Archives I 10,006—16-8 77.

(1) Number of pages 52

(2) Date of repair 5.3.87

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TAMIL NADU ARCHIVES

GOVERNMENT OF TAMIL NADU

Public Works. DEPARTMENT

G.O. No. / B.P. No.	1008-1009-1910.	Press. / Mis.
Dated	24.4.1882	197

Not to be folded or roughly handled

(1)

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Buildings and Roads.
Civil Works.

No. 72.

READ—the following letter from J. H. TAYLOR, Esq., Lieutenant, R.N.R., Master Attendant, Administrative Department, to the Secretary to Government, Public Works Department, dated Madras, 4th April 1882, No. 2682.

I have now the honor to remark that, having carefully attended to various remarks upon the damage done to the Harbour, and the means recommended for its restoration, I feel it my duty respectfully to draw the attention of Government to a most important feature in the case, upon which it seems to me considerable and dangerous misapprehension is likely to exist, viz., the comparative strength of the sea upon the occasion. Few officers have had more opportunities than myself of observing cyclones and estimating their wave action, and I have always said that the attack upon the works on the 12th November was a very mild one, and not calculated to furnish a proper basis for reconstruction. I have now the honor to forward reports from the experienced officers of this department and the boatmen of the port, by which it will be seen that no difference of opinion exists upon this important point. It will be a real calamity if another disaster follows from want of appreciation of the difficulties Nature may again throw in the way. I have had my attention drawn to several theories about cyclone waves, but they do not recommend themselves to me as trustworthy when such important interests are at stake.

2. The random block system is the only one that, as far as I can discover, has the confidence of the public. Had this method been adopted directly the accident occurred, the work would have now been six months advancing towards completion. Stone, such as was used by DeHavilland for his bulwark (which stone still remains *in situ*) and by Sir A. Cotton for his breakwater, is to be found in abundance in the bed of the Adyar, close to the South Indian Railway.

3. I regret to notice the small attention attached by Mr. Parkes to the question of the eastern opening. The Harbour will not be efficient while that is allowed to remain.

4. The suggestion of a small beach boat harbour, though it might do much good, does not seem to take into consideration the insanitary condition such a work would soon fall into, nor its great expense. At present the seas that come in and over the walls heap up water in the Harbour, beating upon the beach with more or less violence, and taking up all deposits, and by the aid of the strong current setting outwards, of which they are the original cause, keep up a cleanly and healthy state of things, which, in my opinion, it would be a pity to disturb.

ENCLOSURES.

Memorandum by T. E. MARSHALL, Esq., Deputy Master Attendant, dated Madras, 30th March 1882, No. 910.

Having been asked by the Master Attendant to record my opinion regarding the relative height of the seas during the cyclones which prevailed at this port on the 2nd of May of 1872

and the 12th of November 1881, I have no hesitation in stating my solemn conviction, from careful personal observations during both cyclones, that a much higher and fiercer sea prevailed in the storm of May 1872 than in that of November 1881.

In making this comparison I am of course particularly referring to the sea and surf outside of the walls of the harbour. The sea inside the harbour was not a natural sea, it was a pyramidal bubbling boiling sea; in fact, one may call it an *artificial* sea. The pyramidal form of wave being in a great measure owing to the great volumes of water which were brought into the harbour by the wind and sea through the easterly entrance, and also by the heavy seas, some of them 50 feet long, topping the harbour wall, finding a vent by running out to seaward through the easterly entrance and *against* the easterly sea. It is now an ascertained fact that during a cyclone there can only be an *easterly* sea prevailing within the harbour walls, no matter from which point of the compass the wind may be blowing.

To revert to the hurricane sea outside, *i.e.*, the cyclonic sea proper, I find it recorded in my notes of the May cyclone, "at daylight the roadstead was an object worth seeing. As far as the eye could reach, between the lulls, the sea out to 9 fathoms of water was a roaring mass of breakers; the shipping at anchor were completely enveloped in spray, the rollers breaking clean over their bows and dashing wildly up to their lower mast heads." I now state that no such sea prevailed on the 12th November last. The sea did not break in 9 fathoms of water. Had such a sea prevailed, the barque *Mars* would have been inevitably lost, instead of being able to go to sea in ballast trim, under doubled reefed topsails and reefed foresail. The heaviest sea prevailed between daylight 6 A.M. and 8 A.M. of the 2nd May 1872, when but very few of the citizens of Madras were out of doors. It was *at this time* that the port was placed on the *advancing* quadrant of the storm, and *nearest* to the centre, before its contact with the shore. At 9 A.M. the wind was east and the vortex had passed inshore and over Sadras, and the extreme violence of the sea had abated in force, though it still continued very violent until noon.

In further confirmation of the heavy sea of May 1872, I would here state that I was an eyewitness of the loss of the *Ardbeg* of 925 tons register. She struck well outside, being deeply laden, and disappeared entirely within the space of two minutes. This ship was simply to my view *engulphed*, as she lay on the ground, by a tremendous sea, the height of which, in my humble estimation, could not have been less than 20 to 30 feet in height.

