

Revenue (1899) Department.

MISCELLANEOUS SERIES.

G.O., No. 1428

DATED 20th April 99

[Despatch Abstract.]

Recording Progs. P. W. Departt., order-
ing that a copy of the B. P. regarding
the supply of sleepers by the Forest
Department required for the
Railway extensions now under
contemplation be commnd to the
railway administrations for
information.

BACK PAPERS.							
G.O.	No.	Department.	Date.	G.O.	No.	Department.	Date.

FURTHER PAPERS.							
G.O.	No.	Department.	Date.	G.O.	No.	Department.	Date.

Revenue (1899) sent

772
13-12-98

RAILWAY.

Government (1899) of Madras. PUBLIC WORKS.

Current No 2395

Recd. } 8th April } 1899.
Regd. } 10th April }

Enclosures

Spare copies

G.O., No. 342 Ry., 27th March 1899.

G.O. M.C. 1428 dt. 2nd April 1899

MARCH.



Recorded.

1/4
20/4/99

Copy of the order has been sent to the Secy of Rev. Dir.

Supply of Sleepers

Ordered that a copy of proceedings of the Board of Revenue regarding the — by the Forest Department, required for the railway extensions now under contemplation as well for annual renewals on the existing lines, be communicated to the railway administrations for information and a copy of these proceedings forwarded to the Government of India.

10/4/99
17/4/99
26-4-99

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15

26-4-99

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Railway.

Read—

G.O., No. 373 Ry., dated 5th March 1898 (communicated to Railway Administrations).

Read also the following papers:—

From—The Agent and Manager, Madras Railway.

To—The Deputy Consulting Engineer for Railways in Charge.

Dated—Madras, 16th August 1862, No. 556.

I have the honour to acknowledge the receipt of Captain O'Connell's letter No. 1005, dated the 3rd ultimo, requesting me to transmit, for the perusal of Government, all documents which may have been received from the Engineers respecting the relative durability of the several kinds of wood used for sleepers.

2. In reply I have the pleasure to transmit, herewith, an original letter from the Acting Chief Engineer, furnishing a statement of the average life of sleepers made of fourteen descriptions of timber and

No. 548, dated 14th August 1862.

annexing a copy of a draft report prepared by the late Chief Engineer Mr. Ross upon the working of the forests in the District of Malabar under his superintendence. This draft seems to have been written, consequent on Lieutenant-Col. Johnston's letter, No. 7710, dated the 5th September 1861 (replied to by me on the 16th April and 2nd May 1862). But the sudden decease of Mr. Ross unfortunately prevented the completion of his report.

3. I shall feel obliged by your returning Mr. Pinson's letter, at your early convenience.

ENCLOSURES.

From—The Chief Engineer, Madras Railway.

To—The Agent and Manager, Madras Railway.

Dated—Madras, 14th August 1862, No. 548.

I have to acknowledge the receipt of the Acting Consulting Engineer's letter No. 405 of the 3rd July.

I am not at present in a position to forward very extensive information upon the subject referred to, but I think it better (to avoid any further delay) to furnish you with the result of our experience upon the first or Madras division of the south-west line.

The following statement gives the average lives of sleepers of various woods, taken out of the line in a state of decay, and replaced by iron pot sleepers, up to the present date:—

Distinguish- ing mark.	Name of wood.	Average life.
A	Ancha	4 years, 7 months.
F	Kurrah Murdah	3 " 10 "
C	Combadi	4 " 2 "
K	Cadookoy	4 " 1 "
S	Saul	4 " 2 "
E	Dud Eloopay	3 " 10 "
Y	Eroovanloo	2 " 8 "
V	Vangay	4 " 3 "
P	Panlay	2 " 10 "
R	Auray	2 " 6 "
M	Myladee	1 " 5 "
H	Myroothy	4 " 3 "
D	Katvoy	4 " 4 "
B	Karavallum	4 " 2 "

I am awaiting returns from the Engineers of the other divisions on the south-west line, to enable me to ascertain the durability of erool which we confidently expect will turn out to be the best description of wood for sleeper purposes.

The creosoted sleepers of Baltic fir, which we have from time to time received from England, are, as a rule, exceedingly durable. We had recently occasion to take some decayed ones out of the line near Sholinghur, which were ascertained to have been in the road for a period of nearly 6½ years. The cost of these sleepers, however, interferes materially with their extensive use in this country.

I append to this letter a copy of a draft report in the hand-writing of the late Chief Engineer on the timber-cutting operations in the Malabar forests. The document will probably be interesting to Government, although not bearing directly upon the subject under reply.

COPY of Mr. Ross' Draft Reports.

In accordance with the desire of Government, I beg to submit a report about the timber-cutting operations in Malabar. These operations were conducted by myself for four years up to April 1861, since which time they have been conducted by Mr. Wilkinson, the Engineer in charge of districts 13 and 14.

It was found prior to 1857 that contractors could not be induced to bring sleepers in sufficient numbers, to supply the midland districts, and Mr. Heppel accordingly requested me to arrange for cutting timber myself, partly with a view to increase the supply, and partly for the purpose of letting contractors see that we were independent of them. The effect of these operations was to make contractors come forward and offer to supply us with sleepers, while at the same time we were supplying ourselves with a much better description of sleepers than we were able to purchase from contractors.

My first operations were in the jungles at the foot of the Anamalai Hills near Pollachi. The timber there was very fine, consisting principally of pillay murdah (*Terminalia Alata*) kurrah murdah (*Terminalia* —) and erool (*Inga Xylocarpus*).

The Cadars inhabiting these jungles came forward willingly to work for us then, and I had the satisfaction of teaching them, after a short time, the use of the cross-cut saw. The distance over which we had to cart the timber was so great that I was reluctantly obliged to abandon the operations in that jungle. I cannot help thinking that it might be to the interest of Government to connect the valuable forests in the Anamalai Hills by means of a tramway or light railway with the Madras Railway. The amount of timber (teak for the Bombay dockyard) now carried by bandy from Anamalai is very great. This tramway, if made to join the railway at either Palghat or Coimbatore, would run through a very rich country (that about Pollachi being considered very suitable for cotton).

After abandoning the Anamalai jungles, I was allowed by the Conservator of Forests to cut trees in the Chenet Nair forests near Palghat, and in the Walliar jungle, half way between Coimbatore and Palghat. The Walliar jungle has been almost entirely worked out, at least in those portions which are easy of access. The timber of which I found the greatest quantity was vela nagay, which, although stronger than any other, does not last more than four or five years when used as sleepers.

