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TAMIL NADU ARCHIVES

GOVERNMENT OF TAMIL NADU

P. W. D. DEPARTMENT

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Dated	7.7.1879	197.

Not to be folded or roughly handled

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GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

7th July 1879, No. 1,790 W.

Buildings and Roads
Civil Works.

Read the following:—

No. 34. Despatch from the Right Honorable the Secretary of State for India.

Public Works,
No. 14.

INDIA OFFICE, LONDON,
29th May 1879.

MY LORD DUKE,—Herewith is forwarded, for your Grace's information, copy of a report on the progress made on the Madras Harbour Works, for the five months ending 28th February last, which has been submitted to me by Mr. Parkes since his return from India.

I have, &c.,

His Excellency the Most Noble
The Governor in Council, Fort St. George.

CRANBROOK.

From W. PARKES, Esq., C.E., to the Under Secretary of State for India, dated 23, Abingdon Street, 29th April 1879.

MADRAS HARBOUR.

Report on the Progress of the Works for the five Months ending 28th February 1879.

I HAVE the honor to forward herewith a plan showing the state of the works on the 28th February. The plan is on a smaller and more convenient scale than those hitherto submitted, the larger scale being unnecessary now that there are no details of progress in the preliminary works to show.

2. Owing to my absence from England, I was unable to submit a report for the quarter ending 31st December, and much of what would have been the subject of such report has been already anticipated in the communication I have made to the Government of Madras, and of which copies have been laid before you.

3. I have, however, thought it desirable to make this report in order that the series addressed to you may be continuous, and also to enable me to enlarge upon some subjects on which I was not able to speak so fully as I could wish without reference to previous papers which were not with me at Madras.

4. The plan shows that the north pier has advanced in the five months 323 feet, and the south pier 405 feet. It also shows a length of 450 feet at the north pier, and of 300 feet at the south pier of rubble base substantially completed in advance of the concrete blocks. This has been deposited from the steam hopper barges and from ordinary 12 ton cargo boats. The new block ground at the south pier has also been completed, and the Goliath steam crane erected upon it. It was in use before I left Madras.

5. The period under review includes the rough weather season of the north-east monsoon, and this caused considerable delay, especially at the north pier during the months of December

and January. During the other three months the progress of the north pier was regular and uninterrupted, and though the rate was considerably less than what may be hoped for in future, the retardation was not due to any of the difficulties of the site which had previously given so much trouble. As the whole annual cycle of seasons has now passed without any disturbance of the sandy bottom in the neighbourhood of this pier we need fear no recurrence of it.

6. That a greater rate of progress was not attained was mainly due to the fact that the pier has been used as a loading place for the rubble stone, and this until the operation was fully organised rather interfered with the passage of blocks from the block ground to the Titan. This will not be so much the case for the future. On the whole, however, I do not think the amount of progress can be considered as unsatisfactory.

7. During the quarter ending 30th September, the south pier was struggling through an immense accumulation of sand, an advance of 114 feet having been with difficulty made in the three months. The blocks were got into place by sinking them through the sand on to the rubble base below which had been deposited before the accumulation took place. At that date, however, the work was brought to a standstill for want of further reliable foundation, and block setting was not resumed till the last week in November when the sand had partially cleared away.

8. In December and January as at the north pier there was much interruption by bad weather, and even when work could be carried on there were still some remains of the sand mixed with and covering the rubble base, but the tendency was now to an improvement day by day, and by the end of January the foundations were absolutely clear.

9. The work then advanced rapidly; 160 feet were added in the month of February, and, as I have been informed by telegram, 134 feet more in the month of March.

10. The work is now considerably more in advance of the site of the last sand accumulation than the north pier was at the corresponding period of last year, and as the latter has experienced no further interruption we have a strong presumption that we have also seen the last of the trouble at the south pier. The work of the south pier was continuing to advance at the date of my last intelligence (5th April), but I much regret to say that the current quarter Superintendent or myself. The work at the north pier is stopped, and at the south pier will soon be stopped for want of diving dresses which were indented for on the 1st October last, but were not ordered by the India Office till the 27th February. This report is not the proper occasion for raising any question in regard to this unfortunate miscarriage, but in placing the result on record, it is only justice to those who are conducting the work to place on record at the same time that it has occurred in spite of our repeated endeavours to avert it.

