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MADRAS RECORD OFFICE

Government of Madras

Public Works DEPARTMENT

G.O. No. 2024-2025	Press
B.P. No. 224 to 226	Mis.
Dated 14 8	1873.

Not to be folded or roughly handled

Proceedings of the Madras Government, Public Works Department,
14th August 1873.

No. 224. Read the following letter from Lieutenant-Colonel J. H. M. SHAW-STEWART, R.E., Consulting Engineer for Railways, to Colonel G. W. WALKER, R.E., Secretary to Government, Public Works Department, dated Madras, 18th June 1873, No. 333:—

In the Order of Government, dated the 21st November 1872, No. 2,742, I was instructed to furnish, for submission to the Government of India, "a calculation of the probable result of getting coal from the Lower Godavery fields by inland water carriage to Madras, and of using it wholly or in part on the railways under the control of the Government of Madras."

2. I complied with those instructions upon the 1st March 1873 in letter No. 126. Assuming the navigation of the Godavery River from the coal fields near Dumagudiem to Vijaishweram to be improved, and assuming the completion of the East Coast Canal between Nizampatam and Dugerazapatam, I showed by calculations that the cost of conveying coal to Madras would probably be within Rupees 5 per ton, or somewhat less than 2 pies per ton mile. In corroboration of those calculations, I mentioned that Mr. Fraser had proved that firewood is now carried between Madras and Dugerazapatam at rather less than 2 pies per ton mile.

Taking, therefore, Rupees 5 per ton as the cost of carriage to Madras, and Rupees 5 as the cost of a ton of coal delivered on board at Dumagudiem, the cost at Madras would be Rupees 10 per ton, at which figure I showed there could be little doubt that the Godavery coal might be profitably used upon the Madras and Carnatic Railways.

3. The order * passed upon my report contained nothing which could lead me to suppose that my calculations were mistrusted by the Government; but from what appeared in the public newspapers, I gathered that, in addressing the Government of India, His Excellency in Council had placed upon record an expression of doubt as to the accuracy of those calculations. A copy of the letter addressed to the Government of India has since reached me, and from it I learn with very great regret that I have been charged by His Excellency in Council with having based my report upon purely arbitrary assumptions and upon incorrect calculations. I respectfully submit that it is a serious disappointment to an officer in the position which I have the honour to hold to find his opinion upon a professional point of such importance treated by the Government with so little consideration. I trust that I shall be able to convince His Excellency in Council that my calculations were not untrustworthy.

* No. 1,257, 2nd May 1873.

4. First, with reference to the cost of coal delivered on board a boat near Dumagudiem. No direct information is available with regard to the cost of quarrying coal at this place; but in a letter † from Mr. Vanstavern, it is described as "a seam of 5 feet thick" cropping out in the bed of the river, and dipping under the right bank." From this it may be fairly inferred that the seam is favourably situated for working, and that the cost of the coal delivered at the pit's mouth would in all probability be less than the ascertained cost of quarrying the Chandah coal. In a letter, dated 8th November 1870, Colonel Haig estimates

† dated 14th February 1873.

the cost of coal put on board a boat at Chandah at Rupees 4 per ton, and in a memorandum from the Chief Engineer of the Central Provinces, it is stated that "Mr. Mark Fryar reports that coal can be mined and placed at the pit's mouth for Rupees 2 per ton" at Chandah. It may be safely assumed that the last named gentleman is the highest authority in India upon the cost of quarrying coal, inasmuch as he was specially recommended by the late Sir Roderick Murchison to the Secretary of State for the purpose of examining the Indian coal pits "with a view to improving the system of working."

5. In his letter to which allusion has been already made, Mr. Vanstavern speaks of the Dumagudiem coal fields as being favourably situated for shipping coal. He says "there are places where the river is deep all the year round, and the country shows every facility for the construction of tramways."

6. Under the circumstances, I respectfully submit that the rate of Rupees 5 or 10 shillings per ton, at which I assumed that coal could be delivered on board at Dumagudiem, cannot justly be said to be "purely arbitrary." On the contrary, I maintain that it is a very liberal estimate, and based on the best available data.

7. Second, with regard to the cost of conveying the Dumagudiem coal to Madras. In paragraph 4 of the letter to the Government of India it is stated that the rate arrived at in my report of 2 pies per ton mile, or Rupees 5 per ton on the whole distance, "is based on Mr. Fraser's statement of the lowest cost of carriage of one class of goods out of a list of ten."