In working this jungle, I was able to bring common carts close up to the place where the trees were felled, and consequently had little use for elephants. In this jungle, I succeeded in getting the Malsens (natives of the jungle) to come forward and work. These tribes are averse to using any implement but the axe. I succeeded with some difficulty in inducing them to use the saw.

In working the Chenet Nair forest near Palghat, I tried to introduce a system. The trees useful for sleepers found in this forest are erool, kurrah murdah, and pillay murdah; there is also a good deal of vengay in one part of the jungle.

In this forest, I had to pay for every tree which was cut down one rupee and a half seigniorage to Government. In this agreement there were certain conditions by which I was prevented from cutting young trees, and which compelled me to cut trees not more than certain height (1' 6") above the ground. I was not allowed to cut teak or black wood, and it was understood that I was to do my best to conserve the forest. My system here was to do as much as possible by contract—the tree was cut down, cut into lengths of ten feet and squared, all by contract.

In cutting the tree into lengths of ten feet, the contractors occasionally used the cross-cut saw. After the tree was cut into lengths of ten feet, elephants were brought in to drag out the timber to the nearest jungle road where depots were formed along its line. At these depots the logs were tilted and all underwood cut away from near them. This was done to prevent any damage from fire during the dry season. From these depots, I carted all timbers that could be put into common bandies, the roads were bad, but as a general rule, it is better to do as much work as possible out of the jungle, and for this reason I reduced the logs only sufficiently to

enable me to cart them. In this, as in most jungles, the fever was a great hindrance to our successful working; there are high hills on three sides of it. It is said during the monsoon to be free from fever, but on one occasion I slept there for two nights during the monsoon, the result was that all my servants got fever of a very virulent kind, and one of them unfortunately died of it. With these servants, I took every usual precaution. In working these jungles it was necessary for me occasionally to bring out very large logs ($40' \times 1' 2" \times 1' 2"$) of the heaviest wood (kurrah murdah) for use in the railway.

In doing this, I tried to economise elephant labour. I used in some cases sling carts, the logs were suspended at about two-third of the length underneath the axle, and the elephant was then ordered to pull, the objections to this mode of taking heavy logs out of the jungle are the difficulty which the elephant experiences in taking the load down hill, and the great strength of which it is necessary to make the carts. I also tried a pair of small wheels placed under one end of the log, but this, although it worked well on tolerably smooth ground, was awkward to manage in crossing nullahs. These are difficulties, however, which may be overcome. For elephants in Malabar, we paid at the rate of Rs. 5 per day.

I hoped, at one time, to have been able to do a good deal of the sawing work by steam, and I proposed on first entering this forest, to get a steam engine and sawing apparatus from Home. The contract time has now nearly expired and it would not be worth while getting out a sawing apparatus without knowing whether the lease will be renewed. I would prefer steam to water power, as with steam you are more independent, and fuel would cost nothing.

Government may not think that it is profitable to let the forest to us on the same terms. It is true that the amount paid to the Conservator of Forests has not been much each year; this is because I have always made it a rule to cut not a single tree in excess of what I was able to carry out. I think, however, that this is in reality the most profitable way in which Government can use the forests, because while we take a comparatively small number of trees out of the jungle, we conserve it, and at the same time, do all in our power to avoid injury to the young trees.

My opinion is that in working forests, it would be advisable to try whether a very light tramway could not be used with advantage.

In this forest, I intended to have put up a large charcoal oven for the purpose of converting all waste branches, &c., into charcoal; this oven is now being erected and will, I have no doubt, be of great service, both in economising the timber, and in clearing the ground from waste timber which takes fire during the dry season, and injures so many young trees, and sometimes also, unless precautionary measures have been taken, destroys logs ready for transport. A charcoal oven might, I think, to be put up in most jungles.

The usual time for cutting trees in this and in other jungles is in the middle of the monsoon; this is on account of its being impossible to remain in most of them after the dry weather has set in. It is usual at Home to cut trees only when the sap is down; very few of the trees in this country are deciduous; I doubt therefore whether it is of so much consequence to cut the trees at any particular time of the year. It is, however, of great importance that after the tree is cut down it should undergo a proper seasoning. To effect this, I think that after the tree is cut, it should be squared and hauled away to some situation, when it can be tilted at a considerable angle, where no rank vegetation is allowed to grow about it, and where it can be exposed to a free current of air, but above everything rank vegetation ought not to be allowed to get near it.

It is difficult to estimate the cost of the sleepers which have as yet been turned out from the jungles worked by ourselves, as we have still a large quantity of timber unconverted. The price will not be greater than that which we have to pay contractors, while the character of the sleeper is infinitely superior.

I have gradually lost confidence in every kind of countrywood, except erool and vengay. Teak I put out of the question as being too expensive; almost all other description of timber I have seen decay when used as sleepers.

With reference to many of the inferior woods, which are almost useless, I have already asked for an apparatus such as that used by Boucherie to be sent from Home. I am inclined to think that with such an apparatus the worthless timber might be made valuable. It would be difficult or next to impossible to use this apparatus with hard woods as kurrah murdah, but it would be a very great matter if, by the use of the Boucherie process such inferior woods as thanee, eloopay and padrie, &c., could be rendered useful. I do not mean merely for sleepers, but those woods which at present command very little sale, might, under these circumstances, become a source of profit as well to Government as to the Railway Company.

In conclusion, I have to say that although having so many other duties to attend to, I was unable to introduce as many improvements as I would wish in working the forests; still I believe that much could be done to work forests effectually, were pains taken to improve the means of carriage, to improve the roads, and to economise elephant labour and sawing power. These improvements could only be effected with close supervision.

I would especially recommend that the Boucherie process be tried. It is not an expensive process, and the trial would not cost much.

From—The Agent and Manager, Madras Railway.
To—The Consulting Engineer for Railways, Madras.
Dated—Madras, 12th March 1898, No. 9294/B. 218.

I have the honour to inform you that, on the 10th ultimo, I enquired of my Board, at the request of the Chief Engineer, at what rate, inclusive of freight, good creosoted pine sleepers $10' \times 10" \times 5"$ could be delivered at Madras, and in reply I have to-day received the following telegram:—

Sleeper 10 feet eight and two, 9 feet six and six

which is understood to mean that sleepers 10 feet in length can be delivered at 8s. 2d., and those 9 feet in length at 6s. 6d.

NOTE BY THE CONSULTING ENGINEER FOR RAILWAYS, MADRAS, DATED 25TH MARCH 1898.

Railway Sleepers in Malabar.

