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*Proceedings of the Madras Government, Revenue Department,
15th September 1871.*

No. 191. Read the following Proceedings of the Board of Revenue, dated 18th August 1871, No. 3,534 :—

Read the following letters :—

From Captain R. F. OAKES, R.E., Superintending Engineer, 6th Division, to the Secretary to Government, Public Works Department, Fort Saint George, dated Tanjore, 29th April 1871, No. 94.

As promised in my letter No. 1,055, dated 9th March, I have the honour to

1 List showing depths of water in the Canal.
1 Copy of Salt Deputy-Collector's letter,
No. 44, of 30th March 1871.

report the result of my examination of the canal in March last.

2. The enclosed list gives the depths of water in the canal reduced to tidal low water-mark in February, just after the close of the monsoon, and when the canal was receiving no drainage water; and from it, it will be observed that the depth of water from Negapatam to the junction canal is every where in excess of the three feet, to which it was originally proposed to limit the depth at L. W., except just at the junction of the canal with the Cuddaviyaur, straight cut where the depth was $2\frac{1}{2}$ ' and at a crossing in the Velliyaur river near Valanguny where

8 miles.

the depth was $1'9''$. The maintenance establishment was set to work on these spots, and has doubtless increased the depths there considerably. With regard to the former spot there is no difficulty, and some deposit must be expected just above the junction of the canal with the Cuddaviyaur during the monsoon, and it may easily be removed. The crossing in the Velliyaur river is a more difficult spot to deal with; here the river must be considerably reduced in width by planting, etc.; the efforts hitherto made in this respect have failed, but it is believed that by the formation of a few palmyra groynes or fences to protect the grass when young, considerable improvement may be made in this reach of the river.

3. In the junction canal between the Velliyaur and the head of the Ramanaden Voikal, the minimum depth was

2 miles—8 to 10.

$3\frac{1}{2}$ ', except under the bridge; here the depth was $2'8''$, owing probably to the arresting of the water brought down by the Coopien Voikal by the surplus water from the Chendranaddi; the mouth of the Coopien Voikal will be closed as soon as the subsidiary channels, for the completion of which funds were allotted in Government Order No. 11, dated 3rd April, have been excavated.

4. The depth of water in the canal from the junction canal to the Adapaur through the old drainage channel* varied

10 miles—10 to 20.

* Ramanaden, Papan, Koodichithiyaur.

from 3 to $5''$; except near the channel opening into the Hurrischendranuddi where it was $2'9''$, this connecting channel or calagum will be closed when the Chuckilien Voikal is turned into the Hurrischendranuddi.

5. From the 15th mile to the Adapaur the banks of the canal are too low, and will have to be made up to admit of the lands to the east of the canal being

5 miles.

irrigated; and here the people seem disposed to extend the cultivation, for which they now receive a partial supply, through the syphon-sluiques already provided and for which they will receive a more permanent supply when the subsidiary channels adverted to above have been completed.

6. The troublesome section of the canal is that from the Adapaur at Topetorai to the Vadis or platforms at Vadarniem; here the depths were from 1' 2' to 2' 3" at L.W; considerable damage had, however, been done to this section of the canal by the breaching into it of the drainage of a large tract of country to its west during the late heavy monsoon. A channel to divert this drainage exists, but it requires to be cleared and to be extended into one of the swamps in which water now accumulates. An estimate for this work is under preparation; it will amount probably to 1,800 or 2,000 Rupees.

7. This portion of the canal forms a *cul-de-sac*, and must inevitably silt up; it passes through pure sand, and though slopes of from 4 to 6 to 1 have been given to the sides; even this slope does not appear to have been sufficient during the late monsoon when the weight of water and of the sand without the canal appear to have caused the sand to raise in the bed of the canal.