It has been alleged that the sea in a cyclone need not necessarily be high or low according to the force of the wind, and that in the last cyclone, although the wind blew with but comparatively little force, yet there was a greater sea on as compared with the sea in 1872. This *may* be the case on some occasions. For instance, we know that the sea in the advancing quadrant of a cyclone when near to the vortex is much heavier than the sea further away from the vortex. We know that the sea immediately behind or in the wake of the vortex is a very violent cross sea, when perhaps the wind has considerably lulled. But in taking into consideration the force of the wind in the last gale it seems to have escaped notice that the *strength* of the gale was from *N.W.*, or off the land, and that therefore the sea could not possibly be very heavy. In the May gale of 1872 the wind for four days had no westing, *but all easting* in it—a most important factor in *raising a sea*. The last cyclone came in upon the shore on a N.W. or W.N.W. course; the storm in 1872 ran nearly parallel with the coast for about 48 hours, which was abnormal, and which, combined with the slow rate at which the vortex travelled, helped materially to raise a tumultuous sea with which that of November last should not be compared.

Finally, I would state that, in my opinion, the *average* height of the waves in the May cyclone of 1872 was not less than 15 feet.

Memorandum by W. H. BARTLETT, Esq., dated Madras, 31st March 1882.

I am of opinion that the sea outside in the cyclone of 2nd May 1872 was much heavier than that of 12th November. In the former case, in the very early part of the day, and when only a few people were out of their beds, or on the beach, the wind and sea were both coming in from N.E., and, acting conjointly, produced such a sea as I have seldom seen.

The *Ardbeg*, a loaded vessel, of about 1,000 tons, parted or slipped from her anchor, and, failing to get an offing, she took the ground broadside on, and in less than two minutes there was not a vestige of her to be seen.

A little later on the *Burlington*, about half loaded, came ashore to the southward, also broadside on, and in a very few minutes she parted amidships.

Later on in the day other ships came ashore, but by about 9. A.M. the wind went round to the southward of east, and as a natural consequence the sea went down.

It was from this time that people began to assemble on the beach. This is a very important factor in comparing the seas on the two occasions in question, as those who witnessed the state of things at 9 A.M. and later on could not possibly form a correct estimate, the worst of the weather being then over.

In the height of the cyclone the *Evelyn*, which was lying much in shore of the *Inverness*, and consequently had a more perilous position, cut away her main and mizen masts, and she even then dragged considerably to the W.N.W.

(2)

Some stress has been laid on the fact that the *Inverness* and *Bonnie Dundee* rode out the cyclone. True, they did so, with a long scope of cable, and in 10½ fathoms water, but very wisely neither of them attempted to put to sea, while in the rough weather of last November the *Mars* put to sea without difficulty, under an amount of canvas which would have insured her capsizing had she attempted to do so in the cyclone of May 1872.

From Mr. C. STOLBERG, Pier Master, to the Master Attendant, Administrative Department, dated Madras, 31st March 1882, No. 182.

In accordance with your order, I have the honor to submit my humble opinion with reference to the cyclone in 1872 and the rough weather in November last.

2. The cyclone of 1872 was very severe one. I can only equal it to those hurricanes that blow off Mauritius and Cape Hatteras, in which it is impossible to face the wind. It was so in May 1872. About 8 A.M. it blew the strongest, and most of the ships parted their cables. Captain D. Foreman of the ship *Lincolnshire* told me that the sea broke over his ship in 8½ fathoms of water when his cable parted. The pier suffered great deal during 1872 cyclone; most of the sleepers were washed away; several beams torn away from the pile caps owing to the very high sea which prevailed. Whereas in November last the wind and sea were nothing like it. I was on the pier for most of the day, and up to noon boats were plying between some of the lighters and the pier. I saw the harbour Titans fall at the time the sea was nothing to speak of to what it usually is during rough weather. In the afternoon the sea got worse and the wind increased to a gale. Towards midnight, before the wind changed to south-east, it did blow in gusts. In the year 1872 carriages were upset by the wind, whereas in November last they were seen night and day up and down the beach road. The gale that we had in the latter part of 1874 the wind was stronger and the surf higher than what they were in rough weather under reference.

Statement of Yagapen, Antony, Veeraragaven, and Pathathan, Boat Tindals.

Yagapen, Tindal of a boat.—I have been a boatman from my youth up. I am now 65 years of age.

Do you remember the storm of 1872? Yes.
Where were you that day? I was on the beach.
Did you notice the height of the waves in 1872? I did.
Do you remember the storm of the 12th November last? I do.
Did you notice the height of the waves inside the harbour? I did.
Did you notice the height of the waves outside the harbour? I did.
Now, in which storm was the sea the highest? In 1872.

Antony.—I am a boat Tindal. I have been a boatman from my youth up. I am now 50 years of age.