There will soon be a very heavy demand for 136,000 railway sleepers for the Calicut-Cannanore Railway, 62 miles; and in all probability a demand will also arise very soon for 164,000 sleepers for 74 miles of the Shoranur-Cochin Railway. The demand for Pyngadu (*Xylia dolabriformis*) from Burma is far in excess of the supply, so much so that the Burma firms were quite unable to supply the Bezwada-Madras Railway's requirements, and Deodar (*Cedrus deodara*) sleepers had to be got round from Kurrachi at a very high price, and the opening of the line has consequently been delayed by many months.

I hear that there are large quantities of timber fit for sleepers in the two forest divisions, North and South Malabar, not far from the Calicut-Cannanore Railway, and that not only is "maddi" (*Terminalia tomentosa*) found but also teak and other woods eminently fit for sleepers. I hear also that the Forest Department have machine saws working somewhere not far from Podanur whence Shoranur-Cochin and Podanur-Dindigul sleepers could perhaps be supplied.

But, however excellent and plentiful the timber may be in the forest, it is hopeless to expect to get it out, anything like fast enough or anything like honestly, through the agency of the petty sort of private enterprise that is available. It seems to me that the agency of the Forest Department might be made use of, and that Provincial finances might as well get whatever profit may accrue from the proposed expenditure of perhaps 3 to 5 rupees per sleeper.

Though nominally the work of a Railway Company, the Calicut-Cannanore Railway is really *de facto* a Government work, and it only seems right that all the help which the Forest Department can give should, under the circumstances, be given.

The Company's Agent is already enquiring into the price at which creosoted pine sleepers from Europe can be delivered. But it seems a pity to send to Europe for what we ought to be able, so far as I can learn, to obtain from the forests alongside of the railway through the agency of a Government department specially organized for such purposes.

Order—No. 544 Ry., dated 7th April 1898.

The Board of Revenue will report upon the subject and will advise whether any special steps should be taken or expenditure incurred to enable the Forest Department to meet the probable demand of 136,000 sleepers for the Calicut-Cannanore Railway in the next two years.

Proceedings of the Board of Revenue (Land Revenue).
Dated—7th May 1898, No. 204.

If the Forest Department is to make any special arrangements for the provision of sleepers, it is probable that a considerable initial expenditure will be involved, and the Board would be glad if some estimate could be given of the probable annual demand for sleepers for renewals at different centres, and the kinds of wood approved by the Railway authorities.

The woods which occur to the Board are:—

Teak	<i>Tectona grandis.</i>
Maddi	<i>Terminalia tomentosa.</i>
Ironwood—Iruil	<i>Xylion dolabriformis.</i>
Vengai or Yegi	<i>Pterocarpus marsupium.</i>
Achca or Yepi	<i>Hardwickia binata.</i>
Säl	<i>Shorea robusta.</i>
Sóme	<i>Soymida febrifuga.</i>
Manjakadambai or Rudrajanapa	<i>Adina cordifolia.</i>

Order—No. 715 Ry., dated 12th May 1898.

The Board will be informed that the quantity of metre gauge sleepers, which would probably be bought from the Forest Department if proper arrangements were made for their supply would, in round numbers, be as follows:—

For the Calicut-Cannanore Railway, 136,000, within say 3 years.
For the Shoranur-Cochin Railway, 164,000 „ „ 3 „

Future requirements for both railways, 10,000 annually to begin with, rising at the end of 10 years to 30,000 and standing thenceforth at that figure. It is hoped that this estimate will enable the Forest Department to make a forecast as to what it would be possible for it to do, in order that the Madras Railway Company may be able to come to such arrangements with them as will allow of the sleepers they require being obtained in the Presidency instead of from England.

Read—

- * G.O., Nos. 841-42 Ry., dated 21st June 1898.
- * G.O., No. 1141 Ry., dated 16th September 1898.

* [NOTE.—The orders marked with an asterisk have been communicated to Railway Administrations.]

Read also the following papers:—

From—the Conservator of Forests, Southern Circle.
To—The Secretary to the Commissioners of Land Revenue.
Dated—Coimbatore, 30th June 1898, Ref. on C. No. 4992.

With reference to the Board's Reference No. 184, dated 23rd April, regarding the supply of sleepers for the Calicut-Cannanore Railway, I have the honour to report having consulted the District Forest-officers, Nilgiris, North Malabar, South Coimbatore, South Malabar and South Canara on the subject. The two former District Forest-officers quote rates which are either altogether prohibitive or are so high as to leave but a small profit even if the sleepers are supplied at the rates which is stated pine creosoted sleepers could be supplied at. I am, however, not quite satisfied that North Malabar could not supply *Terminalia tomentosa* at reasonable rates, as the rates quoted for sawing and carting by the Acting District Forest-officer appear very high and could possibly be reduced considerably if proper arrangements for procuring sawyers at reasonable rates as well as for carting the sleepers to the nearest Railway Station or water way were made. I therefore propose as soon as the permanent District Forest-officer, Mr. Tireman, returns from leave to ask him to go into the matter of rates thoroughly and report further. In the meantime, North Malabar may be omitted from our calculations.

2. The District Forest-officers, South Coimbatore, South Canara, and South Malabar, report the number of sleepers of each kind of timber they can supply as well as the lowest rates it would be advisable to accept. I give below a précis of their replies together with my recommendation regarding each proposal made.

Presuming the demand of the Calicut-Cannanore Railway amounting to 136,000 sleepers is spread over three years, this would give an annual demand of 44,000 sleepers to be met by the Department from three Districts or, say, roughly 15,000 sleepers per District if the indent was equally divided among the three. This, of course, is neither necessary nor advisable as the possibility of each district varies. Taking them therefore in the order of greatest possibility, South Coimbatore should supply the greatest number. The District Forest-officer states that given men and money he could supply 65,000 the first year and 100,000 the second, the sources of supply being so far as concerns the first year 15,000 from Tekadi leased forests, 25,000 from Pollachi Upper Anaimalai forests, and a similar number from Udamalpet Upper Anaimalai forests. In the 15,000 sleepers proposed for supply from Tekadi forests 2,500 Teak sleepers are included, which, however it would not pay us to supply as teak in the log will pay us much better than the price we could realize for it when sawn into sleepers. This would leave 12,500 sleepers to be supplied composed of *Terminalia tomentosa* and *Lagerstræmia microcarpa* in about the proportion of nine to four respectively. It is not certain that the Railway Company would accept the latter kind of wood although it should prove fairly suitable for sleepers. I shall therefore ask the District Forest-officer to send some sample sleepers to the Company for testing and opinion at once.