I most respectfully submit that this passage conveys an altogether incorrect view of my report. The rate in question was arrived at by two independent calculations; the one, supposing the coal to be brought by private individuals as a speculation, and the other on the supposition that the Railway Companies built and maintained their own boats. Mr. Fraser's authority was only quoted in corroboration of the result arrived at in those calculations; and I submit that, when the object in view was to arrive at the *actual* expense incurred in carrying the coal, it was perfectly justifiable to take the lowest of the rates quoted by Mr. Fraser as being to his knowledge in force upon the East Coast Canal. I submit that, ton for ton, coal can certainly be carried cheaper than firewood. The idea of arriving at the cost of its carriage by comparing it with any *ad valorem* scale is altogether out of the question.

8. In the same paragraph of the letter to the Government of India, it is also stated that Mr. Fraser's rates apply to "a length of only 73 miles, or little more than one-seventh the whole, and that perhaps the easiest portion of the navigation." With reference to this, I beg to observe that out of the 247 miles from Dumagudiem to the junction with the East Coast Canal at Nizampatam, the current will be in favour of the boats for 204 miles; the only part in which navigation will be against the stream being from Ellore to Bezwadah, a distance of 43 miles. As the whole of the East Coast Canal is to be on the level of the sea, the navigation throughout it will be similar to that on the part already constructed. It appears, therefore, that for a distance of 43 miles only will the navigation be more difficult than on the 73 miles of the canal between Madras and Dugerazapatam; that for a distance of 160 miles, it will be precisely similar; and that for the remaining 204 miles there will be a current in favour of the boats.

Proceedings of the Madras Government, Public Works Department, 14th August 1873.

9. It may also be observed, as an important point when comparing the cost of bringing coal to Madras with the charges now actually incurred upon the small length of open canal, that the greater the distance a boat travels the less will be the cost of carrying a ton of cargo per mile, inasmuch as the portion of the freight which represents loading and unloading charges, and delay in loading and unloading, will vary inversely with the distance travelled.

10. In paragraph 5 of the letter to the Government of India it is stated that "looking to the various rates of freight entered in Colonel Anderson's report as actually in force on a long length of Northern Canals, it does not appear to His Excellency the Governor in Council that a lower than the lowest rate of 4 pies per ton can be calculated upon." Now, with reference to this I must ask His Excellency's careful consideration to paragraph 15 of Colonel Anderson's report, which is as follows:—

> "15.—On the supposition that a 30-ton dhoney conveys 20 tons cargo at ten miles per diem for 15 days in the month, and at the rate of 6 pies per ton per mile, the receipts would amount to about Rupees 94. Now the total monthly expenses, including a charge for depreciation and repairs, cannot exceed if they are so much as Rupees 40, so that it is to be inferred either that the boat owners gain extraordinary high profits, or that they wantonly sacrifice profits by their unsystematic and dilatory style of proceeding."

11. It is here clearly shown that at a rate of 6 pies per ton mile, the receipts of a 30-ton dhoney carrying only two-thirds of its full cargo, and working only half the month, would exceed the expenses in an enormous proportion. I submit that such a dhoney, if engaged in carrying coal, may fairly be assumed to have a full cargo, and to work for at least 26 days in the month; at least that this assumption may be fairly made when the object in view is to ascertain the lowest cost at which coal can be profitably carried. Supposing then that a dhoney of the size named by Colonel Anderson conveys 30 tons of cargo, at 10 miles only per diem, for 26 days in the month, the receipts at 2 pies per ton mile would amount to upwards of Rupees 81. Colonel Anderson states that the monthly expenses cannot, at the very outside, exceed Rupees 40, and I therefore submit that the assumed rate of 2 pies per ton mile will leave an extraordinary margin for profits.

12. As regards the 117 miles of river navigation upon the Godavery, Colonel Haig states that, in the event of the proposed improvements being carried out, coal could be conveyed from Chandah to the coast at the rate of 2 pies per ton mile; and Mr. Vanstavern states that from Dumagudiem, in his opinion, a still lower rate would be sufficient to cover the cost.

13. I trust that the foregoing observations will convince the Government that my previous report was not based upon purely arbitrary assumptions and upon incorrect calculations; and that His Excellency in Council will be pleased to remove the serious charge which, in his letter to the Government of India, was brought against me.

Proceedings of the Madras Government, Public Works Department, 14th August 1873.

No. 225. ORDER THEREON, 14th August 1873, No. 2,024.

RAILWAY, No. 33.

COLONEL Shaw-Stewart is mistaken in supposing that the Government imputed any blame to him in the letter to which he alludes, or had any intention either of depreciating the care and ability which he has brought to the consideration of the subject, or questioning the sincerity of his belief in the accuracy of his calculations and conclusions. Colonel Shaw-Stewart's data are the best available, but they are unavoidably, in the nature of assumptions, not of facts, and it seems still questionable whether coal can be delivered at Madras from the Godavery fields for the sum named by him.