11. In previous reports I have always spoken of the deposit of rubble base as an operation which was not fully in action and of certain anticipated difficulties connected with it as remaining unsolved. I am happy to say that this department of the work is now in full and successful operation. After much consideration and many trials a satisfactory mode of securing the steam hopper barges and other craft alongside the breakwater pier to receive their cargoes of rubble stone has been arrived at. On one side or the other the sea is generally sufficiently calm for them to ride easily, and the one steamer at work, the *Salisbury*, can carry out and deposit in a fair day's work from 600 to 700 tons of stone. The cargo boats do about as much more, though at a greater cost than the steamer. The other steamer, the *Hobart*, unfortunately damaged the submerged doors of her hopper and had to be sent to Calcutta to be docked and repaired. When she returns the two steamers will be sufficient to do the great bulk of the work at a very cheap rate.

12. The great advance made in this department of the work is shown by the fact that while in the very favorable month of February 1878 the quantity of stone deposited was 9,469 tons, the quantity in February 1879 was 29,539 tons.

13. During the months of November and December the works were exposed to the action of two unusually heavy sea disturbances, evidently propagated from the courses of the cyclones in the Bay of Bengal which struck the coast near Vizagapatam and caused damage to the shipping at that port at the same dates.

14. I quote Mr. Thorowgood's description under date 9th November:—

"On the 4th a very heavy surf came in quite suddenly accompanied by no wind. The rollers, however, came from the north-east and broke with great violence along the north pier. A course of blocks was set in the early morning after which all work on the pier had to be stopped as it was not safe to walk to the end. Four men were washed off the pier, and one man had his leg broken. When I got to office the swell was very heavy along the north pier, the crests of the waves piling up about 4 feet above the top of the blocks. I quickly ordered the engine to withdraw all the laterite wagons back to the surf bank. At the south pier the broken water dashed over the Titan girders, the Titan standing about five courses back from the end. Four Masula boats were smashed all to pieces and three men drowned. These boats were trying to go out to the north of the Harbour. Under the lee of the north pier the water was quite still and boats could ply easily. The high surf flag was hoisted at 4-30 P.M.

"On the morning of the 5th we found that the north row of blocks in the north pier from 445 feet to 545 feet had been undermined. This was the length of work which was built on somewhat doubtful foundations. We could not be certain what depth of stone there was under the blocks, but we knew there was some * * *. The result of the undermining was that the centre joint opened for more than 100 feet. The greatest opening was 2 feet 9 inches wide * * *. The road (railway) was of course broken up, but by the 7th was made up again and the gap filled up with concrete, and on that day a course of blocks was set, so not much delay was caused by the disaster * * *. In itself the damage was slight and the surf was heavy, perhaps as heavy at that spot as in May 1877. But I do not call it a heavy sea at all; a mere nothing compared to the coast of Northumberland seas, and according to all accounts a mere nothing for the Ooromandel Coast."

15. I received the above only a few days before I left England for Madras and too late to make any formal report to you. Indeed there is nothing in it requiring a special report. I have quoted it entire because it gives not only a description of the effect of the sea on the works, but also gives a good idea of the inconveniences resulting from the present unprotected state of the shore, on an occasion of by no means extraordinarily bad weather.

16. With regard to the effect on the works the term "undermining" is scarcely correct. There is no instance on record of true undermining of a rubble stone foundation at so great a depth as 16 feet below water, even under much heavier seas. Mr. Thorowgood himself supplies the true explanation of the cause of the sinking of 100 feet of the blockwork when he says that it was built on "somewhat doubtful foundations." The thickness of rubble stone below the blocks was insufficient to protect the sand below the rubble from the disturbance caused by the sudden arrest of the lateral propagation of the waves by the mass of the breakwater. So long as the sea is calm the surface of the sand is sufficiently solid to carry the superincumbent weight of the rubble stone and blocks, but the sand becomes softened under the agitated water and the rubble sinks into it, the blocks of course following. The result is to produce a more secure foundation formed by a compact layer of rubble stone with the interstices filled solid with sand. The stability of the superstructure is in no way affected by the slight subsidence though the regularity of the line of the wall is rather disturbed.

