

MADRAS RECORD OFFICE.

Government of Madras.

Revenue DEPARTMENT.

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	187-190	
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Not to be folded or roughly handled

*Proceedings of the Madras Government, Revenue Department,
12th April 1865.*

No. 189. Read the following Circular from Colonel R. STRACHEY, R. E., Secretary to the Government of India, Public Works Department, Revenue—Forests, to the Secretary to the Government of Madras, Revenue Department, dated Fort William 16th March 1865, No. 4:—

SIR,

I am directed to transmit, for communication to Forest Officers, a Report by Dr. Brandis, Inspector General of Forests, on the subject of seasoning Teak Timber by girdling, and to request that any additional facts bearing on the different questions at issue may be communicated to this Department.

(Signed) E. C. S. WILLIAMS, Captain, R. E.,
Under Secretary to the Government of India.

Enclosure to Revenue—Forests Circular No. 4 of 1865.

REPORT on the practice of seasoning timber by girdling trees previous to felling, by Dr. Brandis, Inspector General of Forests to the Government of India,—dated Calcutta, 3rd March 1865.

1. The question of the best method of seasoning timber in India, has, for some time, engaged the attention of the officers of the Forest and Public Works Departments, and others interested in the use of wood. Nearly all the Teak timber exported from Burmah is seasoned by girdling. The practice has also been adopted in some parts of India proper, it has called forth some discussion on the part of Forest Officers, and has attracted the attention of the Home Government. The data available on the merits and demerits of this mode of seasoning timber are not sufficiently precise to admit at present of an exhaustive treatment of the subject. The following summary of the recorded opinions on the question may induce Forest Officers to institute further enquiries:—

2. *Remarks by the Home Government.*—In March 1863, Her Majesty's Principal Secretary of State, in Despatch No. 7 of 1863, on the subject of the Gurhwal and Kumaon Forests, called the attention of the Government of India to certain passages in the Madras Forest Report for 1861-62 on the subject of girdling trees, and directed, that, as the practice of girdling was chiefly resorted to in Burmah, Major Morgan's views should be communicated to Dr. Brandis and also to Colonel Ramsay. In April of the same year, when reviewing the above Report, the Secretary of State, in Despatch No. 14 of 1863, dated 24th April, referred to the practice of girdling in the following words:—"A further advantage of departmental cuttings is, that it does away with all excuse for 'girdling,' a practice which, if I rightly interpret paragraphs 2 and 100 of the Report, is now discovered to be on all accounts prejudicial."

When reviewing the Madras Forest Report for 1862-63 in the Despatch to Madras, No. 15, dated 24th March 1864, Her Majesty's Secretary of State again adverted to this question with reference to a Statement in the Report, that the girdling of trees in South Canara had not been discontinued—

"On receipt of the Forest Report of the previous year from Madras, I referred this point to the Government of India for communication to Dr. Brandis, but have not yet received information upon it."

The present Report has been drawn up with reference to the above remarks in the Despatches from the Home Government.

3. *Teak trees girdled in Burmah to facilitate their transport by water.*—It may be well first to review the practice as existing in Burmah, and then to notice the remarks of Forest Officers in India.

In Burmah, the Shan and Karenee States, and Siam, Teak is almost always girdled before felling, and it is believed that the practice has been in force in those countries ever since Teak has been exported on a large scale.

The operation consists in cutting a complete ring, through the bark and the sapwood of the tree, penetrating to the heartwood. If the sapwood is entirely severed, the tree dies in a few days, but if any connection remains between the sapwood above and below the cut, the tree will revive, and instances have been observed in which the tree recovered fully, the wound being gradually filled up by the formation of new bark and sapwood. Timber cutters, therefore, take care to scoop out the sapwood from the recesses which often occur in irregularly shaped stems. The trees thus killed are allowed to stand for one, two, or three years, when the wood is sufficiently dry to float. The size of the trees, the locality, and perhaps also the nature of the soil, affect the length of time required for the seasoning of the timber. A large piece of the wood is sometimes cut out from the stem, which considerably hastens the drying or seasoning of the tree.

4. *Girdling practised occasionally in Europe and in India.*—The practice of ringing or girdling is not unknown in Europe, though it is rarely adopted. An instance is on record of an extensive Beech Forest in Hungary, the wood of which could not be made available owing to the distance from a market. It was considered more advantageous to grow Pines for timber, and in order to make room for them, the Beech trees were killed by girdling. In some parts of Europe, Oak trees are ringed previous to felling, because it is believed that the timber improves by the operation.