Do you remember the storm of 1872? Yes.
Where were you that day? I was watching on the beach opposite Arbuthnot office.
Did you notice the height of the waves in 1872? I did.
Do you remember the storm of 12th November last? I do.
Did you notice the height of the waves inside the harbour? I did.
Did you notice the height of the waves outside the harbour? I did.
Now, in which storm was the sea the highest? In the first storm.

Veeraragaven.—I have been a boatman nearly 60 years.

Do you remember the storm of 1872? Yes.
Where were you that day? I was on the beach.
Did you notice the height of the waves in 1872? I did.
Do you remember the storm of the 12th November last? I do.
Did you notice the height of the waves inside the harbour? I did.
Did you notice the height of the waves outside of the harbour? I did.
Now, in which storm was the sea the highest? In the first storm.

Pathathan.—I am a Port Boat Tindal. I have been a boatman from my youth up. I have now been in Government employ for five years. I am now 55 years of age.

Do you remember the storm of 1872? Yes.
Where were you that day? I was on duty at the beach.
Did you notice the height of the waves in 1872? I did.

Do you remember the storm of the 12th November last? I do.
Did you notice the height of the waves inside the harbour? I did.
Did you notice the height of the waves outside of the harbour? I did
Now, in which storm was the sea the highest? In the former storm.

Joseph states—I am an Assistant Diver. I am an Italian. I was here in 1872. I remember the height of the sea. I noticed the height of the sea last November, and think that the sea in 1872 was very much higher.

Antonio states—I am a Pier Boatswain. I remember the storm of 1872. The sea broke clean over the pier. I think the sea last November was very nearly as high as the former.

V. Green states—I am a boatowner. I remember the storm of 1872. I think the sea was higher this last storm. I noticed the storm of 1872 carefully. I say the last storm was heavier because the sea took a large lighter and lifted it clean over the harbour wall.

Johan states—I am a boatowner. I remember the storm of 1872. I am of opinion that in the former storm the sea was much heavier than the last storm.

Taken before me this Third day of April 1882.

(Signed) T. E. MARSHALL,
Deputy Master Attendant.

No. 72-A.

Read—the following Note by the Chief Engineer, dated Ootacamund, 17th April 1882.

In the accompanying letter from the Master Attendant, No. 2682, dated 4th April 1882, that officer submits his own evidence and that of several experienced marine officers and boatmen as to the character of the seas during the cyclone of the 12th November 1881, when the Harbour works were so much damaged.

2. There has been much difference of opinion in regard to the point dealt with in these papers, and as neither the records of past cyclones, nor the evidence available from that of the 12th of last November, afford any very reliable scientific basis for instituting a comparison as to the actual height of the waves, we can only take for what they are worth the opinions of the best qualified observers.

3. Mr. Parkes, in paragraph 8 of his report of the 9th March 1882, observes that "the testimony of all observers is to the effect that the sea of the 12th November must rank with those of the great historical cyclones," but while adducing the opinion of Mr. Chisholm, the Government Architect, to this effect, he admits that the officers of the Marine Department considered the storm of 1872 to have been the most severe.

4. The undersigned in dealing with this portion of Mr. Parkes's reports—see paragraph 10 of his Note of the 13th March 1882—felt himself compelled to observe that although "doubtless the seas were much heavier than might have been expected from the comparatively low recorded wind pressure at Madras, as also from other phenomena connected with the storm, many high authorities would be unprepared to accept the cyclone of the 12th November" as affording "a sufficiently crucial test of the forces which may be expected to be called into action in a cyclone of maximum intensity."

5. The evidence now adduced, particularly that by the Deputy Master Attendant, goes far, it is thought, to confirm this opinion.

6. The statement from a note kept by him of the cyclone of 1872, that "as far as the eye could reach between the lulls the sea out to 9 fathoms of water was a roaring mass of breakers," accurately corresponds with the recollection of the undersigned in regard to one of the cyclones which late in 1856 burst on Madras, and which he personally witnessed. Viewed from the top of a two-storied house at Ennore the seas were observed to break with the character of a surf right out to sea to an immense distance from the shore.

(3)

7. Although not so favorably placed for commanding an equally extensive view in the last storm, he can safely say that no such violent action of the sea was apparent.

8. Since the time when half the French fleet went down off Madras in the storm of October 1746, and so many English storeships and transports were driven ashore off Pondicherry on the 1st January 1761, down to the cyclone of 1872, the record of all severe storms along the Coromandel coast shows that a great majority of even the best found ships have foundered at their moorings or have parted their anchors and been driven ashore.

9. Here, however, during the late cyclone the only vessel lying off the port, viz., the barque *Mars*, after riding out the storm till the evening of the 12th November, put to sea as now shown "without difficulty, under an amount of canvas which would have insured her capsizing had she attempted to do so in the cyclone of 1872."

10. The Deputy Master Attendant emphatically says, "the barque *Mars* would have been inevitably lost instead of being enabled to go to sea in ballast trim under double reefed topsails and reefed foresail." He avers, moreover, that "no such sea prevailed on the 12th November last" as he had previously observed in the cyclone of May 1872. The Pier Master also observes that he saw the "Titans fall at a time the sea was nothing to speak of to what it usually is during rough weather."