17. On the 7th December Mr. Thorowgood again wrote as follows:—

"Since December 3rd and until yesterday we have had as bad a sea as I have ever seen here, caused by a cyclone out in the bay. On the 4th and 5th the waves were tremendous and never ceased to thrash into the north pier all day and night with great violence. It was perfectly impossible to go along the pier, and it was not pleasant to stand on the end of the laterite bank. The waves tore along the pier with crests of solid water 8 feet above the top of the blocks. It was a magnificent sight, and the Duke with the Ladies Grenville, Captain Taylor, Sir Michael Kennedy and myself stood on the iron pier for an hour and-a-half watching the attacks on the two breakwaters. The portion of the Harbour area between the south and iron piers was one mass of white surf. Breakers commenced to curl over about 200 feet outside the iron pier, their crests just coming up to the underside of the planking. Through all this week of sea and surf so great has been the shelter afforded by the north pier that my diving boat, with jolly boat attached, rode the weather out in safety. The only damage incurred is that the centre joint has opened about 4 inches from 450 to 600 feet (3 course work). Many broken pieces of blocks have been carried away from the top course, and nearly all the rails have been torn up and washed overboard. The 4 course work has remained as firm as a rock, and the centre joint has nipped up closer, as was the case at Kurrachee. At the south pier the end course got displaced, but it is to-day set right, and block-setting is resumed. The road there was not damaged much, but it will take some days to repair the road of the north pier. I can hardly tell you how pleased and thankful I am to be able to report the works as having stood so severe and continuous a siege as well as they have."

18. It will be observed that while the heavy sea of November resulted in the opening of the centre joint to the extent of 2 feet 9 inches the very much heavier sea of December only increased that opening 4 inches, showing that the effect of the first settlement was a consolidation and strengthening of the work in a part which was unavoidably imperfect in its original construction. In the parts where there was no such original imperfection no effect whatever beyond slight uniform subsidence was produced.

19. So far therefore it must be admitted that the strength of the works has proved sufficient. What may be the greatest force of sea to which they may be liable, compared with that experienced on this occasion, is a matter upon which there is no definite basis for judgment, though there is abundant scope for conjecture, and this I need hardly say has led persons of local experience but imperfect knowledge to very various and inconsistent conclusions. The only conclusions I feel justified in submitting are that there is in the works an amount of stability sufficient to withstand a considerably greater force than that exhibited on this occasion, and that if future experience should prove it to be still insufficient, that same experience will point out what further strengthening is required.

20. I now come to the sand question. On the 30th September the shore line south of the Harbour had advanced seaward considerably, the high water mark being 200 feet seaward of the commencement of the blockwork of the south pier; during October it was about stationary, but in the following three months it retreated 280 feet, being at the end of January about 200 feet in advance of its position twelve months previously.

21. These changes of the line of beach are quite consistent with the general conclusion I have previously submitted that the accumulation of sand will not affect the entrance of the Harbour for a long period roughly estimated at a century, but they do not at present offer sufficient data for a more definite calculation. The rapid advance during the south-west monsoon naturally revived the misgivings in the mind of the local public as to the ultimate success of the work, but the almost equally rapid retreat in the north-east monsoon had allayed those misgivings before I reached Madras. In the coming monsoon the conditions of the race will be much more favorable to the breakwater than they were last year, as it is now 1,200 feet seaward of the beach line instead of 600 feet.

22. At present the only result of the accumulation of sand which has been so often represented as presenting a fatal objection to the Harbour works is the gain of a strip of shore about 200 feet wide of which the end abutting on the Harbour will be ultimately of great value, and of which the remainder if properly levelled and reclaimed will make a handsome extension of the esplanade seaward. I have not been able to discover any valid grounds for the objections which have so often been assumed to attend this advance of the coast line.

23. The corresponding erosion of the coast to the north of the Harbour is a matter requiring more attention. I beg to refer to my report to the Madras Government, dated 25th February, on this subject, of which I have already submitted a copy to you.

24. In the plan which I submitted to you with my last report I was unable to show the extent of the accumulation of sand under water around the end of the south pier. It is now shown on the accompanying plan by brown-shaded contour lines. These give the state of the bottom in October and November, when the accumulation was at its greatest; since then everything to the south of the pier has been swept back to an extent corresponding to the recession of the coast line, but the accumulation to the north of the pier has not been materially affected. It forms, as will be seen, a semi-circular heap of which the pier itself is the diameter. The highest point, on which there was in October less than 6 feet of water, occupies a position in which there was about 21 feet in the previous February, showing a maximum shoaling of about 15 feet. The shoaling has pushed out the 3 fathom line and the 4 fathom line, but has scarcely affected that of 5 fathoms. The result is an encroachment on the useful Harbour space of about 6 acres out of 150.

25. If this result were likely to be repeated it would be a serious matter, but I do not think there is the least fear of it. It will, however, be a great satisfaction when confidence on this point can be based on fact rather than, as it is yet, on hypothesis, however well grounded.

