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MADRAS RECORD OFFICE

Government of Madras

Public Works DEPARTMENT

G.O. No.	884	(iv)	Press
B.P. No.			Mis.
Dated	4-4-		1876.

Not to be folded or roughly handled

*Proceedings of the Madras Government, Public Works Department,
4th April 1876.*

No. 56. Read the following Proceedings of the Government of India in the Public Works Department, (Civil Works—Miscellaneous,) dated Fort William, 14th March 1876, Nos. 81—5 M:—

Tidal Observations in the Indian Sea.

Read the following:—

From the Secretary of State for India, to the Government of India, dated 27th January 1876, No. 6.

THE question of the extension of tidal observations in the Indian Seas has recently been brought under my consideration by
* Dated 10th December 1875. a letter* from Sir William Thomson, to Lieutenant-General Strachey, R.E., a copy of which is herewith transmitted.

2. It has, as you are aware, been customary, for some time past, to send out annually to the Government of Bombay, copies of tide-tables for the ports of Bombay and Kurrachee, computed and prepared by Mr. W. Parkes, and arrangements have now been made for the computation of the tables for 1877. Tidal observations are also being made in India, to a limited extent, by the Surveyor-General's Department, under orders passed by my predecessor in 1872. It appears to me, however, that for the full utilization of the operations of the Marine Surveys lately re-organized, something more like a systematic course of tidal observations should be undertaken at some of the principal ports and harbours round the coasts of India, and that, in the reduction and treatment of these observations, one uniform method should be applied.

3. As a preliminary step, it would, of course, be necessary to determine the points on the coast at which tidal registers should be maintained, and for which tide-tables should be prepared. Doubtless, in the first instance, it would be found desirable to undertake the observations at Kurrachee, Bombay, some point near Cape Comorin, Madras, Cocanada, the mouth of the Hooghly, and Rangoon; but of these a few only would probably be selected as stations for permanent observation.

4. Another point for consideration will be the arrangements that would have to be made for the reduction of observations, the calculation of tide-tables, and the subsequent comparison of observations with the calculations, to test the system adopted, and to introduce needful corrections. Possibly these duties might be performed in India by the Surveyor-General's Department, but, if not, it might be necessary to have the records of the observations sent home for the purpose.

5. After a while it might be found desirable gradually to extend the preparation of proper tide-tables to the minor ports where such aids to navigation are desirable. This would be naturally done through the Marine Surveyors, the work being based on the results to be obtained from the more accurate determination of the tides for the chief stations.

6. I shall be glad to be furnished with your Excellency's views on this subject by an early date, as it is desirable, if possible, that I should be in a position to inform Mr. Parkes, by the 30th April next, in the event of his services not being required for the preparation of tide-tables for Bombay and Kurrachee for the year 1878.

*Proceedings of the Madras Government, Public Works Department,
4th April 1876.*

From Sir WILLIAM THOMSON, to General R. STRACHEY, R.E., dated 10th December 1875.

In our conversations during the Bristol Meeting of the British Association, I urged upon you the importance of continuing and extending tidal observations in the Indian Seas, not merely on account of the purely scientific question, but also on account of the various practical benefits to be gained. According to your request, I now give you in writing a short statement regarding the action which I think may properly be asked of the Indian Council in the matter.

The ordinary tide-tables, such as those published by the British Admiralty, are, as is well known, quite insufficient for giving even a rough approximation to the rises and falls of the water throughout the twenty-four hours on the coasts of India, on account of the great amount of the diurnal tide in the Indian and China Seas. The first practical tide-tables for India, so far as I know, in which the diurnal tide was taken into account, are those of Mr. Parkes, who has certainly done very good service by his observations at Kurrachee and the reductions by which he has prepared tide-tables from them. The observations at Kurrachee ought certainly to be continued, but I think the improved method of reduction afforded by the harmonic analysis ought now to be systematically applied to them, and tide-predicting tables constructed from the results by the tide-calculating machine, which, after January next, will be available for public use at South Kensington.

For scientific purposes it is very desirable that continuous observations from year to year should be carried on by aid of self-registering tide gauges on several coast stations of the Indian continent and at island stations, such as Port Blair, in the Andaman Islands, Penang, Singapore. Observations at Aden and Rangoon would also be very valuable.