11. The evidence deduced from the fact of the timber flooring of the screw pile pier (17½ feet above mean sea level) having been injured in both the storms immediately in comparison is apparently of little value, as during the last occurrence, the sea, inside the harbour, assumed a pyramidal form owing, as stated by the Deputy Master Attendant, to the great volumes of water which were brought in by the wind and sea through the eastern entrance, &c., thus creating a turmoil totally different from the steady normal advance of successive waves with their crests parallel to the coast line.

12. The statements of the native boatmen, who have necessarily such an extensive and intimate knowledge in matters of this character, confirm the opinions expressed by the Master Attendant and his officers.

13. The undersigned would not have dwelt at any length on the evidence now produced had it not been that Mr. Parkes has based his restoration scheme almost wholly on the effects of the late cyclone as, in his opinion, having been one of maximum intensity, or to use his own expression "one of those great historical cyclones," whereas the facts, as vouched for by the officers of the department best capable of judging, appears to point to a very different conclusion. Considering the importance thus attaching to the point he ventures to think that evidence now brought forward should be forwarded to the Government of India and the Secretary of State in continuation of previous correspondence.

(Signed) R. H. SANKEY, Colonel, R.E.,
Chief Engineer, P.W.D.

No. 73.

Order—dated 24th April 1882, No. 1008 W., Public Works.

Ordered to be forwarded to the Government of India and the Secretary of State in continuation of the papers recorded with G.O., No. 780 W., dated 23rd March 1882.

(True Extract.)

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

To the Engineer-in-Chief, Madras Harbour Works.
„ Superintendent, Madras Harbour Works.
„ Marine Department.

Exd. S. T. Austin.
Spare Copies

BUILDINGS AND ROADS.
CIVIL WORKS.

Govt. of [1882] Madras.

PUBLIC WORKS.

To

THE ENGINEER-in-CHIEF,
MADRAS HARBOUR WORKS,
&c., &c., &c.

Dated April, 24th

Issued

Read. Encl.

G.O., 24th April 1882, No. 1008 W.

APRIL.
Nos. 72-73.

Madras Harbour Works.—The additional information which has been submitted by the Master Attendant on the subject of the recent damage to the — ordered to be forwarded to the Government of India.

(4)

24TH APRIL 1882, No. 1009 W., PUBLIC WORKS.

PUBLIC WORKS DEPARTMENT.

Buildings and Roads.
Civil Works.

No. 74.

LETTER—from

COLONEL R. H. SANKEY, C.B., R.E.,
Secretary to Government, Public Works Department,
Madras,

To

THE SECRETARY TO THE GOVERNMENT OF INDIA,
PUBLIC WORKS DEPARTMENT.

SIR,

In continuation of my letter No. 781 W., dated 23rd March 1882, forwarding, for the consideration of the Government of India, papers on the subject of the recent damage to the Madras Harbour Works, I am now directed to forward the accompanying additional information which has been submitted by the Master Attendant, Madras, together with a Note thereon by the Chief Engineer, Public Works Department.

I have the honor to be,
Sir,
Your most obedient servant,

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

FORT ST. GEORGE,
24th April 1882.

Exd/ S. T. Austin.
Spare Copies

BUILDINGS AND ROADS
CIVIL WORKS.

Govt. of India

PUBLIC WORKS.

To

THE SECRETARY TO THE
GOVERNMENT OF INDIA

Dated April 1882.

Letter

Read

Letter

28th April 1882, No. 1009 W.

APRIL.
No. 74.

REMARKS additional information which
may be required by the Master Attendant
the subject of the recent damage to the
Public Harbour Works.

Administrative Department

171 (5)

No. 2682.

Madras Marine Office
4th April 1882

From

The Master Attendant
Administrative Department
Madras

To

The Secretary to Government
Public Works Department
Fort Saint George

Sir

I have now the honour to remark that, having carefully attended to various remarks upon the damage done to the Harbour, and the means recommended for its restoration, I feel it my duty respectfully to draw the attention of Government to a most important feature in the case, upon which it seems to me considerable and dangerous misapprehension is likely to exist, viz the comparative strength of the sea upon the occasion. Few officers have had more opportunities than myself of observing Cyclones, and estimating their wave action, and I have always said that the attack upon the works on the 12th November was a very

mild

mated over, and not calculated to furnish a proper basis for reconstruction. I have now the honor to forward reports from the experienced officers of this Department and the boatmen of the Port, by which it will be seen that no difference of opinion exists upon this important point. It will be a real calamity if another disaster follows from want of appreciation of the difficulties Nature may again throw in the way. I have had my attention drawn to several theories about Cyclone waves, but they do not recommend themselves to me as trustworthy, when such important interests are at stake.