8. I examined the country carefully, with a view of ascertaining whether the canal could be extended about 3 miles westwards along the margin of the salt swamp, and be carried through the Manankondanaur across the salt swamp into the sea, so as to afford direct communication between the Adapaur at Topetorai and the sea, about 3 miles west of Point Calimere; but am of opinion that during the dry months, the mouth of the Manankondanaur could not be kept open. The only other method of keeping this section of the channel clear, and of maintaining a minimum depth of 3', is by the construction of a lock and of scouring sluices at the junction of the canal and the Adapaur and the level of tidal H. W., or within an inch or two of it might then be maintained by closing the lock at H. W., and the canal might be scoured every 3 or 4 tides by opening the scouring sluices at half tide.

9. These works, however, would be very expensive, for they would have to be built on pure sand, and both materials and labour would have to be brought from a great distance, and they would not be required if proper canal-boats, with flat bottoms, were used for the conveyance of salt, and care were taken to start the boats from the Vadi about an hour before H. W.; at this state of the tide, a depth of 3' 6" of water may be maintained throughout this portion of the canal, while the flat bottomed boats, which carry from 15 to 16 tons, draw only from 2½ to 2⅞ when fully loaded. Ten such boats have been procured; they could pass through the rest of the canal at all times and states of the tide.

10. The quantity of salt required to be conveyed from Vadarniem to Negapatam in a year is 4,000 garce or 16,000 tons. The Deputy-Collector states that the average journey occupies "two days, i.e., one day with the wind and 3 against," but adds "if we take the time of loading and unloading, stoppages, delays, and obstructions, etc., into consideration, it extends to even 6 or 7 days"; now, if canal boats drawing 2½ to 2⅞ of water were used, "stoppages, delays,

and obstructions" would no longer occur, and as the whole length of the canal is only 35 miles, an average of 4 days for a trip to the pans and back from Negapatam would appear to be a very liberal allowance; and if a year is supposed to consist of 300 working days, 75 trips may be made by each boat, and if 15 tons are carried, we have $X = \frac{16,000}{15 \times 75} = 14$, the number of boats required; hence if 6 more boats were supplied, there would be no difficulty in conveying the salt required from Vadarniem to Negapatam without making use of boats unsuitable for the canal, and which have a draught of from 3½ to 4', while the canal at tidal L. W. is not supposed to have more than a depth of 3' of water in it; and I must here record my protest at complaints being made relative to the condition of the canal and to the difficulty of navigating it, when common sense is altogether laid aside and a boat drawing 4' of water is made use of in a canal in which avowedly only a depth of 3' of water at L. W. is provided.

11. It is clear from the enclosed list of depths that, with the exception of the 3 miles from the Vadis at Vadarniem to the Adapaur, a canal-boat, drawing from 2½ to 2⅞ of water when fully laden, can pass freely through the canal at all times and seasons, and there would be no difficulty in navigating even this section with such boats from ½ to full tide.

12. The following information has been obtained from the Salt Deputy-Collector, a copy of whose letter* is enclosed:—

Salt conveyed by the canal.

			Maunds.	Tons.
In 1868	...	...	1,98,551	6,618
„ 1869	...	...	1,91,416	6,380
„ 1870	...	...	1,38,415	4,613

* No. 44 of 30th March 1871.

Probable saving to Government owing to carriage of the above by the canal instead of by sea, Rs. 46,783-13-2.

13. Extra sales since 1868, as compared with the sales of the three previous years, 30,162 Indian maunds, which is stated to represent Rs. 52,783-8-0; hence the return from the canal since 1868 may be said to be Rupees 99,567-5-2, and if from this be deducted Rupees 12,543-11-7, the cost of maintenance, we have a net return of Rs. 87,023-9-7 on an outlay of Rupees 1,42,260-9-6, or a return of 20 per cent. per annum on the capital expended.

			RS.	A.	P.
1868-69	...	...	4,348	1	0
1869-70	...	...	3,255	0	11
1870-71	...	...	4,940	9	8
Total	...	...	12,543	11	7

14. It will be observed that the total number of maunds conveyed from 1868 to 1870 is 5,28,382, while that estimated for 1871 is 4,80,000; and this latter can be conveyed by 16 nay 14 canal-boats worked steadily; hence, had 16 canal-boats been provided in 1868, it is probable that the return from the canal might now have been represented by nearly three times the amount given above, and the capital would have yielded an interest of nearly 60 per cent.

