

MADRAS RECORD OFFICE.

Government of Madras.

Revenue DEPARTMENT.

G.O. No.	1988	Press Mis.
203-05 Dated	9-12-18	18.20

47

Not to be folded or roughly handled

*Proceedings of the Madras Government, Revenue Department,
9th December 1870.*

Read the following papers :—

No. 203. Endorsement of the Acting Superintending Engineer, 7th Division, dated 26th September 1870, No. 141.

Read the following letter from the Assistant Engineer, Collegal Range, to the Acting Superintending Engineer, 7th Division, dated Bhowany, 22nd September 1870, No. 502.

As directed in G. O., No. 2,041, dated 24th ultimo, I have the honour, herewith, to submit my report, prepared in communication with Colonel Morgan, on the subject of floating fuel for the railway down the Cauvery river.

2. I joined Colonel Morgan at Cauverypoorum on the 2nd instant, and on the three following days we travelled down the river in basket-boats to the Erode railway bridge, a distance of about 50 miles, examining the river. We were accompanied for twenty four miles, as far as Nerinjepett, by a bamboo raft laden with about five tons of firewood. The dimensions of the raft were 12×27 , and it drew fifteen inches of water. It required one man to steer it and two men, with poles, to keep it off the rocks. There are a number of small rapids in the river, caused by ledges of rock extending across; but the fall being small, there is no difficulty in floating rafts or boats, so long as the depth of water is sufficient. This, to my knowledge, is the case during six months of the year, namely, from June to December. The channel in which the main current flows at the present height of the water, which is between nine and ten feet below the highest flood, is studded in places with rocks which are dangerous to boats and rafts, unless very carefully guided, and will have to be removed by blasting, to lessen the risk of the floating operations.

3. In order to know exactly what rocks it is most necessary to blast, Colonel Morgan intends to have the channel, which the floats must take during low water, marked by poles let into rocks on either side from fifty to one hundred feet apart, and, where practicable, the depth of water shown. When this is done, and the water has gone down two or three feet more, it will be possible to form a correct detailed estimate for removing all obstructions to floating in the channel. In the meantime, I estimate roughly that about 11,000 Rupees will be required to remove such rocks as will endanger the floating operations in the Cauvery from June to December, between Cauverypoorum and the Erode railway bridge. For this purpose, Colonel Morgan thinks that the services of a few Sappers would be most useful. They should commence work as early as possible, as in the month of February the country begins to be feverish.

4. I append a list of the existing obstacles to be removed. The sum of Rupees 11,000, roughly calculated as required for this purpose, does not dispose of the obstruction caused by the old Nerinjepett anicut, which has to be dealt with separately. The mean fall over this anicut is about twelve feet, divided over a length of fifty feet; at present there is about eighteen inches of water rushing over the apron, with rocks and stones cropping out in various places. Basket-boats do not, as a rule, go over the anicut, but are unloaded and carried round the wings of the dam, to be floated again below. Nor would it be safe to send rafts with wood over the anicut, as they would most likely be upset, lives would be sacrificed and

most of the wood lost. The raft which Colonel Morgan sent down on the 3rd instant, had to be unloaded at Nerinjepett, and two boat men took the empty raft over the anicut, remaining on the raft during the passage. This was a hazardous undertaking, and does not demonstrate the general practicability of the anicut for floats under ordinary circumstances, as but few boatmen would be found willing to repeat the experiment; and the attendant risks are very considerable.

List of Obstacles.