2 The random block system is the only one that, as far as I can discover, has the confidence of the public. Had this method been adopted directly the accident occurred, the work would have now been six months advancing towards completion. Stone, such as was used by De Hamilland for his bulwark (which stone still remains in

in site) and by Sir A. Cotton for his breakwater, is to be found in abundance in the bed of the Adyar, close to the South Indian Railway.

3 I regret to notice the small attention attributed by Mr Parkes to the question of the Eastern opening. The Harbour will not be efficient while that is allowed to remain.

4 The suggestion of a small beach boat Harbour, though it might do much good, does not seem to take into consideration the insanitary condition such a work would soon fall into, nor its great expense. At present the seas that come in and over the walls keep up water in the Harbour, beating upon the beach with more or less violence, and taking up all deposits, and by the end of the strong current setting outwards, of which they are the original cause, keep up a cleanly and healthy state of things,

which

which in my opinion it would be a
pity to disturb.

C. No. 2203

I have the honor to be

Rec'd 6 Oct/32

Sir

your most Obedt Servant

W Taylor

Master Attendant

Administrative Department

(1)

Mr

Ooby 14/4/82.

D/19/11 Sent to Ordnance
Yarbrough

15th March/81 No 285-4W
Despatch No 71
1855-W of 81.

28 Nov/81 No 2927W
Despatch No 74
2928W of 81.

25th Nov/81 No 2954W 2955W

21st Dec/81 No 3169W

16th July/82 No 424W

B. No 495W d/23 July/82

23 March/82 No 780W 781W

Despatch No 14
782W of 82

(188) DEPARTMENT.

P.W. No. 2203

From

THE MASTER ATTENDANT,

ADMINISTRATIVE DEPARTMENT,

Madras,

To

THE ~~Marine~~ SECY. TO GOVERNMENT,

P.W. ~~Marine~~ DEPARTMENT,

Fort St. George.

No. 2682

Dated 4th April, 1882.

Received 6

No.

Subject.

Forwards Reports of the Officers &c of the Marine Department regarding the Cyclone of 1872 and the storm of November 1881, with remarks on the means recommended for the restoration of the Madras Harbour.

O.L. 4-4
Cots - 6-4-82 B/24/4/82
Cir. 17-4-82 Rd 20-4-82

Encl. No 2 to Letter No 2682 dt 4/4/82

Memorandum

Having been asked by the Master Attendant to record my opinion regarding the relative height of the seas during the Cyclones, which prevailed at this port on the 2nd of May of 1872 and the 12th of November 1881, I have no hesitation in stating my solemn conviction from careful personal observations during both Cyclones that a much higher and fiercer sea prevailed in the Storm of May 1872 than in that of November 1881.

In making this comparison I am of course particularly referring to the sea and surf outside of the walls of the harbour. The sea inside the harbour was not a Natural sea; it was a pyramidal, bubbling boiling sea; in fact one may call it an "artificial" sea. The pyramidal form of wave being in a great measure

measure owing to the great volumes of water which were brought into the Harbour by the wind and sea through the Easterly entrance, and also by the heavy seas, some of them 50 feet long, topping the Harbour wall finding a vent by running out to seaward through the Easterly entrance and against the Easterly sea. It is now an ascertained fact that during a Cyclone there can only be an Easterly sea prevailing within the harbour walls, no matter from which point of the Compass the wind may be blowing.

To revert to the Hurricane Sea outside, i.e the Cyclonic Sea proper, I find it recorded in my notes of the May Cyclone "at day light the "roadstead was an object worth seeing. "As far as the eye could reach between "the hills, the sea out to 9 fathoms "of water was a roaring mass of "breakers, the shipping at anchor were "completely enveloped in spray, the "rollers breaking clean over their bows

and

(9)

"and dashing wildly up to their "lower Mastheads" I now state that no such sea prevailed on the 12th November last. The sea did not break in 9 fathoms of water. Had such a sea prevailed the Bg. "Mars" would have been inevitably lost instead of being able to go to sea in ballast trim, under doubled reefed topsails and reefed foresail. The heaviest sea prevailed between daylight 6 A.M. and 8 P.M. of the 2nd May 1872 when but very few of the Citizens of Madras were out of doors. It was at this time that the port was placed on the advancing quadrant of the storm, and nearest to the centre, before its contact with the shore. At 9 A.M. the wind was East and the vortex had passed inshore and over Madras, and the extreme violence of the sea had abated in force, though it still continued very violent until noon.

In further confirmation of the heavy sea of May 1872 I would here state that I was an eyewitness of the loss of the "Ardheg" of 925 tons

registered

register. She struck well outside being deeply laden and disappeared entirely within the space of 2 minutes. This slip was simply to my view "Engulphed" as she lay on the ground by a tremendous sea the height of which in my humble estimation could not have been less than 20 to 30 feet in height.