*Proceedings of the Madras Government, Revenue Department,
15th September 1871.*

ENCLOSURE No. 1.

From E. G. RICKETTS, Esq., Deputy-Collector in charge of the Salt Department, to the Superintending Engineer, 6th Division, Tanjore, dated Negapatam, 30th March 1871, No. 44.

In reply to your letter under date the 9th instant, No. 1,052, I have the honour to inform

In 1868	...	...	...	IN IND MDS.	1,98,551	you that the items noted in the margin exhibit
" 1869	...	...	...		1,91,416	the net quantity of salt conveyed by the Canal
" 1870	...	...	...		1,38,415	from Vadarniem to Negapatam from January
Total...					5,28,383	1868 to the end of December 1870.

2. The ten new boats were designed of one uniform plan, on the Madras pattern, to carry between fifteen and sixteen tons of salt (which were sold conditionally to the salt carrying contractor at prime cost), and, being almost flat-bottomed, their maximum draught when loaded varies from 2' 3" to 2' 6", and minimum draught when empty, from 9" to 1'; "their width across or the breadth of beam" is shown in the plan handed over to you. Other boats of different sizes are also employed by the contractor, and their draught when loaded being from 2' 6" to 3' 6" (Port Boats 4'), and when empty from 1' 3" to 1' 6".

3. "The average time which the journey occupies" I take it to be two days, i.e., one day with the wind and three against it, but if we take the time of loading and unloading, stoppages, delays, and obstructions, etc., into consideration, it extends to six or even seven days; but it is really impossible to fix any particular time, as it all depends on the state of the Canal.

4. "The probable saving to Government owing to carriage by Canal" I can only arrive at, by contrasting it to the actuals of expenditure incurred in carriage by sea as undertaken by this Department in the year 1864, (for it was never contemplated, I imagine, to undertake it by land), and which gives Rupees 0-1-5 in favour of the Canal per Indian maund, or Rs. 46,783-13-2.

5. In regard to "whether any increase of sales may be attributed to the Canal on account of the facility of carriage," there can be no doubt of (independent of the policy of always having a large stock of salt in hand at the chief depôt of the district and terminus of the Great Southern of India Railway); "if so, what is their value, or what sum may be indirectly credited to the Canal" is a harder conclusion to arrive at, unless we compare the sales from January 1868 to the end of December 1870 with the corresponding period of the three previous years, before the Canal was in use, and which, as far as I can see, is the only way to do it, and which exhibits an increase of 30,162 Indian maunds, the equivalent of which, when we take into consideration the present enhanced price of salt, may be represented by Rs. 52,783-8-0, reckoned at the average selling rates from 1-8-0 per Indian maund in 1865 to 2 per Indian maund in 1871.

RS. A. P.
52,783 8 0
146,783 13 2
99,567 5 2

6. This sum* added to the saving† owing to carriage by Canal makes a net increase of nearly one lac of Rupees in round numbers; but, as a set off, from which I presume the repairs to the Canal during the period under remark must be deducted.

ENCLOSURE No. 2.—List showing depth of the Vadarniem Canal.

TRANSFERRED to the Revenue Department, with reference to the undermentioned orders in that department:—

No. 484, dated 20th March 1871.

" 580, " 29th " "

(Signed) J. CARPENDALE, Colonel, R.E.,
Secretary to Government, P.W.D.

11th March 1871.

*Proceedings of the Madras Government, Revenue Department,
15th September 1871.*

REFERRED to the Board of Revenue for their remarks.

FORT SAINT GEORGE,
26th May 1871.

(Signed) F. BRANDT,
Under-Secretary to Government.

REFERRED to the Collector of Tanjore for report.

(Signed) J. GROSE,
Secretary.

From the Officiating Collector of Tanjore, to the Acting Secretary to the Board of Revenue, dated Mayaveram, 22nd July 1871, No. 219.

