coming up; and it is hoped will suffice to replant the Shola. Much injury to the young plants arises from the cattle, which Burghers and Todders will persist in allowing to enter these plantations.

A portion of the forest cut down at Coonoor, has also been replanted with plants chiefly *Acacia Stricta* which are coming on well.

Subordinates.—With regard to the Establishment, Forester Friend has resigned his appointment and been succeeded by W. Taylor, late a private in the 3rd Battalion 60th Rifles. Forester Seffield has given great satisfaction by his zeal, willingness and energy in the discharge of his duties. Of the peons not much can be said, they are very far from being what they ought to be, and instead of putting a stop to depredations in the Sholas, it is much feared that they connive at these acts.

Kotagherry.—Nothing has been done as yet for Kotagherry, as without a watcher stationed there, no stop can be put to irregular cutting in the Sholas; an attempt was made to dispose of the sale of the firewood to the station to a contractor, but no one is willing to purchase the right, this seemed the only way by which a watcher could have been kept.

J. H. BABINGTON, Major.

Assistant Conservator of Forest.

OOTACAMUND, 9th May 1862.

APPENDIX F.

WELLINGTON AUSTRALIAN PLANTATION.

The amount expended on these plantations is very small, viz. Rupees 333-6-0, this is owing to the sum of Rupees 2,500 sanctioned in January 1860 being expended, and the annual grant of Rupees 500 not having been received from the Collector, for want of instruction from the Accountant General, besides this, a sum of Rupees 692-7-3 was deducted by Captain Farewell (from the amount lodged in his hands by Dr. Cleghorn, for convenience, to be paid to the Plantation Overseer from time to time as it might be required); the claim was preferred by the Wellington Barracks for stores, reported to have been issued to the Plantations.

From the above cause hardly anything has been done in the plantation, in fact since November 1861, not a cooly has been employed on it, as without funds it was impossible to carry on work. A sum of Rupees 100 was borrowed from the Nilghiri Shola Fund, and agreeably to the Orders of the Officiating Conservator of Forests paid to the Special Engineer of Wellington, towards the expenses of a new road, he is making along the southern margin of the ground for the plantations.

The trees generally have improved greatly since the last annual Report; the Porcupines destroy a considerable number of the healthy young plants; the remedy for this appears difficult. A piece of ground has been selected by the Officiating Conservator of Forests for planting, during the ensuing year, which as far as soil and exposure go, ought to prove very good; hitherto sufficient attention does not appear to have been paid to these necessary objects; the aim in view apparently having been, to make the whole a continuous plantation, and poor soil twice and even thrice planted without success. In some parts the plantation requires thinning, but at present there is but small demand for the description of timber the thinnings furnish. A fringe of *Pinus Longifolia* thrives well. *Pinus longifolia* on the west side of the old plantation is very thriving, and it is much to be desired that this description of tree was more cultivated in this place, but at present no seeds are available. Though were applications made to Bengal, a supply could readily be procured.

It appears that from the commencement of the plantation in 1856, about 106 acres have been planted with 2,40,000 young plants, chiefly *Acacia Stricta* and *Molissima*, but there are also a few *Eucalyptus* trees growing very well. The cost as taken from Dr. Cleghorn's reports,

and what has been expended since the plantation was placed under charge of the Assistant Conservator, Nilgiri Shola, amounts to Rupees 12,617-0-7, but in this is not included Overseer Hall's pay of Rupees 80, and horse allowance Rupees 15 per month.

The Garden at Ootacamund being kept up by Government, it is highly desirable that plants from it should occasionally be sent to Wellington, for trial in the plantations there, particularly plants of the *Coniferae* tribe, for which Ootacamund may be too cold; at all events it would be worth the trial, having two or three dozens of each kind of the above genus, planted at Wellington; mention has already been made of the *Pinus longifolia*, which the Superintendent of the Botanical Gardens, Calcutta, reported as growing more luxuriantly than in its own locality on the Himalays.

Overseer Hall has been as usual hard working and zealous, but in the plantation owing to the want of funds has been able to do but little, he has however not been idle, having looked after the Sholas at Conoor and planted a portion of one, which was cut down for firewood.

OOTACAMUND.
9th May 1862.

(Signed) J. H. M. BABINGTON, Major,
Assistant Conservator of Forests.

APPENDIX G. ANAMALLAI.

I have the honor to forward the annual Accounts of the Anamallai Forest for the Official year 1861-62, countersigned by the Collector in accordance with Extract Minutes of Consultation, dated 12th November 1857 No. 1,153 paragraph 9.

2. The amount realized by the sale of timber to the Bombay Government during the past year is Rupees 18,086-14-6, The Madras Gun Carriage Manufactory has not been supplied with any Blackwood or other description of timber during the past year, no requisition having been made by that Department. The only other source therefore from which revenue has been derived is from the sale of timber to private individuals. The usual annual auction sale did not take place, there being no bidders. I purpose having an auction sale in the beginning of next September, which is more convenient as well as healthier time of year. The aggregate receipts for the past year amounts to Rupees 22,090-10-2. The expenditure exclusive of the pay of the establishment is Rupees 32,448-12-11 making a total debit of Rupees 42,200-14-11. The expenditure for the past year therefore exceeds the assets by Rupees 20,110-4-9. The profit on the former years transaction was Rupees 14,166-2-6.