I have from the first anticipated that there would be great and troublesome disturbances of the sandy bottom in the belt immediately outside the ordinary surf line. This anticipation has been fully realised, and the form of the disturbance is now seen. But the facts we have been able to place on record are not sufficient to justify any more definite theory as to the nature of the action by which the results we see are produced. Much will probably continue to remain unexplained. But all the facts we have recorded are consistent with, and many of them confirm, the confident opinion which has been from the first expressed, that whatever be the nature and cause of these disturbances, their action will be confined to comparatively shallow water, and will not be found in the depths on which the north pier entered last year and the south pier has now reached. In the case of the north pier our confidence has been fully justified. There are some circumstances on which it might be possible to base a theory of a different result for the south pier, but I do not myself attach any weight to them, nor so far as I am aware has the idea been put forward by any one else. But the next few months will decide the question whether we may pronounce our sand difficulties as finally overcome.

26. If then my anticipations are justified, the accumulation now lying inside the south pier represents the whole permanent result of the "sand difficulty" so far as the Harbour is concerned. It may alter a little in form, but it will not increase in quantity. It occupies space that would otherwise have been available as a deep water berth for one ship out of thirty. But even as shallow water space it will be of great use.

27. The 5 and 6 fathom lines show a small advance seaward, but this represents a very slight diminution of depth which may be accounted for by the deposit of the unusual amount of sand raised by the breakers round the end of the pier, and which while in suspension in the water is conveyed by the local currents beyond the area of direct disturbance. There is not, so far as I am aware, any grounds for the supposition which appears to be prevalent in some quarters that there will always be a tendency to shoaling of the water between the piers. The theory that the alongshore currents have any scouring force, and that the depth is dependent on them, appears to me to be absolutely untenable.

No. 35.

ORDER THEREON, 7th July 1879, No. 1,790 W.

ORDERED to be recorded.

(True Extract.)

(Signed) R. H. SANKEY, Colonel, R.E.,
Secretary to Govt., P.W.D.

To the Superintendent, Madras Harbour Works.

Edw. C. Howarth.
Spare Copies

BUILDINGS AND ROADS.
CIVIL WORKS.

Gobt. of 1879: Madras.
PUBLIC WORKS.

To
The SUPERINTENDENT,
MADRAS HARBOUR WORKS.

Dated July 7th.

From

Recd.

Encl.

G. O. 7th July 1879, No. 4790 W.

JULY.

Nos. 34-35.

Madras Harbour Works.—Despatch from
Secretary of State forwarding copy of
Mr. Parkes' report on the progress made
in the five months ending 28th February
last on the—, recorded.

Public Works
No. 14.

India Office, London.
29th May 1879.

My Lord Duke,

Herewith is
forwarded for your
Grace's information,
copy of a report on
the progress made
on the Madras Harbour
Works, for the 5 months
ending 28th February
last, which has been
submitted to me by
His Excellency, Mr. Parkes since his
return

The Most Noble,
The Governor in Council
Fort St. George.

return from India -

I have the honor to be,

My Lord Duke,

Your Grace's most obedient

humble servant,

Granville

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No. 5

Public Works

29th May 1879

The
Letter to Lord St. George
No. 14.

Recd. 24/6

1072

Madras Harbour

179/6
Report on the Progress of the Works
for the five months ending 28 Feb. 1879.

23 Abingdon Street
29 April 1879.

Sir,

1. I have the honor to forward
herewith a plan showing the state
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4. The plan shows that the North Pier has advanced in the five months 323 feet, and the South Pier 406 feet. It also shows a length of 450 feet at the North Pier and of 300 feet at the South Pier of rubble base substantially completed in advance of the concrete blocks. This has been deposited from the steam hoppers barges, and from ordinary 12 ton cargo boats. The new block ground at the South Pier has also been completed, and the Lyttrath steam crane erected upon it. It

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was in use before I left Madras.

5. The period under review includes the rough weather season of the North-East Monsoon, and this caused considerable delay especially at the North Pier during the months of December & January. During the three months the progress of the North Pier was regular & uninterrupted, and though the rate was considerably less than what may be hoped for in future, the retardation was not due to any of the difficulties of the site which had previously given so much trouble. As the whole annual cycle of seasons has now passed without any disturbance of the sandy bottom in the neighbourhood of this pier we need fear no recurrence of it.

6. That a greater rate of progress was not attained was mainly due to the fact that the pier has been used as a loading place for the rubble stone, and this until the operation was fully organised rather interfered with the passage of blocks from the block ground to the Titan. This will not be so much the case for the future.