2. The Governor in Council resolves to forward Colonel Shaw-Stewart's letter to the Supreme Government as containing a fuller exposition of his calculations.

(True Extract.)

(Signed) G. W. WALKER, Colonel, R.E.,
Secretary to Government.

No. 226. (DOCKET No. 2,025, dated 14th August 1873.)

COPY of the above forwarded to the Government of India.

(True Extract.)

Colonel, R.E.,
Secretary to Government.

Exd. W. H. French.
Spare Copies

Railway Department.

CONSULTING ENGINEER'S OFFICE.

No. 333

From

LIEUT.-COLONEL J. H. M. SHAW STEWART, R.E.,
Consulting Engineer for Railways,

To

COLONEL G. W. WALKER, R.E.,
Secretary to Government,
Public Works Department,
Fort Saint George.

SIR,

In the order of Government dated the 21 November 1872, No 2742, I was instructed to furnish, for submission to the Government of India, "a calculation of the "probable result of getting coal from "the lower Godavery fields by inland "water carriage to Madras and of "moving it wholly or in part on the "railways under the control of the "Government of Madras."

2. I complied with those instructions

instructions upon the 1 March 1873, in letter No 126. Assuming the navigation of the Godavery river from the coal fields near Dumagudem to Visakhapatnam to be improved, and assuming the completion of the East Coast Canal between Vizianagaram and Duzeragapatam, I showed by calculation that the cost of conveying coal to Madras would probably be within Rs 5 per ton, or somewhat less than 2 pies per ton mile. In corroboration of those calculations I mentioned that Mr Fraser had proved that firewood is now carried between Madras and Duzeragapatam at rather less than 2 pies per ton mile.

Taking therefore Rs 5 per ton as the cost of carriage to Madras, and Rs 5 as the cost of a ton of coal delivered on board at Dumagudem, the cost at Madras would be Rs 10 per ton, at which figure I showed there could be little doubt that the Godavery coal might be profitably used upon the Madras and Carnatic Railways.

X
No 1257
2 May 1873.

3. The X order passed upon my report contained nothing which could lead me to suppose that my calculations were mistrusted by the Government; but from what appeared in the public newspapers I gathered that, in addressing the Government of India, His Excellency in Council had placed upon record an expression of doubt as to the accuracy of those calculations. A copy of the letter addressed to the Government of India has since reached me, and from it I

I learn with very great regret that I have been charged by His Excellency in Council with having based my report upon purely arbitrary assumptions and upon incorrect calculations. I respectfully submit that it is a serious disappointment to an officer in the position which I have the honour to hold, to find his opinion upon a professional point of such importance treated by the Government with so little consideration. I trust that I shall be able to convince His Excellency in Council that my calculations were not untrustworthy.

4 First, with reference to the cost of coal delivered on board a boat near Dunnagudiem. No direct

direct information is available with regard to the cost of quarrying coal at this place; but in a letter* from Mr. Vanstavern it is described as "a seam of 5 feet thick "cropping out in the bed of the river, "and dipping under the right bank". From this it may be fairly inferred that the seam is favourably situated for working, and that the cost of the coal delivered at the pit's mouth would in all probability be less than the ascertained cost of quarrying the Chandalo coal. In a letter dated 8 November 1870 Colonel Haig estimates the cost of coal put on board a boat at Chandalo at @ 4 per ton: and in a memorandum from the Chief Engineer of the Central Provinces it is stated that "Mr. Mark "Fryar reports that coal can be mined

*dated 14 Feby. 1873

"mined and placed at the pits mouth for Rs 2 per ton" at Chandah.

It may be safely assumed that the last named gentleman is the highest authority in India upon the cost of quarrying coal: inasmuch as he was specially recommended by the late Sir Roderick Murchison to the Secretary of State for the purpose of examining the Indian coal pits "with a view to improving the system of working".

5. In his letter to which allusion has been already made, Mr. Vanstavern speaks of the Dumaguden coal fields as being favourably situated for shipping coal. He says "there "are places where the river is deep all "the year round, and the country "shows every facility for the construction of tramways".

6. Under the circumstances I respectfully submit that the rate of Rs 5, or 10 shillings, per ton, at which I assumed that coal could be delivered on board at Dumaguden, cannot justly be said to be "purely arbitrary". On the contrary I maintain that it is a very liberal estimate, and based on the best available data.