It has been alleged that the sea in a Cyclone need not necessarily be high or low according to the force of the wind and that in the last Cyclone although the wind blew with but comparatively little force yet there was a greater sea on as compared with the sea in 1872. This may be the case on some occasions. For instance we know that the sea in the advancing quadrant of a Cyclone when near to the vortex is much heavier than the sea further away from the vortex. We know that the sea immediately leeward or in the wake of the vortex is a very violent Cross sea when perhaps the wind has considerably lulled. But in taking into

Consideration

Consideration the force of the wind in the last gale it seems to have escaped notice that the strength of the gale was from N.W. or off the land, and that therefore the sea could not possibly be heavy. In the May gale of 1872 the wind for 4 days had no Westing but all Easting in it. A most important factor in raising a sea. The last Cyclone came in upon the shore on a N.W or W.N.W course; the Storm in 1872 ran nearly parallel with the coast for about 48 hours, which was abnormal; which, combined with the slow rate at which the vortex travelled helped materially to raise a tumultuous sea with which that of November last should not be compared.

Finally I would state that in my opinion the average height of the waves in the May Cyclone of 1872 was not less than 15 feet.

Master Attendants Office
Executive Department
Madras 30th March 1882

Deputy Master Attendant

O.S. 61
2203

Memorandum

(12)

I am of opinion that the sea on board in the Cyclone of 2nd of May 1872 was much heavier than that of 12th November. In the former case in the very early part of the day and when only a few people were out of their beds, or on the beach, the wind and sea were both coming in from E.S.E. and acting conjointly produced such a sea as I have seldom seen.

The "Ardbeg" a loaded vessel of about 1000 Tons parted, or slipped from her anchor, and failing to get an offing, she took the ground broadside on, and in less than two minutes, there was not a vestige of her to be seen.

A little later on, the "Burlington", about half loaded came ashore to the Southward also broadside on, and in a very few minutes, she parted Amidships.

Later on in the day, other ships came ashore, but by about 9 A.M. the wind went round to the Southward of East, and as a natural consequence the sea went down.

It was from this time that people began to assemble on the beach. This is a very important factor in comparing the seas on the two occasions in question, as those who witnessed

the state of things at 9 A.M., and later on, could not possibly form a correct estimate, the worst of the weather being then over.

In the height of the Cyclone, the "Evelyn" which was lying much nearer shore of the "Inverness," and consequently had a more perilous position, cut away her main and mizzen masts, and she even then dragged considerably to the N. W.

Some stress has been laid on the fact that the "Inverness" and "Bonnie Dundee" rode out the Cyclone. True, they did so with a long scope of Cable, and in 10½ fathoms water, but very much neither of them attempted to put to sea - while in the rough weather of last November, the "Clara" put to sea without difficulty, under an amount of Canvas which would have insured her capsizing, had she attempted to do so in the Cyclone of Jan. 1872.

Master W.H. Smith
31st March 82

P.W.F.3
2205/82

No 182 Public Dept

Madras Pier office
31st March 1882.

(14)

To

The Master Attendant
Administrative Department
Madras.

Sir,

In accordance with your order I have the honor to submit my humble opinion with reference to the Cyclone in 1872 and the rough weather in November last.

The Cyclone of 1872 was very severe one I can only equal it to those hurricanes that blow off Mauritius and Cape Hatteras in which it is impossible to face the wind. It was so in May 1872. about 8 A. M. it blew the strongest and most of the ships parted their cables Captain D. Foreman of the Ship Invershire told me that the

sea

sea broke over his Ship in 8½ Fathoms of water when his cable parted The Pier suffered great deal during 1872 Cyclone most of the Sleepers were washed away several beams torn away from the pile Caps owing to the very high sea which prevailed. Whereas in November last the wind and sea were nothing like it I was on the Pier for most of the day and up to noon boats were plying between some of the Lighters and the Pier I saw the Harbour Tetans fall at the time the sea was nothing to speak of to what it usually is during rough weather In the afternoon the sea got worse and the wind increased to a gale towards midnight before the wind changed to S.E. it did blew

blew in gusts In the year 1872. Carriages were upset by the wind whereas in (15) November last they were seen night and day up and down the beach road The gale that we had in the latter part of 1874 the wind was stronger and the surf higher than what they were in rough weather under reference.

I have the honor to be
Sir
Your most Obedient servant.

Pier Master.

Jaffna

1872

Statement of Egagapen, Antony, Veera-
-razaven and Pallialthan, Boat Tindals.

---

(16)

Egagapen, Tindal of a boat. I have been
a boatman from my youth up. I am now
65 Years of age.

Do you remember the Storm of 1872? Yes
Where were you that day? I was on the beach
Did you notice of the height of
the waves in 1872? I did
Do you remember the Storm of
the 12th November last? I do
Did you notice the height of the
waves inside the harbour? I did
Did you notice the height of the
waves outside of the harbour? I did
How in which Storm was the Sea
the highest? In 1872

Antony, I am a boat Tindal I have
been a boatman from my youth up. I am now
50 Years of age.