From the information available, it does not appear that the practice of girdling trees for timber has been adopted in India proper to any extent until within the last twenty or thirty years, and it seems probable that it was introduced from Burmah, but throughout India, from time immemorial, trees have been killed by ringing for the purpose of cultivation. It may here be stated, that, though in Burmah the practice of girdling Teak for timber has been found convenient, it does not follow that it should be adopted in other Provinces under different circumstances, and with other kinds of timber, nor, as far as we know, has its adoption generally been recommended, though girdling for timber has, in a few instances, been introduced by way of experiment.

In the Forests of Gurhwal a large number of Sâl trees was girdled by Captain Read, shortly before the mutinies. In the Botanic Gardens, Calcutta, a number of trees was girdled by Dr. Griffith previous to felling, and since that time almost all the trees felled at the gardens have first been girdled. It is believed, that the wood, especially of Mahogany trees, improves by this mode of seasoning.

5. *Girdling introduced and abandoned in the Anamallay Forests.*—In 1851, Captain Michael was deputed by the Madras Government to Burmah to make himself acquainted with the mode of working the Forests in that country. On his return he was placed in charge of the Anamallay Forests, and it appears from his reports that he there introduced the practice of girdling Teak before felling. At that time the principal article of export from these Forests consisted of large Teak planks for the Bombay Dockyard. But in January 1853, Captain Michael writes, "that some of the planks cut that season were prepared from trees which had not been girdled, in order to ascertain whether the planks from green trees were superior in quality to those cut from girdled trees." He adds "the most experienced plank-cutters are unanimous in asserting that the fall of a dead tree considerably increases the heartshake, and renders the timber more defective, whereas a green tree felled, sustaining little or no interior damage by its fall, planks cut from it are much more sound. As far as I have yet been able to observe, this appears to be the case."

Again, in his Report for 1863-64, he states "that a number of planks handed over to the Bombay Government Timber Agent that year were cut from trees which had not been girdled, and that they had not suffered from the effects of the sun as they had been lying for some time in the Forests, and were partially seasoned before they were removed from the shade. There was no perceptible difference after they reached Ponany, between the planks cut from girdled and ungirdled trees, all being pronounced by the Timber Agent of very fine quality and remarkably free from splits and defects." Captain Michael adds, "that it will be better in

future to cut planks from green trees and allow them to season gradually in the Forest, and while in course of transport to the Coast, instead of felling girdled trees." He also states, "experience has shewn that the natural heartshake of a girdled tree is so much increased by its fall, that a greater number of sound Dockyard planks can be obtained from a green tree than from a girdled one." Data are not given as to whether this experience was confirmed by a series of comparative observations, shewing the number of planks or their cubic contents obtained from green and girdled trees of the same size and grown in similar localities.

6. *Dr. Cleghorn's Remarks on girdling.*—The next notice of girdling is found in Dr. Cleghorn's third Report on the Madras Forests of the 31st August 1860, viz., "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 waived 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 heartshake increased. It is difficult to explain this, if it be actually the case."

Dr. Cleghorn's statement regarding the greater hardness of girdled trees is based on the experience of the timber-cutters in the Anamallay Forests.

7. *Major Morgan's Remarks.*—In the Madras Forests Report for 1861-62, Major Morgan adverts to the practice of girdling. In the second paragraph, he describes the destruction caused by Coorumbers, in Wynad. "They had girdled many acres of Teak trees of every size, from the sapling of six inches to the noble tree upwards of three feet in diameter." This passage does not refer to girdling for the seasoning of timber, but for destroying trees for temporary cultivation. Again, in the 100th paragraph, Major Morgan writes, "Malabar Teak 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 shewing 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."

No experiments or facts established by experience are adduced to support these assertions, that girdling makes the wood brittle and deprives it of its oil. The assumption, that certain Teak from Malabar, which was found to be too brittle for the use of gun-carriage wheels, had been cut from girdled trees, cannot be received as a sufficient proof.

8. *Captain Beddome's Remarks.*—In Appendix 2 of the Madras Forest Report for 1862-63, it was stated that 1,000 trees of black-wood and Hebalsu wood had been girdled in South Canara, this was noted by the Madras Government and by Her Majesty's Secretary of State. In explanation Captain Beddome reported, that "the system of girdling in reference to all trees was put a stop to in 1862-63, as unnecessary; that the trees in question had been girdled early in 1862-63, at which time the Assistant was not aware that girdling had been discontinued; moreover, that the trees girdled were Black-wood and Hebalsu (wild Jack), which do not suffer from the heartshake caused by girdling in the way that Teak has been found to do."