I beg to remark in explanation of what may otherwise be deemed a serious falling off in the revenue returns of this forest, that during the past year no less than 2,046 planks 257 heads and butts have been cut, and are in progress of carting and slipping. This has of course involved an unusually large outlay, while the proceeds of the sale of the timber cut cannot be realised in the present official year; as the timber cannot be entirely removed from the forest to the foot of the slip, and to the floating station till after the month of May. Meanwhile there is a large amount of cut timber on hand which will, when sold realise a considerable profit. The cut timber of all descriptions now lying in the forest in course of transit from it and in Depot of Mungarah, the floating station, is valued at Rupees 146,403-8-10. Out of 3,000 planks estimated to be cut in the past year 504 were cut by contractor and 1,799 by the Forest Department.

3. The sum of Rupees 2,500 has been included in the charge on the estimate for the past year on account of the purchase of one elephant. This sum I expected would have been paid out of a fund of Rupees 10,000 formerly granted for this purpose. and of

which a balance of Rupees 4,333-9-6 still remained unexpended. The Collector however objected to the disbursement of Rupees 2,500 from this balance, alleging that the sanction of Government was requisite.

4. With the exception of 6 logs lying near the Depot at Perwarry no loss or damage has occurred from the jungle fires.

5. I have endeavoured in accordance with your instructions to entertain Mulsars as permanent labourers on a fixed monthly salary; but they will not work on those terms. Their disinclination to take the permanent service is the result of their now possessing lands of their own, the cultivation of which partly occupies their time; and the produce of which I imagine is sufficient to enable them to live free and unshackled. They never can be got to work for more than a few days at a time, being altogether a wild, roving, and most dissipated set. My predecessor Lieutenant Ouchterlony could not obtain any of them to work as sawyers. I will try what I can do with them when I resume my residence in the Forest.

6. On my return to the Forest I intend executing the following extensions of existing roads to enable me to cart the Timber about to be cut with greater convenience viz. Present Main Road to be extended 4 miles a branch to be made from it at Perwarry, about 5 miles in a westerly direction, and another branch some 3 miles towards the south. The reconstruction of the Timber slip on the plan devised by you shall also have my attention.

7. I have experienced both this year and the last great difficulty in getting the cartmen to faithfully fulfil their contracts. This I apprehend will always be the case so long as the work of carting of the Timber above and below what is placed in the hands of so many individuals. It results in, but comparatively a small quantity of Planks and Logs being got out of the Forest during the current year, and consequently small sale either at Ponany or elsewhere. While the amount of Timber cut and lying in the Forest for want of carriage is always increasing in quantity, but diminishing in value, being exposed to risk of damage by fires and to all the alternations of heat, damp, and cold.

To remedy this I would suggest that parties be invited to tender for the conveyance of all the Timber requiring carriage. No Contract to be made for less than 500 Planks or part of that number to be Logs; and the whole to be completed in the current year under certain penalties, and good securities to be given. I would further suggest that instead of devoting the whole amount of the estimate for the ensuing year to the cutting of a large number of Planks, a few more Elephants to be hired to drag and slip the outlying Timber in the Forests so as to render it available for sale. A matter I conceive of some importance, now that the Railway is completed from coast to coast. The Elephants now belonging to the Establishment 6 in number would be barely sufficient for current work of the year's estimate.

8. The Bombay Government having declined taking any more Timber for Dockyard purposes, I would suggest that Teak and Blackwood might be advertised for sale in the Fort St. George Gazette. There is probably a large demand for it at the Presidency; and it could be conveyed there by intending purchasers by Rail.

9. In conclusion I beg to observe that I was absent on Medical Certificate for 6 months during the whole of the working season, and am therefore precluded from offering for your consideration or information, such remarks as might have presented themselves to my mind during a personal Superintendence.

10. The following is a Comparative Statement of Teak Timber supplied to the Bombay Government for Dockyard purposes in the years 1860-61 and 1861-62, showing the increase or decrease in the number of Planks, quantity and class delivered; and the amount realised in each year. The rates being determined by the Collector of Malabar from their fair Market valuation.

Comparative Statement of Teak Timber supplied to Bombay Government for Dock-yard purposes in the year 1861-62, shewing the Increase or Decrease in the number of Planks, quantity and class delivered and the amount realised in each year.

For the year 1860-61.							For the year 1861-62.						
Number of planks.	Class.	Quantity.				Amount.	Number of planks.	Class.					Amount.
		Koles.	Barrels.	Vessels.	Rate per 100 Koles.				Koles.	Barrels.	Vessels.	Rate per 100 Koles.	
251	1st	19,363	3	4	75	14,522 7 3	160	1st	9,717	7	...	75	2-14-3 7,288 3
123	2nd	7,405	4	2	60	4,443 5 3	89	2nd	4,855	...	9	70	3,398 8 4
108	3rd	5,171	10	13	50	2,588 15 3	187	3rd	7,534	8	3	55	4,144 1 3
55	4th	2,031	5	14	40	812 1 6	52	4th	1,667	1	2	50	833 8 9
24	5th	744	4	6	30	223 4 11	8	5th	226	...	4	35	79 1 5
92	Inferior	4,442	3	3	25	1,110 9 1	192	Inferior	9,373	11	4	25	2,343 7 9
656	..	39,168	7	10	...	23,698 1 3	669	...	33,373	4	...	...	18,086 14 6

KOTAGHERRY,
10th May 1862.