Do you remember the Storm of 1872? Yes
Where were you that day? I was watching
on the beach
opposite Arbuth-
-not & Co's Office

Did you notice of the height of
the waves in 1872? I did
Do you remember the Storm of
the 12th November last? I do
Did you notice the height of the
waves inside the harbour? I did

Did you notice the height of the waves outside of the harbour? I did
How in which Storm was the Sea the highest? In the first Storm

---

Jeerarajaveen. I have been a boatman nearly 60 years.
Do you remember the Storm of 1872? Yes
Where were you that day? I was on the beach
Did you notice of the height of the waves in 1872? I did
Do you remember the Storm of the 12th November last? I do
Did you notice the height of the waves inside the harbour? I did
Did you notice the height of the waves outside of the harbour? I did
How in which Storm was the Sea the highest? In the first Storm

---

Pallia Thau. I am a port boat Jundab. I have been a boatman from my youth up. I have now been in Government employ for 5 years. I am now 55 years of age.
Do you remember the Storm of 1872? Yes
Where were you that day? I was on duty at the beach
Did you notice of the height of the waves in 1872? I did
Do you remember the Storm of the 12th November last? I do
Did you notice the height of the waves inside the harbour? I did
Did you notice the height of the waves outside of the harbour? I did
How in which Storm was the Sea the highest? In the former Storm

---

Joseph States:- I am an Assistant Diver. I am an Italian. I was here in 1872. I remember the height of the sea. I noticed the height of the sea last November and think that the Sea in 1872 was very much higher

---

Antonio States:- I am a Pier Boatswain. I remember the Storm of 1872. The sea broke clean over the Pier. I think the sea last November was very nearly as high as the former

---

V. Green states:- I am a boatowner. I remember the Storm of 1872. I think the sea was higher this last storm. I noticed the Storm of 1872 carefully. I say the last Storm was heavier because the sea took a large lighter and lifted it clean over the Harbour wall.

Johan states:- I am a boatowner. I remember the Storm of 1872. I am of opinion that in the former Storm the Sea was much heavier than the last storm.

Taken before me this Third day of April 1882.

[illegible]
Deputy Master Attendant

E 4
2202/82

(18)

Note by the Chief Engineer

In the accompanying letter from the Master Attendant, No. 2682 dated 4th April 1882, that officer submits his own evidence and that of several experienced marine officers and boatmen as to the character of the seas during the cyclone of the 12th November 1881 when the Harbour works were so much damaged.

2. There has been much difference of opinion in regard to the point dealt with in these papers, and as neither the record of past cyclones nor the evidence available from that of the 12th of last November afford any very reliable scientific basis for instituting a comparison as to the actual height of the waves we can only take for what they are worth the opinions

of the best qualified observers.

3. Mr Parkes in para 8 of his report of the 9th March 1882 observes that "the testimony of all observers is to "the effect that the gale of the "12th November must rank with those "of the great historical cyclones" but while adducing the opinion of Mr Chisholm the Government Architect to this effect he admits that the officers of the Marine Department considered the storm of 1872 to have been the most severe.

4. The undersigned in dealing with this portion of Mr Parkes' report, see para 10 of his Note of the 13th March 1882, felt himself compelled to

observe that although "doubtless the "gale were much heavier than might "have been expected from the comparatively "low recorded wind pressures at "Madras as also from other phenomena "connected with the storm, many high "authorities would be unprepared to "accept the cyclone of the 12th "November" as affording "a sufficiently "critical test of the forces which "may be expected to be called into "action in a cyclone of maximum "intensity."

5. The evidence now adduced, particularly that by the Deputy Master Attendant, goes far it is thought to confirm this opinion.

6. His statement from a note kept by him of the cyclone of 1872 that "as far as the eye could reach

"between the bells the pea nit to 9
"fathoms of water pas at roaring
"nap of breakers" accurately corresponds
with the recollection of the undersigned
in regard to one of the cyclones which
late in 1856 burst on Madras, and
which he personally witnessed. Viewed
from the top of a two storied house
at Egmore the seas were observed to
break with the character of a surf
right out to sea to an immence
distance from the shore.

7. Although not so favorably placed
for commanding an equally extensive
view in the last storm he can safely
say that no such violent action
of the sea was apparent.

8. Since the time when half the
French fleet went down off Madras [illegible]

[illegible] in the year [illegible] when [illegible]

#16

(20)

in the storm of October 1746, and so
many English store ships and trans-
ports were driven ashore off Coudi-
dore - Cherry on the 1st January 1761 down
to the Cyclone of 1872 the record of
all severe storms along the Coroman-
del coast shews that a great
majority of even the best found ships
have parted their anchors and have
either been driven ashore or foundered.

9. Here however during the late
cyclone the only vessel lying off the
port, viz: the Barque Mars after riding
out the storm till the evening of
the 12th November, put to sea & now
shewn "without difficulty, under an
"amount of Canvas which would
"have insured her capsizing had
"she attempted to do so in the

"Cyclone of 1872."

10. The Deputy Master Attendant emphatically says "the Barque "Mars ported "have been plentifully lost instead of "being enabled to go to sea in "ballast trim under double reefed "topsails and reefed forecail."