The statements that certain trees do not suffer from the heartshake in the same way as Teak, and that the heartshake is caused by girdling, not, as Major Morgan reported, merely increased by it, are new, and it would be interesting to obtain the precise data on which they are based.

On the 12th May 1863, Captain Beddome, in a letter to the Madras Government with reference to the Forest Report of British Burmah for 1861-62, stated, that in Madras girdling had long been given up as a grand mistake, "it so increases the heartshake and otherwise impairs the quality of the timber, that girdled Teak is generally sold in the Malabar market at a discount of 50 per cent. upon green felled Teak." Captain Beddome further adds, "the fact is indisputable, that Burmah Teak is sold in the Bombay market at an immense discount upon the price of Malabar Teak."

9. *Colonel Ramsay's Remarks.*—In the North-West Provinces, as above-mentioned, a number of Sâl trees were girdled before the mutinies. In a report on the Kumaon and Gurhwal Forests, Colonel Ramsay writes in October 1861 as follows:—"I do not approve of girdling, because, in the first place, it is difficult to superintend, and if the trees be girdled, they must be cut next year, otherwise they are in danger of being destroyed by fire. Circumstances might occur which would render it inconvenient to cut where trees had been girdled the previous year. Many thousands of trees were destroyed in the Gurhwal Forests from having been girdled. The theory is good, but in these Forests the practice is too dangerous to be adopted."

In a letter to the North-West Government, dated 12th November 1864, Colonel Ramsay again refers to this question as follows:—"In previous reports I have condemned the system of girdling, and experience confirms my opinion. Whatever may be the advantages of girdling elsewhere, I have no hesitation in stating, that, in our Forests, a tree is injured by it. As soon as the sap is arrested by this process, and the tree begins to die, it is attacked by the Carpenter bee, which deposits eggs in the bark, and in a short time the outer part of the wood becomes perforated with innumerable small holes; time only is required to allow these little insects to render the tree worthless. I have now prohibited girdling altogether."

10. *Mr. Leeds' Remarks.*—The question of girdling has also been discussed in the papers appended to the British Burmah Forest Report for 1862-63. It is stated in a Memorandum by Mr. H. Leeds, dated 18th November 1863, page 77 of Selections No. XL from the Records of the Government of India, "that girdling exposes the timber to two years' jungle fires, and thus risks its loss or damage, also that, owing to the brittle state of the timber when felled, a very large proportion of the finest timber is lost, which is shattered by the fall."

11. *Dr. Brandis' Remarks.*—In reply to this, Dr. Brandis says, in a Memorandum, dated 23rd January 1864, on page 94 of the Selections, as follows:—"The practice of allowing killed timber to season, standing exposed to a free current of air on all sides, was not, as has sometimes been supposed, introduced from the Forests on the Continent of Europe. It is purely a Burman practice, and is, probably, the best mode of seasoning Teak timber known in this climate. On that account it has been adopted in the system of management of the Government Forests in Burmah."

"A tree, which has been felled green, dries very slowly and not uniformly on all sides. The wood of a tree left standing after killing, dries more rapidly and thoroughly. The albuminous and other soluble substances, which are dissolved in the fluid of the sap conducting tubes, are sooner brought into a state in which they do not engender decay in the wood. Two objections have been raised against the practice of allowing trees to stand after girdling; one is, that the wood becomes brittle, and the heartshake is increased; the other, that it is too hard. The first I do not think has been proved, and the hardness of the wood is not increased to such a degree as really to cause inconvenience in working."

12. *Increase of heartshake.*—To recapitulate, the following are stated to be the main disadvantages of the method of girdling. The heartshake is said to be increased by the fall of a dead tree, and by its standing exposed to the wind. Captain Beddome goes so far as to say that the heartshake is caused by girdling.

What are commonly called heartshakes in wood by carpenters and ship-builders, are hollows running along the axis of a tree, and frequently more or less flat. Decayed wood often lines the sides of these hollows. In the Teak of Burmah these hollows are commonly of considerable size, and it would be difficult to draw a sharp line of distinction between what should be termed heartshakes, and what should be called central hollows. The central hollows or cavities are probably formed at an early age of the tree, and it is not likely that they would increase by the process of girdling.