3. Passing on to the supply proposed from the Pollachi and Udamalpet forests the District Forest-officer's proposals are dependent in each of these cases on methods of transport which have not yet been tried there and in the case of Pollachi Forests which are not yet available. I refer of course to the new road now under construction to connect these forests with the plains and it is evident that without this road the supply of sleepers from the Upper Anaimalai forests could not be undertaken. I therefore put myself in communication with the Superintending Engineer regarding the time it would take to construct a cart-track suitable for our purposes of slow timber traffic down hill and I would specially invite reference to this correspondence as I regard the Superintending Engineer's last letter, dated 22nd June as very hopeful in so much as he states that "it would be possible to make the Prince of Wales Ghât passable for carts in a very short time, but it would involve very expensive work on the fourth and fifth miles. It might, however, pay to incur this expense to enable you to take up the contract for sleepers, and accept the risk of the Prince of Wales Ghât not being eventually selected as the best line for the cart-road." I am certainly of opinion that unless the very expensive work spoken of by the Superintending Engineer is prohibitively high it should be undertaken rather than allow an indefinite period to elapse before any road at all is available, and I would point out in this connection that even if this Prince of Wales Ghât road was not chosen as the final road to connect the evergreen forests near Sirukunru and Paraiai with the plains, other forests would be tapped by it or by branch cart-tracks from it, which the Department could construct and in this way it could not but prove remunerative and useful to the Department in the long run. I would, therefore, await an expression of opinion on this matter by the Board before replying to the Superintending Engineer. If however that officer could give an approximate figure as to what the cost of the heavy work on the fourth and fifth miles would be in order to make it passable for carts it would help us to come to a conclusion on this point. In the somewhat uncertain time therefore in which we may expect to utilize the new cart-road I think it would be wise not to rely on these Upper Anaimalai Pollachi forests for any supply during the first year, although it might be quite possible to bring down some sleepers towards the end of the official year, provided that arrangements can be made for Travancore or Palghat sawyers who would be required in some numbers for the work. As regards the supply from the Udamalpet Upper Anaimalai forests, the District Forest-officer contemplates utilizing the two rivers connecting the forests with the plains for the purpose of transporting sleepers, but as this means of transport in the locality is new I think it would be advisable not to rely on it for the present. In conclusion, therefore, I do not think that it would be wise to rely on a greater number of sleepers from South Coimbatore during the first year than the 12,500 to be obtained from the Tekadi leased forests, although it is quite possible that this number could be considerably increased from the Pollachi Upper Anaimalai forests, provided the cart-road is made available for slow down-hill timber traffic at an early date. During the second year I think we could with more certainty rely on the supply being largely increased from this source, although I doubt whether it would be possible to supply such a large

number as 25,000 as contemplated by the District Forest-officer when the difficulties of procuring transport and sawyer labour in an entirely new locality are taken into account. I therefore think that 10,000 sleepers would probably be as much as we might expect to supply the second year from these forests and this only provided subordinates possessing tact and interest in their work are employed on the work.

For South Coimbatore, therefore, I am of opinion that it would only be safe to rely on a supply of 12,500 sleepers the first year and 22,500 the second and possibly 30,000 the third.

4. As regards the supply that can be expected from South Malabar, the District Forest-officer of that District reports that he can supply 9,000 *Terminalia tomentosa* sleepers and 13,000 Irul (*Xylia dolabriformis*) during the next twelve months, but taking into consideration possible difficulty in procuring a sufficient number of sawyers during the first year of the work as well as possible loss in converting logs into sleepers over and above the percentage calculated I think it would be safer not to rely upon a greater number than 15,000 sleepers during each year from this District. But it must be pointed out that this number could be considerably increased if the Railway Company would accept sleepers of *Terminalia paniculata* which could moreover be supplied cheaper than either of the two other kinds of timber referred to. This can only be ascertained by sending the Railway Company some sample sleepers to test and examine, which I shall ask the District Forest-officer to do at once.

5. As regards the supply which may be expected from South Canara, the District Forest-officer reports that he can supply the following:—

	RS.
1st Hopea parviflora	6,000
2nd Terminalia tomentosa	4,000
3rd Xylia dolabriformis	3,000
4th Lagerstroemia microcarpa	2,000
Total	15,000

I think however for similar reasons as stated regarding the South Malabar supply that it would be better to reduce this number to 10,000 and that the reduction should as much as possible bear on the Hopea which is such a good wood and so easily disposable in the log that I am doubtful whether it would be justifiable to utilize it in large quantity for sleepers.

6. In conclusion, therefore, so far as numbers are concerned, I am of opinion that we might hope to supply 37,500 sleepers the first year and about 50,000 the second and third, which number would meet the whole demand so far as the Calicut-Cannanore Railway is concerned.

7. The next question relative to the supply is the rate at which we might expect to make it. The District Forest-officer, South Coimbatore, after going into the matter at some length proposes a rate of Rs. 3-8-0 made up of Rs. 1-6-0, actual cash disbursement per sleeper delivered in Coimbatore, Rs. 1-6-0 cost of establishment, elephants, annual lease amount of forests, &c., and As. 11-8 profit and to cover loss by rejection, &c.

I consider this amount rather low even for the smaller sleeper of $3\frac{1}{2}$ cubic feet when taking into consideration the excellent quality of timber we propose to supply, which for Indian underground purposes would probably be superior to creosoted pine sleepers. I therefore think a charge of Rs. 4-8-0 per smaller sleeper and Rs. 5-8-0 per larger one to be more reasonable; these rates moreover are more in accordance with those proposed by the District Forest-officers, South Malabar and South Canara who, however, do not differentiate between the two classes of sleepers when making their proposals on this point. If the Railway Company however would take *Terminalia paniculata* we could supply this wood at 20 per cent. below the above rates.

If the contract is taken up it will be necessary to make immediate arrangements for sawyers in each District. I would, therefore, request that orders may be passed as soon as possible in communication with the Railway Company. In the meantime I shall keep District Forest-officers informed what is being done in the matter.

8. The enclosure to the Board's Reference is herewith returned,

ENCLOSURE No. 1.

From—The Conservator of Forests, Southern Circle.
To—The Superintending Engineer, IV Circle, Coimbatore.
Dated—30th May 1898, No. 4098.

I have the honour to enquire when a cart-road is likely to be commenced connecting Paralai with the Plains and when commenced how long (approximately of course) the cutting of it would take so as to admit of timber being brought down.

This information is asked for as it is under contemplation to supply a portion of the quantity of sleepers required by the Calicut-Cannanore Railway during the next three years from the Upper Anaimalai forests if the cart-road can be made use of during this period.

