

*Campobello Island.* (At Welchpool.)—From August 11 to November 14; affording 76 differences for H. W. and 162 for L. W.

*Windsor, N.S.*—From August 18 to October 12; affording 88 differences for the time of H. W.

*Parrsboro'.*—From July 24 to October 13; affording 148 differences for the time of H. W.

*Hopewell Cape.*—From July 30 to November 15; affording 203 differences for the time of H. W.

*Moncton.*—From August 11 to November 18; affording 180 differences for the time of H. W.

*The Bore.*—A number of observations of the time of arrival of the tidal bore at Moncton, were also secured, by the method of siphoning into a tide-well from the low-water channel of the river, as described in the last report. The arrival of the bore was thus recorded automatically on the tide gauge. The time as thus recorded was carefully compared and checked, by means of such direct observations as were obtained during the season; and any that were affected by irregularity in the working of the siphon, were thrown out. A set of 145 reliable observations was thus obtained; extending from August 24 to November 14.

It was discovered that the relation with the tide at St. John is more nearly constant, if the difference in time is taken between the arrival of the bore at Moncton and the *next following* high water at St. John. This is the more natural way, as the arrival of the bore corresponds in time with half tide at Moncton; and the following high water at St. John is caused by the summit of the same tidal undulation.

The differences given below are in standard time, and thus show the true differences in absolute time. They are derived from a tabulation of the observations in accordance with the moon's phases.

Time of arrival of the bore at Moncton, before the time of high water at St. John; from 145 observations:—

At Spring tides, 2 h. 09 m.

At Neap tides, 2 h. 33 m.

Average throughout the month, 2 h. 21 m.

It may be interesting to note that from twenty-three occasions during the season, on which the arrival of the bore was directly timed, the average value found was the same as above; namely, 2 h. 21 m. before high water at St. John.

This determination enables the time of the arrival of the bore to be found from the St. John tide tables. The difference between the values for spring and neap tides respectively, serves also to show the relation between the vulgar and the mean Establishment. This is a valuable indication with regard to the nature of the tide throughout the Bay of Fundy; being derived from observation at the extreme head of the bay.

*Tidal differences.*—The results obtained for the ports at which the tidal stations were placed, have been published as a slip accompanying the tide tables for 1900, already issued. In addition to the tidal differences which enable the time of the tide to be found, the available draught of water at spring and neap tides is given, for points in the upper part of the bay.

A more complete set of tidal differences for the whole Bay of Fundy will be prepared before the next tide tables are printed; based upon a comparison with the Establishments as already determined by the Admiralty for intermediate points. The observations now obtained, afford a valuable check upon these; and place the time of the tide throughout this bay upon a reliable basis.

The importance to navigation of a correct knowledge of the tide in this bay is evident, when the range of the tide is so great. In the upper part of the bay, navigation may be said to be entirely dependent on the tide, as the wharves do not extend beyond the half-tide mark, and vessels can therefore only reach their berths at high water.

I have the honour to be,

Your obedient servant,

W. BELL DAWSON,

*In Charge of Tidal Survey.*