(Signed) J. J. BRINE, Captain,
Assistant Conservator of Forests.

APPENDIX II.

MADURA.

I have the honor to submit my second Annual Report, shewing the Forest operations of the Madura District, during the official year 1861-62.

2. The operations in the Forests have been principally confined to the marking of full grown trees, which are fit to be felled and selling the same to the public.

3. The Forest Revenue of this District is a mere trifle compared to that of the other Districts. The receipts of the past year amounts to Rupees 6,526-7-10, which shews an increase of Rupees 3,958-2-9, to that of the previous year. Besides there is on hand timber which may be valued at Rupees 420, whilst the expenditure, including the cost of the fixed establishment amounts to Rupees 2,154, thus leaving a profit of Rupees 4,372-7-10, in favor of Government.

4. The trees felled comprehended various kinds of superior jungle wood as well as teak and blackwood, but of all the indigenous trees, Vengé (*Ptero carpus Marsupium*) has been most greedily purchased by native traders from Trichinopoly and Madura, as the well grown timber of this kind is greatly prized for house building purposes.

5. There has been a great demand for Bamboos also; the total number of bamboos cut during the year both small and large amounts to 1,04,145. The bamboo Forests are confined to two places, Kumbum and Virupatchi Hills, the demand for them is very great at certain times in the year.

6. There can be no question as to the advantage of Government working the Forests and sell the timber at regular Depôts by Public Auction. By so doing a better and a more careful system of Forest Conservancy would be introduced and Government derive an increase in the Forest Revenue.

7. Punakád cultivation is still practiced I am sorry to say in the unfrequented vallies and on the slopes of the Hills at Kumbam without the knowledge of the Revenue authorities. The past year has been one of famine arising from the failure of the dry crops, this appears to have led the Ryots of the plains to adopt this practice as a means of livelihood.

8. I beg to forward a receipt to show that the amount noted in the account current has been duly credited to Government in the year under Report.

OVERSEER'S OFFICE, PERIYAKULAM,

(Signed) E. SPERSCHNIEDER,

5th May 1862.

Forest Overseer.

J. H. LEVENGE,

Collector.

APPENDIX J.

CUDDAPAH AND NORTH ARCOT.

I have the honor to submit my Progress Report for the month of May 1862, so far as it appertains to the North Arcot District.

2. *Kircumbaddy*.—This place forms the most convenient junction for all roads from Cuddapah and that portion of the North Arcot District where the red Saunders abounds. From twenty to thirty bandy loads pass daily through the Kircumbaddy valley, containing different descriptions of timber, chiefly the red Saunders. This valley is being deforested with great rapidity, and if strict vigilance is not exercised, the already impoverished Forests will disappear, and the ryots will not only suffer from want of fuel, but the climatic effect may be disastrous.

3. I stopt several bandy men and demanded their passports, they did produce such a document in Telugu, but these were all signed by the headman or Manager of the village. Government in their Proceedings, No. 1,261 of 27th June 1861, Revenue Department, desired that the jungles in the District of North Arcot, contiguous to the Cuddapah border, should be placed under the charge of the Conservator of Forests. What attention has been paid to these instructions is beyond my means to discover! There is not one peon, so far as I can ascertain, that regularly belongs to the Conservancy; there are few men belonging to the Collector's Establishment, engaged not to guard the jungles from spoliation or wasteful cutting, but as tax-gatherers, a proceeding which will materially thwart the object Government had in view when sanctioning the creation of this Department.

4. *Red Saunders*.—In paragraph 2 of your letter to the Board of Revenue, No. 533 of 24th June 1861, you state, that there is no difficulty about the seignorage, as the value of a bandy load of red Saunders at Madras is from 40 to 50 Rupees. This assertion is quite correct, so far as the question appertains to the Cuddapah Forests, and while I admit the justness of these premises on the one hand, you will allow me to hold to the conclusion that the Collector of North Arcot is also correct in stating that the red saunders in his District is not sufficiently valuable as an article of trade to bear the proposed seignorage of Rupees 6 per bandy load.

5. The above will appear at first view incongruous, but this incongruity will admit of an easy solution. In the Cuddapah Forests, the red saunders may be had in any quantity, of a superior quality both in logs, which are converted into posts for houses,

and which the Natives prefer to any other timber, as well as in pieces and roots for export as dye. A bandy will contain from 20 to 25 converted logs, which at Madras readily fetches from 2 to 2½ Rupees the log, then 20 logs $\times$ 2½ Rupees = 50 Rupees.

In North Arcot, the red saunder tree is of a very inferior description and unsuited for posts, the roots, therefore, are the most sought for the dye, and even these, in a commercial point of view, will bear no comparison to what may be had from the Cuddapah Forests, hence the objection of merchants to pay so high a rate of seignorage as Rupees 6 per bandy load. Two and half candies, equal to 1,250 pounds, go to a bandy and a candy at Madras sells for Rupees 6, then two and half candies $\times$ 6 Rupees = 15 Rupees.