It has been observed in some moist evergreen Forests in Burmah, specially in the Upper Mittigate Forests in the Attaran District, that a large proportion of the Teak grown in such localities is sound, whereas in dry Forests, which are annually visited by jungle fires, sound stems, without hollows or heartshakes, are rarely found. From this fact, and from the observa-

tions of seedlings injured by fire, it has been concluded that the jungle fires are one of the causes of the central hollows of Teak in Burmah. But Teak is rarely found in the moist evergreen Forests; and under these circumstances there would not be many opportunities for determining the question, whether the heartshake in Teak in Burmah is increased by girdling or not. To judge from the expressions used by Captain Michael, with reference to the Teak in the

Anamallays, it would appear that the question, whether heartshakes are increased by girdling, might be determined by experiment if it were considered worth while to undertake this investigation. It would, in that case, be necessary annually to select a certain number, say one hundred trees, one-half to be girdled and felled after standing two years, the other half to be felled green with those previously girdled. Care would have to be taken that the trees girdled and not girdled should be sound to all appearance, and should be similar in every respect. If such an experiment were repeated for a few years, it might lead to a satisfactory solution of the question.

13. *The wood of girdled trees is shattered in the fall.*—Another complaint is, that the wood of girdled trees is more brittle, and that girdled trees are more likely to be shattered in their fall. It is doubtless true, that timber is more brittle when perfectly dry, than when fresh or half seasoned, and as the wood of girdled trees whilst standing, dries more rapidly, it is more dry, at the time of felling, and, consequently, somewhat more brittle than that of green trees. But we have no data to prove that the wood of girdled trees which have stood two or three years is so brittle as, on that account, to be injured considerably in the fall of the tree. It is probable that this extreme state of brittleness does not shew itself until the tree has stood many years or after the wood is perfectly seasoned. This, however, might be ascertained by experiments on the breaking weight of timber of different degrees of seasoning.

14. *Trees deprived of oil by girdling.*—The statement that the wood of girdled trees is deprived of its oil, could not easily be proved.

15. *Increased hardness of girdled trees.*—As to the increased hardness, causing greater difficulty in felling and cutting up trees which had been girdled, there can be little doubt. Hard woods are usually easier to work when full of sap than when dry, but if girdling were otherwise desirable in any Forest as a method of seasoning timber or to facilitate its transport, the increased hardness would not alone be considered a sufficient objection.

16. *Risk from jungle fires.*—A more serious objection is the risk of girdled trees being injured or destroyed by the jungle fires. This, however, applies in a much higher degree to felled trees, unless removed immediately after felling. It is easy to protect a girdled tree against jungle fires, by keeping its foot clear of dry branches and other heavy inflammable matter, but it is exceedingly difficult thus to protect a felled tree. Colonel Ramsay says that it may not always be convenient to fell a tree a year after girdling. On the other hand it may be urged, that felled trees often remain unremoved because the means of transport are not at hand.

17. *Risk from damage by insects.*—Insects do great damage to girdled trees in certain localities. Teak, when standing girdled, is rarely attacked by them. But Sâl and other trees are frequently attacked, and sometimes, as Colonel Ramsay remarks, the wood is perforated by them. On this account girdling is not indicated in the case of Pines, and other trees liable to the attack of insects, and in the case of Sâl in those Forests only where insects are less destructive.

18. *Risk from decay of the wood through girdling.*—There are many kinds of wood which decay, unless converted into scantling and brought under shelter immediately after felling. Trees of this description should not be girdled for timber.

19. *Relative value of Malabar and Burmah Teak.*—The greater value of Malabar compared with Burmah Teak in the Bombay market has been adduced as an argument against the practice of seasoning trees by girdling. Assuming that there really prevails in the Bombay market a considerable difference in the prices of Burmah and Malabar Teak, it remains to be proved that this difference is not caused by circumstances quite apart from the mode in which the timber has been seasoned by girdling or otherwise.

The price of timber is mainly influenced by the size of the scantling, the greater or less freedom from hollows, the grain and general quality of the timber depending on soil and climate of the forest where it was produced. But whatever causes may have influenced the price, it would

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12th April 1865.

be of much interest to ascertain precisely the rates at which Malabar and Burmah Teak of the same scantling have latterly been sold at Bombay, say, during the last five years. The importation of Moulmein and Rangoon Teak into that port is very considerable, and it is believed that the quantity of Malabar Teak imported has latterly been small.

