— 3,000—5-2-98.

Revenue (1898) Department.

MISCELLANEOUS SERIES.

G.O., No. 2854

DATED 7th July 98

[Despatch Abstract.]

Comm^n to the Board of Rev. in Continuation of G.O. no 1350 of 17-3-98, G.O. P.W.D. ordering that the Hon^ble Mr Chatterton Consulting Engineer for Railways Madras, on the subject of Sleeper Timbers be Communicated to the Ry. administrations Concerned &c.

BACK PAPERS.

G.O.	No.	Department.	Date.	G.O.	No.	Department.	Date.

FURTHER PAPERS.

G.O.	No.	Department.	Date.	G.O.	No.	Department.	Date.
5-6-98	8.0 7720	13.12.98.					

Revenue 1898 2nd Department

RAILWAY.

Government {1898} of Madras.

PUBLIC WORKS.

7/7/98

Recd. 3 July } 1898. Enclosures

Regd. 4 " Spare copies

G.O., No. 841 Ry., 21st June 1898.

G.O. No. 2854 dy 7th July 98.

Communicated to the Board of Revn in continuation of G.O. No 1350 dy 17.3.98.

7.7.98

JUNE.

To the Bd of Revn (L.R) Dft 9.7.98

Sleeper Timbers Ltr 5.7.98.

Ordered that the note by the Consulting Engineer for Railways, Madras, on the subject of —, be communicated to the Railway Administrations concerned, and copy of the Proceedings forwarded to the Governments of India and Bombay.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Railway.

Read again the following papers :—

G.O., Nos. 373–74 Ry., dated 5th March 1898.
„ No. 715 Ry. „ 12th May „

Read also the following papers :—

From—The Secretary to the Government of India, Public Works Department.
To—The Joint Secretary to the Government of Madras, P.W. Dept., Railway Branch.
Dated—Simla, 3rd May 1898, No. 151/R.S.

I am directed to acknowledge the receipt of your No. 374 Ry., dated 5th March 1898, forwarding copy of the Proceedings of the Government of Madras embodying a note by the Senior Government Inspector of Railways, Madras, regarding the preservation of timber for railway sleeper purposes by the Haskin process of preserving timber as described in an article in *The Engineer* of 28th January 1898, pages 81—4.

2. In reply I am to forward, for the information of the Government of Madras, copy of a note, dated 14th April 1898, by the Inspector-General of Forests on the subject.

ENCLOSURE.

COPY of note, dated 14th April 1898, by the Inspector-General of Forests.

I have seen haskinized wood in America and have studied some papers relating to the process. I have also seen the method employed, but in a less perfect degree in Victoria.

There is no doubt that as regards green freshly-felled timber the effect of the system is wonderful. A heat of over 300 degrees can be employed, changing the sap and forming tissues into antiseptics without damaging the hard texture of the wood. However, with dry wood or with wood which has undergone a long water transport like our Himalayan firs, the same degree of heat cannot be employed without endangering the structural value of the wood, and the system is merely reduced to an artificial seasoning process. In these cases nothing but impregnation will *fully* meet the purpose of giving the timber an artificially longer life.

2. There seems to be no necessity of sending experimental consignments of timber home to be vulcanized; nor would the experiment be a fair one.

We have large forest areas in Burma, which contain enormous quantities of timber of species which I consider structurally and physically fit for railway sleepers or any other works, but which for other reasons have not the same length of life as pynkadu, teak, &c., for instance, *Terminalia tomentosa*, *Dipterocarpus tuberculatus*, &c., and I should feel much inclined to support the erection of an haskinizing apparatus in these localities, if the engineering authorities agree with me as regards the structural value of the woods of which we have large quantities growing in compact areas.

3. From the outset I must, however, dispel the optimistic view that, by Haskin's or any other process, we could save a rupee all round per sleeper, for this would be in many cases more than the entire value of the wood in deodar, pynkadu, sâl and teak sleepers; and would often intrench on the amount to be paid for extraction, conversion, &c.

Read also the following Note by the Consulting Engineer for Railways, Madras, dated 17th May 1898, on the subject of SLEEPER TIMBERS.