I HAVE the honour to reply to the Proceedings of the Board of Revenue, forwarding for my report a letter from Captain Oakes, regarding the state of the Vadarniem canal from observations made by him in the month of March last.

2. I deferred replying to these Proceedings until I had an opportunity of seeing the canal myself, and I now beg to submit the result of my personal examination of the same.

3. I left Negapatam at about 6 A.M. on the 17th June, the day before the new moon, 18th, and when the first freshes had made their appearance. I was in the budgerow boat drawing from 18 to 21 inches, and, with the high tides combined with the floods, had little or no difficulty in getting down to Topetorai, 3 miles to the north of Vadarniem, and which place I reached at about 4 P.M. With all these favourable combination of circumstances, the boat, however, frequently touched ground, and it could easily be seen that, when the water was low, very considerable difficulty must and would be experienced by laden boats, particularly at the head of the new cut opening from the Kaduvaiyar and at the various fords in the Ramanadan and Pappan channels.

4. From Topetorai to Vadarniem, however, the canal is cut through very indifferent and chiefly sandy soil, and it is very much silted up in many places; the banks appear to have entirely slid down, and in some places the canal has assumed a sort of wedge-like appearance without any defined or regular interval between the water-edge and the spoil earth which was formed into embankments. Even with the small draught of water which the budgerow drew, I had considerable difficulty in reaching Vadarniem, and on arrival there I found two laden salt-boats stuck hard and fast, and waiting for the tide.

5. Next morning, 18th, it was dead neap tide, and at Vadarniem the canal had the appearance of a small channel, about 9 or 10 feet wide, and with a depth of about 9 or 10 inches; in proof of this I may mention that the budgerow was lying across the canal with only about one-third of her length touching the water, the two ends being high and dry.

6. On my return in company with Mr. Ricketts, the Salt Deputy-Collector, we started at about 5 P.M. after the tide had made for about three hours, and till we reached Topetorai at about 6-20 P.M. we were touching bottom the whole way; and had it not been for the very strong southerly breeze, which was blowing, we could not have made any way. After reaching the Kallimod backwater, we also grounded more than once, and it is to be observed that in this backwater there

are several extensive mud flats, over which a boat even drawing 2 feet could not easily pass at low water. I should also mention that in the backwater and about 2 or 3 miles from Topetarai, there is a very peculiar bend or turn in the river which seems at the spot to double as it were on itself, and this, as we ourselves experienced, is the cause of very considerable difficulty and delay. After passing this bend, however, we experienced no further inconvenience, and with the combination of floods and spring tide, easily reached Negapatam early in the morning.

7. With regard to the remarks made by Captain Oakes as to the nature of the boats made use of by the contractor and their unsuitability from their draught of water, I would take leave to observe that when light and during the prevalence of the south and westerly winds which, as the Board are aware, blow furiously, the light flat-bottomed boats and especially when empty, are almost unmanageable; in the several parts of the canal and channels and when the banks afford some shelter from the violence of the wind, it is possible to track or punt them along, but in the exposed 12 miles of the Kallimod backwater, the case is very different, and even in the budgerow, well and efficiently manned as it was, we had sometimes the greatest difficulty in making any progress at all, and the only way to get on was by hugging the bank and dragging the boat by main force frequently through liquid mud.

8. I have thus mentioned what came under my observation, not with any intention of throwing any doubt or discredit on Captain Oakes's report, but simply to state what I saw at a different season of the year, and to show that the canal cannot by any means be considered to afford a very perfect or certain line of communication. At the same time, I am of opinion that the canal is a most useful and economical means of communication for salt as well as for travellers and all other commodities, and if the cuttings are gradually deepened and widened, to at least 3 feet below low water, and the bend near Topetorai cut through, I have no doubt the canal will in time entirely supersede the road.

9. I presume it is not intended I should follow Captain Oakes in his calculations as to the large profits which the Government have derived from the construction of the canal. I may, however, observe that the shipping of salt by sea in the year 1864 was merely an experiment, and cannot therefore be taken as a fair basis or ground of comparison. It was also not intended to be repeated, and, as the Board are aware, the Vadarniem manufactured salt, as laid down at the Negapatam Stores, costs Rs. 15, while the rates now paid per garce for Negapatam salt are only Rs. 9, 10, and 12.

