

by means of a constant difference in time. This leads to serious error, chiefly because of the large diurnal inequality in the tides in this strait.

In *Belcher's Almanac*, which is extensively used throughout the provinces bordering on this strait, a tide table for Pictou is given. A comparison was made for the month of July, 1896, between the time of high water in this table, and the tide at Pictou as recorded on a self-registering gauge. The result shows the following wide range of error in this tide table:—

Extreme variation between the time of H. W. as given, and the actual time as observed: 1 h. 13 m. early to 1 h. 35 m. late.

Average error in the tables during this month, 45 minutes.

Tide Tables of U.S. Coast Survey.—In these tables, the tide at Pictou is referred to Sandy Hook at the entrance to New York harbour. The difference for the time of high water at Pictou, as revised in 1896, is given as 2 h. 34 m. to be added to the time at Sandy Hook. A comparison was made for a period of one month, July 16 to August 16, 1897, between the time of high water at Pictou computed in this way, and the time as there observed, with the following result:—

Extreme variation between the time of H. W. as found by this method, and the actual time as observed: 1 h. 45 m. early to 1 h. 11 m. late.

Average error during this month, 38 minutes.

In both these instances, it is the method used that is at fault; because it is not possible to refer the tides of Northumberland strait to an Atlantic port by a *constant* difference in time, without a large error resulting; on account of the essential difference in the nature or type of the tide. This is clear from the following table, which gives the error in the time of individual tides, when computed by the method given in the United States tables. The alternation from early to late, is a feature of diurnal inequality, which is most conspicuous when the moon's declination is high.

TIDES AT PICTOU, N.S. (Northumberland Strait.)		ERROR IN THE TIME OF HIGH WATER.		Moon's declination.
		Early.	Late.	
1897.	Sun., July 25; afternoon.....	1 34		Maximum north; on 25th.
	Mon. " 26; morning.....		1 11	
	" " 26; afternoon.....	1 42		
	Tues. " 27; morning.....		0 40	
	" " 27; afternoon.....	1 22		
	Wed. " 28; morning.....		0 43	
	" " 28; afternoon.....	1 23		
	Thurs. " 29; morning.....		0 14	
	" " 29; afternoon.....	1 21		

Tidal Survey tables.—After observations of the tide were obtained in this region in the summer of 1896, a number of trial calculations were made, to arrive at the best method by which the above source of error could be avoided. The method above indicated was finally adopted. The improvement thus obtained appears from a comparison made for the month of August, 1897; in which the time of high water as now calculated for the Tidal Survey tables, is compared with the tide as observed at Pictou. In the following summary of the result, three tides which are disturbed by the wind are omitted.

Extreme variation between the predicted time of H. W. in the tide tables, and the actual time as observed: 35 m. early to 30 m. late.

Average variation during this month, 15 minutes.

This shows an improvement in accuracy of 61 per cent as compared with the United States tide tables, and an improvement of 67 per cent as compared with *Belcher's*