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On the whole however I do not think the amount of progress can be considered as unsatisfactory.

7. During the quarter ending 30 Sept the South Pier was struggling through an immense accumulation of sand, an advance of 114 feet having been with difficulty made in the three months. The blocks were got into place by sinking them through the sand on to the rubble base, below which had been deposited before the accumulation took place. At that date however the work was brought to a standstill for want of further reliable foundation, and block setting was not resumed till the last week in November when the sand had partially cleared away.

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* The work is now considerably more in advance of the site of the last sand accumulation than the North Pier was at the corresponding period of last year, and as the latter has experienced no further interruption we have a strong presumption that we have also seen the last of the trouble at the South Pier.

179/8
and covering the rubble base, but the tendency was now to an improvement day by day, and by the end of January the foundations were absolutely clear.

9. The work then advanced rapidly - 166 feet were added in the month of February and as I have been informed by telegram 134 feet more in the month of March.* The work of the South Pier was continuing to advance at the date of my last intelligence (5 April) but I much regret to say that the current quarter is beginning with an unfortunate detention due to a cause entirely out of the control of the Superintendent or myself. The work at the North Pier is stopped, and at the South Pier will soon be stopped for want of diving dresses which were indented for on the 1st October last, but were not ordered by the India Office till the 27 February. This report is not the proper occasion for raising any question in regard to this unfortunate miscarriage, but in placing the result on record, it is only justice to those who are conducting the work

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11. In previous reports I have always spoken of the deposit of rubble base as an operation which was not fully in action and of certain anticipated difficulties connected with it as remaining unsolved. I am happy to say that this department of the work is now in full and successful operation. After much consideration and many trials a satisfactory mode of securing the steam hopper barges and other craft alongside the breakwater pier to receive their cargoes of rubble stone has been arrived at. On one side or the other the sea is generally sufficiently calm for them to ride easily, and the one steamer at work, the *Salisbury*, can carry out and deposit in a fair day's work from 600 to 700 tons

1790/1875
tons of stone. The cargo boats do about as much more, though at a greater cost than the steamer. The other steamer the *Hobart* unfortunately damaged the submerged doors of her hopper and had to be sent to Calcutta to be docked and repaired. When she returns the two steamers will be sufficient to do the great bulk of the work at a very cheap rate.

12. The great advance made in this department of the work is shown by the fact that while in the very favorable month of February 1878 the quantity of stone deposited was 9469 tons, the quantity in February 1879 was 29,539 tons.

13. During the months of November & December the works were exposed to the action of two unusually heavy sea disturbances, evidently propagated from the coasts of the cyclones in the Bay of Bengal which struck the coast near Vizagapatam and caused damage to the shipping at that port at the same dates.

14. I quote Mr. Thosowgood's description under date 9 November.

"On the 4th a very heavy surf came in quite suddenly accompanied by no wind. The rollers however came from

"from the North Pier and broke with
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"A course of blocks was set in the early
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"The result of the undermining was that the centre joint opened for more than 100
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1790 1876
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17. On the 7 December Mr. Thorowgood
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18. It will be observed that while the heavy sea of November resulted in the opening of the centre joint to the extent of 2 ft 9 in, the very much heavier sea of December only increased that opening 4 inches, showing that the effect of the first settlement was a consolidation and strengthening of the work in a part which was unavoidably imperfect in its original construction. In the parts where there was no such original imperfection no effect whatever beyond a

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20. Now come to the sand question. On the 30th September the shore line south of the Harbour had advanced seaward considerably, the high water mark being 200 feet seaward of the commencement of the blockwork of the South

South Pier. During October it was about stationary but in the following three months it retreated 150 feet being at the end of January about 200 feet in advance of its position 12 months previously.

21. These changes of the line of beach are quite consistent with the general conclusion I have previously submitted that the accumulation of sand will not affect the entrance of the harbour for a long period roughly estimated at a century but they do not at present offer sufficient data for a more definite calculation. The rapid advance during the South West monsoon naturally revived the misgivings in the mind of the local public as to the ultimate success of the work, but the almost equally rapid retreat in the North East monsoon had allayed those misgivings before I reached Madras. In the coming monsoon the conditions of the race will be much more favorable to the breakwaters than they were last year, as it is now 100 feet seaward of the beach line instead of

of 600 feet.

22. at present the only result ¹⁷⁹⁰ of the accumulation of sand which has been so often represented as presenting a fatal objection to the harbour works is the gain of a strip of shore about 200 feet wide of which the end abutting on the harbour will be ultimately of great value, and of which the remainder if properly developed and reclaimed will make a handsome extension of the esplanade seaward. I have not been able to discover any valid grounds for the objections which have so often been assumed to attend this advance of the coast line.