10. It is, of course, admitted that the salt manufactured at Vadarniem contains generally larger crystals, and is a stronger and more pure salt than that usually manufactured at Negapatam; what is now manufactured at Vadarniem, however, is very different from the magnificent blocks which were formed under the old system, and there can be but very little doubt that after all the salt made at Negapatam is much more approved by and acceptable to the people. I would only add that, through the exertions of Mr. Ricketts, the salt made at Negapatam this year has greatly improved in quality, and if the rate of waram was only raised to Rs. 14 or 14-8, I have no hesitation in saying that not only this improved quality could be

maintained, but that the remaining half of the pans, which are now left waste, would be at once brought under cultivation.

SUBMITTED to Government with reference to their endorsement on a letter from the Superintending Engineer, 6th Division, dated the 29th April 1871, No. 94.

2. The reports of the Collector and the Superintending Engineer taken together probably give a fair idea of the condition of the Vadarniem Canal.

No. 192.

ORDER THEREON, 15th September 1871, No. 1,603.

Separate Revenue, No. 16.

Salt.

ORDERED to be communicated to the Department Public Works.

2. The Government trust that attention will be constantly maintained

on the gradual improvement of the Vedarniem Canal.

3. The Government presume that in paragraph 10 of his letter, when comparing the salt formerly obtained from Vedarniem with that now supplied thence, the Collector alludes to the spontaneously formed salt as compared with the artificially manufactured article. The former unquestionably resulted in "magnificent blocks," but the concentration of the brine was so intense that the salt was found unsaleable when a trial of it was made in the district, the complaint being that it was too bitter for use.

4. The Government are, however, disposed to think that, although the manufactured article may have been more acceptable on the spot, the spontaneously formed salt, which is equally pure, and must be more economical in use, will be found more suitable for distant carriage by rail.

5. They desire to receive the opinions of the Collector and Deputy-Collector in charge of the department and of the Board of Revenue on this subject, and to be informed whether any trial of the salt has been made since the communication by rail and water between Vedarniem and the interior of the Presidency was completed.

(True Extract.)

(Signed)

W. HUDLESTON,

Secretary to Government.

To the Public Works Department.
,, the Board of Revenue.

Exd. F. R. Bantleman.

Handwritten notes on the left margin of the first page, including dates like '15th Sept 1871' and '18th Aug 1871', and various illegible cursive text.

Rev 1871. Sep
Board of Revenue,
MADRAS.

PROCEEDINGS, 18TH AUGUST 1871, No. 3,534.

Received 1 Sep. Encl. 1
Sent to Secy. 1. 1871

No. 1603. 15th September 1871

AUGUST.
No. 3,534.

Vedarniem Canal—in Tanjore District.—Letter from Collector reporting on letter from Superintending Engineer, 6th Division, on condition of, submitted to Government.

Handwritten signature and 'No 191' at the bottom of the first page.

No 1603 11 C 4

Extensive handwritten notes on the right page, starting with '15th Sept 1871' and continuing with several paragraphs of cursive text, including references to 'Vedarniem Canal' and 'Superintending Engineer'.

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article. The former
unquestionably resulted
in "significant blocks"
but the concentration of
the firms was so intense
that the ^{trade} left was insubstantial
than a "bad job" was
done in the District
the complaint being that
it was better for us.

Report are however
disposed to think that
altho the manufactured
article may have been
more acceptable in the
export the constantly
growing ^{left} is equally
prejudicial to the ^{foreign}
economic in case
will be found more
suitable for District

carriage by rail
The decision is
the decision of the
Colt & W. & W. in
charge of the Dept. of
the Dept. of the
subject. The
information is that
any trial of the
business made since
the communication
by rail to the
President of the
of the Presidency
has completed
L.R.

21 To the Public Works Dept.
14 of the Board of Commerce

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