

OBSERVATIONS OF TIDES AND CURRENTS IN THE SUMMER SEASON OF 1901.

Summer stations in Northumberland Strait and Cabot Strait.—It has already been ascertained, that the tides in Northumberland Strait can best be calculated from the principal tidal station on St. Paul Island; and that for the Strait itself, Pictou is the best harbour of reference. The method adopted is therefore first to compute tide tables for Pictou by means of two series of variable differences from St. Paul Island, the series for high and low water being distinct from each other; and the variation being in accordance with the moon's declination, in the period of the draconitic or declination-month. (See Report of Tidal Survey, Dec. 1898, page 9.) From the Pictou tide tables, those for Charlottetown are next calculated by means of a constant difference of time, and tidal differences from Pictou are also given for other ports throughout the Strait.

The data for the main calculation for Pictou were obtained in 1896 and 1897, when the moon's declination had its maximum range. A further analysis of the differences in terms of the degree of declination was made, to allow for the diminished range in succeeding years; but the result was not sufficiently definite to be trustworthy. The present year was eminently suited however to obtain the supplementary observations required for the purpose; as the range of the moon's declination is now at its minimum, having arrived at exactly the opposite extreme since 1896. Better comparative data between Charlottetown and Pictou will also be secured by this season's observations.

The observations at Pictou were begun as early in the season as possible, the first record being secured on May 20. The gauge at Charlottetown was erected a few days later; and observations at Summerside, in Bedeque Bay, were begun on June 12. These last are intended to secure accurate tidal data for that port; as tide tables have already been published locally by the newspapers there, which are far from accurate. To meet the need, a preliminary result from one month of observations has been worked out immediately, in time to issue with the tide tables for 1902.

To show also the immediate advantage often resulting from tidal observations, it may be mentioned that the Engineers of the Hillsborough bridge now under construction, were taking special observations on a tide scale to ascertain the extreme range of the tide. When they found that the complete tide curves were being secured by this Survey on a self-registering gauge, these special readings were discontinued, and the desired values were supplied during the season by this Survey. The saving thus affected to the advantage of the bridge work, would amount to a large proportion of the outlay made by this Survey for the tidal observations secured at Charlottetown this season.

The object of the tidal observations in Cabot Strait was to obtain comparisons with St. Paul Island in case of any accident to that station, which is always possible because of its extremely exposed position. With this object, registering gauges were placed in Sydney harbour and at Port aux Basques, at the corner of Newfoundland near Cape Ray. It was found, however, that the character of the tide at Sydney was so exceptional, that it was not comparable with St. Paul Island; and accordingly, after one complete month of record had been secured there, the gauge was removed to Neil's Harbour, a point on the Atlantic side of Cape Breton Island, as near as practicable to its northern extremity.

The record secured in Sydney harbour will be valuable in determining a tidal difference for that port; and thus, also, in affording a check upon the tidal differences along the Atlantic coast of Nova Scotia eastward from Halifax. The City datum at Sydney was carried onward by instrumental levels, as far as the site of the gauge; which was placed at the Intercolonial Railway wharf, at Battery Point in the South Arm; and this will furnish the value of low water and mean sea level with reference to the City datum itself.

The two gauges at Neil's Harbour and Port aux Basques have afforded a comparison during several months which is simultaneous with the record at St. Paul Island. Port aux Basques is fairly well sheltered, but Neil's Harbour is only a harbour in name, as it has practically no protection from the open Atlantic; and much trouble was experienced in consequence from wave motion, notwithstanding the precautions taken to prevent this from complicating the recorded tide curves. It is proposed, however, to construct a break water there during the coming season, which will make it a more suitable locality for

future observations at distances of these 68 miles eastward.

A well established station affords a definite base for the Gulf area from the Strait, which gives rise to as far up as tidal stations from their original base.

The amount of tidal differences at these localities, was as follows:

St. Paul Island
Pictou
Charlottetown
Summerside
Sydney
Neil's Harbour
Port aux Basques

These stations were established to secure a definite base for their construction. Great care was taken in their construction. Great care was taken in their construction. Great care was taken in their construction.

Time.—At Pictou, the tide was obtained by means of a self-registering gauge. At Charlottetown, the tide was obtained by means of a self-registering gauge.

At Sydney, the tide was obtained by means of a self-registering gauge. At Port aux Basques, the tide was obtained by means of a self-registering gauge.

Levels.—At Charlottetown, the tide was obtained by means of a self-registering gauge. At Sydney, the tide was obtained by means of a self-registering gauge.

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