He avers moreover that "no such "sea prevailed on the 2d November "last" as he had previously observed in the Cyclone of May 1872. The Pier Master also observes that he saw the "Titus fall at a time "the sea was nothing to speak of "to what it usually is during rough "weather."

11. The evidence deduced from the fact of the further flooring of the screw pile pier (17½ feet above mean sea level) having been injured in both the storms immediately in comparison is apparently of little value as during the last occurrence, the sea inside the Harbour assumed a pyramidal form owing as stated by the Deputy Master Attendant to the great volumes of water which were brought in by the wind and sea through the eastern entrance &c thus creating a turmoil totally different from the steady normal advance of successive waves with their crests parallel to the coast line.

12. The statements of the native boatmen who have necessarily such an extensive and intimate knowledge

in matters of this character, confirm the opinions expressed by the Master Attendant and his officers.

13. The undersigned would not have dwelt at any length on the evidence now produced had it not been that Mr Parkes has based his restoration scheme almost wholly on the effects of the late cyclone as in his opinion having been one of maximum intensity or to use his own expression "one of those great historical "Cyclones", whereas the facts as vouched for by the officers of the Department best capable of judging appears to point to a very different conclusion. Considering the importance thus attaching to the point, he ventures

to think that evidence now brought forward should be forwarded to the Govt of India and the Secretary of State in continuation of previous correspondence.

W. B. Lawley Colonel, R.E.
Chief Engineer, P.W. Dept

Ootacamund
17th April 1882

(23)

P. W. Department.

Read the following :—

Letter from the Master Attendant No. 2682 dt/4th April 1882

Note by the Chief Engineer, P.W. Dept. dt/ April/82

FOR ORDERS.

Colonel R.E.
Secretary to Govt. P.W. Dept.

17th April 1882.

I agree in thinking that this Evidence should be sent to the S.D. & Sec. of S. as the proposals for repairs of godowns may so materially depend

Certainly - Hard
"Eastern Opening"
will be the death of
us all, some day —
Taylor says - D. 19/

FOR ORDERS.

on the assumed comparative
Strength of the storm
that damaged the
Harbour works -
Shall be passed
Local Guarantee
Cyclones at Madras
& from that Source
the sea from the Roger
in Nov.r last. Jam

The Hon.ble Mr. Hudleston
The Hon.ble J. Carmichael
H.E. the Governor

from the roof of a 3 storey house -

1008
1009
1076

decidedly of opinion that
it was not nearly so
violent as in the storm
of Oct 46. or Aug.t 72

E.B.

Cir 17-4-82 Rd: 20-4-82

No 1008. W

PUBLIC WORKS DEPARTMENT.

PROCEEDINGS OF THE MADRAS GOVERNMENT.

UNDER date the 24th april 82

Read the following :—

Letter from the Master Attendant, Administration Dept., Madras. (M.E. No 2652 d/ 4th April 82)

Note by the Chief Engr. to Govt. (" " d/ 17th ")

Ordered to be
forwarded to the Govt
of India and the Secretary
of State in continuation
of the papers recorded
with G.O. No 730 W dated
23d March 1882.

(M.E. No. 1009. W d/ 24th april 82)

to,
The Engineer-in-Chief M. & W. Dept.
" Superintendent M. & W. Dept.
" Marine Department

to the Secretary to the
Govt of India, P.W. Dept.

Sir,

In continuation of my letter No 781 W dated 23 March 1882 forwarding for the consideration of the Government of India papers on the subject of the recent damage to the Madras Harbour Works, I am now directed to forward the accompanying additional information which has been submitted by the Master Attendant, Madras, together with a Note thereon by the Chief Engineer N.W. Dept.

D 960
5/5/82

Chief Engineer N.W. Dept (25)
#19.
(M.E. No. 1010-W dt 24/4/1882)

To,

The Most Noble
The Secy: of State for India

My Lord Marquis,

With our despatch No 14 dated 23 March 1882, we forwarded for your Lordships' information copies of Report on the damage sustained by the Madras Harbour Work with Mr. Parkes' recommendations for reconstruction of the Pier

Sirs, We have now
the honor to enclose
some additional information
which has been submitted
by our Master Attendant
at Madras with a
Note thereon by our
Chief Engineer in the
P.W. Department.

2. The papers have not
been laid before the
Government of India for
consideration in consequence
of previous correspondence.

We R.S.

Sir
Your most obedient
Humble Servants

22/4/52
Desp with copy 20 100 82
24/4/52
7/5/52

Encl.

Manager to the Madras H Works

Govt. of 1881 Madras.

PUBLIC WORKS.

To

Dated

Issued

Recd.

Encl.

Pumt Fire

G. O., 24 Public 1881 No. 1108

1009

1010

Nos. 72 to 74

Madras Harbour Works

The additional information which has been submitted by the Madras Attendant on the subject of the recent damage to the — orlue &c. to the Govt of India —

Forwarding additional information which has been submitted by the Madras Attendant on the subject of the recent

Entered in Receipt Register