20. *Supposed advantages of seasoning trees by girdling.*—It should now be stated what are supposed to be the main advantages of seasoning timber by girdling:—

First, as to transport by water.—Girdled timber floats sooner than timber felled green. This is established beyond doubt by the experience of timber cutters in Burmah. This remark does not apply to Sâl and other heavy woods which do not float even when perfectly dry.

Second as to transport by land.—The weight of girdled trees is less than that of trees felled green. Teak, for instance, full of sap weighs more than 62 lbs., if seasoned by girdling, it weighs 50 lbs., and often less. On a log measuring 50 cubic feet, this, therefore, makes a difference of 600 lbs., or one-fifth of the entire weight. This, however, is an advantage of less moment than that gained in the case of transport by water.

Third as to durability of timber.—Trees felled green do not season uniformly throughout the whole mass of the stem, while the upper part, which is exposed to the sun and air, dries—the lower half, near the ground remains moist. The sap or fluid which fills the cells of the wood, holds in solution several substances, which engender decay soon after the death of the tree while the upper half of a tree is safe, in the lower half decomposition may take place, and ultimately cause premature decay of the wood.

On the other hand, when a tree is left standing, after being girdled, exposed on all sides to a free current of air, the sap in the tubes of the wood dries rapidly, and there is less likelihood of decomposition and decay than in a tree felled green. This is a consideration of much importance in the case of Teak, as this timber derives its high value to a great extent from its resistance to decay.

21. *The advantages of seasoning timber by girdling do not apply under all circumstances.*—In conclusion it may be useful to repeat what has already been stated, that it does not follow that, because the practice of seasoning timber by girdling has certain advantages, it should be introduced in the forests of all Provinces of India, and for every kind of tree.

To prepare the Anamallay Teak planks, girdling does not appear requisite, either on account of the greater facility of transport, or the greater durability, for, as soon as a tree is cut up into scantling, the wood dries more rapidly than if left entire, girdled or ungirdled. The same remark applies to all those forests where the timber is cut up on the spot, and not carted or floated in large logs. In such cases no important object would be gained, as far as our present knowledge goes, in girdling the trees previous to felling. The same remark would apply to those kinds of timber which are liable to immediate decay or to attack by insects.

The subject of seasoning timber by girdling is one of great importance for India, and the attention of all Forest Officers might be specially directed to it, with the view of collecting more precise data than we possess at present, regarding the advantages and drawbacks of this practice in the different Forests and under different circumstances.

No. 190.

ORDER THEREON, 12th April 1865, No. 804.

Forests, No. 11.

1. Communicated to the Conservator of Forests for early report.

2. The Government wish also to have the opinion of Captain Beddome, Majors Morgan, Michael, Gib, and D. Hamilton on the subject.

(True Extract.)

(Signed) J. D. SIM,

Secretary to Government.

To the Conservator of Forests.

Exd, S. T. Augustin.

804-
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" To the Conservator of Forests
20th April
12th April 1865.

CIRCULAR No. 4 of 1865.
REVENUE-FORESTS.

FROM

COLONEL R. STRACHEY, R. E.,
SECY, TO THE GOVT. OF INDIA,

TO

*The Secretary to the Govt. of Madras.
Secy. to the Revenue Department.*

PUBLIC WORKS DEPARTMENT,

Fort William, 16th March, 1865.

Revenue.
Forests.

SIR,

I am directed to transmit, for communication to Forest Officers, a Report by Dr. Brandis, Inspector General of Forests, on the subject of seasoning Teak Timber by girdling, and to request that any additional facts bearing on the different questions at issue may be communicated to this Department.

(Signed) R. STRACHEY, Colonel, R. E.,
Secy. to the Govt. of India.

W. H. Smith Captain, R. E.,
Under Secy. to the Govt. of India.

Revenue 1865 Separat
No. 933
Revenue.
Forests.

CIRCULAR No. 4.

To The Secretary to Govt.
Revenue Department
Madras.

FROM SECY. TO GOVT. OF INDIA,
IN THE PUBLIC WORKS DEPT.

Dated 16th March, 1865.

Received 6 April

From the Secy. of
Forests dated 2 May 1865

Forwards a report by Dr. Brandis on the subject
of seasoning Teak Timber by girdling previous to
felling, and calls for opinion of Forest Officers on
the different points at issue.

189-190
1 April

With an Order

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