6. Your decision, therefore, to strike the average and assimilate the rate of seignorage, viz., Rupees 3 per bandy load, both in Cuddapah and North Arcot, and which I hear the Collector of the latter District has concurred in, is not only judicious but extremely just, and this proceeding will, I have no doubt, yet afford

* Vide Proceedings of Government, No. 1,261 27th June 1861 R. D. means of subsistence to a large portion of the "dangerous" classes," and who these are I have not yet discovered.

7. Should you deem further information necessary, I shall again resume the subject after I have made myself further acquainted with it, but before I draw to a close, I would solicit of you to make such arrangements in communication with the Collector of North Arcot for placing the jungles in question under your control, as I feel that it is not a matter of seignorage alone but of conservancy. The question, however, that presents itself is, that, were these jungles placed under your charge, how I am to carry out your plans without an Establishment. The Collector, I have no doubt, will remove his men or ask you to take them over on your Establishment. I fear nothing can be done till the close of the present official year, unless you obtain permission for the Collector to make over to this Department that portion from his Budget estimate, where such salaries are provided for. This I shall leave for your better judgment to work out.

8. One hint I would beg permission to throw out for your consideration, but do so with diffidence, as I am unable, till officially announced as your Assistant in this District, to obtain accurate information. I have, however, casually learned that the headman of each village in North Arcot is allowed twenty per cent. on *all seignorage* collected by him on the different descriptions of timber, but this, I respectfully maintain, was only intended to be charged on *fuel, firewood and bamboos*, as per Section 10 of Circular promulgated by the Board of Revenue, No. 5,497 of 27th November 1860, laying down rules for the preservation of the jungles in the Provinces. If such be the case, what guarantee is there that these men will act honestly while so many instances of extreme accessibility to venality and corruption has often been exemplified by uneducated natives. Will an appeal to their fears, by declaring them liable for any misappropriation or malversation to the penalties provided in Regulation IX of 1822, keep them honest? I trow not, were only a hundred Rupees collected in North Arcot, twenty per cent. on that sum would maintain four peons at 5 Rupees each per month, who would patrol the jungles and maintain conservancy.

(Signed) THOMAS SPRING,

BALPILLI,
7th May 1862.

Acting Asst. Conservator of Forests in charge.

APPENDIX I.

NELLUMBORE TEAK PLANTATIONS.

The report of these is necessarily meagre, the Assistant Conservator having only been placed in charge of these on the 13th of March 1862, when he immediately visited them and found that about 30 acres of ground had been cleared, and was having the felled timber burnt off it. Several logs of Venteak, Errool and Kurramurda had been laid on the bank of the nullah, to be floated away with the freshes. At that time much difficulty was experienced in getting Coolies, as some early rain had fallen and all parties were busy in sowing grains.

The Receipts by sale of timber, &c., according to subjoined Memo. amounts to Rupees 808, and expenditure to Rupees 5,358-10-2. This is certainly far from satisfactory, but it is hoped now that the plantations, &c., are under an Officer, a more satisfactory return will hereafter be shown.

49,705 Saplings were cut in thinning the plantations, but the sale of these will not bring much, in fact many are not worth the carrying away.

The hot weather is the unhealthy season in that part, and felling, &c., is only carried on in the rains, the timber being at once floated down to Calicut.

There are extensive Forests in the vicinity of Nellumbore which are leased to Government for future planting operations; two of these have no water carriage for the timber, and before any cutting can be profitable in them, a road to the river would require to be made. Hitherto it has been usual to sell standing trees, exacting a certain seignorage, a plan which appears to answer, though perhaps the seignorage charged may have been too little. With regard to the valuable timber, such as teak, &c., growing within reach of the streams, it would be better to cut them for Government. A difficulty exists with regard to having these conveyed to the river; as when in flood every available Elephant is engaged by parties who desire to get their wood to market, this causes the hire for Elephants to be very high. It is therefore proposed that some of the Commissariat Elephants at Calicut, and Malliaporum, be employed at Nellumbore on the above work, this would be of service to these Elephants also, as forage for them is more easily procured at Nellumbore, than Calicut. A shed would have to be erected for them, but that might be easily run up. It is hoped that this suggestion will be acted upon, and application made for the services of 3 or 4 Elephants.

An intelligent Forester, by name Ferguson, has been engaged for the Nellumbore plantations; he is an experienced man in his profession, having been engaged in it many years in Scotland. He is not in the regular establishment, but it seems very desirable that Government be solicited to appoint him at once as Overseer, in the same manner as Overseer Hall was appointed. He ought to be permitted to reside in Calicut, during the most unhealthy months of the year, paying occasional visits to the plantations.

The Sub-Conservator Chatoo Menon has not yet been pensioned, as some delay is experienced in filling in the required papers.

As soon as Chatoo menon leaves, there will be no person left to point out the boundaries of the various Forests leased by Government at Nellumbore, therefore immediate application should be made to Government for the service of a Surveyor or two, to survey and mark the boundaries. The monsoon being the healthy season at Nellumbore, and no work it is believed being carried on by the Revenue Survey in Wynaad, at that time no difficulty ought to be experienced in procuring a couple of Overseers.

The present return of the Nellumbore Teak plantations undoubtedly must appear unsatisfactory in a monetary point of view; but sanguine hopes are entertained that under present management, the next return will be more satisfactory. It is proposed that in future instead of burning off wood and clearing for fresh plantations, most of the wood be burned in the charcoal, for which there is a very large demand at the Beypore Iron works. Should this experiment answer, a considerable amount should be shown in future returns under this head.