- (1.) Near Sholapaudy is a reef that will require some blasting.
- (2.) Near Matur, rocks to be blasted.
- (3.) Half a mile north of Colanaickenputty, channel narrow, to be widened.
- (4.) Site of proposed anicut at Myladygoondoo, some rocks to be blasted.
- (5.) Nerinjepett anicut, channel to be cut round western extremity.
- (6.) One mile below Nerinjepett, narrow and shallow channel during low water; to be widened and deepened.
- (7.) A reef below Ammapett, some blasting required.
- (8.) Opposite the mouth of the Sunnasiputty stream, a rocky channel to be cleared of some rocks.
- (9.) Near Pillancoundenpolliem, a narrow passage to be widened.
- (10.) A reef above the Cauvery bridge near Bhowany, some blasting required.
- (11.) Below Bhowany Pagoda, a channel to be cut through small alluvial islands to widen the passage, and some rocks to be blasted.
- (12.) Near Agraram a few small rocks in mid channel to be blasted.
- (13.) Near Shawayashengally narrow and rocky channel, a sudden drop of about a foot, ledge of rock to be blasted. Besides these obstacles, there are numerous small rocks, not visible at the present height of the river, but dangerous with less water.

5. Colonel Morgan and I having carefully examined the Nerinjepett anicut, we are of opinion that, to make this obstruction practicable for floating purposes, it will not be advisable to make a breach in the anicut, but to cut a channel round the western extremity of it on the Coimbatore side of the river. The anicut is to all appearance founded upon a rocky ledge, to blast a passage through which would be very expensive; and even after this were accomplished, the fall would be so great in a short distance, and the rush of water so violent that a considerable amount of risk would still attach to the work of floating rafts or boats, and a great quantity of wood might be lost. Moreover, this passage through the rocks, from the nature of the locality, would have to be at some distance from the bank, where it would be easiest to effect; and thus, during high water, the channel would be difficult of access from the bank, in case the passage were blocked up from any cause, or the floats required assistance. The new channel, on the other hand, which it is proposed to cut round the west extremity of the anicut, will go through a bed of soft limestone, easy to cut and sufficiently compact to prevent erosion by the accelerated current. The channel will also be useful for navigation hereafter, as a lock might easily be constructed in it, if required. It is proposed to start the channel just above the anicut and to make it one-third of a mile in length, 30 feet wide and 3 feet in depth below the crest of the anicut. This will give the channel-bed a fall of about 1 in 147 at low water, which will be decreased during floods. The

current caused by this fall will not be too great to allow of loaded rafts and boats passing down in safety. I am having the survey and levels prepared to enable me to make a correct detailed estimate of the cost of the channel, and I will submit the plan and estimate as soon as completed. Meanwhile, I calculate roughly that the channel will cost about Rupees 13,000.

6. Thus a total expenditure of about Rupees 24,000 will remove all obstacles to floating in the river between Cauverypoorum and Erode. The work of cutting the channel could be commenced immediately, and likewise that of blasting the most prominent rocky obstacles; the smaller rocks, now covered by water, could be taken in hand about three months hence, when the river will be lower than at present. In case the new Nerinjepett anicut is built at Myladygoondoo, it will be necessary to provide a short channel, with a lock at one extremity of the dam, for the purposes of floating and navigation. There are no obstacles of note for boats or rafts on the Cauvery between Erode and Trichinopoly; large basket-boats, with cargoes of grain, drawing 18 inches of water, passing freely between the two places during the months from June to December.

7. As regards the manner of floating the fuel down the river, rafts or basket-boats seem to be the proper vehicles. If the fuel were thrown loosely into the stream, a great deal of it would probably be lost. Hundreds of rocks and islets would, at low water, intercept the wood which would have to be pushed off by men stationed all along the banks and on the rocks and islets, thus causing a great outlay for the wages of these men. It would be a matter of difficulty and expense to catch the logs at Erode or Trichinopoly, especially when borne along on a current of 5 or 6 miles an hour during freshes. A number of men in boats would have to be in attendance to intercept the wood, and a large quantity of it would probably escape them. Colonel Morgan calculates that, as the firewood required by the railway is small, say 20 logs to a ton, to float even 1,000 tons, we should have 20,000 pieces to secure; if 10,000 tons, 200,000 pieces. This would require an enormous amount of labour. Besides, the bridges at Bhowany and Erode would be exposed to damage from logs of wood floated down on high freshes. The local basket-boats, covered with leather, or bamboo rafts can be constructed to take from 4 to 8 tons of wood each; two or three men can manage them, and no wood need be lost. Strings of 10 to 15 boats or rafts can be tied together, whereby the wages of a number of men would be saved, the leading boat or raft only having a full crew. Bamboo rafts have this advantage that the materials composing them can be sold at Erode or Trichinopoly, though they would in time perhaps overstock the market, and probably have to be sold at a loss; they must also be newly made for every trip, which costs labour and time, and will eventually exhaust the stock of bamboos in the localities where the firewood is obtained. Basket-boats, on the other hand, need only be made once in several years. Arrival at Erode or Trichinopoly, the boatmen would carry them back on their shoulders to Cauverypoorum, being used to this kind of work. These boats are easily manageable in the rapids and narrow channels; they are also more buoyant than rafts, and the boatmen understand better how to work them; there would, therefore, be less fear of accidents than with rafts, and the cost would not be greater in the end. There would also be less danger to the bridges at Bhowany and Erode from basket-boats than from rafts.