I understand from a communication (copy enclosed) from Mr. Loam, to the District Forest-officer, South Coimbatore, in reply to a similar query as that contained in this letter, that he has no orders to construct a cart-road but only to frame an estimate for one but that he is engaged in cutting a bridlepath to Sirukunru. I would beg to point out that the bridlepaths though very useful bring no direct return to Government, while from the day that a cart-road is opened connecting the forests with the plains some of the timber can be brought down and sold at remunerative rates which I estimate at from 6 annas to 1 rupee net per cubic foot.

From—The Superintending Engineer, IV Circle.
To—The Conservator of Forests, Southern Circle, Coimbatore.
Dated—7th June 1898, No. 334-M.

In reply to your No. 4098, dated 30th May 1898, I have the honour to inform you that the construction of a metalled cart-road for three and a half miles from the Aliar Crossing will be commenced, I trust, within the next three weeks. The Bridge across the Aliar will, it is hoped, be completed by this time next year.

2. From three and a half miles there are two possible routes to Sirukunru—one by the Prince of Wales Ghât and the water-fall estate and the other by the Villoni Valley. Before deciding which route would be the more favourable for a cart-road estimates have to be prepared, and they ought to be submitted in two months' time.

3. To complete a cart-road to Sirukunru by either route would probably take from three to four years. Government are anxious to have a good cart-road made with the least possible delay.

From—The Conservator of Forests, Southern Circle.
To—The Superintending Engineer, IV Circle, Coimbatore.
Dated—15th June 1898, Ref. on Cur. No. 4098.

With reference to paragraph 3 of your No. 334, dated 7th June 1898, I have the honour to enquire how long it would take to so far construct the road as to admit of carting of timber from the Forests to the plains, as this would only entail laden carts coming down hill.

It would be quite possible to utilize the road for timber down traffic before being metalled and widened to its full width, as a 10-feet unmetalled road would probably answer our purpose almost as well as a fully-metalled wide road which will be necessary for up-hill traffic.

I would, therefore, ask if it would not be possible to construct a cart-track of this nature in a somewhat shorter period than three or four years.

I ask for this information as I believe it would be almost possible for the Forest Department to recover a large portion of the expenditure on the road out of profits from supply of sleepers to the Calicut-Cannanore and other Railways if the road could be so far constructed at a somewhat earlier date so as to admit of slow timber traffic. The matter being of great importance to the Department with reference to timber sleeper supply contracts which will go elsewhere if not taken up by us is my reason for again troubling you for further information on the subject.

From—The Superintending Engineer, IV Circle.
To—The Conservator of Forests, Southern Circle, Coimbatore.
Dated—22nd June 1898, No. 363-M.

In reply to your No. 4098, dated 15th June 1898, I have the honour to inform you that it would certainly be possible to get the road ready for carts carrying sleepers down to the plains in a shorter time than three years.

2. As soon as the line for the cart-road has been definitely decided on every endeavour will be made to form a road which will answer your requirements without loss of time, as I fully appreciate the importance of the work.

3. I should be glad to know when you would be ready to begin carting sleepers. It would be possible to make the Prince of Wales Ghât passable for carts in a very short time, but it would involve very expensive work in the 4th and 5th miles. It might, however, pay to incur this expense to enable you to take up the contract for sleepers, and accept the risk of the Prince of Wales Ghât not being eventually selected as the best line for the cart-road.

ENCLOSURE No 2.

From—The Executive Engineer on Special duty.
To—The District Forest-officer, South Coimbatore.
Dated—15th May 1898, No. 240.

With reference to your letter No. 497-Cur. (b), dated 9th May 1898, I have the honour to report that I am making a bridlepath to Sirukunru and have orders only to make estimates for a bandy road.

Endorsement by—The District Forest-officer.
Dated—23rd May 1898, Ref. No. C-497.

Forwarded to the Conservator of Forests for information; this is the reply to my query as to when carts would be able to get through.

Resolution—Forest No. 301, dated 21st July 1898.

In March last the Consulting Engineer for Railways brought to the notice of Government, in the Public Works Department, Railway Branch, that there was an immediate prospect of a very heavy demand for Railway sleepers in connection with the construction of the line from Calicut to Cannanore and afterwards that from Shoranur to Cochin. He represented that the demand for Pyangadu (*Xylia dolabriformis*) from Burma was far in excess of the supply, and that as large quantities of timber fit for sleepers are said to exist in the North and South Malabar forest Divisions, it would be a pity to ignore the agency of the Forest Department in the matter of this supply and to obtain creosoted pine sleepers from Europe. In its order, No. 544, Railway, dated 7th April 1898, the Government enquired of the Board whether any special steps should be taken, or expenditure incurred, to enable the Forest Department to supply about 136,000 sleepers for the Calicut-Cannanore Railway in the next two years.

2. The Board referred the matter to the Conservator of Forests, Southern Circle, for report, but as the undertaking was one which would involve considerable initial expenditure from forest funds, it desired the Railway Branch of the Public Works Department to furnish an estimate of the probable annual demand for sleepers for renew-

Teak	...	<i>Tectona grandis.</i>
Maddi	...	<i>Terminalia tomentosa.</i>
Ironwood (Irul)	...	<i>Xylia dolabriformis.</i>
Vengai or Yegi	...	<i>Pterocarpus marsupium.</i>
Achea or Yepi	...	<i>Hardwickia binata.</i>
Sâl	...	<i>Shorea robusta.</i>
Sôme	...	<i>Soymida febrifuga.</i>
Manjakadambi or Rudrajanapa.	...	<i>Adina cordifolia.</i>

als at different centres and the kinds of wood approved by the railway authorities. The Board at the same time specified the marginally-noted woods which occurred to it as suitable for the purpose and in a separate communication added *Mesua ferrea* or *speciosa*. The Railway Branch replied that the quantity of metre gauge sleepers which would probably be bought from the Forest Department for the

Calicut-Cannanore line within, say, three years would amount to 136,000 sleepers, and those for the Shoranur-Cochin line, within the same period, to 164,000, and that the future annual requirements would amount to 10,000 sleepers for both railways, rising eventually to 30,000 sleepers at the end of ten years. The Board forwarded this reply to the Conservator of Forests, Southern Circle, and at the same time requested the Railway Branch to furnish an estimate of the probable demand for renewals in the Madras, South Indian and East Coast Railways. The reply to the latter reference has not yet been received.

