ACCURACY OF TIDE PREDICTIONS

The Tidal Section of the Survey of India has published in the yearly Geodetic Reports some very interesting information regarding the empirical corrections to Tidal Predictions and to the accuracy of these predictions.

We give below, as an example, the table taken from the Geodetic Reports 1938 of the Survey of India, concerning the corrections applied to the predicted times and heights at Chandbali for 1939. These empirical corrections are based on the actual tides of recent years. For instance, with regard to the table which we reproduce, the corrections are based on the mean fortnightly results of the comparisons between the predicted and actual times and heights from 1st May 1931 to 30th April 1932, combined with observations taken between 1st April 1933 and 30th April 1935.

The Survey of India publishes similar tables for the predictions of Shortt Island, Dublat, Calcutta, Chandbali, Chittagong and Rangoon. They are to be found in the Geodetic Reports of the Survey of India.

The Survey of India also publishes, with regard to the accuracy of Predictions of the Tidal Section, a table showing the maxima errors found in the predicted heights of low water at ports where actual observations are available. For instance, the table which we reproduce below gives the greatest errors in the predicted and actual heights of low water during 1937 for several Indian Ports.

Greatest differences between the predicted and actual heights of low water during 1937.

Port	Predicted minus actual	Date	REMARKS
	feet		
Aden ...	+0·8	Aug. 9.	
Karáchi ...	+0·9 −0·9	June 18. ⎫ Nov. 8. ⎬	
Bhávnagar ...	−4·4*	April 13.	
Bombay ...	+1·1	July 12.	
Vizagapatam ...	+1·1	July 29.	
Dublát ...	−2·8	Sept. 28.	Riverain port.
Calcutta (Kidderpore)...	−2·7	Sept. 29.	do. do.
Chittagong ...	−3·6	Aug. 10.	do. do.
Akyab ...	−1·9	Dec. 2.	
Rangoon ...	+2·1	Nov. 5 & 6.	Riverain port.

* The mean range of the ordinary spring tides at this port is 31½ feet.

The Tidal Section also issues detailed results for the comparison of the predicted and actual values.

Corrections applied to the predicted times and heights
at Chāndbāli for 1939.

Month		Tide	Corrections	
			Time	Height
			Minutes	*feet*
January	...	H. W.	+ 20	0·0
		L. W.	+ 35	— 0·5
February	...	H. W.	+ 20	0·0
		L. W.	+ 40	— 0·5
March	...	H W.	+ 25	0·0
		L. W.	+ 40	0·0
April	...	H. W.	+ 30	+ 0·5
		L. W.	+ 40	0·0
May	...	H. W.	+ 25	+ 0·5
		L. W.	+ 35	— 0·5
June	...	H. W.	+ 15	0·0
		L. W.	+ 30	0·0
July	1–15	H. W.	— 10	+ 0·5
		L. W.	+ 25	0·0
	16–31	H. W.	0	0·0
		L. W.	+ 25	0·0
August	...	H. W.	— 10	0·0
		L. W.	+ 25	0·0
September	1–15	H. W.	0	— 0·5
		L. W.	+ 35	0·0
	16–30	H. W.	— 15	— 0·5
		L. W.	+ 35	0·0
October	...	H. W.	0	— 0·5
		L. W.	+ 35	— 0·5
November	...	H. W.	+ 15	0·0
		L. W.	+ 35	— 0·5
December	...	H. W.	+ 20	0·0
		L. W.	+ 30	— 0·5

Mean errors E_1* and E_2* for 1937.

CALCUTTA (KIDDERPORE)

PERIOD 1937	E_1* H.W. Time +	E_1* H.W. Time −	E_1* H.W. Height +	E_1* H.W. Height −	E_1* L.W. Time +	E_1* L.W. Time −	E_1* L.W. Height +	E_1* L.W. Height −	E_2* H.W. Time	E_2* H.W. Ht.	E_2* L.W. Time	E_2* L.W. Ht.	30 min H.W.	30 min L.W.	1·0 ft H.W.	1·0 ft L.W.
Jan. 1-15	2·1			0·2	7·2			0·1	9·7	0·4	12·3	0·5	1	2	0	0
16-31		0·8		0·1		10·0		0·3	7·3	0·2	12·0	0·5	0	0	0	0
Feb. 1-15	2·6			0·3	1·8			0·1	8·3	0·3	13·1	0·3	0	3	0	0
16-28		1·8		0·0		11·0		0·4	9·8	0·4	12·2	0·5	0	0	0	1
Mar. 1-15	2·1			0·0		2·3		0·1	9·0	0·3	11·3	0·3	2	1	0	0
16-31		2·2	0·2			12·1	0·0		9·8	0·5	12·8	0·2	0	2	0	0
April 1-15		10·8	0·7			20·5	0·3		15·2	0·8	21·1	0·4	1	1	10	0
16-30		14·4	0·5			13·1		0·1	14·8	0·5	14·4	0·2	4	8	0	0
May 1-15		2·7		0·2		8·8		0·3	9·5	0·3	13·9	0·3	0	0	0	0
16-31		3·9		0·5	1·8			0·8	11·6	0·5	9·3	0·8	1	1	0	7
June 1-15		1·5		0·2		12·8		0·4	9·0	0·4	13·4	0·5	0	0	1	2
16-30	0·8			0·5		4·3		0·2	9·1	0·5	9·0	0·4	0	1	1	0
July 1-15		10·7	0·5			13·3	0·2		14·0	0·6	13·5	0·4	3	1	2	2
16-31		8·7	0·5			4·4		0·0	9·8	0·7	10·7	0·3	2	1	7	1
Aug. 1-15		7·8	0·3			1·6		0·1	11·7	0·6	11·6	0·4	1	1	4	2
16-31	1·4			0·3		1·2		0·4	6·6	0·4	12·0	0·4	0	4	2	0
Sept. 1-15	5·9			0·7	4·1			0·7	9·4	0·7	13·7	0·7	1	3	2	3
16-30		12·0	0·1			21·1		0·4	12·7	0·4	22·6	0·4	0	2	3	2
Oct. 1-15	2·1			1·2		7·1		1·4	10·4	1·2	16·1	1·4	2	2	13	21
16-31		3·7		0·7		21·4		1·2	10·1	0·7	21·4	1·2	2	2	7	16
Nov. 1-15		9·0	0·6			9·0		0·1	10·4	0·6	10·3	0·2	1	0	1	0
16-30		8·8	0·4			16·2	0·0		11·6	0·4	16·7	0·3	0	2	0	1
Dec. 1-15		3·0		0·3		2·6		0·4	9·1	0·4	11·1	0·4	0	0	0	2
16-31	0·7			0·4		7·6		0·2	11·0	0·4	10·7	0·4	0	1	0	0
TOTALS ...	17·7	101·8	3·8	5·6	14·9	200·4	0·5	7·7	249·9	12·2	325·2	11·4	21	33	53	60
MEANS ...	−3·5		−0·1		−7·7		−0·3		10·4	0·5	13·6	0·5				

* E_1 is with regard to sign: E_2 is without regard to sign.

† One-tenth of the mean range of the ordinary spring tides is 1·2 feet.

In the Geodetic Reports for 1938, the tables of the mean errors for 1937 are given for the ports of Aden, Karachi, Bhavnagar, Bombay, Vizagapatam, Dublat, Calcutta, Chittagong, Akyab and Rangoon. As an example, we give on the opposite page the data for predictions relative to Calcutta (Kidderpore). The value E_1 represents the error with regard to sign; the value E_2 is without regard to sign.

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