8. Colonel Morgan, however, is of opinion that the carriage of fuel in basket-boats would be more expensive than on rafts of bamboo, unless ten-ton boats could be built; and even then, he thinks that, if a leather boat touched a rock, it might get cut. Colonel Morgan says: "I estimate that rafting will not cost more than 8 Annas a ton, boats from 1 Rupee to Rupees 1-8-0 the ton. If the bamboos fail, light wood is obtainable, and can be used. We could never get a sufficient number of men for boats. A four-ton boat would require three men; whereas a raft, if in a string of ten, would only require, say, five men on the leading raft of 8 tons, and one man per raft on nine rafts of 8 tons each, equal to fourteen men to 80 tons, or nearly one man to 6 tons. Fifty bamboos support a ton of timber." But floating the wood without either rafts or boats does not seem to promise success; as during low water, the wood would be intercepted by the bushy banks, by rocks, and numerous islets, while during freshes, it would be carried along so swiftly as to render it both difficult and expensive to stop it in mid-stream near the depôt, without losing a large quantity of it, the river being very wide.

9. With regard to the floating capabilities of the Burghoor stream, they are, from my knowledge of that stream, of very small account, and scarcely such as to promise success on practical trial. A torrent of water rushes down the bed of the stream twice or thrice a-year; rises to a great height, and subsides generally within a day or two. To watch for these rare occasions, men would have to be kept in feverish jungles perhaps for weeks, and they might miss a flood of short duration entirely. The bed of the stream is so rocky that boats or rafts could not be used, except during very few days in the year, without a great expenditure for blasting. And, if the wood were thrown in loosely, there would again be almost the same difficulty of intercepting it as in the case of the Cauvery; while no ordinary and inexpensive barrier that could be erected across the Burghoor stream just before its junction with the Cauvery would prove effective in stopping a mass of wood carried by a torrent, 7 or 8 feet in depth, going at a velocity of 6 or 7 miles per hour. I am about to have a line of levels taken along the bed of the Burghoor stream, from its junction with the Cauvery to the foot of the northern Burghoor ghaut, in order to ascertain the fall of the stream exactly, and carefully note the different masses of rock which form the obstacles to floating. Colonel Morgan remarks that barriers across streams, to intercept floating wood, are common in Canada; but those streams are most likely perennial, with a gentle current, not periodical torrents of the nature of the Burghoor stream. The peculiar violence of Indian mountain torrents during floods of very short duration would, I am afraid, prove fatal to the works proposed by Colonel Morgan, namely, dams of earth or barricades to dam the water up, and a chain and heavy stakes thrown across the mouth of the river to arrest all timber coming down.

10. To ascertain the actual number of freshes that come down the Burghoor stream during the whole year, Colonel Morgan has sent an Overseer there to make the necessary observations. We have no account of the number of freshes as yet, but Colonel Morgan says that they are reputed to be eight or ten in number. The Forest Overseer in charge of the works has been ordered by Colonel Morgan to send down trial rafts to ascertain where the principal obstruction is. Altogether, therefore, the present report upon the Burghoor stream cannot be considered a final one; since, in order to prepare that, the result of the line of levels, of the observations

regarding the number of freshes, their height, velocity and duration, and the amount of success attending the floating down of trial rafts during the next freshes must first be known. This stream will hence have to form the subject of a further report.