3. The paper last read above is the Conservator's reply to the references made to him. Mr. Brasier states that he has consulted the District Forest-officers of the Nilgiris, North Malabar, South Coimbatore, South Malabar and South Canara. He considers that the rates quoted by the District Forest-officers of the first-named two forest divisions are either altogether prohibitive or so high as to leave but a small margin of profit, even assuming that the railways would pay as much as they would for creosoted pine sleepers. He is, however, of opinion that from North Malabar *Terminalia tomentosa* can be supplied at a much lower price than that given by the District Forest-officer by a possible reduction in the rates for sawing and carting, and the Board notes that the matter is engaging the Conservator's attention. Leaving, however, these two forest divisions out of account, Mr. Brasier hopes that the estimated quantity of 136,000 sleepers for the Calicut-Cannanore Railway can be met from the remaining three divisions at 37,500 sleepers during the first year and about 50,000 during each of the following two years.

4. As regards the rate, Mr. Brasier proposes to charge Rs. 4-8-0 per smaller sleeper and Rs. 5-8-0 per larger one. He has not named the stations at which he would deliver the supply at the proposed rates except in the case of sleepers from the South Coimbatore division, which it is said will be delivered at Coimbatore, by which is probably meant the Podanûr Railway station. The sleepers from South Malabar will no doubt be delivered at Calicut, and those from South Canara at such port as may be most convenient to the Railway Company. Mr. Brasier states that the rates proposed by him are more in accordance with those suggested by the District Forest-officers of South Malabar and South Canara, whereas the rate of Rs. 3-8-0 quoted by the District Forest-officer, South Coimbatore, is low even for the smaller sleepers, considering that the quality of timber which it is proposed to supply is excellent. The Board considers that Mr. Brasier's rates are reasonable. Apart from the question of the excellence of the timber the Board does not consider that it would be safe to undertake the work at the rates proposed by the District Forest-officer, South Coimbatore. Some of the localities to be worked are isolated and have to be newly opened out, and there may be difficulties with regard to sawyers and carriage involving revised rates as well as the appointment of additional supervising establishments.

5. Mr. Brasier's remarks and conclusions with regard to the quantities that can be supplied from each of the forest divisions of South Coimbatore, South Malabar and South Canara will now be considered. Taking South Coimbatore, the District Forest-officer is of opinion that, given men and money, he could supply 65,000 sleepers the first year and 100,000 the second year. He expects to supply during the first year 15,000 sleepers from the Tekadi leased forests, 25,000 from the Pollachi Upper Anaimalai forests, and 25,000 from the Udumalpet Upper Anaimalai forests. The District Forest-officer's estimate of the proposed supply from the Tekadi forests includes 2,500 teak sleepers. Mr. Brasier rightly thinks that teak would fetch better prices if sold in the log than when converted into sleepers. He would accordingly deduct 2,500 from the number proposed by the District Forest-officer. The balance, viz., 12,500 sleepers, is composed of *Terminalia tomentosa* and *Lagerstrœmia microcarpa* in about the proportion of 9 to 4, respectively, and the Board notes that the Conservator is arranging to ascertain the opinion of the railway authorities as to the quality of this latter wood after test. As regards the supplies from the Pollachi and Udumalpet forests, Mr. Brasier considers that the difficulty of transport largely discounts the sanguine view of the District Forest-officer. The supply from the Pollachi Upper Anaimalai forests is dependent on the completion of the road now in course of construction in connection with the grant of leases for planting in the Anaimalai forest reserve. It seems that it would be possible to make the Prince of Wales Ghaut passable for carts in a very short time, but a large expenditure would have to be incurred on the 4th and 5th miles. Apart from the uncertainty as to whether this Ghaut will eventually be selected as the best line for the cart road to connect the evergreen forests near Sirukunru and Paralai with the plains, Mr. Brasier considers that unless the very large expenditure said to be necessary for this work is regarded as prohibitive, it might be undertaken rather than have no road at all for an indefinite period. In his opinion the Prince of Wales Ghaut road would prove useful and remunerative as other forests would be tapped by it or by branch cart-tracks from it which the Department could construct. The Board trusts that by the time the railway is in a position

to give definite orders for the supply of sleepers, the Superintending Engineer will have decided on the line which the new cart road should take, or if this is not possible, he could frame an estimate showing the probable cost of rendering the Prince of Wales Ghaut fit for cart traffic. Owing to the difficulty of transport from the Pollachi Upper Anaimalais forests as well as from the Udumalpet Upper Anaimalais where the method of transporting the wood by rivers has yet to be tried, Mr. Brasier thinks it wise not to calculate on any supply from these forests during the first year. In the second year a supply would no doubt be obtained from the Pollachi Upper Anaimalais, but when the difficulties of procuring transport and sawyer labour in an entirely new locality are considered, Mr. Brasier doubts whether a supply of 25,000 sleepers could be relied on and thinks that the figures might be taken at 10,000; to procure even this number it would in his opinion be necessary to employ subordinates possessing special tact and interest in the work. In the third year the number might be raised to 17,500, making 30,000 in all from South Coimbatore. The wood of which the sleepers from the Pollachi Upper Anaimalais would be made is not stated, but from other correspondence on the subject there is no doubt that it is *Mesua ferrea* or *speciosa*.

6. In South Malabar, the District Forest-officer estimates a supply of 9,000 sleepers of *Terminalia tomentosa* and 13,000 of *Xylia dolabriformis* during the next twelve months. Taking into account the difficulty of procuring a sufficient number of sawyers during the first year of the work and the possible loss in converting logs into sleepers over and above the percentage calculated, Mr. Brasier relies upon a supply from this division of 15,000 sleepers annually. He adds that this number could be considerably increased if the Railway Company would accept sleepers of *Terminalia paniculata* which could be supplied at rates 20 per cent. cheaper than those given above. It is noted that arrangements are being made to test the usefulness of this wood as a railway sleeper. For reasons similar to those adduced for South Malabar, Mr. Brasier reduces the estimate of the District Forest-officer, South Canara, from 15,000 to 10,000 sleepers.