The aspects of the plantations continue as flourishing as ever, the Scotch Forester Ferguson above alluded to, was perfectly astonished at the appearance of them, declaring he had never seen any plantations in Scotland to be compared with them. There are about twelve lacs of young healthy trees in the plantation.

Another storm of wind has just occurred which has caused some damage to the plantation especially to that of 1844, or the one first planted.

OOTACAMUND,

(Signed) J. H. BABINGTON, Major,

17th May 1862.

Asst. Conservator of Forests.

APPENDIX K.

SALEM.

In submitting my annual report on the Salem Forest for your information, I have the honor to state that in consequence of my not having been in charge longer than 2½ months of this year, I have not been able to explore the district as much as I should have directed, my attention having been almost entirely taken up with examining the working of the Sandalwood Forest.

Establishment.—This you are aware consist of, 1. Assistant Conservator, 2. Overseers and, 12. Peons totally inadequate to the immense tract of country in my charge, to remedy this evil an extra establishment is kept of 1 Writer 3 Gomastahs 6 Pygusts and 39 Peons. The writer is attached to the Assistant Conservator's office, the Gomastahs are employed as Assistants to the Overseers, who without their aid could never do their work, the Pygusts or in other words Duffadar are employed in continually making tours to all the outposts in the jungles; since I took charge I have ordered these latter to send in weekly Reports on the work they have been employed, which it seems was not the custom heretofore.

The sale of tickets &c., still continues brisk, the tickets for Bamboos and firewood are chiefly in demand. Besides selling these ourselves I have distributed a few to the different Government officials in various district for convenience of villagers who live far off. When it becomes generally known that these tickets are easily obtained I am confident the sales of them will be greatly increased. Each license is restricted to 25 cartloads of timber valued at 50 Rs. Now a great many people who have applied to me for a less number to build houses or do small jobs of their own. But as the Officiating Conservator before remarked in a letter of his to the Overseer, that it is much easier to look after 1 cartman, than 25, which is true, at the same time it is a great drawback to the villagers, ryots &c., being supplied, and a great inducement to them to commit constant robberies, which otherwise they would not attempt so that I would recommend that issuing of licenses be discontinued and that we cut our own timber and have periodical auction sales of it, notifying the same in the Gazette previously, this would be very acceptable to the villagers and

towns people and meet the wants of both the rich and poor to one would then be permitted to enter the forest for the purpose of cutting timber and I am certain there would be less damage done to the Jungles.

Offenders.—When a man is found bringing away or having in his possession timber cut unlawfully the timer is seized this taken before a Magistrate to be prosecuted this not only detrimental to the work but interferes in a great measure with the duties of the various officers this might also be prevented by discontinuing the issue of Licenses.

Stamp.—I propose having a stamp for the office for stamping Ticket issued, a plain one easily distinguished by the peons at a glance, this is essentially necessary for at present I am given to understand spurious imitations of ticket are made and issued by private parties for it known one individual as tahsildar who wrote them himself sign and sold them, remitting the proceeds to the treasury and reporting to me that he had done so. And if the ticket were stamped and it was made known to the District that no ticket unless stamped would be passed by the Forest peons, there would be no way of evading the duty except by means of forged stamp.

Saplings.—Of all descriptions are sprinkled over the jungles and on the Munchee Nugherry Hills about that district they abound and I have found teak suckers growing from old stump some of them 1½ foot in diameter clearly showing that those localities are favourable to the growth of this valuable timber.

Bark.—The bark mostly taken out of the jungles this year was the Vel Vaylum or Vaylum bark by a contractor, who in the previous year obtained the contract from the late Assistant Conservator, his contract will expire in the 1st June 1862, and if the Forests are to be protected this person contracting for the bark, should not only be bound down to our rules which it seems he has not been hitherto, but also made to lodge a heavy security in case he should transgress against the rules laid down by the Forest Department I do not make this proposition without having carefully weighed the matter, when the contract is again open to competition should no contractors come forward we can supply numbers of distillers with the quantity of bark they require in small or large quantities which would be very acceptable to them.

Sandalwood.—The sale of this year has unfortunately been most unsuccessful, the only causes I can ascribe it to be are partly the weather preventing cartmen going to the Depot to bring it into Denkcottta and the short notice given to buyers which prevented many attending. The Poojalies are the men employed on this work which only last a few months of the year, they work very laboriously and cheap by felling, cleaning, shaving and cutting into 2½ billets 3½ maunds of 25 lb each for one Rupee and bringing the same to the nearest store, so that we have only to cart it from the Hills to Denkcottta.

Nurseries.—I have selected some suitable sites for nurseries where it would be well to commence planting out S. W. trees the saplings could be brought from the jungles and planted say 10 to 12 feet apart. The expense might be tried first as a small scale to see if it answered, my only fear is want of rain for two or three months in the year, but to remedy that I would employ Poojalies to send and water them and as they are hardy trees when once they have fairly taken root they will require no further attention. I am given to understand our Sandal wood is far superior to the Mysore and ought therefore to command a good price in the market. As we were not able to sell any thing at our last auction I would propose notifying in the Gazettes of the Presidencies what amount of wood we have in store available for any Merchant who likes to come forward and make an offer for it through their Agents here.