11. If water carriage should prove unavailable to bring the wood from the Burghoor Hills to Cauverypoorum, a cheap tramway would probably best effect the object in view. The rolling stock need only consist of sixty or eighty boxes put upon wheels, and two or three small mountain locomotives with the latest improvements. There are no engineering difficulties in the way, and a line of two feet gauge, similar to the Frestiniog Railway in Wales, might be constructed for Rupees 3,500 per mile, inclusive of rolling stock. The distance from Cauverypoorum to the foot of the northern Burghoor ghaut being 20 miles, an outlay of Rupees 70,000 would probably complete the line. There being always a considerable amount of traffic between Collegal and Erode along this line, the proposed tramway could be made to pay at least its working expenses by passenger and goods traffic. It would be worthwhile, on other grounds, to undertake the line, as, besides opening out a rich fuel reserve, it would, at the same time, facilitate the traffic between the silk producing-country around Collegal and the railway station at Erode. To feed this tramway with railway fuel economically, and, at the same time, on a large scale, trains of waggons, drawn by a small "road steamer," might convey the firewood from the Burghoor Hills down the northern Burghoor ghaut to the Gurkecondy tramway terminus, thence to be conveyed to Cauverypoorum on the tramway. If this tramway were found to answer, as there can be very little doubt it would, and more fuel than the valley of the Burghoor stream and the Burghoor hills can furnish were required, another tramway might be laid from Cauverypoorum northwards along the Cauvery valley, where enough fuel to last for generations to come can be obtained.

12. If a tramway is laid from Cauverypoorum westwards to the foot of the northern Burghoor ghaut at Gurkecondy, it will be necessary to widen the northern ghaut to 24 feet on account of the increased traffic. That ghaut was originally designed to be 12 feet in width only, but is not completed even to that width as yet; the unexpended balance of the estimate, Rupees 3,500, having been withdrawn last year, and not yet re-allotted. With reference to the tramway, Colonel Morgan remarks: "I also concur in the tramway, if it is found that dams, chains, and barriers are of no avail; as the amount of wood in the valley is enormous, and the cost of a tramway on 10,000 tons of wood annually would be trifling. A wire railway might even cost less than a tramway, as there is no cutting or bridging required. There is plenty of wood on the banks of the Cauvery, say ten square-miles, to furnish an immediate supply, until the question of the Burghoor river is settled."

13. For the intended Mettapolliem or Kullaur railway station, the valleys of the Moyaur and Bhowany, at the foot of the eastern slopes of the Neilgherry Hills, between Gazzlehutty and Mettapolliem, will yield a very large supply of fuel; a tramway on this side also, to bring the fuel to the Kullaur terminus, would probably be found cheaper in the long run than any other available mode of con-

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9th December 1870.*

veyance. Besides, it would be an immediate benefit for that part of the country, which will come under the influence of the channels to be derived from the Kaniempolliem anicut when restored, if the dense jungle now covering the country were removed. Wild animals would be deprived of shelter, fever would most likely be diminished, and people would be induced once more to settle in a part of the country which was once inhabited and well cultivated, but has during the last twenty years or so become an utter wilderness.

14. There are very fine plantation sites on the Burghoor hills, where soil, climate, and rain-fall, would doubtless be found advantageous for the planting operations of the Forest Department, and the Burghoor ghaut, when completed, will prove most useful in this respect, besides effecting its main object, namely, establishing the communication between Collegal and Erode. There are also several ruined tanks at the foot of the Nerinjepett and Burghoor hills in the Bhowany and Sattiamungalum Taluqs; cultivation under these tanks has long ceased, and the country around is a wilderness; if restored, the land under some of these tanks might be used for plantations, as they are close to the Bhowany and Cauvery rivers.