7. To sum up, the proposals for supply are as follows:—

	<i>Terminalia tomentosa.</i>	<i>Xylia dolabriformis.</i>	<i>Mesua ferrea or speciosa.</i>	<i>Lagerstræmia microcarpa.</i>	<i>Hopea parviflora.</i>
South Malabar—					
First year	5,000	10,000	..	..	..
Second year	5,000	10,000	..	..	..
Third year	5,000	10,000	..	..	..
South Coimbatore—					
First year	7,500	..	..	4,500	..
Second year	7,500	..	10,000	4,500	..
Third year	7,500	..	17,500	4,500	..
South Canara—					
First year	4,000	3,000	..	2,000	1,000
Second year	4,000	3,000	..	2,000	1,000
Third year	4,000	3,000	..	2,000	1,000
Total ..	49,500	39,000	27,500	19,500	3,000
<i>Terminalia tomentosa</i>	..	..	..	..	49,500
<i>Xylia dolabriformis</i>	..	..	..	..	39,000
<i>Mesua ferrea</i>	..	..	..	..	27,500
<i>Lagerstræmia microcarpa</i>	..	..	..	..	19,500
<i>Hopea parviflora</i>	..	..	..	..	3,000
Total ..	..	..	..	..	138,500

From the Consulting Engineer's note recorded in Government Order, No. 841 Ry., dated 21st June 1898, and from Gamble's Manual of Indian Timbers there can be no doubt as to the suitability of *Xylia dolabriformis* and *Mesua ferrea* or *speciosa* for the manufacture of sleepers, and the same may probably be said of *Hopea parviflora* though the Board has no information of any experiment having actually been made. With regard to *Terminalia tomentosa*, definite information can probably be obtained from the Northern Bengal State Railway, who are said, by Gamble, to have made experiments on a considerable scale in 1876. *Lagerstræmia microcarpa* does not seem to have been tried for sleepers anywhere but it is a favourite wood for building on the West Coast.

If all the timbers above mentioned be accepted and the road to the Pollachi Upper Anaimalai forests be pushed on with, the Board considers that Government may safely undertake the supply, by the Forest Department, of all the sleepers required for the Calicut-Cannanore Railway, and possibly some, if not all, of those required for the other extensions mentioned by the Consulting Engineer as likely to be taken in hand at an early date, but the result of the first year's working must be awaited before any further definite proposals can be submitted. As has been represented in Board's Proceedings, No. 227, dated 11th June 1898 the completion of the Anaimalai Ghaut road is a matter of prime importance in connection with the provision of railway sleepers, the supply of suitable timber in that locality being practically unlimited.

G.O., No. 1141, Railway, dated 16th September 1898.

ABSTRACT.—Informing the Board of Revenue of the number of sleepers which are likely to be required annually for renewals on the standard and metre-gauge railways in the Madras Presidency, and requesting it to report what steps it proposes to take for supplying them.

Resolution—Forest No. 427, dated 6th October 1898.

In the Government Order read above the Board is directed to report as early as possible for the information of Government what steps it is proposed to take in the matter of the direct supply of sleepers to railways in this Presidency.

2. Certain proposals were submitted in Board's Proceedings, No. 301, dated 21st July 1898, but the figures given in the Government Order now read show that there has been a misunderstanding as regards the size of the sleepers required for the Calicut-Cannanore Railway.

3. The letter from the Agent, Madras Railway, forwarded with G.O., No. 544, Railway, dated 7th April 1898, gave quotations for two sizes of sleepers, and the Board assumed that the smaller of these, viz., a sleeper of $3\frac{1}{2}$ cubic feet was that which is required for the Calicut-Cannanore Railway and based its proposals accordingly, but from the enclosure to G.O., No. 1141, Railway, dated 16th September 1898, it would appear that the size required is either that used by the South Indian Railway, viz., $6' 6" \times 9" \times 4\frac{1}{2}"$ or that proposed for the Shoranur-Cochin Railway, viz., $6' \times 8" \times 4\frac{1}{2}"$. The Board will require to have definite information on the point before commencing work.

4. It is observed that the Madras and South Indian Railways pay different prices per sleeper according to the wood of which it is made, and if necessary differential prices can be quoted, after further enquiry, with reference to the wood used and the locality from which it is supplied, but the Board would prefer an all-round rate of Rs. 3-4-0 for a sleeper $6' 6" \times 9" \times 4\frac{1}{2}"$ which, it is observed, is the rate that has been paid by the South Indian Railway for Irul sleepers. The price per sleeper $6' \times 8" \times 4\frac{1}{2}"$ would be Rs. 2-12-0. Delivery would be made at Podanur from Coimbatore, at Kallai from South Malabar, at Calicut and Tellicherry from North Malabar, while those from South Canara would be delivered at any port in Malabar which might be found convenient for the Railway Company.

5. In its Proceedings of the 21st July 1898, No. 301, paragraph 7, the Board offered to supply all the sleepers required for the Calicut-Cannanore Railway if all the timbers mentioned by it were accepted and the road to the Pollachi Upper Anaimalai forest were pushed on with. The present Acting Conservator of Forests, Mr. Gass, in consultation with whom the present Proceedings are written and who is also permanent District Forest-officer, Coimbatore, considers that we do not yet know enough of the Pollachi Upper Anaimalai forests to justify us in offering to make any supply from there owing to the long carriage, and the difficulty of converting the prevailing timber, viz., *Mesua ferrea* or *speciosa*; he also considers that the capabilities of the Lower Anaimalai forests have been overestimated. The smaller size of the sleeper required, however, makes it unnecessary for the Board to withdraw its

proposal to supply 136,000 sleepers within three years using only the woods which it now appears are already approved by the Madras and South Indian Railways, viz., Karimaradu (*Terminalia tomentosa*), Irul (*Xylia dolabriformis*) and Iumbogam (*Hopea parviflora*). Further information from North Malabar even enables it to raise its offer to 200,000 within three years, and if the smaller sleeper be used the number would be 250,000. This does not include the demand for the Tinnevely-Quilon Railway. This railway was not mentioned in the former orders of Government and consequently full enquiries have not yet been made as to the capabilities of the Tinnevely forests. A further communication will be submitted on the point, as well as with regard to experiments which are now being made with other kinds of wood in communication with the officers of the Madras Railway Company.

6. It is also proposed to thoroughly investigate the capabilities of the Pollachi Upper Anamalai forests. A saw-mill and wire ropeway have just been successfully installed in the Lower Anamalais in which a tramway has been in work for years, and if similar arrangements on a larger scale can be made for the exploitation of the more extensive and more fully stocked forests of the Upper Anamalais, the Board sees no reason to doubt that it will be in a position largely to increase its contribution towards meeting the very large demand for sleepers which has arisen in connection with the extension of railway construction in the Presidency.

7. The most important timber in the Upper Anamalai forests being *Mesua ferrea*, the Board would be glad to be informed at the earliest possible date whether sleepers of that wood would be accepted. It does not appear that any of them has been used by the Madras or South Indian Railways, but Gamble, at page 27 of his Manual of Indian Timbers, states that it has been found to answer for sleepers equally well with Pynkadu.

Order—No. 1311, Railway, dated 21st October 1898.