7. Second, with regard to the cost of conveying the Dumaguden coal to Madras. In paragraph 4 of the letter to the Government of India it is stated that the rate arrived at in my report, of 2 pies per ton mile, or Rs 5 per ton on the whole distance, "is based on Mr Fraser's statement of the "lowest cost of carriage of one class of "goods out of a list of ten."

I...

I most respectfully submit that this passage conveys an altogether incorrect view of my report. The rate in question was arrived at by two independent calculations; the one, supposing the coal to be brought by private individuals as a speculation; and the other, on the supposition that the Railway Companies built and maintained their own boats. Mr. Fraser's authority was only quoted in corroboration of the result arrived at in those calculations; and I submit that, when the object in view was to arrive at the actual expense incurred in carrying the coal, it was perfectly justifiable to take the lowest of the rates quoted by Mr. Fraser as being to his knowledge in force upon the East Coast Canal. I submit that, ton for ton, coal can certainly be carried cheaper than firewood. The idea of arriving at the cost of its carriage by comparing it with any ad valorem scale is altogether out of the question.

8. In the same paragraph of the letter to the Government of India it is also stated that Mr. Fraser's rates apply to "a length of only 7/3 miles, or "little more than one seventh the whole, "and that perhaps the easiest portion of "the navigation". With reference to this I beg to observe that out of the 247 miles from Dummagudem to the junction with the East Coast Canal at Rajahmundry, the current will be in favour of the boats for 204 miles; the only part in which navigation will be against the stream being from Ellore to Bezwadah, a distance of 43 miles. As the whole of the East Coast Canal

to

is to be on the level of the sea, the navigation throughout it will be similar to that on the part already constructed.

It appears therefore that for a distance of 43 miles only will the navigation be more difficult than on the 75 miles of the canal between Madras and Durgagapatam; that for a distance of 160 miles it will be precisely similar; and that for the remaining 204 miles there will be a current in favour of the boats.

9. It may also be observed, as an important point when comparing the cost of bringing coal to Madras with the charges now actually incurred upon the small lengths of open canal, that the greater the distance a boat travels the less will be the cost of carrying a ton of cargo per mile; inasmuch as the portion of the freight which represents loading and unloading charges, and delay in loading and unloading, will vary inversely with the distance travelled.

10. In paragraph 5 of the letter to the Government of India it is stated that "looking to the various rates "of freight entered in Colonel Anderson's "report as actually in force on a long "lengths of Northern Canals, it does not "appear to His Excellency the Governor "in Council that a lower than the "lowest rate of 4 pice per ton can be "calculated upon". How with reference to this I must ask His Excellency's careful consideration to paragraph 15 of Colonel Anderson's report, which is as follows:—

"15. On the supposition that

"that a 30-ton dhony conveys
"twenty tons cargo at ten miles per
"diem for fifteen days in the
"month, and at the rate of six
"pies per ton per mile, the receipts
"ined amount to about Rs 94.
"Now the total monthly expenses,
"including a charge for depreciation
"and repairs, cannot exceed if they
"are so much as Rs 40, so that
"it is to be inferred either that
"the boat-owners gain extraordinary
"high profits, or that they wantonly
"sacrifice profits by their un-
"systematic and dilatory style
"of proceeding."

11. It is here clearly shown that at a rate of 6 pies per ton mile, the receipts of a 30 ton dhony, carrying only two-thirds of its full cargo, and working only half the month, would exceed the expenses in an economic proportion. I submit that such a dhony, if engaged in carrying coals, may fairly be assumed to have a full cargo, and to work for at least 26 days in the month; at least that this assumption may be fairly made when the object in view is to ascertain the lowest cost at which coals can be profitably carried.

Supposing then that a dhony of the size named by Colonel Anderson conveys 30 tons of cargo, at 10 miles only per diem, for 26 days in the month, the receipts at 2 pies per ton mile ined amount to upwards of Rs 81. Colonel Anderson states that the monthly expenses cannot, at the very outside, exceed Rs 40; and I therefore submit that the assumed rate of 2 pies per ton mile will leave an extraordinary margin for profits.

As

12. As regards the 114 miles of river navigation upon the Godavery, Colonel Haig states that, in the event of the proposed improvements being carried out, coal could be conveyed from Chandah to the coast at the rate of 2 pies per ton mile; and Mr Vanstavern states that from Dumagudium, in his opinion, a still lower rate would be sufficient to cover the cost.

13. I think that the foregoing observations will convince the Government that my previous report was not based upon purely arbitrary assumptions and upon incorrect calculations; and that His Excellency in Council will be pleased to remove the serious charge which, in his letter to the Government of India, was

was brought against me.