SUBMITTED to Government, with reference to paragraph 3 of G. O., No. 1,297, of 19th August 1870, Revenue Department, communicated with Public Works G. O., No. 2,041, of 24th August.

(Signed) W. FAREWELL, Lieut.-Colonel, S.C.,
Acting Superintending Engineer, 7th Division.

TRANSFERRED to the Revenue Department, with reference to the Order in that department, No. 1,297, dated 19th August 1870.

FORT SAINT GEORGE,
29th September 1870.

(Signed) CHARLES A. ORR, Colonel, R.E.,
Secretary to Government, P.W.D.

No. 204. From the Acting Superintending Engineer, 7th Division, to the Secretary to Government, Public Works Department, Madras, dated Cochin, 4th October 1870, No. 146.

With reference to paragraph 5 of Mr. Nordmann's report, forwarded with my endorsement, No. 141, of 26th September 1870, I have the honour to forward

1 Survey.
1 Estimate, No. 27, Rupees 15,000.
a survey and an estimate of Rupees 15,000 for the proposed channel round the west end of the old Nerinjepett anicut.

*Proceedings of the Madras Government, Revenue Department,
9th December 1870.*

TRANSFERRED to the Revenue Department, in continuation of the papers which were transferred to that department on the 29th ultimo.

(Signed) CHARLES A. ORR, Colonel, R.E.,
Secretary to Government, P.W.D.

10th October 1870.

No. 205. ORDER THEREON, 9th December 1870, No. 1,988.

Forests, No. 6.

By G. O., dated 19th August 1870,
No. 1,297, Mr. Nordmann, Assistant
Engineer, Collegal Range, was ordered

to report on the expense which would be involved by the removal of the obstacles which at present prevent the rivers Cauvery and Burghoor from being available for the conveyance of timber as far south as Trichinopoly.

2. In regard to the Cauvery, Mr. Nordmann gives a list of the obstacles between Cauverypoorum and Erode, which have to be overcome either by blasting obstructive rocks, or widening the now existing channels. A water-course to be carried round the western extremity of the Nerinjepett anicut is the most important engineering work necessary to the end proposed, which is to render the river between Cauverypoorum and Erode navigable by boats and rafts; for Mr. Nordmann thinks that the plan which was at first proposed of floating timber down the river loose would involve much loss of timber and expenditure on labour, besides exposing the bridges which intervene to risk of damage.

3. The cost of carrying out this project was estimated by Mr. Nordmann in his letter, dated 22nd September 1870, at Rupees 24,000, but his estimate, dated September 28th, raises the cost of the channel round the Nerinjepett anicut from Rupees 13,000 to Rupees 15,000. The aggregate outlay necessary may, therefore, be roughly estimated at Rupees 26,000.

4. The Budget of the Forest Department for 1871-72, as revised by the Government, contains a provision of Rupees 12,000 for improving the navigation of the Cauvery and Burghoor rivers, and the whole of this sum will probably, therefore, be available next year from Forest funds. It is, however, advisable that operations should be at once commenced, and with this end, Major Beddome should report whether any funds can be spared from the current year's Budget.

5. The cost of carrying out this project must mainly be borne by the Forest Department, but supervision should be provided by the Department Public Works. Care should be taken that the success of the work is tested at each stage, in order that profitless expenditure may be avoided.

6. Mr. Nordmann, while reserving a decided opinion as to the Burghoor river until he has taken levels and concluded a survey of the course of the stream, does not hold out expectations of a successful attainment of the end sought for, chiefly owing to the transient nature of the freshes. As an alternative likely to serve the same purpose more efficiently, he proposes that a tramway should be constructed from the foot of the northern Burghoor hills to Cauverypoorum for

2
Cost. of 1870: 31/10/75.

REVENUE.

To

THE PUBLIC WORKS DEPARTMENT.

Ac., Ac., &c.

Dated December, 9th.

Recd.

10/12/75

G. O., 9th December 1870, No. 1,988.

DECEMBER

Nos. 203-205.