A copy of the Board's Resolution, together with a copy of the description of *Mesua ferrea* given in page 27 of Mr. Gamble's book, will be forwarded to the Madras, South Indian, and East Coast Railways, with an enquiry whether they will be prepared to accept sleepers of the timber for extensions and renewals, and with a request that they will specify the size of sleepers, standard or metre gauge, which they would be prepared to take. It is noted that in the Government of India standard dimensions, the following sizes are recommended: viz., for broad gauge 9' 6" x 9" x 5", with as a minimum 8' 11" x 8" x 5", and for metre gauge 6' 0" x 7" x 4½" with as a minimum 5' 9" x 6" x 4".

ENCLOSURE.

Mesua ferrea.

Vernacular names: *Nagesar*, Bengali; *Nahor*, Assamese; *Nangal*, Tamil; *Naga-kesara*, Telugu.

A large evergreen tree. Heartwood dark red, extremely hard. Pores moderate-sized, often in groups, scanty, often filled with yellow resin. Medullary rays extremely fine, uniform, equidistant, very numerous. Numerous fine, many, concentric lines of light-coloured tissue.

Eastern Bengal from the Monas eastward (though traces of its having formerly been found west of that river occur sometimes in the names of places, e.g., Nageswarbari, or Naksarbari, a town in the Sikkim Terai on the Nepal frontier), Assam, South India, Ceylon, Burma and the Andamans, often cultivated.

The weight and transverse strength have been determined by the following experiments—

	Weight.	Value of P.
	LB.	
A. Mendis—Ceylon No. 59, with bars 2' x 1" x 1" ... found	72	994
Brandis—Burma, No. 18, 1862, ...	69	...
Bennett—Andamans, No. 4, 1872, ...	70	1,053
Assam (4 specimens) 1878, ...	67.5	...
Smythies { Kanara (1 specimen) " ...	62	...
{ Burma (6 specimens) " ...	70	...

Several of our specimens, however, reached 74 to 76 lb. per cubic foot in weight. It is very durable. It has been found to answer for sleepers equally well with Pynkado, but the cost of cutting the hard wood, its weight, and the freight from the Tenasserim forests to Calcutta prevent its being much used, as the total cost is scarcely covered by the price (Rs. 5) per broad-gauge sleeper. It is used for building, for bridges, gunstocks and tool handles; but its more general use is prevented by its great hardness, weight and the difficulty of working it. In Ceylon an oil is obtained from the nut, and the tree is often planted for the sake of its handsome flowers.

Note by the Consulting Engineer for Railways.

In Assam *Nahor* (*Mesua ferrea*) is known to be an excellent sleeper timber.

Order—No. 772, Revenue, dated 13th December 1898.

Recorded. The Board of Revenue should do all they can to develop the market for railway sleepers.

2. The question of the alignment of the Anamalai ghât road is under the consideration of the Government.

Resolution of the Board of Revenue, dated 7th January 1899, Forest No. 17.

Communicated to the Conservator of Forests, Southern Circle, and the Collectors of Coimbatore, Malabar and South Canara whose special attention is drawn to the remarks of Government regarding the development of the market for railway sleepers.

The Board understands that trees were felled in several districts some time ago in view to the manufacture of railway sleepers, but definite information as to the size of the sleepers required for the proposed new railways is still awaited. The sizes required for annual renewals on the Madras and South Indian Railways are given in Government Order, No. 1141, Railway, dated 16th September 1898.

Read—G.O., No. 53 Ry., dated 11th January 1899.

[This order has been communicated to Railway Administration.]

Resolution of the Board of Revenue, dated 3rd February 1899, Forest No. 65.

From the papers read above there seems reason to believe that the forests of the Madras Presidency are capable of supplying a considerable proportion of the sleepers required for the Railway extensions now under contemplation as well for annual renewals on the existing lines, and Government has directed that all that is possible shall be done to develop the market for railway sleepers.

2. Conservators or, in cases in which it may be more convenient, District Forest-officers, should place themselves in direct communication with the Chief Engineers of the different railways in view to obtaining any information regarding requirements which cannot be found in the orders of Government which have been communicated to them.

3. The Board concurs with the Chief Engineer of the Madras Railway in considering that it must be clearly understood that sleepers supplied by the Forest Department will be subject to the conditions of ordinary contracts and should be in accordance with specification, and subject to rejection if considered unfit for use and not up to specification. It has also no objection to the condition that the officers of the railway concerned shall be sole judges in this respect, if it be understood that rejections by a subordinate officer shall, if necessary, be subject to revision by the head of his department.

4. As District Forest-officers will have difficulty in finding time to devote personal supervision to all the details of operations on a large scale, the Board considers that endeavours should be made to secure the services of trustworthy, and, if possible, experienced contractors who could work under conditions prescribed by the District Forest-officer. The officers of the railway administration may be in a position to assist in this matter.

5. The main object in view is the utilization of local resources, and the consequent retention in the country of large sums of money which must otherwise be sent out of it. To this the Board attaches very great importance and it may be understood that there will be no difficulty in obtaining sanction to any well-considered schemes for expenditure in opening out markets which are at present closed for want of facilities for transport or manufacture.

ORDER—No. 342 Ry., dated 27th March 1899.

A copy of these Proceedings, containing the Board of Revenue's Resolutions, Forest Nos. 17, dated 7th January 1899, and 65, dated 3rd February 1899, will be communicated to railway administrations for information.

2. It is the desire of Government that the Railway Companies should make every endeavour to place the Forest-officers in possession of sufficient information, well in advance, so as to enable local sleepers to compete on equal terms with Burma or Australian or English supplies. It is now the definite policy of Government to endeavour by all practicable means to meet the demand for railway sleepers, at first to a somewhat limited extent until the local forests get opened out, but later on more fully.

3. A copy of these Proceedings will be forwarded to the Government of India.

[Here enter No. 343 Ry., dated 27th March 1899.]

(True Extract.)

W. D. Lyle
Under Secretary.

To the Agent, Madras Railway.

- " Agent, South Indian Railway.
- " Agent, His Highness the Nizam's Guaranteed State Railway.
- " Manager, East Coast Railway.
- " Board of Revenue.
- " Revenue Department. *Smith bsc*
- " Consulting Engineer for Railways.

Exd. T. K. Narayana Aiyangar.

When given for copying _____
When copied _____ } 189
When examined _____
When signed _____

READ AGAIN G.O., No. 189

DATED

CURRENT No.

ENCLOSURES TO G. No.

ORDER OF GOVERNMENT

LETTER OF GOVERNMENT

STATEMENT WITH DITTO.

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IN ORIGINAL.

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