Forest Product.—When the Sandal wood season is over there are a few months when the Poojalies are out of work and naturally look to us for employment I find the Overseer at Denkcottta has been employing them during that time in collecting Honey, Wax, Dyes, &c, which when sold recover a very fair remuneration so much so that I have no hesitation in saying if matters were better managed and another system introduced the proceeds of the sale of Forest product such as Honey, Wax, Dyes, banks, &c. would of itself

pay the expenses of working the Forest, leaving the proceeds of the remainder viz., timber, a clear profit to Government.

Denkencotta Forest.—This is the principal seat for our work at present and if during the ensuing year of 1862-63 we confined ourselves entirely to this side in the manner I have already described I am certain we shall be amply repaid for our trouble. These are by far the finest Jungles we have in the whole of the Salem District and every year we neglect to go and work them thoroughly, the more they are getting destroyed. During my late visit to these parts I observed a great deal of damage done, numbers of young saplings of all kinds cut down splendid large and valuable trees felled left lying rotting in the ground. All along the banks of the River Cavery some fine trees are growing in the dry season these could be felled and trimmed (not squared) then cut into portable lengths and floated down the river in monsoon to the village of Seringum (near Trichinopoly). I have not now time to explore this river but when I was at Hognakulum on the banks I heard that the Natives there about were employed in great numbers making Bamboo rafts and floating these and small spars to Seringum by water, below the falls. If you should think this worth while I will go down the river, report more fully on its capability for this work, when the season is favorable.

Accommodation.—I was sorry to observe on my arrival that the Assistant Conservator had no Bungalow for his use in any part of the district convenient for him that he might occupy as his Head quarters. At Harúr there is a Chuttrum, a building formerly used by the Natives of that place, built without any regard to ventilation, accommodation or healthiness the only part of it available for my use is a room about 18 or 20 feet square facing the west and unbearable after 5 p. m. another part of the building is occupied by a Police guard and a Prisoners room. I would earnestly request sanction may be given to build a large and roomy Bungalow at Harúr, and if operations are to be recommended on the Denkencotta division this ensuing year that another be erected on the Munchy or Kodgherry Hills the reason of this latter request is that should I or any of the Overseer or others fall sick they will have a healthy place of resort, whereas at present there is absolutely no place for the Assistant Conservator to go to recruit himself should he get sick.

Account.—These I am sorry to say are at present in a state of great confusion. I cannot account for it in any way but saying that since I joined I have not had the time I require to look into and settle every thing. You will observe towards the close of April I drew the balance of the estimated sum, this sum was absolutely necessary to pay up the arrears of pay due to the Extra Establishment. It is easily explained why this was not done before. On the death of the late Mr. Blenkinson, the Overseer who had charge not having authority to draw out the money from the Treasury for this purpose naturally allowed it to remain unadjusted until my arrival when reformed of the circumstance and I communicated with you on the subject and got orders to pay them up. As this was a work of time I could not wait but hurried off to Denkencotta and on my return to Harúr found I was urgently required in Madras. It is a great pity that these people have not received their pay like the others regularly every month their entertainment was absolutely necessary, and by this delay they have become discontented and should they leave on receiving their pay will deter others from entering the Department.

Profit.—On 30th April ending the year 60-61 I see the accounts shew a collection of Rupees 17,359-15-0, deduct working expenses and contingencies, Rupees 4,285-11-10 which left a balance in favor of Government of Rupees 13,064-3-2. The past year shows a collection on tickets timber, &c., of Rupees 52,124-14-8 deducting working charges &c., Rupees 9177-15-0 and there remains a balance of Rupees 42,947-3-8 this is easily accounted for as I have already informed, as 2 thirds of the Establishment have not received their pay for 7 or 8 months and besides this altho' Rupees 1,050-0-0 was expended in working the Sandalwood Forest although none was sold this year; yet Government are not losers for we have nearly 20,000 Rupees yes and more I think in store.

Travelling.—I request I may be permitted to draw travelling allowance and that the same may be allowed for those who accompany me through the District either monthly on

per mile. I have since my arrival been put to a great deal of inconvenience in consequence of not drawing this allowance.

Estimate.—I find the sum of Rupees 5,000 have been granted for the working of the forest for the ensuing year, this I am afraid will run far short of the work on account of the sum of Rupees 1,776 being arrears of pay due on the 30th April 1862 to the Extra Establishment.

(Signed) J. W. OUCHTERLONY, Lieutenant,

Assistant Conservator of Salem Forests.

SALEM, 20th May 1862.

APPENDIX L.

NORTH CANARA.

I have the honor to submit my accounts for the official year 1861-62.

2. The Account Current shows Rs. 89,678-10-7 in the receipts, and Rs. 92,435-12-9 in the expenditure, leaving a deficit of Rupees 2,757-2-2.

3. The Memorandum of Wood unaccounted for shows the stock of Timber on hand at the Depots and the outstandings for Timber actually sold, but of which the money could not be all collected, so as to exhibit it in the accounts of last month.