2/12/75
To the Hon. the Conservator of Forests
for the delay to 1871

Project for rendering the Burghoor and
Cancery rivers navigable for floating railway
fuel.—Letters from Superintending Engineer, 7th
division, on this subject, with orders thereon.

Proceedings of the Madras Government, Revenue Department,
9th December 1870.

the conveyance of timber. The Government are not prepared at present to sanction the outlay which this scheme would entail, but it will be referred for the consideration of the Consulting Engineer for Railways.

(True Extract.)

(Signed)

W. HUDLESTON,

Secretary to Government.

To the Public Works Department.
,, the Consulting Engineer for Railways.
,, the Board of Revenue.
,, the Conservator of Forests.

Exd. F. R. Gentleman.

R.H.

Memorandum for orders on
Nos 2991 & 3122

Question. What steps are to be taken with a view to rendering certain forests in the Coimbatore district available for Railway fuel supply.

By G. D. dated 19th

I would like the money for improving the Cannery navigation out of the Forest Budget of this year to be used to report on this question. ^{report} ~~of the Government~~ He now submits his report? year - I postpone which concerns firstly the the Warphoor project - improvement of the river. The interest on 24,000 loan - secondly of the will be a very small Barphoor river for the conveyance of timber. Large for loan - H.S.

N. A. A.

2. Mr. Nordmann roughly estimates that a sum of Rs. 24,000 will render the Bawery capable of floating small timber on rafts or basket boats from Baweripooram to Erode a distance of 50 miles. Of this sum 13,000 would be spent on making a channel past the Neringipettu Aicut. Mr. Nordmann points out that as the wood consumed by the Railway is of small size, it would be difficult to secure it at its destination if floated loose down the river.

3. ¹ As to the Barghoon river, Mr. Nordmann does not think that it can be made available for the purpose required. As a substitute he propounds a scheme for a tramway from the foot of the Barghoon hills to Baweripooram. It is submitted that there are no grounds for such a project. The country through which the tramway (which would itself add to the consumption of fuel) would pass is very thinly populated, and it is very doubtful whether enough fuel to pay the

the interest on the
expenditure would be
required.

When the project was
submitted to the Government
for consideration, it was
found that the estimated
cost of the project was
Rs. 15,000. The Government
was of the opinion that the
project was not worth the
cost and was not approved.
The project was then
submitted to the
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cost and was not approved.

20/11/70

G. H. S.

Revenue Department

No. 1988

PROCEEDINGS of the MADRAS GOVERNMENT.

Under date the 9th Oct. 1870.

Read the following letters from the

Super. Engineer, 7th Division.

Subm. Mr. Nordmann's Report
on the subject of floating Railway fuel
on the Bayshore & Cauvery Rivers, to
Erode and Trichinopoly.

M.O. 26th Sept. 1870, No. 141.

Forwarding a Survey & Estimate
of Rs. 15,000 for the channel ground
the west end of the old Meringett
Amicut.

M.O. 14th Oct. 1870 No. 146.

[Handwritten signatures and initials]

By G.O. dated 19 August
1870, No. 1297, Mr. Nordmann,
Asst. Engineer (Legal range)
was ordered to report on
the expense which would
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south as Trichinopoly.

2. In regard to the
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out this project was

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4. The Budget of the
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5. The cost of carrying
out this project must
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b. Mr. Nordmann, while reserving a decided opinion as to the Marghoor river until he has taken levels and concluded a survey of the course of the stream does not hold out expectations of a successful attainment of the end sought for, chiefly owing to the transient

transient nature of the fresher. As an alternative likely to serve the same purpose more efficiently, he proposes that a tramway should be constructed from the foot of the Northern Marghoor Hills to Jaway-pooram for the conveyance of timber. The Govt. are not prepared at present to sanction the outlay which this scheme would entail, but it will be referred for

for the consideration
of the Consulting Engineer
for Railways—
JH

21 For the App. Depl. cost 2 miles Dec 11
3 a Consulting Eng. for Railway
116 in App. Dec 11
13 — — — — —

7/13

J. H. Bell