23. The corresponding erosion of the coast to the North of the Harbour is a matter requiring more attention. I beg to refer to my report to the Madras Government dated 25th February on this subject, of which I have already submitted a copy to you.

24. In the plan which I submitted to you with my last report I was unable to show the extent of the accumulation of sand

sand under water around the end of the South Pier. It is now shown on the accompanying plan by brown shaded contour lines. These give the state of the bottom in October and November when the accumulation was at its greatest. Since then everything to the South of the Pier has been swept back to an extent corresponding to the recession of the coast line, but the accumulation to the North of the Pier has not been materially affected. It forms as will be seen a semicircular heap of which the pier itself is the diameter. The highest point, on which there was in October less than 6 feet of water, occupies a position in which there was about 21 feet in the previous February showing a maximum shoaling of about 15 feet. The shoaling has pushed out the 3 fathom line, and the 4 fathom line, but has scarcely affected that of 5 fathoms. The result is an encroachment on the useful Harbour space of about 6 acres out of 150.

25. If this result were likely to be repeated it would be a serious matter but I do not think

think there is the least fear of it. It will, however, be a great satisfaction when confidence on this point can be based on fact rather than, as it is as yet, on hypothesis, however well grounded.

I have from the first anticipated that there would be great and trouble. Some disturbances of the sandy bottom in the belt immediately outside the ordinary surf line. This anticipation has been fully realized, and the form of the disturbance is now seen. But the facts we have been able to place on record are not sufficient to justify any more definite theory as to the nature of the action by which the results we see are produced. Much will probably continue to remain unexplained. But all the facts we have recorded are consistent with, and many of them confirm, the confident opinion which has been from the first expressed, that whatever be the nature and cause of these disturbances, their action will be confined to comparatively shallow water, and will not be found

in the depths on which the North Pier entered last year and the South Pier has now reached. In the case of the North Pier our confidence has been fully justified. There are some circumstances on which it might be possible to base a theory of a different result for the South Pier, but I do not myself attach any weight to them, nor as far as I am aware has the idea been put forward by any one else. But the next few months will decide the question whether we may pronounce our sand difficulties as finally overcome.

26. If then my anticipations are justified the accumulation now lying inside the South Pier represents the whole permanent result of the "sand difficulty" as far as the Harbour is concerned. It may alter a little in form, but it will not increase in quantity. It occupies space that would otherwise have been available as a deep water berth for one ship out of thirty. But even

even as shallow water ^{1700 ft} ~~1700~~ ¹⁸ ~~18~~ it will be of great use.

27. The five and six fathom lines show a small advance seaward, but this represents a very slight diminution of depth which may be accounted for by the deposit of the unusual amount of sand raised by the breakers round the end of the pier, and which while in suspension in the water is conveyed by the local currents beyond the area of direct disturbance. There is not so far as I am aware any grounds for the supposition which appears to be prevalent in some quarters that there will always be a tendency to shoaling of the water between the piers. The theory that the alongshore currents have any scouring force, and that the depth is dependent on them, appears to me to be absolutely untenable.

Yours truly

Signed J. Parker

No 6

Copy Report by Mr. Parkes,

dated 29th April 1879

In m. No. 1750 to 97-7-77

Referred to in Public Works Letter

Made as No. 14, dated 29th May 1879

1790
16

G.O. 128 W. 9-1-79.
657 W. 6-3-79

1879

Despatch from the
Secy of State for India
No. 14 of 29 May/79.

Forwards copy
of a report on the pro-
gress made in the
Madras Harbour for
the 5 months ending
28 Feb. last, submitted
by Mr. Parkes since
his return from India.

auth'd. *[Signature]* B & R
J. works

Order thereon: -
No. 1790 W. 7th July 1879
Ordered to be
recorded.

[Signature]

[Signature]

14/6/79

Supt. M. H. Wicks
Despatched
15-7-79.

Cir 25-6-79. Del 5-7-79
O.L. Steel 4/June

1290
17

No 5109

Govt. of 1879 Madras.

PUBLIC WORKS.

To

Dated

Issued

Recd.

Encl.

G. O. 7 July 1879, No. 1790 W

Nos. 34 - 35

Madras Harbour Works

Despatch from the Secy of
State forwarding copy of
report Mr Parker's report
on the progress made for
the 5 months ending 30 July
last on the —, recorded.