I am not yet fully informed as to what has been done under Colonel Walker in pursuance of plans which were discussed and approved by the Tidal Committee at the meeting of the British Association in Edinburgh four years ago, and at subsequent meetings of the Committee. But I understand that considerable progress has been made both in the way of observation and of harmonic reduction, and I anticipate very valuable results. A part of Colonel Walker's object was of a temporary character connected with the Trigonometrical Survey of India. I hope, however, that his tide gauges will be kept permanently in action, either at the stations at which he has placed them in the first instance, or at other points which may be deemed suitable.

A self-registering tide gauge ought permanently to be set up in a proper position in connection with the work already commenced by Government for the formation of an artificial harbour at Madras. At the mouth of the Hooghly and at Bombay it is desirable that self-registering tide gauges should be permanently established.

At places, such as may be some of Colonel Walker's stations, not judged suitable for permanent tide gauges, tide gauges set up and kept in action for a term of two years would give results very valuable, both practically and scientifically.

When the subject is brought before the Indian Council, it ought to be pointed out that the British Association has already spent 1,000*l.* to prepare for this work, and that the results developed with this assistance, in the course of eight years by the Tidal Committee first appointed in 1867, and re-appointed from year to year, are now thoroughly available for practical application.

It should also be explained that the tide-predicting machine constructed by aid of an additional expenditure of 200*l.* granted by the Association at its last meeting, is to be placed in the South Kensington Museum, with such arrangements undertaken by the liberal co-operation of the authorities there as shall render it available for public use, so that by it a complete tidal curve may be drawn for years in advance for any port for which the data derivable by the harmonic analysis from observations have been obtained.

ORDER.—Ordered that a copy of the foregoing be forwarded to the Governments of Madras, Bombay, and Bengal, and to the Chief Commissioner of British Burmah,

*Proceedings of the Madras Government, Public Works Department,
4th April 1876.*

in the Public Works Department, with request that they will report what arrangements they consider desirable for giving effect to the Secretary of State's wishes, accompanying their report with full details of the expenditure involved.

Ordered also that a copy of the despatch and its enclosure and of this Resolution be forwarded to the Revenue, Agriculture, and Commerce Department for information.

(Signed) C. H. DICKENS, Col., R.A.,
Secy. to the Govt. of India.

No. 57. ORDER THEREON, 4th April 1876, No. 884.

CIVIL WORKS, No. 2.

HIS GRACE the Governor in Council considers that the ends in view will be most satisfactorily attained by placing

the operations under the undivided charge of Captain Taylor in the Marine Department who will arrange them on a uniform system.

2. That officer will be instructed to arrange for tidal observations at—

- | | |
|------------------------------|--|
| 1. A part of Ganjam. | 7. Tuticorin. |
| 2. Cocanada. | 8. Alleppee or Quilon (with the concurrence of the Maharajah of Travancore.) |
| 3. Nursipore or Masulipatam. | 9. Cochin. |
| 4. Madras. | 10. Beypore or Calicut. |
| 5. Negapatam. | 11. Mangalore. |
| 6. Paumben. | |

3. An estimate of the probable annual outlay should be prepared for sanction, and supply of funds by the Government of India.

(True Extract.)

Colonel,
Offg. Under Secy. to Govt., P.W.D.

To the Marine Department.

Exd. T. O'Connor.

Spare Copies

at Madras where Mr
May can do what is
required.

Wm. C. C. C.

Commander Major General A. C.
Secretary to Government.
S. H. C.

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P. W. Dept Carell N. K.
N^o 884

Proceedings of Madras
Govt
under date 4th April 1876.

Govt. of India

Read the following
H. R. no

His Grace the Governor
in Council considers
that the ends in
view will be most
satisfactorily attained
by placing the operations
under the undivided
charge of ^{Captain Taylor in the} ~~one~~ ^{officer}
~~Marine Department~~
who will arrange
them on a uniform
system.

Captain Taylor
in the Marine
Dept.

2. That officer will
be instructed in the
Marine Department
to arrange for tidal
observations at

1. Dept of Ganjam
2. Coarale
3. Suripora or Masuli
petam
4. Madras
5. Neja-petam
6. Paumkun
7. Pattearim
8. Aleppes, or Sillon
(with the concurrence of
the Maharajah of
Ranancore)
9. Cackin
10. Byfere or Calicut
11. Mangalore
12. A further estimate of
the probable annual
outlay should be
prepared for sanction,
and supply of
funds by the
Government of India.

Mr

Marine Dept

Decr 22-11-76

21228

Govt. of 1876 
 PUBLIC WORKS.

11/1/76
H. Maine Rpt

11th Feb. No. 894

Dec. 50/7

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Indian Seal — Setting
Order on Pros. of the Fort
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San Fran. 27-1-76