Since my note on the haskinizing preserving process, which was embodied in G.O., No. 373 Ry., dated 5th March 1898, was written, I have been in communication with the Board of Revenue on the subject of the probable sources of sleeper supply on the West Coast of this Presidency. The Board of Revenue have furnished a list of woods which will probably be found to be available in the Malabar forests. Some of them are undoubtedly good for the purpose in view. Of others I know little except that, though structurally good, they may, for all I can tell, be likely to fail through not being immune against internal decomposition. I understand that in the West Coast forests the Forest Department have heretofore devoted greater attention to conservation than to commercial utilization; and that, before they can launch out into a departmental system for supplying sleepers directly to the railways which are projected on that side of the Presidency, they must see their way to a reasonably extensive market to justify the necessary initial expenditure on roads, machinery, &c.

2. The list of woods above referred to is as follows:—There is said to be an unlimited quantity of No. (10) in the Upper Annamalai forests, and it is said to be a splendid sleeper timber.

(1) TEAK	*Tectona grandis.*
(2) MADDI	*Terminalia tomentosa.*
(3)	*Terminalia paniculata.*
(4) IRONWOOD, Irul	*Xylia dolabriformis.*
(5) VENGAI, or Yegi	*Pterocarpus marsupium.*
(6) ACHEA, or Yepi	*Hardwickia binata.*
(7) SAL	*Shorea robusta.*
(8) SOME	*Soymida febrifuga.*
(9) MANJA KADAMBAI, or Rudrajanapa	*Adina cordifolia.*
(10) SHUBALI	*Mesua speciosa.*

3. I find in my notes the following information, doubtless taken straight from Gamble, about the true *Pynkadu*, or Ironwood, timber and its rival, *Eng*.

4. PYNKADU is of the Order *Leguminosæ*; the order to which belong the well known trees Sissu, Pulás, Tamarind, Babul, &c.

Sub-order, *Mimosæ*.	Genus, *Xylia*.
Tribe, *Eumimoseæ*.	Species, *Xylia dolabriformis*.

A large diciduous tree, bark gray or reddish brown, $\frac{1}{4}$" thick, with short cracks irregularly distributed; sapwood small; heartwood dark brown, or reddish brown; extremely hard, beautifully mottled, crossgrained, the fibres on a longitudinal section being wavy. The wood is very resinous and the resin is partly soluble in hot water, to which it imparts a reddish colour. Mean weight 73·5 lb., P = 955 lb.

5. The more common ENG of Burma is *Dipterocarpus tuberculatus*, whose weight is about 54 lb. per cb. ft., P = 750 lb. But the species which is apt to replace Pynkadu is Kya-Eng, or *Dipterocarpus obtusifolius*, which has characteristics very similar to those enumerated above for *Xylia*, but the wood floats instead of sinking.

6. TEAK and SAL we all know. I am familiar with the good structural qualities of MADDI and SOME for house-building purposes, but know nothing about their lasting qualities when used as sleepers. IRONWOOD, *Xylia dolabriformis* is the Burma PYNKADU, called *Irul* in Tamil, and *Konda Tangedu*, *Eruvalu*, or *Bojeh* in Telugu. It is one of the very best of our sleeper timbers, and if there is nothing in the climate of the West Coast, or in the soil, or in the conditions of its growth, which would cause the Malabar Irul tree to have qualities less excellent than those of the Burma Pynkadu, we need ask for no better timber. The remaining three timbers I personally know nothing about, and as a copy of Gamble is not at hand, I cannot at the moment find out anything about them. The absence of Gamble must also be my excuse for errors, if any, in botanical or vernacular names.

7. This is a convenient place to note about the false Pynkadu which comes sometimes from Burma. There is so little difference between the appearance of true Pynkadu and that of its very inferior substitute Kya-Eng, that the latter is very apt to be palmed off on confiding railway engineers by unscrupulous suppliers in lieu of Pynkadu. There is, however, a very simple test which can always be applied, for Pynkadu ought always to sink and Eng ought always to float, the weight of the former running from about 65 to 80 lb. and of the latter from about 55 to 60 lb. per cb. ft. Pynkadu as already remarked is *Xylia dolabriformis*, Kya-Eng is *Dipterocarpus obtusifolius*.