Estimated value of Timber in Store	Rupees	3,06,563	6	0
Outstandings	"	1,00,105	13	9
Total Rupees...		4,06,669	3	9

4. As both the Account Current, with a deficit, and the large stock of timber now on hand, are extraordinary, they serve to explain each other. While on the one hand no sale of consequence was held during last year, timber on the other was collected in the Depots. Such sales as were held come off only lately, and the time, as already explained, was too short to bring all the sums to account. Besides, though payments have actually been made by parties belonging to the Bombay Presidency, they were made by Bills not negotiable, on her Majesty's Bank, from whence Bills of exchange in favor of the Collector of North Canara have to be obtained before the sums can appear in the Collector's accounts.

5. Last year the estimated value of Timber in Store was Rupees 1,54,000, while now including the outstandings, it is Rupees 4,06,669-3-9, or Rupees 2,52,669-3-9 more, which sum, had it come to account, would have been the net profit, leaving the same quantity of Timber in Store as was shown last year.

6. The past year was an extraordinary one. Throughout the year, the Establishment as well as the working people were more or less laid up with fever, and such is the case still. Several people of the Establishment died. Contractor Pinto lost no less than sixty-two men in Goond, of whom five were Superintendents. Consequently not one business did, or could go on, as it otherwise might have been expected to have done.

7. This having been the case, the Timber sales above the Ghauts were deferred till better times, and all cuttings of new trees were discontinued. Such of the workmen, who were able and willing to do business for the Depot were ordered to collect only outlying dead wood, wherever they would find any. A certain rate was fixed for them from each jungle to the Kesorally Depot, four miles from Hallial. In this manner about 20,000 candies of old wood of every description have been collected. The collection of this wood was more expensive than it would have been, had fresh trees been cut in a comparatively small area. The cost is about Rupees 60,000. At the sales, this wood will not fetch such a price as could be expected of good large timber; however, next year Rupees 1,50,000 will be realized at the very least. This result is satisfactory, being profitable while it saves an immense quantity of new cuttings.

8. *Smallwood* or clearings from the jungle-land given out for permanent cultivation forms now a regular, though a very troublesome business for the Establishment. The Account Current on this head shows Rupees 12,331-1-9, as the income, while the expenditure is only Rupees 2,643-4-7 well worth the trouble, and much better to save the wood than allow the burning of it.

9. *Sandalwood* in North Canara is not first rate, and it will never show a great figure in the accounts. To go on with the work as commenced three years ago, began at one end of Sircy Taluq, cutting dead and defective as well as ripe trees, and at the freeing others from Bamboos or other overhanging stuff, it is calculated that another ten years will be required to finish the Sircy taluq. The average expenditure will be about Rupees 600, while the income on this head will be about 5,000 Rupees, a sufficient remuneration for mostly defective wood only.

10. *The new seignorage* rule, according to which the local wants are supplied, has now had its trial for one year. The measuring and stamping each piece of wood entails not only an Establishment, but a vast deal of work for the same. During the year 1,034 permits were issued, of which 465 only have been returned to the Office. Sickness prevented many people to cut the wood in the given time, and therefore two additional months were granted to every permit holder throughout the District, otherwise the whole number of issued permits would have been returned duly filled up. The accounts can therefore only be shown of the 465 returned, on which were cut,

Wood	12,105 pieces—Candies 5,673-1-4-15.
Bamboos	1,36,090
Small bamboos	15,728
Canes	18,011
	<u>2,69,829</u>

Considering this to be half of the number of permits issued, the other half may be estimated at the same rate. The annual grant would therefore amount to Timber 24,210 pieces containing Candies 11,346-2-10. and Bamboos 5,39,658. Financially the present system is better. The receipts on this head were Rupees 6,881-13-9, and the expenditure Rupees 750-9-3, or about 8½ per cent. on the income. According to the old rule, trees were granted at 8 Annas each, from which 1 Anna or 12½ per cent. was deducted.

11. *Firewood* is now mostly cut up from branches and other dead smallwood, and this year Rupees 3,103 were realized. It is more expensive to cut up the branches and such wood fetches less in the market, than wood cut up of the Kanagala tree (*Dillenia Pentagyna*) for which always more is paid on account of its being so easily split.

12. *Kallanuddy*.—It was impossible to do anything this season towards clearing this river. People could not be procured who knew anything of blasting rocks, and such as could have been had, were urgently required by the Engineer Department.

SEDASHEGHUR,
8th May 1862.

(Signed) S. MULLER,
Asst. Conservator, North Canara Forests.
(Signed) J. H. GOLDFINCH,
Collector.

PROCEEDINGS OF THE MADRAS GOVERNMENT.

Read the following letter from Major H. R. MORGAN, late Officiating Conservator of Forests, to J. D. SIM, Esq., Secretary to Government, Revenue Department, Fort Saint George, dated Ootacamund, 5th July 1862:—

SIR,

1. I have the honor to forward my annual Report for 1861-62.
2. I have to explain that there has been some delay in the printing, to account for the Report not reaching Government by the 30th of June.

ORDER THEREON, 19th September 1862, No. 2,040.

1. The Government proceed to review the Report of the late Officiating Conservator of Forests for the official year 1861-62.