I have the honour to be
Sir
Your most obedient servant
J Stewart Lt Col R.E.
Com Engineer for Railways

Madras
18 June 1873

Encd
Bundle

P. W. D.

P.W. 1573 Copy
P.W.D. 4 Ed. for Augt.

RAILWAY DEPARTMENT

1873.

From No. 354

The Consulting Engineer
for Railways

To

The Secretary to Government
P. W. Department,
Fort Saint George

Dated 18th
Recd. 19th June 1873

No. 333

Regarding the
calculations arrived
at by the Consulting
Engineer of the probable
cost of obtaining con-
tinl. the Lower Godaveri
by inland water carriage
to Madras

No 2024-2025-14 "Aug

No 224
to Sec to Govt 19 June 73

The first return of Government Col. S's letter to the reference put as containing a fuller exhibition of his calculations.

No 227
[illegible]

25

P. W. D.

Proceedings of the Madras Government,

Under date the 187 .

Read the following :—

I do not [illegible] with the terms of the Draft, but in the terms of [illegible] Mr. [illegible]'s Note, which is with the papers.

[illegible]

The Consulting Engineer for Railways has no just cause for complaining that in sending up to the Government of India his Report on the probable cost of getting Coal from the Lower Godavery fields by inland water carriage to

to Madras; his assump-
-tion of Rs 5 a Ton
as the price of coal
delivered on board
of boats in the Godavery
was stated to be purely
arbitrary, and his
deductions from Mr.
Fraser's Memo on East-
Coast Canal traffic
that Rs 5 a ton would
represent the cost of
carriage to Madras was
stated to require correction.

These statements
do not constitute a
serious charge against
the Consulting Engineer
as he erroneously

assumes in the last
para of his letter. They
simply guarded against
it's being supposed by
the Govt. of India that
the Local Govt. were
satisfied that any
definite conclusion
as to the price of Coal
on board of the
Godavery boats could
be arrived at without
further explorations
of the Coal fields, es-
-pecially South of the
River; or that the
very lowest rate de-
-termined as being charged
on an exceptionally

favorable portion of the water communication, on one only out of a number of products referred to in Report on Canal Navigation, could safely be adopted as the rate of transit for Coal. The Govt. enrolled the Consulting Engineer's special pleading with the well defined practical view of inducing the Govt. of India to persevere in the task of exploration and utilize fully the available services of an officer peculiarly fitted for the duty. The Consulting Engineer should learn to lay aside his personal feelings in the discussion of public matters, and look more to the realization of the objects the Government have in view than to the exact extent to which the opinions of the Govt. are influenced by his.

Gww

Lo. The Consulting Engineer for Railways.

No. 2024 R.M.D.

Rec'd of the Madras Govt.
Read the following:
from the Govt Secy Pol. Dept. No 333 of 18 June/73/

Colonel Shaw
Stewart is mista-
-ken in supposing
that the Government
imputed any blame
to him in the letter
to which he alludes,
or had any intention
-tion either of depre-
-ciating the care and

Oct 18th Rec'd

ability which he
has brought to the
consideration of the
subject, or question-
-ing the sincerity of
his belief in the
accuracy of his
calculations and
conclusions- Colonel
Shaw Stewart's data
are the best availa-
-ble but they are
unavoidably, in the
nature of assump-
-tions- not of facts-

And it seems still
questionable whether
Coal can be delivered
at Madras from the
Godavery fields for
the sum named by
~~Major Colonel Shaw Stewart~~
The Governor in Coun-
-cil resolves to for-
-ward Colonel Shaw
Stewart's letter to
the Supreme Govern-
-ment as containing
a fuller exposition

of his calculations.

V.C. Chingleput Rajs
Dept 21/8/73

Docket No. No. 2025 dated

Copy of the
above forwarded
to the Government
of India—

Dept.

26
1/2

I.C. Dept 21/8/73 with
6 Copies of the preceding G.O.

H-224-26.

Forwarding a letter
from the Consulting Engr
for Railways regarding the
Calculations arrived at
by him of the pro bable
cost of obtaining Coal
from the Lower Godavery
by inland water carriage
to Madras—

of his

Gen. 2354

Govt. of {1873} Madras.

PUBLIC WORKS.

To The Consulting Engr for Railways

&

To The Secretary to the Govt of India

Dated

Recd. Encl.

G. O. 14th Augt No. 2024-2025

Nos. 221-225 & 226

Coal

Passing orders on letter from the Consulting Engr Railways regarding the calculations arrived at by him of the probable cost of obtaining Coal for the Lower Godavery by sea & water Carriage &c.