8. I have now received a copy of the note by the Inspector-General of Forests which accompanied the Government of India letter No. 151-R.S., dated 3rd May 1898, on the subject of my note on the Haskin process, and am very glad to find that Mr. Ribbentrop has so good an opinion of the process. It is easy to understand that, inasmuch as the success of the Haskin process depends entirely on the chemical changes caused in the natural juices of the wood by the action of heat, once these juices are washed out by ordinary seasoning, such as takes place with deodar sleepers from the Himalayas while floating down the rivers, any attempt to apply the process must be ineffective, except in so far as it may serve to complete the seasoning. I recognise, too, now that Mr. Ribbentrop points it out, that as to send home specimens of timber would be to dry up their juices it would be unfair to haskinise them under such conditions. Apparently the only fair conditions for applying the process is in or near the forests, where the freshly cut timber can be quickly brought to the apparatus.

9. But I must differ from the Inspector-General of Forests about the reduction of price likely to be effected by the use of some process whereby trees now growing to waste may be utilised for sleeper purposes, and I adhere to my rough estimate of a saving of one rupee per sleeper all round by the use of a cheap and effective preservative process.

10. I do not say that a haskinised sleeper of *Terminalia tomentosa* or of *Dipterocarpus tuberculatus* will cost a rupee less when it leaves the factory than a pynkadu, sál, teak or deodar sleeper costs when stacked where cut. But I claim that anything we do to largely increase the available area from which sleepers may be derived must at once reduce the price which the dealers charge us for a sleeper delivered in depôt. The demand is so great for the very limited number of species of timber which are all that are now available that the dealers are driven to charge high prices by reason of the sources of supply being year by year found at an increasing distance from rivers and railways.

11. We may very roughly take the relative cost of transport at, for railways one pie, for good roads ten pies, and for jungle roads twenty pies, per maund per ten miles (or per ten maunds per mile). The average weight of a sleeper, broad or metre and of average quality of wood, may perhaps be taken at $1\frac{3}{4}$ maund. So that for every 50 miles by which we reduce its haulage along bad roads, or for every 100 miles by which we reduce its haulage along good roads, or for every 1000 miles by which we reduce its haulage by rail, we knock one rupee off the ultimate price of each separate sleeper.

12. It seems to me that if by any process, that of Haskin or any other, we can bring our railways in touch with those forests of India which are full of timber, structurally excellent but chemically impossible for sleeper purposes, we shall easily succeed in reducing the all round average length of haulage by something not very far from the above figure. And in this reckoning I take no account of the effect of the breaking down of the monopolies or semi-monopolies which now exist, and which cannot but tend to raise prices.

13. To give an illustration from Assam. The Province is full of magnificent forests of grand-looking timber trees, and the little Jorhat 2 ft. Railway gets all it wants locally at, I think, five or six annas per sleeper. The metre gauge Dibru-Sadiya Railway was getting structurally excellent but chemically impossible sleepers, that is sleepers which turned to tinder in two or three years, at I think twelve or fourteen annas per sleeper. The Assam-Bengal Railway, with the example before it of the rapid failure of local sleepers, was obliged to arrange for nearly the whole of its

supply of sleepers to be Burma Pynkadu. The margin between the price of local timber sleepers as paid by the Dibru-Sadiya Railway and that of Pynkadu as paid by the Assam-Bengal Railway, a margin I think of about three rupees per sleeper, would I imagine pay for haskinizing several times over. One rupee each saved on the sleepers of this one railway alone would have meant about fifteen lakhs of rupees to the good.

Ootacamund,
17th May 1898.

Francis J. E. Spring,
Consulting Engineer for Railways.

Order—No. 841 Ry., dated 21st June 1898.

A copy of these proceedings will be communicated to the Agents, Madras, South Indian, His Highness the Nizam's, and Nilgiri Railways, to the Manager, East Coast Railway, and to the Revenue Department for information.

2. A copy of these proceedings will also be forwarded to the Governments of India and Bombay for information.

[Here enter No. 842 Ry., dated 21st June 1898.]

(True Extract.)

Francis J. Spring
Under Secretary.

To the Agent and Manager, Madras Railway.
" Agent, South Indian Railway.
" Agent and Manager, His Highness the Nizam's Railway.
" Agent and Chief Engineer, Nilgiri Railway.
" Manager, East Coast Railway.
" Revenue Department.
" Consulting Engineer for Railways.

S.C. Hill Esqr

Esq. Shaik Kasim.

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ENCLOSURES TO O. No.

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STATEMENT WITH DITTO										
PAPERS NOT FILED UP, BEING MEANT FOR DESPATCH IN ORIGINAL.										

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