2. *Wainad Forests*.—Paragraphs 2—5. These forests consist principally of Teak, but they contain an abundance of fine Blackwood and much Bamboo jungle. They have received much damage from the depredations of Kurambars, and by the practice, called “takkul,” of making temporary clearings for the clandestine cultivation of Raggee, but “takkul” seems to be on the decline. Paragraphs 2, 3 and 4 will be brought to the notice of the Collector through the Board of Revenue.

3. In paragraph 5 it is urged that the Assistant in charge of these forests should, for forest purposes, be invested with magisterial powers. This the Government cannot permit. It would be contrary to principle that the Conservator should adjudicate in his own cases.

4. *Hoonsoor Forest*.—Paragraphs 6—14. This forest has lately* been transferred from the Commissariat to the Conservator's Department. A grant of 10,450 Rupees has recently† been sanctioned in the Department Public Works for the completion of the Tambracherry Ghât.

5. In paragraph 9 of the Report, Major Morgan observes, that “the boundaries of the different Government forests have not yet been decided.” The boundary line between Wainad and Mysore was finally determined on in the Order of Government No. 1,479 of the 8th July last, but this remark seems to refer to the claims advanced by certain Devastanams and Uralars, upon which the Director of Revenue Settlement has been directed to report. The Survey and Settlement parties have now been withdrawn from Wainad, but the Director will report what progress has been made in the demarcation of forest boundaries, and whether any arrangements can be made by his Department for the final settlement of the above claims. It is desirable that the limits of all the forests in the country should be defined where practicable and the progress of the Revenue Survey will tend to this result.

6. *Mudumalai Forests*.—Paragraphs 15—18. These forests are held on a lease which expires in March next, by which time it is anticipated that nearly the whole of the Teak fit for felling will have been cut. There is a large stock of timber on hand, lying in the forest. This should be removed without delay, as it is stated that all timber remaining in the forest after the expiration of the lease will be forfeited to the proprietor. The question of renewing the lease is now under the consideration of Government. Financially Mudumalai exhibits a very small profit, but the wood in store has not been brought to account.

7. *Sigur Forest*.—Paragraphs 19—22. The cuttings in this forest have been confined to Sandalwood, the Teak jungles having been exhausted by former contractors and requiring rest. Its receipts exceed its expenses by nearly 20,000 Rupees and Government are assured that this profit will be annually maintained.

8. *South Canara*.—Paragraphs 23—27. These forests would not appear from the Overseer's Report to be in a very flourishing condition, though young trees, worth taking care of, are said to be springing up in abundance. The forests of this District should be visited by the Conservator and separately reported on.

G. O. 166 of 31st January 1860.
„ 814 of 15th April 1862.

26. Paragraph 103 deals with the subject of waste lands, and Major Morgan states his opinion that it would be impolitic to refuse systematically all forest land, and that it should be given on condition that the jungle above 6,700 feet should not be cut, and that for every bandy load of wood sold a seigniorage of 1 Rupee should be paid. The Government have already authorized the reservation of the Devi Shola, and they will be prepared similarly to reserve other forests that may be required for public purposes, or the destruction of which would be likely to affect unfavorably the rain-fall and climate, but where waste land is to be sold they prefer selling it outright with all upon it. The reservation of the timber would lead to endless disputes and its value will always be realized at the sale of the land.

27. A map of the Wainád forests accompanies Captain Hunter's very complete and interesting report, and Major Morgan recommends (paragraph 106) that it should be lithographed. Captain Hunter however states that he has been unable to mark off the forests belonging to Government on account of the uncertainty which exists regarding the boundaries. The Government therefore defer passing any orders regarding the map, pending the submission of the reports called for in paragraph 5 *supra*.

28. Major Morgan expresses himself well satisfied with the exertions of the Assistant Conservators and his other subordinates.

29. *Financial results.*—Paragraph 109. The profits of the year considerably exceed those of the preceding years, as exhibited in the margin, and so far the results of conservancy are satisfactory. North Canara which contains the finest and most profitable forests

has now been transferred to the Bombay Presidency, and if the profits of that District be taken at the same amount as in the previous year for the sake of comparison, and because the value of the wood in store appears to have been entered in the receipts, the total profits will be reduced from Rupees 4,28,639 to Rupees 2,03,585. Even after this deduction the profits of 1861-62 show a satisfactory excess over the preceding years.

See Statement submitted with the Acting Conservator's letter, recorded in Government Order, 18th June 1862, No. 1,311

* G. O. 9th July 1862, No. 1,500.

30. The value of the timber on hand is estimated at 2,69,000, but this is exclusive of the wood stored in North Canara for which the Bombay Government have to account. There is in hand 91,000 Rupees worth of Anamalai wood.

Had this been sold within the year, as Major Morgan remarks, the operations in those forests would have presented a very different result. In fact instead of a loss of 20,000 Rupees a profit of 70,000 would have been exhibited. Major Morgan says 50,000, but he appears to have deducted the expenses of the year, 42,200 Rupees, which have already been brought to account, and he has omitted to make allowance for the loss now standing in the financial Statement. The profit to be derived from the sale of this timber will appear in the accounts for next year.

(True Extract.)

(Signed) P. P. HUTCHINS,

Acting Deputy Secretary to Government.

To the Conservator of Forests.
 „ Board of Revenue.
 „ Director of Revenue Settlements.
 „ Military Department.
 „ Financial Railway Department.
 „ Department Public Works.

Exd. S. T. Augustin.

